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Prevalence Rates, Profile, and Outcomes for Federally Sentenced Offenders with Cognitive Deficits

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Prevalence Rates, Profile, and Outcomes for Federally Sentenced Offenders with Cognitive Deficits

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Executive Summary

Key words: c*ognistat, offenders, cognitive deficits, recidivism*

Impaired cognitive function, variously defined, has been found to be associated with criminal behaviour. Until recently there has been no systematic method for estimating the prevalence of cognitive deficits within the Correctional Service of Canada (CSC) population or the extent to which such deficits may impede progress towards completion of offenders' correctional plans and the impact they could have on their correctional outcomes. This study estimated the percentage of incoming men offenders with cognitive deficits, profiled these offenders to assess the association of cognitive deficits with other offender characteristics, and examined the impact that cognitive deficits have on correctional outcomes such as institutional charges, admissions to segregation, correctional program completion, and success on release.

Over 14 consecutive months, 527 incoming offenders in the Regional Reception and Assessment Centre (RRAC) in the Pacific region were approached to participate in an assessment of cognitive function using the Cognistat. In total, 93% of offenders who were approached consented to participate in the study (N = 488). Results indicated that 25% of these offenders had some level of cognitive deficit (21% of non-Aboriginal offenders and 38% of Aboriginal offenders). Factors theoretically related to cognitive function such as lower levels of educational achievement, unstable employment history, learning disability, and symptoms of attention deficit hyperactivity disorder (ADHD) were associated with the presence of cognitive deficits in this sample. The findings indicate that cognitive deficits as measured by the Cognistat have an impact on some areas related to successful function in the community. Offenders with cognitive deficits were significantly more likely to have admissions to segregation and served a significantly larger proportion of their sentences incarcerated before release. Cognitive deficits were not significantly related to institutional charges, completion of required correctional programs, returns to custody for any reason, or returns to custody with an offence.

Further analysis did not demonstrate a significant relationship between offenders serving a current sentence for a violent offence and level of cognitive deficits. While offenders with cognitive deficits were more likely to have serious alcohol problems, they were not more likely to have significant problems with drugs. This finding is consistent with the literature which indicates that a relationship exists between serious alcohol abuse and impaired cognitive function. Although offenders with deficits appeared to have higher overall criminal history risk and criminogenic need ratings, this difference was not significant. Apart from the association of deficits with symptoms of ADHD, a diagnosis for a mental health disorder was not related to the presence of cognitive deficits.

From an operational point of view, these results indicate that offenders with cognitive deficits may require assistance with educational upgrading and employment to improve their reintegration potential. The association of these deficits with ADHD suggests that interventions like those exemplified by correctional programs that teach skills to manage impulsivity and poor planning may also be beneficial to offenders with cognitive deficits.

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Introduction

There is now an established literature demonstrating that impaired cognitive functioning plays a role in criminal behaviour (Farrington, 1992; Moffitt, 1993; Raine, Moffitt, Caspi, Loeber, Stouthamer-Loeber, & Lynam, 2005). Cognitive functioning is a broad term which encompasses essential areas of brain function such as orientation (to person, location, and time), attention, language, constructional skills, calculations, memory, and reasoning and may also include mental tracking, spelling, reading, spatial memory, story paragraph memory, executive functioning, and processing speed (Mueller, Kiernan, & Langston, 2011). Although there is often an overlap among individuals with impaired cognitive functioning and lower intelligence or intellectual disabilities, these problems are not equivalent. People with intellectual disabilities are considered to be those who have significant difficulty with social and adaptive functioning due to a long-term condition (Hayes & McIlwain, 1988). Generally, an IQ below 70 as measured by a standardised test of intelligence is regarded as a significant level of intellectual impairment while an IQ of 70-80 is within the borderline range. Individuals may, however, test within an average range of IQ and still manifest limitations due to specific cognitive deficits. Learning disabilities, for example, are defined by a marked discrepancy between IQ and educational achievement. Cognitive deficits, specifically those that affect executive planning abilities, may be evident with IQs within the average range (e.g., Leeson, Barnes, Harrison et al., 2010). Executive function abilities involve attention control, strategic goal planning, abstract reasoning, cognitive flexibility, hypothesis generation, and the ability to organize and adaptively use information contained in working memory (Morgan & Lilienfeld, 2000).

Estimates of the prevalence of cognitive deficits in offender populations vary widely due to the heterogeneity of the definitions used to describe cognitive impairment and the range of measures used to assess it. In addition, a number of factors make it difficult to compare prevalence rates among offenders with those of the general population. For example, there is a more restricted range of intellectual ability within the offender population given that offenders with most serious intellectual impairment are diverted from the correctional system or are too impaired to be involved in criminal activity. Furthermore, age-associated cognitive deficits should also be rarer in offender populations since the mean age of offenders is relatively young. For example, the mean age in Correctional Service Canada (CSC) is 34 years and only 3% of the incarcerated federal offender population in Canada are over 65 years old (CSC, 2012), compared

to 14% of the Canadian population (Statistics Canada, 2011). Age-associated cognitive deficits for individuals over 60 years old has been estimated at rates from 12% to 19% (15% having cognitive impairment without dementia and 4% having cognitive impairment with dementia) in two well-controlled population-based studies (Ritchie & Artero, 2001; Rodriguez-Sanchez et al., 2011).

It is important to note that cognitive impairment among offenders may not have occurred in the developmental period (Hayes & McIlwain, 1988). For example, acquired impairments may be related to drug and alcohol abuse which is higher among offender populations (Weekes, Moser, Ternes, & Kunic, 2009). Studies have found that most alcoholics exhibit at least mild-to-moderate deficiencies in intellectual functioning, the most prevalent of which are problems in visuospatial abilities and higher cognitive functioning (Parsons, 1998) and disruption of long-term memory (White, 2003). Long-term use of cocaine has also been associated with cognitive deficits, specifically those linked to problems in executive function and impulsivity (Garavan & Hester, 2007). Additionally, there is evidence that concurrent use of alcohol and cocaine produces an additive negative effect on the brain (Bolla, Funderburk, & Cadet, 2000). Also, as noted, psychiatric conditions are higher among most offender populations than in the general population (Motuik & Porporino, 1991), and medications to address these conditions may contribute to impaired cognitive function (Visser, 2006).

