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Illicit Drug Use and Property Offending among Police Detainees

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Aim: *The primary objective of the current study was to examine whether the frequency of recent illicit drug use is related to higher levels of offending among police detainees in Australia. In particular, the study investigated whether the frequency of property offending escalates with offenders' self-reported illicit drug use.*

Method: *Data from the Australian Institute of Criminology's Drug Use Monitoring in Australia (DUMA) program were analysed for a national cohort of 9,453 arrestees interviewed between 2008 and 2010. Statistical analysis examined whether the number of property offences recorded at arrest was related to self-reported frequency of illicit opioid and amphetamine consumption in the 30 days prior to arrest, while controlling for other relevant drug use and demographic factors.*

Results: *Results showed a high level of illicit drug use among police detainees. Outcomes from regression modelling revealed that heavy users of illicit opioids and amphetamines, who reported at least 16 days of use in the month prior to arrest, had significantly more property charges recorded at arrest than both less frequent (moderate) users and non-users. Compared to non-users, heavy opioid users had 57 per cent more property charges recorded at arrest while heavy amphetamine use was associated with a 53 per cent increase in property charge counts. Higher rates of property offending were also related to younger age, being unemployed and having reported illicit use of benzodiazepines in the 30 days prior to arrest.*

Conclusion: *These outcomes clearly demonstrate that heavy drug use, of either amphetamines or opioids in the 30 days prior to arrest, is associated with frequency of property offending. This has important implications for the treatment of drug using offenders within the criminal justice system.*

Keywords: *property offending; illicit drugs; heroin use; amphetamine use; police detainees*

INTRODUCTION

A vast amount of criminological research has focused on the relationship between illicit drug use and crime. While evidence of a direct causal relationship has not been established, there is overwhelming empirical support from both Australian and international studies that there is a strong association between drug use and crime. Evidence for this relationship can be derived from studies showing that the prevalence of illicit drug use is higher among offender populations compared to the general community, and that a high proportion of illicit drug users report involvement in crime and often attribute their offending to their drug use (Crime and Misconduct Commission, 2005; Gaffney, Jones, Sweeney, & Payne, 2010; Indig et al., 2010; Kevin, 2010; Stafford & Burns, 2011). For example, data obtained from the most recent inmate health survey in New South Wales revealed that lifetime prevalence of illicit drug use is substantially higher among the inmate population (84 per cent) compared to the general community (38 per cent: Australian Institute of Health and Welfare, 2008), with 44 per cent of recently surveyed inmates reporting regular (daily/near daily) drug use in the year prior to incarceration (Indig et al., 2010). In a separate survey of inmates in New South Wales, Kevin (2010) found that 72 per cent of incarcerated males and 67 per cent of incarcerated females attributed at least one of their current offences to use of alcohol or illicit drugs. Elevated rates of drug use are also observed among police detainees in Australia, with recent monitoring reports indicating that nearly two-thirds of detainees in police custody test positive for at least one illicit drug at time of arrest (Gaffney et al., 2010). Among illicit drug users,

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survey studies have shown high rates of involvement in crime. Findings from the most recent Illicit Drugs Reporting System (IDRS) survey of injecting drug users in Australia revealed that 39 per cent of those surveyed nationally reported engaging in crime, most often drug dealing and property crime, in the last month (Stafford & Burns, 2011). Similarly, a targeted survey of methamphetamine users in Sydney observed very high levels of contact with police, with the majority of the sample (88 per cent) reporting committing an offence in their lifetime, of whom 72 per cent reported engaging in property crime (McKetin, McLaren, & Kelly, 2005).

