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**Abstract** | Early estimates point to higher rates of cognitive impairment among Indigenous Australians in custody compared to non-Indigenous Australians. This study sought to examine the prevalence of cognitive impairment in a representative sample of Indigenous offenders from Victorian prisons. Differences in mental illness prevalence, offending history and post-release recidivism were explored by presence of cognitive impairment. Results revealed an over-representation of cognitively impaired prisoners in the sample and a large minority with concomitant mental illness or disability. Cognitively impaired prisoners were more likely to re-offend, were younger at first offence, and had greater numbers of prior offences. Findings signal the need for culturally themed disability assistance and diversionary options at all levels of the criminal justice system.

## Aboriginal prisoners with cognitive impairment: Is this the highest risk group?

Dr Stephane M Shepherd, Professor James RP Ogloff, Professor Yin Paradies and Associate Professor Jeffrey Pfeifer

### Introduction

Cognitive impairment (CI) or cognitive disability describes deficits in mental processing affecting memory, reasoning, comprehension, communication and learning ability. People who are cognitively impaired often have an intellectual disability (ID) or an acquired brain injury and are over-represented in the criminal justice system (Baldry et al. 2013; Dias et al. 2013; Indig et al. 2011; Jackson et al. 2011; Hayes 2000; Vanny et al. 2009). ID is characterised by impairments in intellectual ability and adaptive functioning and is often acknowledged by standardised IQ scores of less than 70 (American Psychiatric Association 2013). The prevalence of ID in the general Australian population is estimated to be approximately 2.9 percent (Australian Bureau of Statistics 2014b) yet much higher rates have been found in Australian offender cohorts, where ID prevalence has ranged from eight to 15 percent (Dias et al. 2013; Frize, Kenny & Lennings 2008; Indig et al. 2011). This proportion is significantly higher when including offenders identified as having IQ scores in the borderline ID range (<80).

There are several factors that explain why people with cognitive impairment may have an increased likelihood of contact with the criminal justice system. These include difficulties regulating behaviour, impaired decision making, problems communicating, a poor understanding of criminal justice procedures, poor memory and attentiveness and social immaturity (Australian Human Rights Commission 2014; Brown & Kelly 2012; Cockram 2000; Gray, Forell & Clarke 2009; Rushworth 2011; Simpson 2013; Vanny, Levy & Hayes 2008). Having a disability and underprivileged living circumstances enhances susceptibility to homelessness, substance misuse, poor general health, low levels of community support, visibility to police and ultimately criminal engagement (Baldry, Dowse & Clarence 2012; Holland, Clare & Mukhopadhyay 2002; Mackelprang et al. 2014; Simpson 2013). People with cognitive impairment are additionally vulnerable to physical and sexual trauma, coercion, peer pressure and victimisation (Australian Human Rights Commission 2014; Baldry et al. 2013; Baldry, Dowse & Clarence 2012; Mackelprang et al. 2014; Vanny, Levy & Hayes 2008; Simpson 2013; Villamanta Disability Rights Legal Service 2012).

## Indigenous Australians

While less is known about the prevalence of cognitive impairment among Indigenous offenders, extant findings suggest they have higher levels than non-Indigenous offenders (Baldry, Dowse & Clarence 2012; Bhandari et al. 2015; Dias et al. 2013; Dowse et al. 2011; Frize et al. 2008; Haysom et al. 2014; Holland & Persson 2011; Simpson & Sotiri 2004). These findings reflect the health and socio-economic disparities in the population. Indigenous Australians have higher rates of disability than non-Indigenous Australians across all age groups (ABS 2014a), including four times the rate of ID (ABS 2007).