Another important cause of cognitive deficits in offender populations is traumatic brain injury (TBI). TBI is defined as brain injury caused by either a blunt or penetrating impact to the head or the force of sudden deceleration (Halldorsson et al., 2012). There is recent evidence that rates of TBI are higher than had been believed within the non-offender population and present long-term public health risks (Halldorsson et al., 2012). Acute TBI is associated with the following symptoms: decreased level of consciousness, amnesia, neurologic or neuropsychological abnormalities, skull fracture, intracranial lesions, or death. Long-term effects include impaired intellectual functioning, judgment, and problem solving (Lezak, 1995). Importantly, for offender populations, TBI and related executive function deficits are implicated in aggressive, impulsive, and erratic behaviour (Lezak, 1995; Paschalla & Fishbein, 2002). Damasio, Tranel, and Damasio (1990) have gone so far as to label a constellation of personality changes produced by frontal lobe damage as "acquired sociopathy." Broomhall (2005) found evidence for brain impairment among subgroups of violent offenders who demonstrated impulse

control problems. He found that the primarily reactive group of violent offenders showed cognitive impairment while those who were primarily instrumentally violent, simply "choose not to control their behaviour." Recent estimates in the US suggest that the rate of TBI in the American population is about 8.5%, while among offender populations, the rate is seven times higher at about 60%, (cited in Harmon, 2012). It should be noted, however, that these estimates vary in individual studies depending on the procedures used to measure TBI.

Although the literature is consistent in identifying cognitive deficits as a factor related to criminality, the relationship between IQ and crime is more ambiguous. A large scale analysis of ten surveys from four countries assessing offenders' intellectual ability found that 0 to 2.8 had IQs below 70 as measured using standardised tools (Fazel, Xenitidis, & Powell, 2008), a rate in line with estimates based on the general population where 2% are expected to score below two standard deviations below the mean (ARC, 2012). The researchers noted that screening tools tend to provide higher estimates of impairment than full scale assessments. Smaller studies on specific offender populations have sometimes found much higher rates of cognitive impairment than the larger studies. Hayes (1997), for example, who studied the prevalence of intellectual disability amongst individuals appearing before courts in New South Wales, found the prevalence to be around 30%.

Nestor (1992) concluded that while violent offenders do not necessarily commonly meet criteria associated with intellectual disabilities, they have lower IQ scores than those of the general population. The 2009 *Handbook of Crime Correlates* stated that reviews have found that around eight IQ points, or 0.5 standard deviation, separate offenders from the general population, especially for persistent serious offenders (Ellis, Beaver, & Wright, 2009), although it should be noted that this score still places offenders within the average range of IQ. An American Psychological Association report stated that the correlation between IQ and crime was -0.2 (APA, 1995) and debated whether this association was meaningful. There is evidence that higher IQ may be a protective factor buffering at-risk youth against future criminality and that the corollary is also true: lower IQ may be a criminal risk factor (Shader, 2003). Farrington (1992), analysing longitudinal data on boys followed from age 8 to 32, noted that a third of those with IQs of under 90 at ages 8-10 later became convicted juvenile offenders, twice as many as those with IQs above 90. Lower IQ was one of several robust predictors of persistent adult criminality after age 21 among boys 8-10 years old. Morgan and Lilienfeld's (2000) meta-analysis of studies

examining the relationship between antisocial behaviour and problems in executive functioning found that, on average, those with histories of antisocial behaviour scored 0.62 standard deviations worse than those without antisocial histories on standardised measures of executive function. The authors did acknowledge the problems with variable measurement tools and definitions across the studies. Moffitt has identified two groups of offenders, one of whom engaged only in crime during adolescence (adolescent-limited), and a second, smaller group that engaged in crime throughout their lives (Moffitt, 1993a). She attributed this life course pattern of antisocial behaviour to developmental neuropsychological problems that interact with a criminogenic environment, culminating in an antisocial personality (Moffitt, 1993b). Further research, however, has also linked adolescent-limited criminality to cognitive impairment (Raine et al., 2005). Cullen, Gendreau, Jarjoura, and Wright (1997) argue that while some aspects of the research are contentious, researchers should accept that, "IQ is a criminogenic factor, and, thus, is an individual difference that must be included in theories of crime causation" (p. 403).

There is limited evidence that offenders involved in some types of crime may be more likely to suffer from cognitive impairments. Sex offenders and arsonists, for example, have been noted among those offence groups with higher rates of cognitive impairment (Simpson & Hogg, 2001). A study of 2,280 male sex offenders, however, found that sex offenders were generally of average intelligence and that the intellectually disabled were not over-represented among them (Langevin & Curnoe, 2008). The authors did find that learning disabilities were over-represented. A review of studies of intelligence among sex offenders over a 70-year period also found that sex offenders did not have lower IQs than non-sex offender comparison cases. The majority of the studies showed average intelligence for the group, with an overall mean IQ of 94.2 (Cantor, Blanchard, Robichaud, & Christensen, 2005). Baxter, Motiuk, and Fortin (1995) noted that any degree of cognitive impairment will increase the risk for criminality due to its association with problematic interpersonal relationships and poorer academic achievement which exacerbate existing maladaptive traits and further compromise prosocial adjustment.

There has been very little research establishing the rate of cognitive impairment among offenders in the federal Canadian offender population. Endicott's (1991) review claimed that intellectual disabilities are more prevalent among inmates of Canadian correctional facilities than among the population at large although the sources of this conclusion were not well-established. Using a diagnostic clinical interview format, a mental health survey of Canadian federal

offenders found a 4.3 % lifetime prevalence rate of organic brain syndrome (Motiuk & Porporino, 1991). Another Canadian study compared the results of neurological and intellectual assessments of over 500 offenders at a maximum security psychiatric penitentiary to non-psychiatric controls and non-offender psychiatric patients (Marceau, Meghani, & Reddon, 2008). The researchers found that, while the mean IQ of offenders was within the average range at 94, a substantial group was found to have scored more than one standard deviation below the mean of non-psychiatric controls. Offenders also manifested a number of neurological deficits on several measures relative to controls. Hancock, Tapscott, and Hoaken (2010) studied 77 offenders at a medium security penitentiary in Canada and found that they scored below the mean of the normative sample on several tests of executive functioning. The authors concluded that offenders had a relative weakness in areas related to executive function compared with the general population. In particular, they found a relationship between violent offending and deficits in executive function. Another recent study of 91 federal Canadian offenders in one penitentiary examined the rate of fetal alcohol syndrome disorder (FASD). The results showed that, while fewer than 10% of offenders met the criteria for a diagnosis of FASD, over 70% of their sample had shown some form of cognitive deficit (MacPherson, Chudley, & Grant, 2011).

For those offenders who have more severe cognitive deficits, the correctional environment can be especially challenging. Difficulties understanding and abiding by institutional rules, including correctional program components with considerable literacy requirements, and vulnerability to victimisation and exploitation are some of the concerns that could make the experience of incarceration more difficult for offenders with cognitive deficits (Endicott, 1991). There is some evidence that problems in executive functioning may impair offenders' ability to respond to correctional programming as measured by program completion and treatment readiness, responsivity, and gain (Fishbein et al, 2009).

In summary, while there is inconclusive evidence suggesting offenders have lower intellectual function than non-offenders as assessed by standardized IQ measures, there is reliable evidence that offenders are more likely to manifest specific cognitive deficits. In particular, there is evidence of increased rates of learning disabilities, ADHD (Usher, Stewart, Wilton, & Malek, 2010), and impairments in executive function related to planning and impulse control (e.g., Moffitt, 1993b; Morgan & Lilienfeld, 2000).