While the relationship between drug use and crime is complex and can differ for different types of drugs and offences, one of the most commonly observed associations between drug use and crime is in the context of property crime (e.g., theft, break and enter, stealing). An often cited explanation for this relationship is that drug users commit property offences to raise money to support their drug habit (Bennett & Holloway, 2005a; Goldstein, 1985; Klee & Morris, 1994; Weatherburn, Topp, Midford, & Allsop, 2000) and that engagement in property crime is strongly correlated to severity of use and expenditure on drugs (Blumstein, Cohen, Roth, & Visher, 1986). This has typically been reported in the empirical literature in the context of heroin use. Indeed, there are a number of studies that have shown that indicators of heroin use are positively associated with property crime rates, both internationally (e.g., Ball, Shaffer, & Nurco, 1983; Bennett & Holloway, 2005b; Klee & Morris, 1994) and from Australian studies focusing mainly on the impact of the well-documented heroin drought on property crime rates (e.g., Donnelly, Weatherburn, & Chilvers, 2004; Moffatt, Weatherburn, & Donnelly, 2005). However, the effect of drug use on property crime is certainly not limited to heroin use, as drug using property offenders often report using a variety of different drugs (Makkai, 1999; 2001). For example, there is growing evidence of an association between methamphetamine use and property offending; with findings from studies conducted both internationally and locally indicating that property offending is common particularly among regular or heavy users of methamphetamine (Crime and Misconduct Commission, 2005; Gizzi & Gerkin, 2010; Klee & Morris, 1994; McKetin et al., 2005; Wilkins & Sweetsur, 2010). In addition, there is evidence that multiple drug users are more likely to be involved in property offending than single drug users (Makkai, 2001), and that there is a relationship between the number and types of different drugs used and higher offending levels (Bennett & Holloway, 2005a).

In developing an understanding of the relationship between drug use and crime, it is important to consider not just the prevalence of illicit drug use, but also the frequency of use. Determining whether high frequency users of illicit drugs are more likely to engage in crime or, importantly, offend at higher rates than lighter users is critical from a policy perspective in developing targeted interventions for reducing both drug use and crime (Weatherburn et al., 2000). Indeed, research suggests that more frequent drug use is associated with higher rates of offending (Ball et al., 1983; French et al., 2000). For example, in 2001, researchers in the United Kingdom reported that among a treatment sample of drug users those who reported chronic drug use (of heroin or crack) had committed a significantly higher number of acquisitive offences in the previous month than occasional drug users (Best, Sidwell, Gossop, Harris, & Strang, 2001). Similarly, among a sample of police detainees in New Zealand Wilkins and Sweetsur (2010) found that that there was a strong association between the amount spent on methamphetamine and earnings from property crime in the 30 days prior to arrest, indicating that higher levels of methamphetamine use are associated with more frequent property offending. Some scholars have suggested that frequency of offending "can be six times higher during periods of heavy drug use" (Blumstein et al., 1986, p. 5). This evidence strongly suggests that there is a relationship between intensity of drug use and offending frequency.

However, currently there is little research in Australia examining the association between frequency of use of different types of drugs and offending rates. Indeed, prior research on drug use and crime in Australia has focused on prevalence of any illicit drug use or criminal involvement to a much greater extent than frequency of use or offending. In addition, many previous drug-crime studies have relied on self-reported involvement in crime and have failed to include appropriate controls for other demographic, socioeconomic or drug use variables (e.g., age, gender, ethnicity, socioeconomic status, injecting drug using status) that are often associated with offending behaviour. Furthermore, while there have been numerous studies conducted in Australia on the link between heroin use and property crime (e.g., Donnelly et al., 2004; Moffatt et al., 2005), there is little research examining whether users of other types of drugs engage in comparable levels of income generating crime. This is especially relevant to amphetamine use, with recent indicators showing that amphetamines are one of the most commonly used drugs among populations of drug users and offenders in Australia (Indig et al., 2010; Stafford & Burns, 2011). Clearly, there remains much to be explored about the relationship between intensity of drug use and rates of involvement in crime.

The aim of the current study is to examine whether there is an association between frequency of illicit drug use and property offending among a cohort of arrestees captured as part of the Australian Institute of Criminology's Drug Use Monitoring in Australia (DUMA) program. This monitoring program provides a unique opportunity to study the relationship between intensity of drug use and offending frequency because it collects

extensive information on alcohol and illicit drug use among a national sample of police detainees (Gaffney et al., 2010). As such, detailed information on recent illicit drug use and objective records of offending can be readily accessed and the relationship between the two explored in depth. Given the high prevalence of both amphetamine and heroin use in Australia (Indig et al., 2010; Stafford & Burns, 2011) and the previously identified links with property offending (e.g., McKetin et al., 2005; Moffatt et al., 2005), the primary focus of the current analysis was on recent use of these two drug types. In particular, we investigated whether the number of property offences recorded for detainees at time of arrest is related to their self-reported level of illicit opioid and amphetamine consumption in the 30 days prior to arrest, while controlling for other relevant drug use and demographic factors.