Higher instances of disability occur against a backdrop of marginalisation, disadvantage, intergenerational trauma, discrimination, family and cultural breakdown, unemployment and poor educational attainment (Australian Human Rights Commission 2008; Dingwall & Cairney 2010; Glasson et al. 2005; Hollinsworth 2013; North Australian Aboriginal Justice Agency 2013; Productivity Commission 2011; Sotiri & Simpson 2006). This environment has often cultivated dysfunctional communities with high levels of alcohol abuse, poor health, violence and injury. Many of the assessment tools employed to detect cognitive impairment may be culturally inappropriate (Dingwall, Lindeman & Cairney 2014; Dingwall, Pinkerton & Lindeman 2013). This may be because of a lack of normative data on Indigenous populations, assessors with little cross-cultural training, language differences, a lack of client motivation during assessment, assessment stimuli that have no localised relevance and the neglect of culture-specific conceptualisations of health (Australian Human Rights Commission 2008; Bohanna et al. 2013; Dingwall & Cairney 2010; Dingwall, Lindeman & Cairney, 2014; LoGiudice et al. 2006; NAAJA 2013; Productivity Commission 2011). Cognitive impairment may be perceived in a different way culturally but may also be deemed inseparable from past traumas inflicted upon Aboriginal people at large.

While challenges remain in measuring cognitive disability among Indigenous Australians, it is apparent that levels are higher than among non-Indigenous Australians in custody and in the general community. It is additionally troubling that cognitively impaired Indigenous people face several barriers when accessing disability services (Australian Human Rights Commission 2008; Bohanna et al. 2013; Dingwall, Lindeman & Cairney 2014; Simpson & Sotiri 2004; Productivity Commission 2011).

## Comorbidity and recidivism

Despite differing characterisations of cognitive impairment, several studies have shown that offenders with varying levels of this condition are more likely than non-impaired offenders to have comorbid mental illness and/or psychological distress (Dias et al. 2013; Moore, Indig & Haysom 2014; O'Brien 2002; Vanny et al. 2009; Williams et al. 2010). Offenders with a cognitive disability have greater numbers of prior custodial episodes, are more likely to be charged, are less likely to receive parole, are more likely to be classified as a high security risk, and are younger at first contact with the justice system (Baldry, Dowse & Clarence 2012; Cockram 2005; Frize et al. 2008; Holland et al. 2007; Moore, Indig & Haysom 2014). The small number of prospective investigations indicates that cognitively impaired offenders are more likely to reoffend than other offenders (Cockram 2000; Holland & Persson 2011; Moore, Indig & Haysom 2014; see Riches, Parmenter, Wiese & Stancliffe 2006). In addition, outcomes are decidedly worse for offenders with comorbid diagnoses or complex needs (Baldry, Dowse & Clarence 2012; Dias et al. 2013; Hobson & Rose 2008; Klimecki, Jenkinson & Wilson 1994).

Information on comorbidity and recidivism rates for Indigenous offenders with a cognitive disability is scarce. Existing research has shown that Indigenous offenders with a cognitive disability had earlier contact with police than both Indigenous offenders without a cognitive disability and non-Indigenous offenders with a cognitive disability (Baldry, Dowse & Clarence 2012; Baldry et al. 2015). Among mentally disordered and cognitively impaired prisoners, Indigenous men and women had earlier police contact, an earlier first custodial episode, higher rates of police contact and higher rates of convictions than non-Indigenous men and women (Baldry et al. 2015). Generally, the rate of cognitive disability among Indigenous offenders is not well understood. The accurate identification of cognitive impairment among Indigenous offenders in custodial settings is paramount given the additional needs of this group.

## Study aims

The purpose of this study was to identify the extent of cognitive impairment among Aboriginal offenders in custody and the association between cognitive impairment and recidivism through the following aims:

- ascertain the prevalence of cognitive impairment in adult Aboriginal offenders in custody in Victoria, Australia;
- determine the level of dual diagnosis among the cohort; and
- explore differences in offending patterns before and after release for offenders with and without cognitive impairment.

It is cautiously expected that the sample will have elevated rates of mental illness but perhaps small differences across impairment categories. With regard to reported high rates of recidivism among Aboriginal prisoners in general, few differences in offence histories and recidivism rates across cognitively impaired and non-cognitively impaired Aboriginal offenders are predicted.

## Method

### Data Sources

Data for the study were obtained from two sources. The first was the Koori Mental Health and Cognitive Function Study database. These data were collected by the Centre for Forensic Behavioural Science for the Victorian Department of Justice's Justice Health and Koori Justice Unit in 2012. The second source was the Victoria Police Law Enforcement Assistance Program (LEAP) database, from which data were obtained in 2015. The LEAP database records all contact between the Victorian public and the police in Victoria.