In CSC, provision of programming specifically structured to address the needs of lower

functioning offenders has been in place in some institutions for several years and an electronic resource provides on-line reference material and advice to staff working with offenders with cognitive deficits. Until recently, however, offenders were not routinely screened for low cognitive function or for more specific cognitive deficits. The Cognistat, a brief cognitive screening instrument designed to detect the presence of organic-cognitive impairment (Kiernan, Mueller, & Langston, 1995), was used in a pilot conducted in Pacific region. The purpose of the pilot was to assess whether the Cognistat could be adapted as a screening tool that could eventually be integrated into the Computerised Mental Health Intake Screening System (CoMHISS) that assesses all incoming federal offenders.

The present study examines the prevalence of cognitive deficits, as measured by the Cognistat, among a sample of incoming federal men offenders in the Pacific Region. The study provides an estimate of the prevalence of cognitive deficits among men at the time of reception and examines the relationship of levels of deficits to key profile variables and correctional outcomes including institutional misconducts, admissions to segregation, performance in correctional programming, and success on release. We hypothesized that: 1) offenders with deficits would have poorer outcomes with respect to correctional program participation, institutional behaviour (i.e., institutional infractions), and success upon release relative to those with no deficits; and 2) higher levels of deficits would be associated with histories of lower educational attainment, evidence of learning disability, job instability, substance abuse, and mental disorders. The efficacy of including the Cognistat as part of the mental health screening process in CoMHISS was also examined.

Method

Participants[1]

Federally sentenced men newly admitted to the Pacific region's Regional Reception and Assessment Centre (RRAC) over a 14-month period during 2006-2007 were asked to participate in this study. In total, 527 men were approached to complete the Cognistat after having signed a consent form. Of these, 7% (39 offenders) either refused or produced invalid results. A total of 488 men completed the Cognsitat. The mean age of the participants in the sample was 34 years old (SD = 9.94). The length of sentence for the group averaged 3.5 years (SD = 2.02).

Typically, over a 12-month period, CSC receives nearly 5,000 offenders with new sentences. Previously, we compared the profiles of offenders admitted at RRAC to all other new admissions to CSC during the same time period (Stewart, Wilton, & Malek, 2011). This sample from RRAC is the same one that was assessed on the Cognistat in the current study. Generally, there was no consistent pattern of differences between the offenders admitted to RRAC compared to the offenders admitted to reception centres in the other four regions in CSC based on key profiling variables, although offenders admitted at RRAC had slightly higher criminogenic need ratings ($\chi^2(2) = 11.21$, $p < .01$). Based on these results, it was determined that this sample of offenders admitted and assessed at RRAC were representative of the population of new admissions to CSC during the time period examined.

Measures/Material

Cognistat. The measure of cognitive deficits used in the study was the Cognistat (formerly known as the Neurobehavioral Cognitive Status Examination). The Cognistat is a brief cognitive screening instrument designed to detect the presence of organic cognitive impairment (Kiernan, Mueller, & Langston, 1995). Participants are assessed individually by a trained assessor. In addition to the fundamental cognitive abilities of level of consciousness, attention, and orientation, Cognistat assesses five major abilities: language, memory, calculations, reasoning, and construction. Language is subdivided into comprehension, repetition, and naming,

[1] Parts of the following Methods section are extracted from a previous report that used the same sample of offenders to assess ADHD (Usher, Stewart, Wilton, & Malek, 2010).

and reasoning is subdivided into similarities and judgment. In a clinical setting, each area of intellectual functioning is measured as having no, mild, moderate, or severe deficits, and the resulting scores are plotted on a cognitive status profile intended to guide professional clinical judgment in diagnosis.

Englehart, Einstein, and Meininger (1994) found weak evidence for the Cognistat as a multi-dimensional assessment and instead proposed that is was a unitary, possibly attention-based general cognitive function measure. Research on the Cognistat has found that it has acceptable validity and reliability and can differentiate levels of impairment despite a skewed distribution toward high performance among community samples (Doninger et al., 2006). The researchers advise that the measure should be used in applications with samples showing considerable cognitive impairment.

Nabors, Millis, and Rosenthal (1997) examined the correlation of the Cognistat with established neurocognitive measures. The authors concluded that the subtests were significantly associated with standard neuropsychological measures of related cognitive constructs and therefore recommended the measure for making general statements regarding specific domains of cognitive functioning based on subtest scores. The measure has been used to successfully screen across cultures with adaptations for language and cultural content (Gupta & Kumar, 2009). Krajacich and English (1998), however, cautioned in their small scale study of adolescent Aboriginal substance abusers that the use of the Cognistat with this group demonstrated significant cultural biases on some language-based items.

For the purposes of the current study, scores on the subtests of Cognistat were not considered individually. Rather, total scores were generated across all area scores for each individual. These total scores were then used to assign membership in one of three study groups: 1) no or one mild deficit; 2) two mild or one moderate deficit(s); and 3) more deficits or at least one severe deficit.[2]

Profile information from the Offender Management System (OMS). Demographic information on the participants, as well as sentence information, criminal histories, criminogenic

[2] Group membership was determined in this manner in order to provide a holistic account of deficit levels across the sample. Offenders with no deficit or one mild deficit were collapsed into a single group as a reflection of the demographic similarities of these offenders. This grouping was supported by the developer of the Cognistat (Ralph J. Kiernan, Ph.D., personal communication, April 2012).

needs, substance abuse, institutional charges, admissions to segregation, correctional program participation, and releases from custody were drawn from the OMS, a comprehensive electronic record on all federal offenders. Key measures included in the analyses are described below.

Dynamic Factors Identification and Analysis (DFIA). The DFIA component of the Offender Intake Assessment (OIA), conducted on all offenders upon admission to CSC, assesses a variety of dynamic criminogenic needs grouped into seven domains including substance abuse, associates, attitudes, employment/education, marital/family, community functioning, and personal/emotional. Each domain consists of multiple indicators. The DFIA yields need ratings for each domain, as well as an overall level of criminogenic need of low, moderate, or high.

Risk assessment. The principal tool used for assessing criminal risk level in federal non-Aboriginal men offenders is the Statistical Information on Recidivism-Revised Scale (SIR-R1)[3]; Nafekh, & Motiuk, 2002) which is based on static risk factors.The final score provides an estimate of risk of recidivism from very good to very poor. In addition to this tool, the Static Factors Assessment (SFA) portion of the OIA provides comprehensive information pertaining to the criminal history and static risk factors of each offender yielding an overall level of low, medium, or high static risk (Motiuk, 1997). Based on analysis of the SFA and the SIR-R1, parole officers provide a structured professional judgment of overall risk rating of low, moderate, or high. CSC policy does not permit the use of the SIR-R1 for Aboriginal offenders. Therefore, for this study, the rating of risk for Aboriginal offenders is provided through the overall criminal history risk rating of the SFA only.

