



Criminal thinking and self-control among drug users in court mandated treatment

GREG PACKER, DAVID BEST, ED DAY AND KELLY WOOD
University of Birmingham and Solihull Mental Health Foundation Trust, UK

Abstract

This article aims to explore the relationship between self-control and criminal thinking in a population of drug using offenders attending a court mandated treatment programme, and how this relates to recent offending and substance use. Fifty drug using offenders attending a Birmingham Drug Intervention Programme clinic under the terms of a Drug Rehabilitation Requirement (DRR) completed standardized measures of self-control and criminal thinking. Associations were found between both self-control and criminal thinking and drug use and offending. A strong association was found between low self-control and high criminal thinking. Lower levels of self-control were associated with younger age, and there was some evidence of a link between younger age and higher criminal thinking. The links between drug use and crime are more complex than could be explained by either the self-control model of crime or criminal thinking alone, although the current findings suggest a mediating role for age and indications that drugs-crime linkage is mediated by patterns of substance use and offending.

Key Words

coerced treatment • drugs-crime linkage • offending patterns • self-control • thinking styles

Background

The strong links between drug use and crime, particularly acquisitive crime, have been previously demonstrated in several UK (Hammersley et al., 1989; Parker and Kirby, 1996; Coid et al., 2000; Gossop et al., 2000) and international studies (Nurco, 1993; van der Zanden et al., 2007). Increased contact with other drug users also appears to be a risk factor for increased criminal involvement (Best et al., 2007).

Bennett and Holloway (2005) have outlined the primary models used to explain the linkage ranging from 'drugs cause crime'; 'crime causes drug use'; the reciprocal model and the 'common cause' model, with the 'drugs cause crime' model the most compatible with a 'medical model' view of addiction. This can take the form of either a psychopharmacological model (where there is assumed to be a direct link between drug effects and criminal behaviour) or the 'economic necessity' model (Goldstein, 1985), although as Bennett and Holloway caution, this will depend on which drug, which crime, how measured and in what context the offending is believed to occur.

However, the nature of the drugs–crime link has also been conceptualized in developmental terms with the concept of 'careers' increasingly prominent in writings on both offending (Laub and Sampson, 2003) and addictions (Hser et al., 2007). Indeed, Thornberry (2005: 156) has argued that 'the advent of developmental life-course theories of delinquency is perhaps the most important advance in theoretical criminology during the latter part of the twentieth century'. While this has been traditionally characterized in terms of 'which comes first' in drugs and crime, an alternative approach is to consider the impact on long-term addiction and crime careers. Farrington's (1979) conclusion that substance use significantly impairs adolescents' ability to mature out of delinquency and reintegrate into mainstream society, has been supported by Welte et al. (2005). In the Buffalo Longitudinal Study of Young Men, Welte et al. concluded not only that drug use prevents a speedy maturing out of crime careers, the extent of substance dependence and the negative consequences experienced will determine the 'peak level' of the delinquency career.

In the addictions field, much of the rationale for the 'drugs cause crime' model derives from longitudinal drug treatment outcome studies. Thus, the UK National Treatment Outcome Research Study (NTORS) has shown that treatment is associated with reductions in drug use in a community setting, but also with significant reductions in offending despite criminal behaviour not being specifically targeted in most of the participating services (Gossop et al., 2000, 2005). The effect appears particularly marked among drug users with a high level of pre-entry criminal activity. The NTORS study concluded that the economic benefits of reduction in crime alone far outweigh the costs incurred in running the treatment programmes (Godfrey et al., 2004). However, it is notable in the NTORS cohort that the majority of the crime reduction was reported in a sub-sample of around 10 per cent of those followed up, with a further 50 per cent reporting no crime in the period prior to treatment entry.

The relationship between drug treatment and reduced criminal activity has been supported in further research in the UK (Keen et al., 2000) and internationally (Simpson and Sells, 1990) providing support for the 'drugs cause crime' model, supplemented by the belief that 'treatment ameliorates this criminal drive'. This is an integral assumption of the UK Drug Intervention Programme (DIP) (Home Office, 2007), a UK government initiative to increase the accessibility of treatment for offenders at various stages of the criminal justice process.