METHOD

This study draws upon national data collected routinely as part of DUMA program. The DUMA program was established in 1999 and is Australia's largest national survey of the illicit drug use patterns of police detainees, conducted quarterly at selected police stations and watch houses across Australia, including three in New South Wales (Bankstown, Parramatta and Kings Cross). As part of the DUMA protocol, detainees are interviewed within 48 hours of arrest about their experiences of drug and alcohol use, participation in the drug market, treatment history, prior contacts with the criminal justice system and a range of demographic indicators. In addition, all detainees are asked to provide a urine sample to be tested for several different types of drugs. Due to the selected sampling methodology employed, the DUMA cohort does not comprise a representative sample of all police detainees or offenders. Further information about DUMA's objectives and methodology are detailed in more depth in the most recent annual report (Gaffney et al., 2010).

For the current study, ten quarters of DUMA data were extracted covering the period from quarter one 2008 through quarter two 2010. During this period, 10,242 interviews were conducted with detainees across ten DUMA sites (Southport, Brisbane, Bankstown, Parramatta, Kings Cross, Adelaide, East Perth, Footscray, Darwin, and Alice Springs).[1] From this overall cohort, all interviews involving adults who had a least one charge recorded at arrest were identified for analysis (n = 9,453).[2] Within this sample, 11.9 per cent of detainees reported that they had previously participated in DUMA. However, since DUMA does not record identifying information or the date of any previous participation, we cannot rule out the possibility that some of these individuals may appear more than once at different time points in the current data set. Taking this into account, the focus of this analysis is on episodes of detention rather than individual detainees.

OUTCOME VARIABLE

For each detention episode, DUMA records up to 10 different charges, coded according to the Australian Standard Offence Classification (ASOC: Australian Bureau of Statistics, 2008).[3] These data are collected from the police charge books or computer systems after the completion of self-report interviews. For the current study, the dependent variable was the count of the number of property charges recorded at the time of arrest (0, 1, 2, 3, 4+), with higher counts reflective of more property offences. This included all mentions of property charges irrespective of other concurrent charge types. That is, these were not necessarily cases where property charges were either the only charges or the most serious charges recorded at arrest. Property charges included non-aggravated robbery, break and enter, theft, and fraud offences (ASOC codes: 612, 711-999).

EXPLANATORY VARIABLES

The primary explanatory variable of interest was the number of self-reported days of illicit opioid use (e.g., heroin, morphine, oxycodone, street methadone, or other illicit opioids) in the 30 days prior to arrest. In addition, we sought to explore whether the impact of drug consumption on property offending is similar across different classes of drugs. To this end, we also included self-reported days of amphetamine (amphetamine, methamphetamine)[4] use as a key explanatory variable in the model. Both of these variables were coded into three categories: 0 days; 1-15 days; 16-30 days.[5] A number of other explanatory variables associated with property offending among DUMA detainees were also included in the model. These were:

- Age category: The age of the detainee at the time of arrest and DUMA interview (35+; 26-34; 18-25).
- Gender: (female/male).
- Indigenous status: whether the detainee self-identified as Aboriginal or Torres Strait Islander descent (Non-Indigenous/ unknown vs. Indigenous).
- Employment status: whether the detainee reported being employed at the time of DUMA interview (employed in full-time or part-time work vs. unemployed or not currently working).
- Heavy alcohol use: Whether the detainee self reported heavy use of alcohol on at least one occasion in the 12 months prior to arrest (yes/no). In the DUMA survey heavy use of alcohol is defined as five or more alcoholic drinks in one day for men and three or more alcoholic drinks in one day for women.
- Injecting drug use: Whether the detainee self-reported injecting any illicit drugs in the 12 months prior to arrest (yes/no). This included cocaine, heroin, illicit opioids, amphetamines, ecstasy, LSD and other hallucinogens, and illegal benzodiazepines.

- Benzodiazepine use: Whether the detainee self reported using benzodiazepines illicitly in the 30 days prior to DUMA interview (yes/no).

STATISTICAL ANALYSIS

The bi-variate relationships between each of the proposed explanatory variables and the outcome variable were initially assessed using chi-square tests of association. Variables that were significant at the 5 per cent level were included in subsequent statistical modelling.