Education and learning disability. Offender education information was collected from several sources in OMS and included educational assessment information (e.g., documented levels from the community, educational assessment levels), CSC education program assignment information, and information on certificates/diplomas obtained while incarcerated. Information on learning disabilities was drawn from two sources: the DFIA indicator in the Employment/ Education domain, a dichotomous item that simply asks whether the offender has ever been told he had learning disability, and the learning disability flag that is raised as part of the educational intake assessment. Suspected learning disability is flagged if offenders report a school history of

[3]A more recently modified version, the Statistical Information on Recidivism-Revised One (SIR-R1), is currently used in place of the SIR.

learning problems or if the educational level is very low relative to estimates of intellectual functioning.

Mental health diagnosis. Mental health status diagnosis was measured by coding files for evidence of a mental health disorder diagnosed by a qualified mental health professional (registered psychologist or psychiatrist). A detailed description of this procedure and the coding manual can be found in Stewart et al. (2011). Inter-rater reliability for the diagnoses was conducted on 31 cases. There was an agreement rate of 93% and a *kappa* of .76.

Computerized Substance Abuse Assessment (CASA). The CASA is the part of the intake assessment that evaluates the extent of substance misuse and its relationship to offending. This assessment procedure includes the results of several well validated measures of substance misuse including the 20-item Drug Abuse Screening Test (DAST; Skinner, 1982) and the Alcohol Dependency Scale (ADS; Skinner & Horn, 1984). These instruments are applied to derive overall substance abuse scores and program referral recommendations.

Adult ADHD Self-Report Scale (ASRS). The ASRS (Kessler et al., 2005) was used to measure symptoms of ADHD. The ASRS is an 18-item self-report scale that screens for ADHD based on DSM-IV criteria. Each item is presented on a five-point scale ranging from "never" to "very often". The ASRS was developed in collaboration with the World Health Organization (WHO) for inclusion in their World Mental Health surveys (Kessler et al., 2005). Internal consistency of this measure has been reported as high with Cronbach's alpha coefficients of 0.88 to 0.89 (Adler et al., 2006). Concurrent validity is also high, with correlations of 0.84 between the ASRS and other ADHD rating scales, including the semi-structured clinical ADHD Rating Scale (ADHD-RS) and the semi-structured clinical interview for DSM-IV adult ADHD (Adler et al., 2006). The ASRS groups individuals into four categories of ADHD symptoms: none, low, moderate, or high.

Institutional charges. One measure of institutional adjustment used in the study is the rate of infractions. Institutional charges were identified from the institutional charges database in OMS. The database includes charges classified as minor (e.g., disobeys rules, being in a prohibited area) and serious (e.g., an incident that threatens the security of the institution, the staff, and other offenders such as assaults and fights, possession of contraband, and failing a urinalysis test).

Correctional programs participation. Information on program participation was drawn

from the database in OMS on program assignments. Information on completions and reasons for non-completion of correctional programs is provided in this database. Participation in all programs listed as nationally recognised correctional programs was counted in this analysis. Some offenders had enrolled in more than one program during the defined study period.

Placement in segregation. Within CSC there are two types of segregation placement: disciplinary segregation and administrative segregation. Disciplinary segregation is used to sanction inmates who have been found guilty of serious disciplinary offences within the correctional institution. Administrative segregation is used to maintain the security of the institution or the safety of any person. Placement in administrative segregation may be voluntary or involuntary. Voluntary placement is where the inmate requests a placement in administrative segregation and the institutional authority believes that the continued presence of that inmate in the general population might jeopardize the inmate's safety (Commissioner's Directive 709, Sec. 13). Involuntary administrative segregation may be imposed if it is determined that the inmate jeopardizes the security of the institution or the safety of any person; (2) where the continued presence of the inmate in the general population could interfere with an investigation that could lead to a criminal charge; or (3) where the presence of the inmate in the general population could jeopardize the inmate's own safety. Data on placements in voluntary, involuntary, and disciplinary segregation were taken from the administrative database of OMS.

Offence types. Index offences on the current sentence were examined in the profile of the offenders by categorizing offences into violent and non-violent offences. Violent offences include offences of homicide, robbery, physical assault, kidnapping, forcible confinement, and sexual assault. Non-violent offences include drug offences, property offences, and fraud.

Release outcomes. Data on outcomes on release were collected and recorded from the OMS database and from Canadian Police Information Centre (CPIC) files. The OMS database provides information on revocations of parole and statutory releases for violations of conditions and criminal offences up to the offenders' warrant expiry dates. CPIC files provide information on criminal offences resulting in convictions and sentences that fall outside of the federal jurisdiction. Coding of CPIC files allowed extending follow-up periods beyond warrant expiry dates.

Procedure/Analytic Approach

Staff members of the psychology department at RRAC administered the Cognistat one-on-one to all consenting participants. Results of the Cognistat measure were entered into a database by a mental health team staff member.

Differences between offenders based on level of cognitive deficits were analysed by two major categories: offender profile variables and correctional outcomes. Variables included in the offender profile category were age, race, length of sentence, current offence, marital status, education level, job history, risk, need, alcohol and drug problems, suspected learning disability, and mental health diagnosis. Chi-square tests of association and Analyses of Variance (ANOVA) were applied and effect sizes were used to determine the overall strength of association between variables. Cramer's *V* is used to measure the strength of association between two categorical variables. Values of .1 represent a small effect; values of .3 represent a medium effect; and values of .5 represent a large effect (Rea & Parker, 1992). Thus, only values of .1 or more were considered of substantive importance in the present results. R-squared, or the coefficient of multiple determination, is the proportion of variance in one variable explained by a set of independent variables and can be used as a measure of effect size for an overall model involving continuous variables. Values of .02 represent a small effect size; values of .13 represent a medium effect size; and values of .26 represent a large effect size (Cohen, 1988).

Rate calculations were used to compare the occurrence of offenders' institutional charges across groups. This type of analysis was appropriate to control for time-at-risk, as offenders in the study sample were incarcerated for variable periods of time. Rates were calculated by taking the total number of offenders who had a minor or a major institutional infraction and dividing by the total number of days that offenders were incarcerated (e.g., prior to release, end of the study period, warrant expiry date, or date of deportation or death). The difference between the rates of infraction between the study groups were then tested using rate ratios (i.e., one rate divided by the other) and corresponding confidence intervals. If the rates of the two groups are the same, the ratio will be equal to one. A rate ratio greater than one indicates that the rate on the numerator of the ratio was greater than the rate on the denominator of the ratio, whereas a rate ratio less than one indicates the rate in the numerator was less than the rate in the denominator. Confidence intervals for the rate ratio can be calculated to determine whether an observed rate ratio is significantly greater than or less than one. If the confidence interval for a rate ratio includes one,

then the two rates are not significantly different.

Other variables included in the analysis of correctional outcomes were comparisons of correctional program completions, admissions to segregation, and returns to federal custody after release and returns to custody with an offence. A chi-squared test was used to compare the proportion of completed programs between groups. Rates of admissions to segregation were compared across the cognitive deficit groups.