In England, DIP began in 2003 with three aims: to facilitate integration between criminal justice agencies and treatment providers; to deliver seamless treatment pathways across agencies; and to address drug using offenders' needs across treatment journeys. DIP is based on the rationale that addressing the treatment needs of drug using offenders will reduce their involvement in criminality and will enable such offenders to enter treatment at an earlier stage of their drug using careers. The programme aims to provide a continuous treatment pathway for drug abusing offenders through the integration of criminal justice agencies (police, probation, prison and the courts) and treatment providers. There is some supporting evidence for the effectiveness of court-based schemes in England, which were originally referred to as Drug Treatment and Testing Orders (DTTOs; Hough et al., 2003), which have evolved into the Drug Rehabilitation Requirement.

Turnbull, McSweeney and Hough (2000) conducted an 18-month evaluation of DTTOs in England, and found that offenders reported drug spend reducing from £400 in the month before arrest to £25 in the first few weeks of the order. Decreases were also found in acquisitive crime from 137 offences in the month before arrest falling to 34 after the order, although the authors acknowledged problems caused by low retention in the study. In Scotland, Eley et al. (2002) found that DTTOs were associated with a reduction in average expenditure to £57 per week on drugs six months into a DTTO, compared to £490 per week prior to the order.

The DTTO was replaced with the Drug Rehabilitation Requirement (DRR) in 2005. DRRs are part of the Drug Intervention Programme (DIP), introduced by the Home Office in 2003 and permit greater flexibility around supervision and case management. The goal of the programme is to integrate treatment through criminal justice agencies and treatment providers to provide drug using offenders with seamless routes into and through treatment. In a recent review, McSweeney et al. (2008) concluded that the variability in evidenced effectiveness of DTTO/DRR was in part a consequence of treatment quality, availability and delivery, as well as resulting from local setting issues and factors relating to the interface with the criminal justice system such as enforcement practices.

This study investigates two approaches to predicting underlying causal factors in the relationship between drug use and criminal behaviour: the Criminal Thinking Scale (Knight et al., 2006) and Gottfredson and Hirschi's General Theory of Crime (Hirschi and Gottfredson, 1990). The Criminal Thinking Scale (CTS) is based on a traditional therapeutic model

of cognitive change in response to treatment (Walters, 2006a), building upon a cognitive mapping approach to criminal thinking patterns (Knight et al., 2006). Dembo et al. (2007) reported that, relative to an adult sample, adolescent offenders had higher mean scores on four of the six dimensions of the CTS with strong associations found between CTS scores and self-reported offending history and some aspects of drug use.

The General Theory of Crime (Hirschi and Gottfredson, 1990) suggests that criminal activity and analogous behaviours (including illegal drug use) are influenced by a common strong underlying causative factor—low self-control. Control theory states that self-control is an invariant quality that will not respond significantly to treatment. Low self-control has been well supported as a predictor of criminal behaviour (Pratt and Cullen, 2000; Baron, 2003; Benda, 2005) and of drug use (Vaszonyi and Crosswhite, 2004; Morris et al., 2006). Some research studies have questioned the extent to which self-control is mediated by parental control, social class or peer behaviour (Perrone et al., 2004; Wright and Beaver, 2005) and how useful the theory is when applied to women (Tittle et al., 2003). It has also been noted that imprisonment does not appear to have any beneficial effect on self-control and may even increase propensity to commit crime (Mitchell and MacKenzie, 2006).

The aim of this study was to assess clients attending a treatment service for drug using offenders to examine the relationship between drug use and offending at the first level, then to relate the association to:

- 1 demographic characteristics;
- 2 criminal thinking style;
- 3 self-control.

These findings are then compared to previous results taken from US samples and another sample of Birmingham drug using offenders. The overall aim was to assess whether low self-control acts as a single linking mechanism that can predict both offending and drug use, and or whether the factors underlying these behaviours are due to criminal thinking, a cognitive style which can be influenced by aspects of drug treatment.

