



Self-report and behavioural measures of impulsivity as predictors of impulsive behaviour and psychopathology in male prisoners



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ABSTRACT

Impulsivity is an important factor in adverse outcomes such as substance use, problem gambling and psychopathology. Extensive research has shown these negative outcomes are associated with both self-report and behavioural measures of impulsivity but these two measurement domains are not themselves associated. There has been limited research in prison samples. This is surprising given the high variability in impulsive behaviours that should make them ideal for investigating the convergence of impulsivity measures. Using a cross sectional design we investigated the associations of impulsivity – measured by self-report and two behavioural indices – with substance misuse and psychopathology in a sample of 72 male prisoners. We found higher self-reported impulsivity was associated with crack/cocaine use, problem gambling and a positive screen for personality disorder. Behavioural measures of impulsivity showed fewer associations with problematic behaviours; they were also not independent predictors of impulsive behaviour in multivariate analyses. These data suggest that self-reported impulsivity is a more consistent predictor of problematic behaviours than behavioural measures in a sample of people with significant levels of substance use and psychopathology. This difference could reflect relevance of self-reported measures to emotionally charged decision-making in daily life compared to more neutral behavioural measures.

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1. Introduction

Higher levels of impulsivity have been linked to a range of behaviours that impact on daily functioning (Sharma, Markon, & Clark, 2014). For example, there is evidence for higher levels of impulsivity in those with greater substances use problems (Verdejo-Garcia, Bechara, Recknor, & Perez-Garcia, 2006), psychopathology (Chamorro et al., 2012) or offending behaviour (Leverso, Bielby, & Hoelter, 2015). Such findings have informed theories of addiction (West & Brown, 2013) and criminality (Lynam & Miller, 2004). However, recent commentary suggests further understanding of the construct of impulsivity is required before additional theoretical progress can be made in making sense of its role in adverse behavioural outcomes (Sharma et al., 2014). One obstacle concerns the measurement of impulsivity, which

falls into two broad categories. One domain is self-report measures that are assumed to capture what participants do across time and situations. In contrast, behavioural measures are intended to capture the manifestations of underlying traits assessing what people do in specific situations. A recent comprehensive review of the literature found robust support for associations between problematic daily life behaviours and impulsivity across both the two main domains of measurement (Sharma et al., 2014). However, the associations between self-reported and laboratory behavioural measures of impulsivity were consistently low. The authors concluded that each domain is tapping unique variance in daily life behaviour, if true this would question of the validity of impulsivity as a single construct, and support the notion of ‘varieties of impulsivity’ (Evenden, 1999).

The majority of research on the two domains of impulsivity has been conducted within specific clinical groups or general population samples. These studies have shown weak associations between the two domains of impulsivity measures though associations are somewhat stronger between measures of impulsivity and impulsive behaviour (Sharma et al., 2014). A possible means to increase sensitivity is to identify samples where there is likely to be high variability on measures of impulsivity,

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psychopathology and types of problematic behaviours. Prison populations are ideal in this regard as high levels of both substance use (Fazel, Bains, & Doll, 2006; Cooper et al., 2016) and mental health difficulties (Fazel & Danesh, 2002) produce greater variability on these dimensions compared to the general population.

Existing research has established consistent associations between self-reported impulsivity and substance use in prison samples (Cuomo, Sarchiapone, Giannantonio, Mancini, & Roy, 2008; Devieux et al., 2002; Ireland & Higgins, 2013; Mooney et al., 2008; Bernstein et al., 2015), with only isolated exceptions (Fishbein & Reuland, 1994). In contrast, there have been very few studies using laboratory measures in samples of prisoners. An exception is discounting, which is the tendency to perceive and attribute reduced value to delayed rewards, even if these are preferable to more immediate gratification (Bickel & Marsch, 2001). There is evidence of higher rates of discounting in prisoners compared to the general population (Arantes, Berg, Lawlor, & Grace, 2013; Wilson & Daly, 2006) and evidence that discounting is associated with criminal thinking styles (Varghese, Charlton, Wood, & Trower, 2014). However, only one of these studies examined the association between discounting and substance use in prisoners (Arantes et al., 2013) and this found this was not significant. In the same study there was no evidence of convergence between the domains of impulsivity. Instead they were, surprisingly, negative correlated (Arantes et al., 2013). The latter single finding is an indication of the very limited research on the degree of convergence between the two domains of impulsivity measurement in prison samples.