To determine whether the intensity of illicit drug use in the period prior to arrest is associated with higher levels of property offending, a count model regression approach, namely zero-inflated negative binomial regression, was employed. This technique was selected to account for a number of important features of the data set. First, the frequency distribution of property charge counts (0, 1, 2, 3, 4+) was highly skewed and showed evidence of over-dispersion (e.g., the variance exceeded the mean of the distribution). When data are over-dispersed, the negative binomial model is an appropriate modelling strategy (Cameron & Trivedi, 1998), and for this reason was chosen in favour of a Poisson model. Second, the vast majority of the sample (74.6 per cent) had no property charges recorded at time of arrest, resulting in an excessive number of zeros in the distribution (see Table 3). The zero-inflated negative binomial approach effectively accounts for the excess zeros by constructing the model in two parts, estimating first the probability of the outcome occurring (zero vs. non-zero), then modelling the frequency counts for the outcome (Long & Freese, 2001).[6]

Statistical analysis and modelling was undertaken using Stata/IC 10.1.

RESULTS

SAMPLE CHARACTERISTICS

Tables 1 and 2 present the frequencies for a range of demographic and drug use variables for the final cohort of 9,453 DUMA detainees. As shown in Table 1, the vast majority of the sample was male, of non-Indigenous status, with roughly equal proportions across age categories. The mean age among detainees was 31 years (SD = 10.1 years), with a range from 18 to 79 years. With respect to employment status, less than half (40.5%) of the sample reported being currently engaged in either full time or part-time employment.

DRUG AND ALCOHOL USE

In terms of drug and alcohol use, results displayed in Table 2 show that nearly three quarters of the overall sample (72.7%)

Table 1. Detainee demographic characteristics (n = 9,453)

Detainee characteristic	n	%
Gender[a]		
Female	1,526	16.1
Male	7,925	83.8
Age category (years)		
35+	3,093	32.7
26-34	2,967	31.4
18-25	3,393	35.9
Indigenous status		
Non-Indigenous/Unknown	7,507	79.4
Indigenous	1,946	20.6
Employment status[b]		
Employed (Full-time/part-time)	3,825	40.5
Unemployed/not working	5,627	59.5

Source: AIC DUMA data collection 2008-2010.

[a] Information on gender was missing for two cases.
[b] Information on employment status was missing for one case.

Table 2. Percentage of detainees reporting recent alcohol and illicit drug use (n = 9,453)[a]

Drug and Alcohol Use	n	%
Heavy drinking (12 months)	6,865	72.7
Injecting drug use (12 months)	2,606	27.6
Any drug use (30 days)	5,577	59.0
Cannabis use	4,432	47.0
Cocaine use	480	5.1
Heroin use	1,102	11.7
Other illicit opioid use	582	6.2
Amphetamine use	2,008	21.3
Ecstasy use	910	9.6
Hallucinogen use	164	1.7
Benzodiazepine use	703	7.4
Inhalant use	127	1.3
Days of amphetamine use in last 30 days		
0 days	7,425	78.7
1-15 days	1,565	16.6
16-30 days	443	4.7
Days of opioids use in last 30 days		
0 days	8,106	85.8
1-15 days	760	8.0
16-30 days	587	6.2

Source: AIC DUMA data collection 2008-2010.

[a] Data on alcohol and illicit drug use was missing for a small number cases (0.2% or less of the sample). In summary, 6 cases were missing for heavy alcohol use; 15 cases missing for cannabis, cocaine and benzodiazepine use; 9 cases missing for heroin use; 13 cases missing for other illicit opioid use; 20 cases missing for amphetamine use; 22 cases missing for ecstasy use; 19 cases missing for hallucinogen use; and 11 cases missing for inhalant use.

Table 3. Count of current property charges recorded at time of arrest (n = 9,453)

Count of Current Property Charges	n	%
0	7,056	74.6
1	1,516	16.0
2	425	4.5
3	162	1.7
4+	294	3.1

Source: AIC DUMA data collection 2008-2010.

met the DUMA criteria for heavy alcohol use in the past 12 months (74.3% males; 64.4% females). This is consistent with previous findings among DUMA samples showing high levels of heavy alcohol use among both male and female police detainees (Gaffney et al., 2010). For each class of drug, detainees were coded as being a recent user if they self-reported use of that drug within the 30 days prior to arrest.[7] Overall, 59 per cent reported recent use of at least one illicit drug, with cannabis identified as the most commonly used drug (47%), followed by amphetamines (21.3%), and heroin (11.7%). When use of all illicit opioids was considered (including heroin, morphine, oxycodone, street methadone etc.) 14.2 per cent met the criteria for recent use. In addition, over a quarter (27.6%) of the sample reported at least one episode of injecting drug use within the 12 months prior to interview. With respect to frequency of amphetamine and opioid use, while the vast majority of respondents reported no recent use, there were a number of cases who reported both moderate (1-15 day) and heavy use (16-30 days) of these substances in the period leading up to their arrest.