Method

The population examined were 50 drug using offenders attending a Birmingham Drug Intervention Programme clinic under the terms of a Drug Rehabilitation Requirement (DRR). DRRs are given as part of a sentence to drug abusing offenders aged over 16 who have expressed a willingness to co-operate with treatment, and consist of a treatment programme lasting between six months and three years (Criminal Justice System Online, 2007). This is a form of coerced treatment, as breaching the DRR order may result in a court appearance and the imposition of a custodial sentence (Criminal Justice System Online, 2007).

Each individual attending the clinic was offered an information sheet by the reception staff, which explained the purpose of the project and the details of their proposed participation. Those who expressed an interest were given the opportunity to ask the researcher questions or for further explanation and then asked to sign a consent form. To encourage participation and full completion of the questionnaire the information sheet included an offer of a £5 voucher, valid for High Street shops, upon completion of the research interview. Both the information sheet and the consent form emphasized confidentiality and understanding of this was clarified prior to beginning the questionnaire and if required throughout their participation. Individuals who were under the age of 18 or were unable to understand the participant information sheet or consent form were excluded from the study.

An interview of approximately 25 minutes was then conducted in a private room between the researcher and the participant during which a 13 section questionnaire was completed. The questionnaire consisted of a researcher completed section including demographic questions, measures of current and past drug use (including the Severity of Dependence Scale, Gossop et al., 1995), measures of current and past offending and treatment history. This was followed by a participant completed section including the Criminal Thinking Scale (CTS) (Knight et al., 2006) assessing aspects of criminal thinking: Entitlement, Justification, Personal Irresponsibility, Power Orientation, Cold Heartedness and Criminal Rationalization. The CTS has been validated within the US criminal justice system and scores have been shown to be responsive to treatment (Knight et al., 2006). Self-reported drug use, with the exception of estimates of spending, and criminal behaviour (Grasmick et al., 1993) have been demonstrated to be reliable and valid methods of data collection in face-to-face interviews (Nurco, 1993; Walters, 2006b).

Analysis

The results are based on correlational methods to assess associations between continuous variables. The initial section analyses relationships between reported substance use and offending, both current and historical, to assess the drug–crime link in this population. The psychological measures—criminal thinking and self-control—are then introduced in order to assess the link between criminal thinking overall, self-control and the measures of drug use and offending.

Results

The sample constituted just under one-third (30.3%) of the 165 clients receiving treatment from the Birmingham DRR team at the time of the project. Forty-three participants were male (86%), and 39 (78%) described their ethnicity as white. The sample had a mean age of 30.7 years (range 19–49, σ 7.5).

Current drug use and drug use history

In the 30 days prior to completing the questionnaire 35 participants (70%) had used heroin on a mean of 11.9 days (range 1–30, σ 11.5), and 27 (54%) had used crack cocaine on a mean of 11.1 days (range 1–30, ; 13.0). Thirty-five participants (70.0%) were taking prescribed methadone (mean daily dose 56.8ml, σ 16.0). Overall, 45 participants (90.0%) reported spending money on drugs in the past 30 days, with a mean reported weekly spend of £117 (range £5–1500, σ £238.80). There were significant correlations between intensity of heroin and crack cocaine use¹ in the last 30 days ($r = .81, p < .001$) and between intensity of both heroin and crack cocaine use and drug spend per week ($r = .597, p < .001$ and $.673, p < .001$ respectively). There was no significant correlation between intensity of heroin use and dose of prescribed methadone, or between methadone dose and criminal activity in the last three months.

Criminal history and current offending

Sixteen (32%) participants reported committing acquisitive crimes within the last 90 days, with a mean number of offences of 23.7 (range 16–40, σ 5.8). Given the nature of the DRR programme all participants had at least one previous conviction, but the mean number of previous convictions was 23.3 (range 1–100, σ 21.6). Thirty-nine participants (78%) reported having been incarcerated at least once, and the mean number of months incarcerated was 55 (range 2–180, 45.4).