### Participants

Participants in this study were 122 adult Koori male ( $n=107$ ) and female ( $n=15$ ) prisoners who were remanded or sentenced in Victorian regional or metropolitan prisons. The mean age of the sample was 34.4 ( $SD=10.3$ ) years.

### Procedure

Interviews were conducted between January and October 2012. They were conducted in teams comprising a culturally trained mental health clinician and an Indigenous research officer. Interviews ranged from 50 to 240 minutes in length. All interviews were conducted in private rooms visible to custodial staff.

### Measures

A semi-structured questionnaire was developed in consultation with an advisory group including Aboriginal psychologists. Key areas covered included: participant details or demographics (age, gender, date of birth), cognitive impairment and mental health.

### Cognitive Impairment

Assessment measures included the Kimberley Indigenous Cognitive Assessment (KICA), which is a validated, culturally relevant assessment tool for identifying cognitive impairment in Indigenous Australians (LoGiudice et al. 2006). Non-verbal intellectual functioning components (matrix reasoning and block design) of the Wechsler Abbreviated Scale of Intelligence (WASI; The Psychological Corporation 1999) were also employed, generating a standardised score based on the performance IQ. The full-scale intelligence quotient was not assessed for reasons of cultural fairness, given its inclusion of vocabulary subsets. The study employed an IQ cut-off of 80, which encompasses both participants with an intellectual disability ( $<70$ ) and those who scored in the borderline range (70–80).

### Mental Health

The presence of current or lifetime mental disorders of mood, anxiety, psychosis and substance use was assessed through a self-reported history of diagnosis and employment of the Mini International Neuropsychiatric Interview (MINI). The MINI is a short diagnostic clinical assessment tool (Sheehan et al. 1998).

## Offending

Criminal histories from the LEAP database were obtained for all consenting participants for up to two years after the custodial interview. An offence was defined as any police charge. Violent crimes were described as any acts intended to cause or threaten to cause physical harm (including violent sexual offences). Sexual offences included both contact and non-contact charges of a sexual nature, violent or otherwise. General crimes encompassed all charges.

## Statistical Analyses

Descriptive statistics were performed to characterise the sample. Using a two-tailed  $p$ -value of 0.05, impaired and non-impaired groups were compared across offence categories and prevalence of mental disorder. Offending information included past and prospective levels of police charges and age at first offence. Odds ratios were calculated to ascertain effect sizes. Next, survival analyses were conducted to ascertain whether the time to reoffend differed by level of impairment. Finally, a hierarchical logistic regression analysis was conducted to determine whether cognitive impairment predicted recidivism after controlling for mental illness.

## Results

### Offence Categories

Over 80 percent of the cohort was imprisoned for a violent offence and 16.4 percent for a sexual offence (of a violent or non-violent nature). Significant differences were identified across offence categories by cognitive impairment grouping ( $\chi^2[5]=11.44$ ,  $p=0.04$ ). Cognitively impaired offenders were more likely to be imprisoned for general offences while non-cognitively impaired offenders committed the bulk of index sex offences.

### Cognitive Impairment

The KICA had a mean total score of 37.79 ( $SD=3.75$ ; range=0–39) among this population. Only one participant received a total score below 33, signifying potential dementia. The performance components (matrix reasoning and block design) of the WASI generated an adjusted mean IQ score of 93.17 ( $SD=14.16$ ; range=54–128). Approximately 70 percent of the sample was below the community average IQ of 100. After implementing the ID/borderline ID cut-off IQ score of 80, 21.6 percent of the cohort was found to have impaired cognitive functioning.

### Dual Diagnosis

Table 1 presents the prevalence of mental disorder in the overall cohort as determined by the MINI and participant self-report. Almost 90 percent of the sample was classified as having been diagnosed with a mental disorder in their lifetime. Mood disorders and substance use diagnoses were the most commonly diagnosed or reported disorders. Comorbidity (cognitive impairment and mental disorder) was high, with almost nine out of 10 cognitively impaired participants presenting with a lifetime mental disorder. The most common co-occurring mental disorders were mood disorders, substance use and anxiety. No significant differences were observed across cognitive impairment groups by mental disorder prevalence.