Survival analysis was used to determine if cognitive deficit groups were related to recidivism after release into the community. Two survival analysis models were considered. The first model included only the cognitive deficit groups, while the second model included variables with established predictive power related to recidivism: offender need level, motivation level, reintegration potential, age at release, level of drug abuse, and correctional program completions. Survival analyses allow a control for time-at-risk post-release. Time-at-risk began at the date of first release and ended at the date of data collection, the first return to custody, death, or deportation. Time-at-risk was not censored by an offender's warrant expiry date because the current study considered all returns to custody occurring during the study period, including those following sentence expiration. Offenders who were not released during the time period examined for this study were excluded from recidivism analyses. The median time-at-risk for the entire sample was 1.30 years (*SD* = 1.46, range = 0.003 to 4.97).

Results

The following section presents the results of the analyses beginning with an estimate of the prevalence of cognitive deficits in an incoming sample of men offenders and then follows with a profile of the offenders in each of the Cognistat groupings. Finally, the institutional and community outcomes of offenders with cognitive deficits relative to those with none or low deficits are compared.

Prevalence of Cognitive Deficits

Results of the Cognistat assessment indicated that 25% of offenders (n = 122) presented at least some level of cognitive deficit. Table 1 displays the distribution of results by Cognistat grouping.

Table 1
Distribution of Cognistat Ratings by Cognistat Group

	Distribution	
Cognistat Group	%	(*n*)
No deficits or one mild deficit	75.0	(366)
Two mild deficits or one moderate deficit	9.6	(47)
More than two mild or moderate deficits or one severe	15.4	(75)

The Cognistat allows an analysis of deficits across domains pointing to the extent of specific and global impairment. Table 2 provides the distribution of mild, moderate, and severe scores across the assessment areas. For the entire sample, deficits were most prevalent in the Memory, Calculations, and Similarities domains.

Table 2

Distribution of Mild, Moderate, and Severe Scores for Cognistat Deficit Areas

	Mild		Moderate		Severe		Total Deficits	
	%	(*n*)	%	(*n*)	%	(*n*)	%	(*n*)
Memory	17.6	(86)	4.7	(23)	3.4	(18)	26.0	(127)
Calculations	8.2	(40)	3.3	(16)	0.4	(2)	11.9	(58)
Similarities	4.1	(20)	2.9	(14)	3.7	(18)	10.7	(52)
Repetition	4.5	(22)	1.2	(6)	0.2	(1)	5.9	(29)
Construction	2.5	(12)	0.6	(3)	1.2	(6)	4.3	(21)
Attention	4.5	(12)	1.4	(7)	0.0	(0)	2.9	(19)
Judgment	2.7	(13)	0.2	(1)	0.8	(4)	3.7	(18)
Naming	3.1	(15)	0.0	(0)	0.0	(0)	3.1	(15)
Orientation	1.6	(8)	0.4	(2)	0.0	(0)	2.0	(10)
Comprehension	0.0	(0)	0.4	(2)	0.0	(0)	0.4	(2)

Note. $N = 488$.

Demographics and Profile Information

Demographic and profile characteristics were compared across study groups and are presented in Tables 3 and 4. No significant differences were found with respect to average age at admission, average sentence length, marital status, offence type, criminal history risk, or dynamic need variables. Aboriginal offenders in this sample had higher rates of cognitive impairment than non-Aboriginal offenders (χ^2 (2) = 11.03, p = .004). Among non-Aboriginal offenders, 21% had some cognitive deficits compared to 38% of Aboriginal offenders.

Education level (χ^2 (6) = 28.97, $p < .001$) and the presence of a potential learning disability (χ^2 (2) = 47.81, $p < .001$) were significantly related to deficits as assessed by the Cognistat. Lower educational achievement was associated with having either moderate or severe cognitive deficits. Further analysis indicated that of those offenders with cognitive deficits, 44% (n = 54) were identified as having a learning disability compared to only 15% (n = 54) of offenders with no deficits. Of those offenders with cognitive deficits and a learning disability,

73% (n = 37) had an education level less than Grade 10. Unstable job history was also related to Cognistat rating (χ^2 (2) = 6.51, p = .03).[4] Offenders with cognitive deficits served a significantly greater proportion of their sentence incarcerated before their first release (F = 5.35, p = .005).

Table 3

Demographic and Sentence Characteristics by Cognistat Group

	No deficits or one mild (n = 368)		Two mild deficits or one moderate (n = 50)		More than two deficits or one severe (n = 70)		
	M	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	R^2
Age at admission	33.6	(9.73)	34.0	(10.23)	36.1	(10.7)	.008^{ns}
Sentence length[a]	3.5	(2.09)	3.0	(1.71)	3.4	(1.83)	.007^{ns}
Proportion of sentence served before first release[1]	0.5	(0.21)	0.5	(0.18)	0.5	(0.21)	.02**
	%	(*n*)	%	(*n*)	%	(*n*)	*V*
Self-identity							.15**
Non-Aboriginal	82.1	(299)	70.2	(33)	66.7	(50)	
Aboriginal	17.9	(65)	29.8	(14)	33.3	(25)	
Marital status							.10^{ns}
Single	34.4	(126)	29.8	(14)	25.6	(19)	
Common-law	8.2	(30)	4.3	(2)	6.7	(5)	
Married	46.2	(169)	54.5	(27)	46.7	(35)	
Other	11.2	(41)	8.5	(4)	21.3	(16)	
Education level							.18***
Less than Grade 8	11.1	(37)	28.6	(12)	31.9	(22)	
Grade 8 to 9	20.1	(67)	23.8	(10)	21.7	(15)	
Grade 10 to 12	34.8	(116)	33.3	(14)	21.7	(15)	
High school or more	33.9	(113)	14.3	(6)	24.6	(17)	

[a]Indeterminate sentences were removed from this analysis
^{ns} non-significant, **p < .01, ***p < .001

[4] The unstable employment history variable is one of a number of indicators that contribute to the assessment of employment need at intake.