There were significant positive correlations between intensity of acquisitive crime in the last 90 days and intensity of heroin use ($r = .50, p < .01$), intensity of crack cocaine use ($r = .54, p < .01$) and drug spend per week ($r = .31, p < .05$). There were significant positive correlations between age of first arrest and age of first heroin ($r = .39, p < .01$) and first crack cocaine use ($r = .41, p < .01$). When the sample was split between those who reported no offending in the last month and those who reported at least one offence, the difference in reported weekly drug spend in the same period was not significant (no offences mean = £85.45; at least one offence, mean = £143.82, $t = 0.85, p = .40$).

There is also an age effect with age inversely associated with the estimated number of acquisitive crimes in the last month ($r = -.28, p < .05$) but not related to the average amount of drug spend ($r = .02, p = .88$).

Criminal Thinking Scale (CTS)

As shown in previous studies (Knight et al., 2006) there were significant internal correlations between all Criminal Thinking Scale sub-scales with the exception of Cold Heartedness. The Criminal Thinking Scale sub-scales scores are shown in Table 1.

When the CTS results from the DRR team were compared to US norms and to a second Birmingham cohort of drug using offenders (Best, et al., in press), the DRR clients were comparable on four of the dimensions, but reported slightly higher levels of Cold Heartedness and slightly lower levels of Criminal Rationalization (see Figure 1).

Males scored significantly higher on the Cold Heartedness sub-scale than females ($t = 2.36, p < .01$). There was a significant negative correlation between age and Power Orientation ($r = -.291, p < .05$), meaning that in this population younger individuals have greater need for power and control than older individuals.

Criminal thinking and drug use

There were no significant correlations between intensity of current heroin use or severity of heroin dependence and any of the Criminal Thinking

Table 1. Criminal Thinking Scale data

CTS subscale	N	Minimum	Maximum	Mean	SD
Entitlement	50	10.0	44.3	20.2	7.8
Justification	50	10.0	48.3	22.0	9.6
Power Orientation	50	10.0	48.6	25.0	9.9
Cold Heartedness	50	10.0	48.0	25.3	8.8
Criminal Rationalization	50	10.0	48.3	26.9	8.3
Personal Irresponsibility	50	10.0	43.3	22.0	8.3

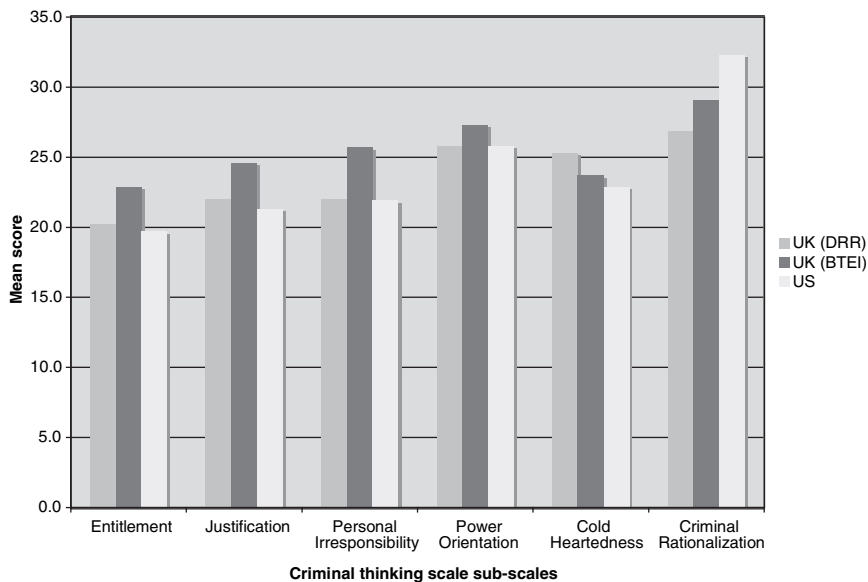


Figure 1 Criminal Thinking Scale comparison with previous studies

Note: DRR: Drug Rehabilitation Requirement; BTEI: Birmingham Treatment Effectiveness Initiative.