PROPERTY OFFENDING

The distribution of the count of property charges recorded at arrest is displayed in Table 3. As shown in the table, a quarter (25.4%) of detainees had at least one property charge recorded at arrest. Among this group of property offenders, the majority (16%) had only one property charge, with 3.1 per cent charged with four or more property offences.

BI-VARIATE COMPARISONS

The bi-variate outcomes for each of the explanatory variables that were significantly associated with the count of property charges are presented in Table 4. The results displayed in the table indicate that higher levels of property offending were significantly associated with a range of demographic indicators. Significantly higher counts of property charges were observed for females compared to males; younger adults compared to older adults; those of non-Indigenous or unknown status compared to those of Indigenous status; and for those who were unemployed or not currently working compared to those currently employed. For alcohol use, property charges were significantly more common among those who did not meet the DUMA criteria for heavy drinking. With respect to drug use, property charge counts were related to recent injecting drug use and to use of benzodiazepines, amphetamines and all illicit opioids (all *p*-values <.001). Furthermore, there was evidence that more frequent use of amphetamines and opioids was associated with higher levels of property offending.

STATISTICAL MODELLING

The first stage of the zero-inflated negative binomial regression model was constructed by using detainees' status as an injecting drug user to model the likelihood of whether or not a property charge was recorded at arrest. This variable was selected because, as shown in Table 4, it strongly differentiated at a bi-variate level between cases with zero property charges versus those cases with at least one property charge. The second stage count model was then constructed using the other demographic and drug use variables identified in the bi-variate analyses.

The final zero-inflated negative binomial regression model with robust standard errors was statistically significant in predicting the count of property charges recorded at arrest (χ^2 (11) = 223.17, $p < .001$). The predictor of the excess zeros in the distribution, injecting drug using status, was also statistically significant ($p < .001$).[8] Model outcomes including measures of relative rates denoted by incident rate ratios (IRR) for each explanatory variable are presented in Table 5. As displayed in the table, IRRs less than one indicate a lower number of property charges compared to the reference category, while IRRs greater than one indicate a higher number of charges. For example, results of the statistical model yielded an IRR for unemployment of 1.20. This indicates that individuals who were unemployed had a count of property charges that was 20 per cent higher than those who were employed in either full-time or part-time work (the reference category).

Consistent with the bi-variate outcomes reported in Table 4, results displayed in Table 5 show that heavy users of illicit opioids, who report near daily use in the last month (16-30 days), had significantly more property charges recorded at arrest than those who reported no use of opioids in this time period. This equated to a 57 per cent increase in the number of property charges over non-users. The count of property charges also increased with heavy amphetamine use. Compared to those who reported no recent amphetamine use, detainees who used at the heaviest levels (16-30 days) had 53 per cent more property charges recorded at the time of arrest. A test of the difference between heavy amphetamine users and heavy heroin users showed no significant differences in property charge counts,

Table 4. Bi-variate relationships between explanatory variables and counts of current property charges (n = 9,453).