Table 4

Profile Characteristics by Cognistat Group

	No deficits or one mild (n = 368)		Two mild deficits or one moderate (n =50)		More than two deficits or one severe (n = 70)		
	%	(n)	%	(n)	%	(n)	V
Learning disability							.31***
	14.7	(54)	38.3	(18)	48.0	(36)	
Unstable job history							.12*
	66.8	(223)	81.0	(34)	78.6	(55)	
Violent current offence (most serious)							.03 ^{ns}
Violent	52.7	(193)	53.2	(25)	48.0	(36)	
Non-violent	47.3	(173)	46.8	(22)	52.0	(39)	
Criminal history risk							.10 ^{ns}
Low	16.5	(55)	4.8	(2)	5.7	(4)	
Medium	38.6	(129)	38.1	(16)	44.3	(31)	
High	44.9	(150)	57.1	(24)	50.0	(35)	
Criminogenic need							.10 ^{ns}
Low	9.3	(31)	4.8	(2)	2.9	(2)	
Medium	29.6	(99)	16.8	(7)	22.9	(16)	
High	61.1	(204)	78.6	(33)	74.3	(52)	

^{ns} non-significant, *p < .05, ***p < .001

Institutional Behaviour

The relationship between cognitive deficits and institutional adjustment was examined through an analysis of institutional charges, admissions to segregation, and program completions. Given the relationship between cognitive deficits, learning disabilities, and low educational attainment, it would be expected that offenders with cognitive impairment might have more difficulty completing correctional programs. Rates of enrollment in correctional programs between offenders in each of the three groups did not differ. A chi-squared goodness of fit test comparing the observed frequencies of program enrollments in each of the three groups to the

expected frequencies given the relative sizes of each of the groups was not significant (χ^2 (2, N = 512) = 4.81, p = .09). Table 5 presents the proportions of enrollments in nationally recognized correctional programs resulting in completion, drop-out, and incomplete programs due to population management by Cognistat grouping. There were no significant differences across groups on proportion of program enrollments ending in completion, drop-out, or institutional population management. Despite their cognitive problems, these results suggest that offenders with cognitive deficits complete correctional programs at the same rate as offenders without deficits.

Table 5

Proportion of Nationally Recognised Correctional Program Enrollments by Cognistat Group

	No deficits or one mild		Two mild deficits or one moderate		More than two deficits or one severe		*V*
	%	(*n*)	%	(*n*)	%	(*n*)	
Outcome							.05 [ns]
Completion	72.3	(290)	72.0	(36)	77.0	(47)	
Drop-out[a]	14.5	(58)	14.0	(7)	8.2	(5)	
Population management[b]	12.7	(51)	10.0	(5)	14.8	(9)	
Total Enrollments	100	(401)	100	(50)	100	(61)	

Note. Percentages do not sum to 100 because some enrollments were in progress at the time of data collection. Note that each offender may have completed more than one correctional program. [a]Drop-outs include program assignments ending in suspension from the program, withdrawal from the program, or incomplete programs.
[b]Population management includes program assignments ending in offender transfers or release, program cancellation, or assignment cancellation.[ns] not significant.

To further examine the relationship between Cognistat rating and institutional behaviour, rates of institutional charges were compared across groups. The rates of serious and minor institutional charges are presented in Table 6. The differences between pairs of rates were tested using rate ratios to determine whether the differences were significant. Results indicated that rates of minor institutional charges are significantly greater for offenders with two mild or one moderate cognitive deficit than for those offenders with more deficits (rate ratio = 1.50, CI [1.20, 1.86]) and no deficits (rate ratio = 1.56, CI [1.31, 1.84]). The rates of minor charges among the

no deficits and the more deficits groups were similar. Regarding serious institutional charges, while the two mild or one moderate deficit group presented significantly greater rates of serious institutional charges compared to the more deficits group (rate ratio = 1.73, CI [1.14, 2.65]), the rate of serious charges in the two mild or one moderate deficit group was not significantly greater than the group with no deficits or one mild deficit (rate ratio = 1.35, CI [0.98, 1.84]). The rate of serious institutional charges in the group with no deficits or one mild deficit was not significantly higher than the group with more deficits or one severe deficit (rate ratio = 1.28, CI [0.93, 1.80]).

Table 6

Rates of Institutional Charges by Cognistat Group

Charge Level	No deficits or one mild	Two mild deficits or one moderate	More than two deficits or one severe
	(*n* = 368)	(*n* = 50)	(*n* = 70)
Minor	127	198	132
[CI 95%]	[119, 136]	[169, 231]	[113, 153]
Serious	44	59	34
[CI 95%]	[39, 49]	[44, 78]	[25, 46]

Rates of admissions to segregation were also calculated per 100 offenders by Cognistat group and are presented in Table 7. A comparison of rate ratios across groups indicated that offenders with cognitive deficits are significantly more likely to be admitted to segregation than those without substantial deficits. Offenders in the two mild deficits or one moderate deficit group were admitted to segregation at a significantly higher rate than the offenders in the no deficit or one mild deficit group (rate ratio = 1.78, CI [1.33, 2.36]). They were not significantly more likely to be admitted to segregation than the more than two deficits or one severe group (rate ratio = 1.11, CI [0.79, 1.56]). Offenders with more deficits or one severe deficit had a significantly greater rate of admissions to segregation than the offenders with no deficits or one mild deficit (rate ratio = 1.60, CI [1.24, 2.05]).

Table 7

Rates of Admissions to Segregation by Cognistat Group

	No deficits or one mild	Two mild deficits or one moderate	More than two deficits or one severe
	n = 368	*n* = 50	*n* = 70
Rate of Admission to Segregation	41	74	66
[CI 95%]	[36, 47]	[56, 94]	[53, 82]

Considering the significantly different rates at which offenders with cognitive deficits were found to be admitted to segregation, further analysis was warranted. The median number of days spent in segregation over the study period was considered by Cognistat group and presented in Table 8. Given that sentence length among the three groups were not significantly different (see Table 3), these analyses did not control for time at risk. It should be noted, however, that the proportion of sentence served was slightly less for the no/mild deficit group (R^2 = .02); therefore, slightly lower average days in segregation might be expected for this group based on length of the period of observation. Although the median days in segregation was greatest for the two mild/one moderate deficit group (*Median* = 75, *SD* = 128.3), results of a Kruskal-Wallis test showed no significant difference across groups (χ^2 (2) = 3.6, p = .16).

Admissions to segregation were also analysed by type of admission. The proportions of admissions to voluntary and involuntary segregation were considered out of the total number of admissions. No significant difference in placement in segregation based on segregation type was found across study groups (χ^2 (2) = 1.31, p = .52). Additional analysis of days spent in segregation showed no differences between Cognistat groups. These results suggest that while cognitive deficits are associated with admissions to segregation, there was no relationship with length of time spent in segregation or type of segregation.

Table 8

Days Spent in Segregation and Admissions to Segregation by Type by Cognistat Group

	No deficits or one mild		Two mild deficits or one moderate		More than two deficits or one severe		
	n = 368		*n* = 50		*n* = 70		
	Median	(*SD*)	*Median*	(*SD*)	*Median*	(*SD*)	χ^2
Days in Segregation[a]	40.5	(137.5)	75.0	(128.3)	44.5	(82.5)	3.6[ns]
	%	(*n*)	%	(*n*)	%	(*n*)	χ^2
Type[b]							5.87 [ns]
Voluntary	18.3	(48)	14.5	(9)	21.8	(19)	
Involuntary	81.7	(215)	84.5	(53)	78.1	(68)	

[a]Median calculated for those offenders with at least 1 day in segregation. [b]Percentages are out of the total number of admissions to segregation.[n] not significant.