**Table 1: Prevalence of mental illness by impairment status**

Diagnosis	Total %	CI %(n)	No CI %(n)
Any	88.3	87.5 (21)	88.5 (77)
Psychotic	16.2	16.6 (4)	16.1 (14)
Mood	69.4	66.7 (16)	70.1 (61)
Anxiety	44.6	50.0 (12)	43.7 (38)
Substance Use	61.3	58.3 (14)	62.1 (54)
Personality Disorder	11.1	9.5 (2)	11.6 (8)

n=99–121; Impairment determined by WASI total score <80.  
Mental disorder diagnoses determined by MINI and self-report

## Offending

### Past offending

Table 2 presents information on prior offending across groups with and without cognitive impairment. Interestingly, the mean age of first offence was unusually high for this cohort, at 20 years of age. However, participants with cognitive impairment were found to be significantly younger at the time of their first recorded offence. They also had a higher number of total offences as well as a greater diversity of offences prior to their index offence compared to non-impaired participants; however, neither result reached statistical significance. Further analyses found no significant differences between groups for the presence of violent offences ( $\chi^2[1]=1.19$ ;  $p=0.28$ ) and sex offences ( $\chi^2[1]=0.72$ ;  $p=0.40$ ) prior to the index offence. An analysis of odds ratios discovered that those in the cognitively impaired group were over three times more likely to have a prior violent offence compared to those in the non-cognitively impaired group. In contrast, the non-impaired group were 40 percent more likely to have recorded a prior sexual offence.

**Table 2: Offending history by cognitive impairment (CI) group**

	Total M(SD)	CI M(SD)	No CI M(SD)	U	p
Age at first offence	20.38 (10.53)	14.86 (4.77)	22.28 (11.34)	447.00	0.003
Total number of offences prior to index	51.31 (54.13)	62.10 (53.18)	48.21 (52.74)	631.50	0.110
Diversity of offences prior to index	5.93 (3.21)	6.57 (2.79)	5.80 (3.19)	675.50	0.210

n=96

### Recidivism

The follow-up sample was reduced to 86 as 16 participants were not released during this period and a further 20 participants did not consent to researchers accessing their criminal histories. Offending data were captured for up to two years after the baseline interview for consenting participants. At the conclusion of the follow-up period, 57 percent (n=49) of the cohort had reoffended. Over 40 percent (n=35) had been charged with a violent offence and 2 percent (n=2) had been charged with a sex offence. The mean time to recidivism was 10.8 months (SD=8.18) for general reoffence, 14.34 months (SD=7.86) for violent reoffence and 18.44 months (SD=5.66) for sexual reoffence.

Rates of post-release charges are presented in Table 3. Though the difference is not statistically significant, cognitively impaired offenders had higher rates of recidivism for both general and violent