Variable	Count of current property charges (%) 0	1	2	3	4+	Mean count of property charges
Gender						
Female	63.5	22.5	6.4	2.8	4.8	0.76
Male	76.8	14.8	4.1	1.5	2.8	0.44
Age category (years)						
35+	77.9	14.4	3.8	1.2	2.7	0.43
26-34	73.0	16.5	5.0	2.2	3.3	0.54
18-25	73.1	17.1	4.7	1.8	3.3	0.51
Indigenous status						
Non-Indigenous/Unknown	73.8	16.4	4.8	1.7	3.4	0.52
Indigenous	78.1	14.6	3.4	1.8	2.1	0.39
Employment status						
Employed (Full-time/part-time)	79.5	13.6	3.3	1.2	2.5	0.40
Unemployed/not working	71.4	17.7	5.3	2.1	3.5	0.56
Heavy drinking (12 months)						
No	67.5	19.9	6.3	2.2	4.0	0.64
Yes	77.3	14.5	3.8	1.5	2.8	0.44
Injecting drug use						
No	79.2	13.9	3.3	1.3	2.3	0.39
Yes	62.7	21.6	7.7	2.8	5.3	0.77
30 day Benzodiazepines use						
No	76.0	15.3	4.3	1.5	2.9	0.46
Yes	58.4	24.8	7.0	4.4	5.4	0.85
Days of amphetamine use in last 30 days						
0 days	77.0	15.1	3.9	1.3	2.7	0.44
1-15 days	68.4	18.7	6.8	2.5	3.6	0.62
16-30 days	58.9	21.4	6.8	5.2	7.7	0.97
Days of opioids use in last 30 days						
0 days	77.5	14.5	3.9	1.5	2.7	0.43
1-15 days	63.0	24.1	6.3	2.0	4.6	0.68
16-30 days	50.1	26.6	10.9	4.9	7.5	1.10

Source: AIC DUMA data collection 2008-2010.

Note. Chi-square tests for all variables presented in the table were statistically significant (p <.001).

suggesting that heavy drug use, of either amphetamine or opioids in the 30 days prior to arrest, has a strong impact on the frequency of property offending. With respect to moderate amphetamine and opioid use (1-15 days), there were no statistically significant differences in property charge counts observed when compared to non-users. However, additional statistical tests conducted comparing moderate use (1-15 days) with heavy use (16-30) revealed that heavy users had more property charges recorded at arrest compared to moderate users. This finding was observed for users of both amphetamines and illicit opioids. Among the other explanatory variables, higher property charge counts were also related to younger age, unemployment, and use of benzodiazepines in the 30 days prior to arrest. Conversely, being male, of Indigenous status and engaging in heavy alcohol use in the last 12 months were associated with fewer property charges at arrest.

Table 5. Zero-inflated negative binomial regression incident rate ratios, 95% confidence intervals and associated p-values (n = 9,414).

Variable	IRR	95% Confidence Interval		*p*-value
Gender				
Female (ref)	1.00	--	--	--
Male	0.70	0.636	0.777	<.001
Age category (years)				
35+ (ref)	1.00	--	--	--
26-34	1.17	1.046	1.300	.006
18-25	1.38	1.240	1.537	<.001
Indigenous status				
Non-indigenous/unknown (ref)	1.00	--	--	--
Indigenous	0.77	0.691	0.864	<.001
Employment status				
Employed full-time/part-time (ref)	1.00	--	--	--
Unemployed/not working	1.20	1.093	1.327	<.001
Heavy drinking (12 months)				
No (ref)	1.00	--	--	--
Yes	0.77	0.701	0.841	<.001
30 day benzodiazepines use				
No (ref)	1.00	--	--	--
Yes	1.17	1.015	1.336	.030
Days of amphetamine use in last 30 days				
0 days (ref)	1.00	--	--	--
1-15 days	1.10	0.980	1.233	.107
16-30 days	1.53	1.296	1.794	<.001
Days of opioids use in last 30 days				
0 days (ref)	1.00	--	--	--
1-15 days	1.07	0.925	1.238	.360
16-30 days	1.57	1.366	1.800	<.001

Source. AIC DUMA data collection 2008-2010.

Note. Additional statistical testing indicated that heavy (16-30 day) amphetamine users had significantly more property charges recorded at arrest than moderate (1-15 day) amphetamine users (p <.001). Similar findings emerged for heavy versus moderate illicit opioid users (p <.001). Further testing among heavy users only (16-30 days) revealed no differences in property charge counts for users of amphetamines versus illicit opioids (p = .788).