Co-occurrence of Substance Abuse, Mental Disorder and ADHD

Co-occurrence of substance abuse and ADHD with cognitive deficits was analyzed by assessing the percentage of offenders in each study group with high scores on measures of alcohol (ADS), drug abuse (DAST), and ADHD (ASRS). An examination of the frequency of co-occurring substance abuse disorders and cognitive deficits was conducted by including participants with scores on the ADS and DAST indicating moderate to severe levels of abuse. Offenders with ratings at this level typically meet the DSM-IV-TR criteria for a diagnosis of substance abuse disorder (Peters et al., 2000). Although high levels of ADHD are required to reach the threshold for a clinical diagnosis, problems associated with ADHD are also evident with moderate symptoms (Usher et al., 2010). Therefore, participants with scores of moderate to high on the ASRS were considered. Table 9 shows the relationship of these problems with Cognistat group. While alcohol dependence was significantly related to cognitive deficits (χ^2 (2) = 10.28, p = .006); drug abuse problems were not (χ^2 (2) = 0.09, p = .95). The presence of moderate to high symptoms of ADHD was also found to be significantly related to the presence of cognitive deficits (χ^2 (2) = 9.81, p = .007). As the degree of deficits increases, so does the prevalence of alcohol problems and symptoms of ADHD. Although the trend suggests that offenders with more cognitive deficits were also more likely to have an Axis I or Axis II disorder

(16% for those without deficits, compared to 21% for the more deficits group), the differences between the groups were not significant (χ^2 (2) = 1.68, p = .43).

Table 9

Co-ocurring Problems with Cognitive Deficts, ADHD Symptoms, Substance Abuse and Mental Disorder by Cognistat Group

	No deficits Or one mild n = 368		Two mild deficits or one moderate n = 50		More than two deficits or one severe n = 70		V
Overall Factor Rating	%	(*n*)	%	(*n*)	%	(*n*)	
Alcohol Dependence (ADS)	8.5	(31)	17.0	(8)	20.0	(15)	.15**
Drug Abuse (DAST)	49.2	(180)	46.8	(22)	49.3	(37)	.01 ^{ns}
ADHD (ASRS)	41.5	(152)	53.2	(25)	60.0	(45)	.14**
Diagnosis (Axis I or II)	15.6	(57)	19.2	(9)	21.3	(16)	.06 ^{ns}

Note. ADHD = Attention Deficit Hyperactivity Disorder. ADS = Alcohol Dependence Scale; DAST = Drug Abuse Screening Test; ASRS = Adult ADHD Self-Report Scale; ^{ns} not significant, ** $p < .01$

Outcomes on Release

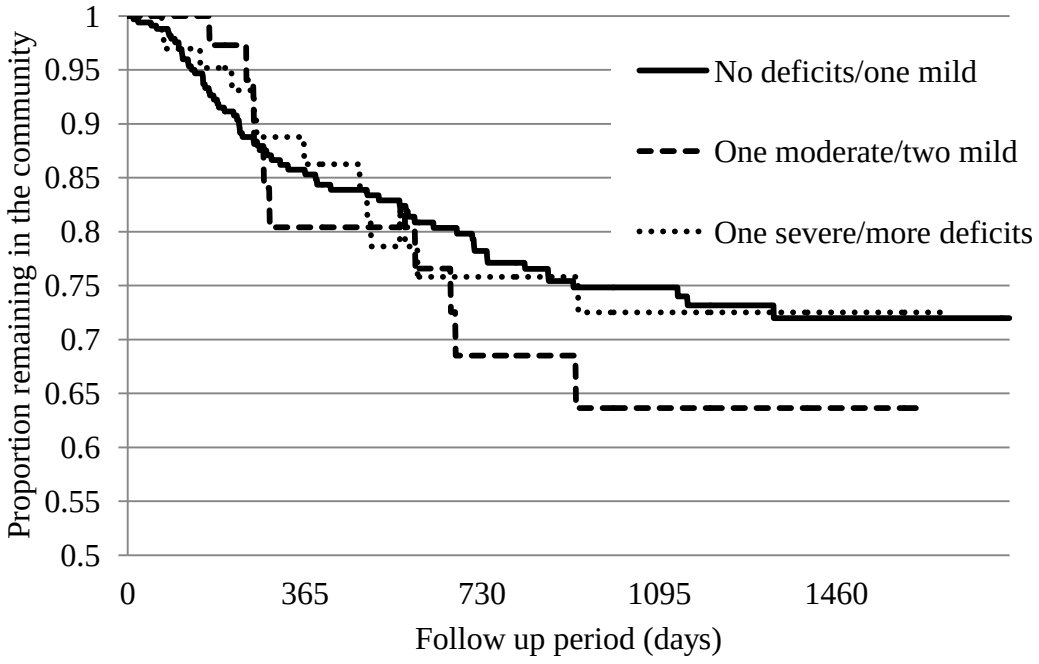
A survival analysis was conducted to examine the relationship between cognitive deficits and post-release outcomes. The survival analysis permits a determination of whether cognitive deficits are a criminogenic factor. By selecting covariates that are related to the outcome variable (returns to custody), the variability in the outcome can be controlled, leaving any unique contribution of cognitive deficits to be compared to a smaller portion of remaining variability in the outcome. This makes it more likely to find the unique effect of cognitive deficits.

The results were stratified by Cognistat grouping (i.e., no deficit or one mild, two mild or one moderate, more deficits or one severe). Figure 1 presents the survival curves for each Cognistat group based on all returns to custody for whatever reason. This could be either for a new offence or for violations of the conditions of release. Follow-up periods extended beyond an offender's warrant expiry date and concluded either with a return to custody, the end of the study period, or a censoring event such as death or deportation. The survival curves presented in Figure 1 reveal no significant differences for the proportion of offenders remaining in the community for each Cognistat group without consideration of additional covariates (χ^2 (2) = 2.64, p = .27).

An analysis the proportions of offenders who remain in the community in fixed six-

month follow-up periods were consistent with the results in the survival analysis. There were no significant differences between groups (χ^2 (2) = 3.59, p = .32). Together, these results indicate that cognitive deficits as measured by the Cognistat do not significantly attenuate success on release. To test whether covariates were influencing the impact of cognitive deficits on post release outcomes, a second analysis was conducted in which key covariates related to recidivism (i.e., offender need, motivation level, reintegration potential, drug abuse level, age at release, correction program completions) were included in the model.[5] Cognitive deficit grouping still did not predict returns to custody, but reintegration potential (χ^2 (2) = 9.08, p = .01), motivation level (χ^2 (2) = 15.69, p < .001) and drug abuse level (χ^2 (2) = 4.26, p = .04) were found to be significant predictors.

Figure 1. Proportion of offenders remaining in the community by Cognistat group (N = 241).



Given that public safety is the mandate of CSC, we also examined the outcome of

[5] An initial analysis had shown that alcohol abuse did not contribute unique variance after drug abuse was entered and that risk level did not add variance after need and reintegration potential levels were entered.

offenders on release by returns to custody with an offence. Results of survival analyses again indicated that there were no differences between groups for returns with any offence (χ^2 (2) = 0.40, p = .82). Reoffence rates were too low to allow us to conduct survival analyses on reoffending that included covariates. For the same reason, we were unable to compare survival analyses across groups on violent and sexual reoffending.