Scale sub-scales, or between prescribed methadone dose and any of the Criminal Thinking Scale sub-scales. However, there were significant correlations between intensity of current crack cocaine use and both Justification ($r = .348, p < .05$) and Personal Irresponsibility ($r = .330, p < .05$). There was also a significant correlation between severity of cocaine dependence, as measured by Severity of Dependence Score, and Personal Irresponsibility ($r = .304, p < .05$). There was a significant correlation between Personal Irresponsibility and drug spend per week ($r = .343, p < .05$).

Criminal thinking and offending

The only significant association was a correlation between intensity of acquisitive crime in the last 30 days and Justification ($r = .394, p < .01$) but there were no associations between any of the scales of criminal thinking and either total amount of time incarcerated or the number of previous convictions reported.

Self-Control Scale

The scores for each dimension of the Self-Control Scale are reported in Table 2, and full details of both self-control and criminal thinking measures are given in the Appendix.

The 46 participants (92%) who fully completed the Self-Control Scale reported a mean total score of 56.6 (range 36.5–83.5, σ 10.1) out of a maximum potential score of 96 in which higher scores reflect lower self-control. This can be compared to a mean score of 50.2 in a community survey of 295 adults (not explicitly identified as offenders) in Oklahoma, USA. Furthermore, the mean scores on each dimension were higher in the study sample than in the US sample, which may reflect the differences in sampling between an offender population and a general population sample.

There were positive internal associations between most of the domains of the self-control measure with only the relationship between physical activities and impulsivity showing a small negative association ($r = -.02, p < .89$). Nonetheless, there were strong positive associations between the composite score for the Self-Control Scale and each of the sub-scales (ranging from .36 to .81, and all statistically significant).

Table 2. Self-Control Scale data

<i>CCS subscale</i>	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Impulsivity	50	7.0	15.0	10.2	1.83
Simple Tasks	48	4.0	16.0	9.1	2.70
Risk Seeking	47	4.0	16.0	9.1	2.67
Physical Activities	50	6.5	15.0	10.9	1.94
Self-Centredness	50	4.0	13.5	8.8	2.42
Temper	50	4.0	15.0	9.1	2.65

Self-control and demographics

There were significant negative correlations between age and total Self-Control Scale score ($r = -.352, p < .05$) and the Temper sub-scale ($r = -.328, p < .05$), suggesting that as individuals age so their self-control improves and their temper decreases. There was a positive correlation between number of weeks attending DRR treatment and total Self-Control Scale score ($r = .291, p < .05$), and Temper ($r = .301, p < .05$), indicating that those in treatment for longer had lower levels of self-control.

Self-control and drug use

There were negative correlations between age of first cocaine use and total Self-Control Scale score ($r = -.318, p < .05$) and between age of first heroin use and Impulsivity ($r = -.291, p < .01$). This suggests that lower self-control, and higher Impulsivity is associated with younger age of initial drug use. There were also significant positive correlations between intensity of current heroin use and total Self-Control Scale score ($r = .322, p < .05$) and the Simple Tasks sub-scale ($r = .458, p < .01$). These findings suggest that greater intensity of heroin use is linked to lower self-control. Similarly there were positive correlations between intensity of crack-cocaine use and both the Simple Tasks sub-scale ($r = .394, p < .01$) and Self-Centredness sub-scale on the SCS measure ($r = .310, p < .05$), showing that poorer self-control in each of these areas was associated with increased use of cocaine.

There were strong correlations between current drug spend per week and total Self-Control Scale score ($r = .449, p < .01$) and Self-Centredness ($r = .450, p < .01$). In other words, there was a strong association between low self-control and greater drug spend. There were no significant correlations between low self-control and severity of drug dependence for heroin or crack cocaine.

Self-control and offending

There was a significant correlation between current intensity of acquisitive crime and total Self-Control Scale score ($r = .375, p < .05$), the Simple Tasks sub-scale ($r = .406, p < .05$), and Self-Centredness ($r = .334, p < .05$). There were no significant associations between self-control and age of first arrest, total time incarcerated or number of previous convictions.