DISCUSSION

The findings from the current study have shown that illicit drug use is highly prevalent among police detainees in Australia and that heavy drug use is linked to higher levels of property offending. Results from statistical modelling revealed that after controlling for relevant demographic and drug use factors, heavy users of either opioids or amphetamines, who report using at least four days a week on average, had a significantly higher number of property charges recorded at arrest compared to both less frequent and non-users of these drugs. The magnitude of the effect comparing heavy users and non-users was remarkably similar for opioids and amphetamines, with findings indicating that heavy use of either drug was associated with at least a 50 per cent increase in the number of property charges recorded at arrest. Notably, moderate users were not more likely than non-users to have more property charges recorded at arrest. This is somewhat contrary to the notion that participation in drug use per se is associated with property crime and provides evidence for the contention that it is frequent and chronic drug users that account for much of the observed drug-related property offending. However, it is also possible that this finding could be an artefact of the very high rates of drug use observed among the current sample, where 59 per cent of detainees reported using illicit drugs in the 30 days prior to arrest and over two-thirds (68%) reported illicit drug use in the last 12 months. This level of

use is markedly higher than what is typically observed in general population surveys of drug use, where less than 15 per cent (13.4%) of respondents sampled recently in Australia reported use of illicit drugs in the past 12 months (Australian Institute of Health and Welfare, 2008).

These findings are consistent with an extensive list of prior research showing that engagement in income-generating property crime is strongly related to frequency of use, dependence and expenditure on drugs (e.g., Ball et al., 1983; Best et al., 2001; Blumstein et al., 1986; French et al., 2000; Wilkins & Sweetsur, 2010). However, much of the previous Australian research on the relationship between drug use and acquisitive crime has been conducted in the last two decades, at a time when heroin was typically more widely available and prevalent in use than amphetamines. More recently, amphetamine use has increased such that it has now surpassed heroin and other opioids as one of the most commonly used illegal drugs, especially among police detainees (Gaffney et al., 2010) and incarcerated offenders (Indig et al., 2010). However, research on the association between amphetamine use and crime in Australia has typically focused on its link with violence (e.g., Hall & Hando, 1994; McKetin, McLaren, Riddell, & Robins, 2006; Smith & Rodwell, 2009) and less so on its association with income-generating crime. Further, of those existing studies that have examined property offending in the context of amphetamine use, most have relied on self-reported involvement in crime (e.g., McKetin et al., 2005; 2008). Though this study does not examine the relationship between amphetamine use and violence, it is nevertheless one of few in Australia to demonstrate that heavy amphetamine users are just as likely as opioid users to be engaged in comparatively high levels of police-recorded property crime. This finding challenges the popular perception that heroin use is primarily associated with property offending while use of amphetamines, particularly crystal methamphetamine, is primarily linked to violent offending. Furthermore, the current findings emphasise the importance of considering the frequency and the associated expense of any reported illicit drug use in evaluating the relationship between drug use and property offending. This is especially important when bearing in mind that most drug users are poly-drug users (Darke & Hall, 1995; Darke, Ross, & Teesson, 2007), for whom the need to seek illegal income will likely be more closely associated with their frequency of use and total expenditure on drugs rather than their pattern of consumption of one particular type of drug.

These findings have important implications for drug treatment and the effectiveness of treatment programs for reducing drug-related offending behaviour. Indeed, insofar as drug treatment reduces dependence on expensive illegal drugs, it should also result in a reduction in any associated income-generating criminal activity. With respect to opioid dependence, there are relatively well-developed treatment options available (e.g., pharmaceutical substitutes such as methadone and buprenorphine) and empirical support for the efficacy of these interventions in reducing offending behaviour (e.g., Hall, 1996). For example, research into the link between methadone maintenance therapy and crime among a large cohort of methadone clients in Australia has shown that offending rates are significantly lower during the period of ongoing maintenance compared to periods when users are not engaged in treatment (Lind, Chen, Weatherburn, & Mattick, 2004). As a result, opioid substitution programs have become an important component of treatment interventions such as drug courts and diversion programs for drug-using offenders that operate within the criminal justice system. However, treatment options for amphetamine and stimulant dependence are less well-developed and although there has been some recent success reported for the use of controlled doses of dexamphetamine as a substitute for amphetamine abuse (Merrill et al., 2004; Shearer et al., 2001; White, 2000), there is still no recognised equivalent to methadone or buprenorphine. Consequently, unlike opioid users, for whom there are pharmaceutical substitutes that can assist in minimising the costs associated with illicit opioid dependency, no such option exists for those dependent on amphetamines. This highlights the need for improved treatment options for amphetamine dependence, especially given the high rates of amphetamine use in Australia.