Discussion

The purpose of this study was to estimate the percentage of incoming men offenders with cognitive deficits, profile these offenders to assess the association of cognitive deficits with other offender characteristics, and, finally, examine the relationship of cognitive deficits with correctional outcomes such as institutional charges, correctional program completion, and post-release success. Results indicate that 25% of the incoming men examined have some level of cognitive deficit as measured by the Cognistat. The 25% estimate of the prevalence of cognitive deficits provided by the Cognistat is within the range of rates quoted in several other studies of offender populations in other consistencies (Hayes, 1997). Although some researchers caution that the Cognistat is not a sensitive tool for measuring deficits in non-clinical samples, the results did show associations in the expected direction linking educational achievement, employment history, learning disabilities, and ADHD to the presence of cognitive deficits. The strength of these associations was small, but the pattern was consistent, providing construct validity for the use of Cognistat in this population. The findings suggest that these impairments, probably in combination with other factors, have an impact on some areas related to successful functioning in the community.

Offenders with cognitive deficits tended to serve a larger proportion of their sentence prior to their first release. Although the results indicated that cognitive impairment was associated with being sent to segregation, level of cognitive deficits was not consistently related to institutional charges or other key correctional results such as completion of required correctional programs. More importantly, cognitive deficits were not significantly related to returns to custody. This result was found even when significant covariates were held constant. Likewise, level of cognitive deficit was not related to reoffending.

Further analysis did not demonstrate a significant relationship between the proportion of offenders serving a current sentence for a violent offence and extent of cognitive deficits. This finding may be in part explained by the high rates of violent offending within the federal offender population where 80% of offenders have a current or prior history of violence (CSC, 2012). While offenders with cognitive deficits were more likely to have serious alcohol problems than those without cognitive deficits, they were not more likely to have significant problems with drugs. This result is consistent with literature indicating a relationship between serious alcohol

abuse and impaired cognitive function (Cairney, Clough, Jaragba, & Maruff, 2007; Cardenas, Studholme, Meyerhoff, Song, & Weiner, 2005), particularly for those who begin consuming alcohol in adolescence (Zeigler et al., 2005). This difference in the relationship between drug abuse and cognitive deficits and alcohol abuse and cognitive deficits result may have been an artifact of the choice of measures. The ADS is a stringent measure of actual alcohol dependence and, as such, a score above moderate is an indication of serious problems related to addiction to alcohol; in our total sample, only 11% had scores higher than moderate. The DAST, however, scores for problems associated with drug use, not addiction or dependence; 49% of incoming offenders in our sample scored as having at least moderate problems on this measure. A more detailed analysis examining the drug of choice may have found a stronger association with cognitive deficits for some drugs. For example, there is a considerable literature on the negative neurological effects of heavy cocaine use (e.g., Bolla et al., 2000). Although there was a tendency for offenders without deficits to have lower overall criminal risk and criminogenic need ratings than those with deficits, this difference was not significant. With the exception of ADHD and substance abuse, a diagnosis for either an Axis I or Axis II mental disorder was also not related to the presence of cognitive deficits.

The results indicate that offenders with cognitive deficits do not pose a challenge for institutional management based on their rates of serious or minor infractions. They do, however, have higher rates of admission to segregation, whether the admission is voluntary or involuntary. It is unknown why these rates are higher and could be linked to impulse control problems, poor understanding of institutional regulations, or the staff's perception of the vulnerability of these offenders in the general population. Possibly related to their more frequent transfers to segregation, offenders with deficits spent slightly more of their sentences incarcerated prior to release.

There are also no differences in the rates of enrollments in correctional programs between the study groups. What is more, offenders with cognitive deficits who begin correctional programs are likely to complete them as those without deficits. This result is unexpected given the relationship of deficits to educational achievement, ADHD, and learning disabilities. As has been noted in previous reports, program facilitators have been successful in accommodating special needs offenders with mental disorders (Stewart, Wilton, & Cousineau, 2012) and ADHD (Usher et al., 2010). Several factors may contribute to this indicator of success. Program

managers and facilitators are provided with information on recommended accommodations for offenders who may be exhibiting intellectual problems in an on-line resource guide with links to more in-depth information. What is more, the type of skills taught and pedagogical techniques used in the delivery of correctional programs are consistent with what has been shown to be effective in special education programs (Scruggs, Mastropieri, Berkeley, & Graetz, 2010). It is possible, therefore, that even though no routine screening for intellectual deficits was in place at the time of this study, program facilitators are already providing appropriate programming and making targeted accommodations for offenders who need additional support.

Given that cognitive deficits were related to alcohol dependence and ADHD, it was expected that there would be considerable levels of co-occurring problems. Results indicate that of those offenders with serious alcohol problems, 43% have cognitive deficits and for those with substantial symptoms of ADHD, 32% have cognitive deficits. Further research could examine whether there are increasingly poorer correctional outcomes for offenders with co-occurring substance abuse disorders and cognitive deficits than for those with cognitive deficits problems or substance abuse problems only, as has been found in previous research on federal offenders with co-occurring substance abuse and mental disorders (Wilton & Stewart, 2012).

With respect to the use of the Cognistat measure as a screening tool for cognitive deficits, while it appears to be sensitive enough to demonstrate a link between functional areas related to cognitive impairment, it is not a practical choice as a screening measure within CSC. The tool requires individual assessment and the scoring is most appropriately interpreted clinically. Instead, CSC has recently integrated the General Ability Measure for Adults (GAMA; Naglieri & Bardos, 2006) as a self-administered IQ screen within the CoMHISS assessment.

It should be noted that, although the selected group distribution has a logical rationale and was approved by the measure's developer as an appropriate interpretation of Cognistat results, raw scores from the Cognistat could have been interpreted differently, which may have produced an alternative pattern of group membership. This, in turn, might have affected the results for some of the correctional outcomes examined.

Conclusions

From an operational point of view, these results indicate that offenders with cognitive deficits may require assistance with educational and employment training to improve their reintegration potential. This may be a particular concern for Aboriginal offenders as the rates of

cognitive deficits are significantly higher than among non-Aboriginal offenders. Offenders with cognitive deficits, however, do not appear to pose a particular challenge to institutional or community management, although they are more likely to be admitted to segregation at some point during their sentence. The link between cognitive deficits and symptoms of ADHD suggests that interventions like those exemplified by correctional programs could help these offenders manage problems with impulse control and planning.

The recent implementation of a self-administered IQ screen in CoMHISS now provides CSC with valuable information on intellectual functioning level that can assist parole officers, program facilitators, and educators in case planning, and helping offenders complete their correctional plans. Future research will examine the relationship of these IQ results to correctional outcomes; this work will help to determine whether the pattern found with the Cognistat measure of cognitive deficits holds.

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