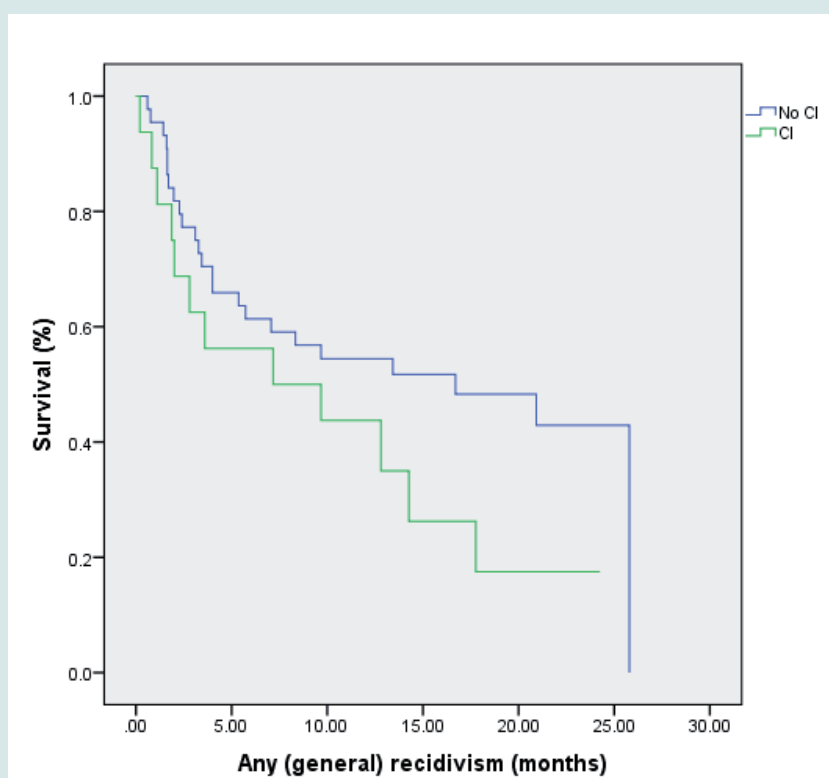
offences. Almost three-quarters of cognitively impaired participants reoffended during the follow-up period. Cognitively impaired participants were 2.8 times more likely to reoffend than non-cognitively impaired participants.

<b>Table 3: Recidivism by cognitive impairment grouping</b>					
	CI % (n)	No CI % (n)	$\chi^2$	<i>p</i>	OR
General recidivism	73.7 (14)	50.0 (30)	3.28	0.07	2.80
Violent recidivism	57.9 (11)	36.7 (22)	2.67	0.10	2.38

n=79

Time to general reoffence by cognitive impairment group is depicted in Figure 1. Although group differences were not statistically significant ( $\chi^2_{\log[1]}=2.43$ ;  $p=0.12$ ), the curve indicates that the cognitively impaired group tended to reoffend sooner.

**Figure 1: Time to reoffence by cognitive impairment group (general reoffence)**



A hierarchical logistic regression analysis was conducted to determine whether or not having cognitive impairment could predict recidivism after controlling for the presence of a mental disorder (see Table 4). Preliminary testing indicated no collinearity between predictor variables (VIF=1 for mental health diagnosis; VIF=1 for intellectual disability: IQ<80). For general recidivism, findings suggested that cognitive disability may add to the likelihood of recidivism ( $\chi^2[1]=3.41$ ;  $p=0.07$ ) more than mental disorder, which did not significantly contribute to the model at step 1. Similar trends were observed for violent recidivism. An inspection of odds ratios and confidence interval data suggest that cognitive impairment may be a reliable predictor of recidivism in a larger sample.



Table 4: Hierarchical logistic regression analysis predicting recidivism			
General Recidivism	OR	95% CI	p
Step 1			
Mental disorder	1.01	(0.25, 4.070)	0.99
Step 2			
Mental disorder	0.99	(0.24, 4.10)	0.99
Cognitive impairment	2.80	(0.90, 8.85)	0.08
Violent Recidivism			
Step 1			
Mental disorder	1.5	(0.35, 6.49)	0.59
Step 2			
Mental disorder	1.49	(0.34, 6.61)	0.60
Cognitive disorder	2.37	(0.83, 6.80)	0.22

## Discussion

Indigenous Australians are over-represented in custody and early estimates point to higher rates of cognitive impairment compared to non-Indigenous Australians. This study sought to examine the extent of cognitive impairment in an Indigenous only custodial sample and to identify differences in mental illness prevalence, offending history and recidivism between offenders who may or may not have a cognitive disability.

The presence of mental illness was remarkably high across the cohort. Close to nine out of 10 participants had a lifetime mental disorder diagnosis. Rates within this vicinity have been detailed in other Australian research (Haysom et al. 2014; Queensland Government 2012). Unsurprisingly, comorbidity was high for the 22 percent who presented with an intellectual disability. Given the widespread presence of mental illness, no differences in prevalence were observed by level of impairment. Interestingly, KICA scores indicated only a low level of impairment. Further research should explore whether the use of KICA can be extended to young adult offenders given that it was designed to assess dementia in ageing Indigenous rural populations.