Criminal thinking and self-control

There was evidence of a strong positive association between higher criminal thinking and lower self-control (i.e. a higher Self-Control Scale score). There were significant correlations between total Self-Control Scale score and four of the six Criminal Thinking Scale sub-scales: Justification

($r = .501, p < .01$), Power Orientation ($r = .747, p < .01$), Criminal Rationalization ($r = .519, p < .01$) and Personal Irresponsibility ($r = .347, p < .05$). For further analysis, the cohort was split into three groups on the basis of their self-control—'high', 'medium' and 'low' self-control with comparisons shown in Table 3.

Thus, clients of the DRR programme with low self-control were significantly younger, and reported higher average mean scores for power orientation, justification and criminal rationalization. They also had higher average drug spend in the last month, and reported committing crime on more days in the last three months, although neither of these differences attained statistical significance.

Discussion

Most of the Birmingham DRR population have continued to use drugs while in treatment: 70 per cent report using heroin in the previous 30 days, 54 per cent crack cocaine and 90 per cent admit to having spent money on illegal drugs, with an average drug spend of £117 per week reported by 90 per cent of the sample. Around one-third of the sample reported offending in the last 90 days. The absence of any significant relationship between substitute prescribing and heroin use or offending measures would suggest that the methadone treatment received by the majority of the sample does not generate a completely protective effect against either ongoing drug use or criminal behaviour in this population, although we do not have a measure of change in either of these dimensions at the start of the programme. However, there is marked variability across the sample in the patterns of offending and ongoing substance use.

Table 3. Self-control in groups by drug and crime variables and dimensions of the Criminal Thinking Scale

	<i>High self-control</i> (n=15)	<i>Medium self-control</i> (n=15)	<i>Low self-control</i> (n=15)	F
Age	32.7 years	33.1 years	26.5 years	4.16*
Drug spend	£49.23	£89.23	£115.00	1.13
Heroin days	7.3	9.0	7.9	0.92
Crack days	3.2	7.9	6.1	0.40
Crime days in last 90	4.0	4.6	15.9	1.57
Entitlement score	18.7	21.0	22.5	0.91
Power orientation score	16.4	20.7	28.4	7.69***
Justification score	17.0	23.6	34.0	22.57***
Cold Heartedness score	25.1	25.1	24.8	0.01
Criminal rationalization score	22.4	26.6	31.0	4.74*
Personal irresponsibility score	18.1	23.4	24.5	2.88

* $p < .05$; ** $p < .01$; *** $p < .001$.

The first methodological question this generates is about the accuracy of self-report in this population. While there may be some scope for assuming that benefits are used to fund drug use, only 16 of the 45 people spending an average of £117 per week on drugs report criminal involvement. This not only provokes questions about the funding of drug use, it may suggest a different threshold for willingness to report substance use in research settings relative to the reporting of offending. Thus, we find that those reporting no offending in the last month have an average weekly drug spend of £85.45 per week, less but not significantly so than those who reported offending in the last month. Thus, there are two possible implications from this—the association between offending and drug spend is low in this sample, or that reporting drug use is perceived to be more acceptable and that the measured relationship between offending and drug use is distorted by an unwillingness to report undetected crime. This has potentially significant ramifications for interpreting the evidence from drug treatment outcome studies about the impact of substance use on offending.

In contrast, there were strong correlations between measures of past and present drug use (both heroin and crack cocaine) and past and present offending, supporting the evidence base linking drug use and crime, but without clear indications favouring any direct influence models, and with the above caveat about data to be considered. As with the NTORS cohort (Gossop et al., 2000), it would appear that the overall association between drug use and crime is a consequence of a sub-sample who report high levels of both. In other words, as well as concerns about reporting bias, there may also be evidence for a contextual or ideographic basis for the linkage where a small number of people, involved in high levels of both drug use and crime, generate an overall ‘over-prediction’ of the strength of the association. This suggestion for a differentiation by group is suggested by the age effects reported in the study—starting with the finding that there was a strong inverse association between reported offending and age but not between drug use and age. In other words, younger offenders reported more current offending behaviour but not more spending on current drug use, which may also be relevant to the methodological issues around consistent reporting of drug spend and offending, or may reflect differences in drugs and crime careers.