As already noted, mental health problems are elevated amongst prisoner populations but potentially the most important problem for current purposes is the heightened rates of personality disorder (Fazel & Danesh, 2002). There is substantial evidence of comorbidity between substance use and personality disorders (Nace, Davis, & Gaspari, 1991; Bowden-Jones, Iqbal, Tyrer, et al., 2004; Compton, Thomas, Stinson, & Grant, 2007). It may be that this reflects bidirectional or mutual causation, whereby substance use is a response to extreme emotional states in those with personality disorder, which subsequently exacerbates affective disturbance. Similar bi-directionality also has been found in relation to criminality and substance use (Xue, Zimmerman, & Cunningham, 2009). Another perspective is that impulsivity could be a common factor underlying comorbid personality disorder and substance use (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). Indeed, the presence of a comorbid personality disorder in those that abuse substances is associated with markedly high impulsive behaviour on various tasks (Petry, 2002; Dom, de Wilde, Hulstijn, van den Brink, & Sabbe, 2006; Rubio et al., 2007). Another revealing study by Dom et al. (2006) found that while abnormalities in response inhibition distinguished problem drinkers with personality disorder from those without it, this discrepancy was not found on a delay-discounting task. This highlights the importance of studying impulsivity with multiple measures as this holds potential for disentangling the overlap between substances use and personality disorder in offending populations. Alternatively it may be that impulsivity is an underlying shared mechanism across these distinct adverse outcomes.

The current study aimed to determine both the relationship between the measurement domains of impulsivity and their individual associations with daily-life impulsive behaviour in a prison sample. For the behavioural domain of measurement we included the discounting task previously employed in studies of prisoners. This behavioural measure was complemented with the matching familiar figures test (MFFT) (Cairns & Cammock, 1978). The two tasks are thought to tap different properties of impulsivity with discounting defined as 'choice impulsivity' and the MFFT measuring 'reflection impulsivity' (Sharma et al., 2014). Reflection impulsivity is the tendency for individuals to engage in behaviour without appropriate reflection or deliberation. Greater reflection impulsivity is associated with problematic use of various substances (Morgan, 1998; Clark, Robbins, Ersche, & Sahakian, 2006). To our knowledge, no studies have been conducted on the association

between reflection impulsivity and substance use in samples of prisoners. There has also been no research on the association between distinct behavioural measures of impulsivity in this population.

Our first aim was to establish the relationships between self-report and behavioural measures of impulsivity in a prison sample. Our second aim was to determine the associations of the three impulsivity measures with the extent of substance misuse, problem gambling and psychopathology. Evidence of psychopathology was determined using a screening tool for personality disorder (Moran et al., 2003).

2. Method

2.1. Participants

Seventy-two participants were recruited from a Category C adult male prison for prisoners aged 21 and older in London, United Kingdom (UK). Category C prisons are the third highest level of security in the UK justice system. They provide closed conditions so that prisoners' movement is restricted so that they must spend much of their time confined in cells. Recruitment took place through a prison mental health service. The service screened prisoners <35 years old upon reception into prison for early detection of at risk mental states for psychosis (Jarrett et al., 2012). For the purpose of this study all prisoners screened were asked to participate independent of the outcome of their screening. Exclusion criteria included prisoners not screened by the mental health service (i.e. above 35 years or those refusing screening); those who could not speak English; and those identified as experiencing a current psychotic and/or severe depressive episode and/or those reporting a history of head injury, given potential interference of such difficulties during neuropsychological assessment (Heerey, Robinson, McMahon, & Gold, 2007; Lempert & Pizzagalli, 2010; Slaughter, Fann, & Ehde, 2003). The participants' eligibility against these criteria was determined by interview.

2.2. Procedure

Participants were seen for assessment in accordance with local prison policies governing the times during which prisoners are allowed out of their cells, usually for approximately 2 to 3 hours during the morning and for a similar period in the afternoon. The study was approved by both the local Research Ethics Committee and National Offender Management Service (NOMS). After informed consent was obtained they completed the measures in the order presented below.

2.3. Measures

2.3.1. Barratt impulsiveness scale (BIS)

The BIS (Version 11; (Patton, Stanford, & Barratt, 1995)) is a 30-item measure widely used to assess impulsive personality traits, comprising a total score and subscale scores for trait domains of (i) attentional, (ii) motor and (iii) non-planning impulsiveness. The current analysis used the total BIS score as a measure of trait impulsivity, with scores treated as continuous.

2.3.2. Monetary choice questionnaire (MCQ)

The MCQ (Kirby & Marakovic, 1996; Kirby, Petry, & Bickel, 1999) was used to measure delayed reward discounting. The MCQ is a 27-item assessing how quickly individuals tend to discount delayed rewards in favour of immediate rewards; the discounting rate, k . Trials differ both in terms of temporal delay to receipt of larger reward and in size of delayed reward. Guidance from Kirby (Kirby, 2000) was used to infer k for each reward magnitude; the geometric mean of these was taken as an overall measure of discounting, as used previously (Kirby et al., 1999). Higher k is considered indicative of elevated discounting. Discount rates were treated as continuous for analysis.

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