It is also likely that amphetamine users will pose different treatment challenges compared to heroin users in the context of treatment and diversion interventions in criminal justice system. Although the goals of criminal justice programs for drug using offenders, to reduce drug use and any associated offending, will be the same for all types of drug users, it may be the case that primary amphetamine users have a different set of treatment needs than primary illicit opioid users. Given that the population of heavy amphetamine users and heavy opioid users in the criminal justice system is nearly equal in size, it is essential that such interventions consider any differences in offender profiles and the specific needs of different types of drug users in developing appropriate case management strategies. While there has been a strong focus in recent years on treatment of opioid using offenders, further research investigating the most effective ways to target criminal justice treatment interventions to the population of amphetamine users is needed to develop best-practice models to reduce both dependency and drug-related offending.

While the findings of the current study provide an in-depth characterisation of the relationship between drug use and property offending among police detainees in Australia, there

are also some limitations to the study. First, DUMA does not comprise a representative sample of all offenders. Indeed, DUMA arrestees are selected from ten sites nationally, and the data collection captures only those who the police deem to require detention. This excludes the population of offenders who are not brought into police custody and are instead dealt with by other means (e.g., street summons, cautions). In addition, DUMA does not capture detainees who are heavily intoxicated or violent, as these detainees are generally not interviewed at the discretion of local police. As a result, the DUMA data collection may not capture particular offender sub-groups and the exclusion of these groups may have exerted some influence on study outcomes. Though notably, the findings of the current study are consistent with some recent international research focusing on the relationship between frequency of use of opioids and stimulants and rates of property offending (e.g., Best et al., 2001; Wilkins & Sweetsur, 2010). Furthermore, it is important to acknowledge that while the results of the current study show that heavy use of amphetamines or opioids is associated with high rates of property offending, the statistical model did not test for the combined effect of heavy use of both amphetamines and opioids on property charge counts. Although it seems likely that heavy users of both substances would engage in high rates of property offending by virtue of their very frequent use, the magnitude of this increase would unlikely be a simple addition of the individual risks associated with heavy use of each of these substances alone. That is, it cannot necessarily be assumed that a daily user of heroin and amphetamines would be at double the risk of committing property offences compared to a daily user of either heroin or amphetamines only. Future research would benefit from further exploring the relationship between poly-drug use and crime, exploring particularly the association between patterns of multiple drug misuse and the commission of property crimes.

Finally, it is important to note that in the current analysis, heavy drug use was not the only factor linked to higher levels of property offending. Even after controlling for frequency of drug use the detainees' employment status, gender, age and Indigenous status all remained significantly associated with rates of property offending. Together, this serves as an important reminder that drug treatment programs operating in the context of the criminal justice system will benefit from taking a multi-faceted approach that addresses drug dependency as well as the demographic and social factors that contribute to involvement in criminal activity. Indeed, where possible, programs that can be tailored to individual case management needs are likely to yield the best outcomes for addressing drug dependency and offending behaviour. Simply treating a person's drug dependency without consideration of other environmental and contextual factors will likely result in less favourable treatment outcomes.

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NOTES

1. Data for Alice Springs was only collected in quarters one and two in 2008. Data collection in Kings Cross took place only in quarters one and three in 2009, and quarter one in 2010.
2. Of the cases excluded from analysis, 204 cases were excluded because detainees had no charges recorded; while 585 cases were excluded because detainee's age was less than 18 or was missing in the data set.
3. Since DUMA caps recording of charge counts at 10, there may be some individuals who present with more than 10 charges whose offending is not fully captured in the current dataset. While the impact of this unrecorded data is likely to be small, it may have exerted some effect on our estimates of frequency of property offending.
4. This included all forms of amphetamines (powder, base, ice/crystal).
5. In the DUMA survey, there are separate questions dealing with heroin use and use of all other opiates (combined). In this study, a respondent is categorised according to the highest frequency with which they used either heroin or other illegal opiates.
6. In determining the most appropriate method to analyse the current data, both standard and zero-inflated poisson and negative binomial models were tested. Model fit statistics produced in Stata/IC 10.1 indicated that zero-inflated negative binomial regression yielded the best fit for the data.
7. It is important to note that there were some cases who reported no 30 day use of a particular drug but had a positive urine test for that drug at arrest (e.g., 255 cases for heroin and 304 cases for speed/amphetamine). However, since the focus of the current analysis is on self-reported use, these cases were retained in the sample.
8. Results of a Vuong test indicated that the zero-inflated model yielded a better fit than a standard negative binomial regression model.

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