Turning to the measure of control used to compare DRR clients with the norm data (Grasmick et al., 1993), lower levels of self-control were reported in the current sample than in the US population. It is also worthy of note that, within the Birmingham DRR population, lower self-control was strongly associated with earlier age of onset and higher current intensity of drug use as well as with greater intensity of current offending. The strong positive association between drug spend and measures of self-control would support, within an offender population, a relationship between a general measure of low self-control and an index of intensity of current drug involvement. These findings support the contention of the General Theory of Crime (Hirschi and Gottfredson, 1990) that lower than average

self-control is strongly associated with risk-taking behaviours such as offending and drug use. This would provide support for a 'common cause' relationship (Goldstein, 1985) according to which the association between drug use and crime is underpinned by self-control.

However, the age effect reported is not consistent with the trait approach adopted by Gottfredson and Hirschi, which would suggest invariance of scores over time. Here we report an association between lower self-control and younger age, and fail to demonstrate a clear link between self-control and measures of previous offending, such as number of convictions or time incarcerated, thus challenging the General Theory of Crime (Hirschi and Gottfredson, 1990). However longitudinal data would be needed to test this proposition fully, as cohort effects may influence the reporting patterns, and the potential of differential crime reporting by age may also distort this statistical relationship.

Using the second measure, there was a positive association between the criminal thinking style and intensity of current offending. However this was less pronounced than expected, with only a single significant association between intensity of current acquisitive crime and the Justification sub-scale. This suggests that reported criminal thinking may not be directly related to current or historical offending patterns, but may reflect a more generic belief system associated with the drug-crime nexus. The positive associations between criminal thinking and intensity and severity of crack cocaine use support the expected links between criminal thinking and drug use, suggesting that greater crack cocaine use and drug spend may lead to a tendency to justify offending based upon external circumstances and unwillingness to accept responsibility for it. In contrast, neither heroin use, severity of dependence or methadone dose were related to levels of criminal thinking. Overall, there was an association between higher criminal thinking and more intense drug use and drug spending, but this may be more strongly associated with crack cocaine use than with heroin. There was a strong association between lower self-control and higher criminal thinking, and with the exception of Entitlement, all sub-scales on both measures correlate strongly. Links between criminal thinking and offending have also been previously recognized (Garner et al., 2007) but this study has established that there is additionally a strong association between criminal thinking and self-control.

This would further support a 'common cause' model in which lower self-control may generate higher levels of both drug use and crime, which may in turn provoke a thinking style that reduces conflict and distress by justifying the behaviour as a result of external forces. This putative causal modelling would require longitudinal data to test it satisfactorily. However, it would be consistent with the data presented that low self-control is associated with early onset of heroin and cocaine use, which are not linked to criminal thinking scores. That both criminal thinking and self-control are linked to current substance use and offending would support a model where low control is the 'underlying cause' of substance use (as Gottfredson and

Hirschi would have argued) but that the ongoing nexus of offending and substance use is rationalized in ways that are consistent with high scores on the criminal thinking scale. However, this model would not explain the failure to show a relationship between self-control (as an invariant) and early conviction or incarceration, nor is it consistent with the apparent improvements in self-control over time.

This study is limited by its relatively small sample size, and may not be sensitive enough to detect more marginal relationships between factors investigated. Generalizability outside of Birmingham may be an issue, although similar findings to studies elsewhere in the UK and the USA suggest this may not be a great issue. The results are based upon self-reporting and, despite repeated emphasis upon confidentiality, response bias is a possibility, as is consistency of responding styles across the instruments. However recent research has reasserted the validity of offender self-reporting in this population (Walters, 2006b). Nonetheless, the mismatch between drug expenditure reported and levels of crime would indicate that there are different thresholds for reporting offending and drug use behaviours, and that this reporting bias may increase with age. In other words, older drug using offenders may be more cautious about reporting on crimes for which they have not been arrested or charged. This may call into question the viability of a correlational model, which makes naïve assumptions about veridicality or even about the consistency of reporting bias within each interview setting. Nor should we assume that self-report bias would be restricted to the recall of factual events, with measures of both self-control and criminal thinking equally susceptible to self-presentational and reporting biases. The method employed is firmly embedded within a positivist and realist tradition and it is important to acknowledge that this approach may be particularly susceptible to the impact of discursive and empowerment issues.