## Offending

Indigenous offenders with a cognitive disability were significantly likely to be charged with their first offence at a younger age than those without cognitive impairment. This finding is in line with Baldry, Dowse and Clarence (2012), who found that the median age of first police contact for Aboriginal youth with cognitive disability was 13.8 years of age, which was significantly lower than for Aboriginal youth without a cognitive disability. The combination of having complex needs, being unaware of legal processes, and exhibiting behaviour that may come to the attention of or be misinterpreted by law enforcement increases the likelihood of early police contact. Evidence suggests that cognitively impaired young Indigenous offenders move through the justice system faster than non-Indigenous offenders with cognitive impairment (Baldry, Dowse & Clarence 2012).



More than half (57%) of the cohort reoffended during the two-year follow-up period and 40 percent violently reoffended. The recidivism rates reflect national figures indicating that 57.9 percent of Indigenous prisoners are imprisoned again within a decade of release (ABS 2010). Offenders with a cognitive impairment were almost three times more likely to reoffend. This relationship held when mental illness was accounted for. A non-significant trend of faster reoffending times for cognitively impaired offenders was also observed.

Study findings should be considered in light of several limitations. The sample was relatively small. However this was due to the small proportion of Aboriginal and Torres Strait Islander prisoners in Victorian prisons. Victoria has the smallest proportion of Indigenous people in custody (8%) of any state in Australia (ABS 2015). The performance component of the WASI was used as a proxy for cognitive impairment. Moreover, an accommodating IQ cut-off of 80 was used, which is higher than the traditional designated cut-off point of 70 for an intellectual disability. However, given that borderline intellectual disability is often included as cognitive impairment, this cut-off is justifiable, particularly given the dearth of research on this topic. A cautious interpretation of cognitive impairment outcomes is therefore appropriate. Notably, the likelihood of findings reaching greater significance with a larger sample is especially high given that robust effect sizes were obtained despite a small sample size.

## Implications

Several recommendations arise from the findings which support suggestions from earlier research (see Baldry et al. 2015). Screening for cognitive disability should be performed on entry to prison for every Indigenous prisoner, using culturally appropriate instruments (Murphy, Gardner & Freeman 2015). As such, the development of a culturally appropriate cognitive screening test for forensic settings is warranted. Existing instruments such as the abbreviated WASI and the KICA may be unsuitable in these circumstances. Given the high prevalence of mental health issues in custody and culturally specific conceptualisations of disability, cognitive impairment is in danger of being under-diagnosed or even unnoticed.

Second, it is apparent that cognitively impaired Indigenous offenders require improved access to a multitude of services in custody and in the community to meet their complex needs and these services should feature cultural supports throughout (Baldry et al. 2015). Law enforcement would benefit from training to help them recognise the signs of cognitive disability and how this presentation differs from mental illness (Henshaw & Thomas 2012). Disability-specific diversionary alternatives should be readily available, particularly for Indigenous individuals with complex needs. It is problematic that cognitively impaired Indigenous people are processed through the criminal justice system quicker than any other group. Community health organisations would also benefit from specialist disability training to better equip them to provide wellbeing supports for offenders transitioning back to the community. Last, culturally appropriate disability assistance networks should be available at every stage of the justice system for Indigenous people with cognitive impairment to ensure that equitable care is accessible.

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**Dr Stephane M Shepherd is a research fellow and lecturer at the Centre for Forensic Behavioural Science, Swinburne University of Technology.**

**Professor James RP Ogloff AM is Professor of Forensic Behavioural Science and Director of the Centre for Forensic Behavioural Science, Swinburne University of Technology, and Director of Psychological Services and Research at the Victorian Institute of Forensic Mental Health (Forensicare).**

**Professor Yin Paradies is Professor and Chair of Race Relations and Deputy Director (Research) at the Alfred Deakin Research Institute for Citizenship and Globalisation, Deakin University.**

**Dr Jeffrey Pfeifer is Associate Professor of Psychological Sciences, Swinburne University of Technology.**

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GPO Box 1936  
Canberra ACT 2601, Australia  
Tel: 02 6268 7166

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