This was also a cross-sectional study and so was limited in its ability to draw conclusions as to causation and changes over time, which means that it is not possible to address satisfactorily the competing hypothesis of the two models—namely that deviant behaviour is time-invariant (as would be suggested by the General Theory) or that interventions will shift thinking styles and so the likelihood of drug-related offending (as is assumed in the cognitive model deployed by Knight et al., 2006).

Both low-self control and high criminal thinking have been previously demonstrated to be associated with higher intensity of drug use and offending and this study has confirmed those findings. Additionally a strong association has also been demonstrated between high criminal thinking and low self-control. However, the proposed interpretation of these data are that the reporting of current drug use, current offending and reporting on self-control and criminal thinking styles are linked, whether this is regarded as an issue of cognitive consistency or as indicative of underlying personality characteristics and real events. From a criminal justice perspective, each of these measures may be regarded as markers that are predictive of future

behaviour. In other words, the criminal thinking assessment may be a good indication of ease with offending and ongoing drug use and so lower scores on this measure may indicate greater dissonance and so desire to change.

The relationship between the variables of criminal thinking, self-control and intensity of drug use and offending is worthy of further investigation in order to inform better future treatment and policy. Most immediately, there is a need for outcome-focused research that will assess both the extent to which thinking patterns and self-control may be amenable to change (in contrast to the expectations of the original Gottfredson and Hirschi model of self-control), and also the extent to which this correlates with both treatment engagement and reductions in subsequent offending. The role of criminal thinking styles as a mediator of the relationship between offending and drug use would be most effectively examined in the context of interventions that link drugs and crime within comprehensive treatment packages.

Notes

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- 1 Intensity is defined as the total amount used—that is, the mean amount per using day multiplied by the total number of days of use in the last month.

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Melf-Control Scale

Criminal Thinking Scale

<i>Entitlement</i>	Sense of ownership and privilege, misidentifying wants as needs.
<i>Justification</i>	Justify actions based on external circumstances or actions of others.
<i>Power Orientation</i>	Need for power, control and retribution.
<i>Cold Heartedness</i>	Callousness and lack of emotional involvement in relationships.
<i>Criminal Rationalization</i>	Negative attitude towards the law and authority figures.
<i>Personal Irresponsibility</i>	Unwillingness to accept ownership for criminal actions.

Self-Control Scale

<i>Impulsivity</i>	A tendency to respond to tangible stimuli in the immediate environment, to have concrete 'here and now' orientation, rather than to defer gratification.
<i>Simple Tasks</i>	A tendency to lack diligence, tenacity or persistence in the course of actions, to prefer easy or simple gratification of desires, and to avoid complex tasks.
<i>Risk Seeking</i>	A tendency to be adventuresome rather than cautious because criminal acts are 'exciting, risky or thrilling'.
<i>Physical Activity</i>	A tendency to prefer physical activity rather than cognitive or mental activity.
<i>Self-Centredness</i>	A tendency to be self-centred, indifferent or insensitive to the suffering and needs of others.
<i>Temper</i>	A tendency to have a minimal tolerance for frustration and little ability to respond to conflict through verbal rather than physical means.

GREG PACKER is a fourth-year medical student at the University of Birmingham who completed this project as part of the BMedSci degree during his intercalating year in Psychological Medicine.

DAVID BEST is a Chartered Psychologist and Criminologist who has specialized in the links between drug use and crime careers. He has previously worked for the National Treatment Agency and the Institute of Psychiatry at the Maudsley Hospital.

ED DAY is a Senior Lecturer in Addiction Psychiatry at the University of Birmingham and a Consultant Psychiatrist with Birmingham and Solihull Mental Health Foundation Trust. He has published widely in the areas of drug treatment effectiveness and residential drug treatment.

KELLY WOOD is an assistant psychologist working for Birmingham and Solihull Mental Health Trust in criminal justice. Her work involves development of brief manualized interventions for clients entering treatment and in measuring criminal thinking in drug using populations.
