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The Relationship Between the Detection of Acquisitive Crime by Forensic Science and Drug-Dependent Offenders

ABSTRACT: Drug- and nondrug-related acquisitive crime offences such as burglary, theft, and motor vehicle theft, were compared to assess whether drug abusers were more likely to be apprehended via forensic science techniques. Data were all acquisitive offences committed over a 6-year period within a police force area in England. Drug-dependent offenders committed a wider range of offence types than nondependent offenders, and they were significantly more likely to be detected via their DNA or fingerprints ($p < 0.01$). A logistic regression ($n > 14{,}000$) revealed a number of predictors that influence the detection of the crime by forensic techniques. The results indicate that a number of these predictors are of statistical significance; the most significant of these being drug use by the offender with sex, ethnicity, and employment status also being relevant. Age of the offender and number of offences committed were found not to be significant. Of the four hypotheses considered to explain this, the most likely was thought to be the physical and mental impact of drug use on crime scene behavior. Consideration is given to the disciplines of forensic science and forensic psychology working closely together to distinguish factors that influence crime scene behavior.

KEYWORDS: forensic science, drugs of abuse, crime, psychology, identification

The relationship between drug abuse and crime has been well explored over the past 25 years [see e.g., Seddon, (1)]. During this time, many researchers have investigated the connection between drug abuse and crime using methods such as conviction data (2,3), interviews with drug users (4) and analyses based on crime statistics and surveys of drug abuse (5,6). A connection between heroin abuse and acquisitive crime (especially domestic burglary) was established in the early 1980s by Parker and Newcombe (7). In this context, acquisitive crime is taken to mean any offence in which the offender is hoping to acquire property for their own use or for monetary gain. In the U.S., similar offences are collectively known as property crime and would include burglary, larceny-theft, and theft of a motor vehicle. More recently, Bennett and Holloway (8) reaffirmed this connection by revealing the link between heroin and crack cocaine (HCC) abuse and acquisitive crime. Although the nature of the link between drugs and crime is well established, causal connections are difficult to determine. These are outside the remit of the current work, which has an investigative focus: assessing how knowledge of the crime scene behavior of drug abusers may aid their detection.

Although tackling acquisitive crime remains a priority for the U.K. Home Office and for the most U.K. police forces (9), we have been unable to find any research that investigates the relationship between acquisitive crime detection by forensic means (such as DNA or fingerprints) and drug dependency by the offender. As forensic science is a major contributor to acquisitive crime detection in the U.K. (10), we feel it is important to understand the part played by forensic science in detecting acquisitive crime committed by drug dependent offenders. The National Criminal Intelligence Service estimated that in 2001, the British street market in crack cocaine alone was valued at £1.8 billion, and that users funded at least 48% of this by stealing goods that were then resold on the black market for 20–25% of their actual values. Drug-related crime evolves according to a number of variables, including fluctuations in street prices for illegal substances [e.g., Caulkins and Reuter (11)] and the development of new intoxicants [e.g., Goldstein et al. (12)]. As such, it is paramount that techniques for detecting drug-related offences also see progression.

In this paper, we examine acquisitive crime detected in Northamptonshire, U.K., for the 6-year period 2000–2005. We review the distribution of drug-related acquisitive crime compared to national data and then consider the relationship between drug- and nondrug-related acquisitive crime offences detected by forensic science (fingerprints or DNA). Various hypotheses for the observed relationship are explored in detail and suggestions given for further work in this field.

Drug Crime in Northamptonshire

Offences detected between 2000 and 2005 were examined to determine the proportion of those committed by offenders dependent of drugs at the time of the offence. This dependency was determined during the police interview with the offender. Acquisitive crime and associated offences (such as possession of an offensive weapon and handling stolen property) were aggregated into 12 headings, the results being shown in Table 1.

Clearly, a particular offender will not commit all of their offences whilst a drug abuser and, in Table 1, the final column (number of offenders that were drug dependent) includes only those offenders where >50% of their offending was drug related. Although an arbitrary figure, >50% means that the majority of that person's offending over the 6-year-study period, in a given offence type, was drug related. Table 1 includes offenders who become drug abusers after starting their criminality and, equally, offenders who desist from drug abuse through treatment on drug rehabilitation programs, such as the ROSE project in Wellingborough, Northamptonshire (http://www.wellingborough.gov.uk/site/scripts/documents).

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TABLE 1—*Number of offences, offenders and the proportion that were drug related for the period 2000 to 2005 in Northamptonshire.*

Offence	No. crimes detected	Percentage of crimes detected that were drug related	No. offenders	Percentage of offenders that were drug dependent
Cheque fraud	4780	35.9	96	22.9
Shoplifting	15470	21.2	730	22.1
Business robbery	202	29.7	25	20.0
Handling stolen property	1470	19.0	87	17.2
Theft from motor vehicle	5949	11.5	126	15.9
Theft	5909	10.4	266	14.3
Domestic burglary	4084	36.6	322	13.4
Personal robbery	1176	15.3	99	11.1
Other fraud	2792	15.3	187	10.2
Other burglary	4998	26.4	345	9.6
Theft of motor vehicle	4802	31.9	170	5.9
Possession of offensive weapon	1407	11.2	243	2.9

Table 1 confirms that a large percentage of crime types that are a priority for the U.K. police service are drug related, particularly domestic burglary and theft of motor vehicle offences where over 30% of recorded crime is drug related. Drug-related cheque fraud is also in excess of 30%. Such findings are in keeping with Bennett and Holloway (8) who state that:

> 60% of arrestees who reported using one or more illicit drugs and committing one or more acquisitive crimes in the last 12 months thought that there was a connection between their drug use and offending behavior.

Bennett and Holloway (8) noted that this percentage increased when the offenders had abused heroin or crack cocaine. Clearly, offenders will commit multiple offences and Fig. 1 shows the degree of multiple offending for Northamptonshire in which the data for all acquisitive crime has been broken down into those offenders who offended on multiple occasions (committing any acquisitive crime).

Employing the Pearson chi-square test (13), it can be seen from Fig. 1 that the number of drug abusers who commit multiple acquisitive crime offences is statistically significant compared with nondrug abusers ($p < 0.01$). In their study, Bennett and Holloway (8) found that abusers of HCC commit nearly six times the acquisitive crime of nondrug abusers. Similarly, offenders commit more than one type of offence and this data is shown in Fig. 2.

In Fig. 2, the *y*-axis value for each bar relates to that percentage of the total number of either drug or nondrug abusers. That is, the sum of each of the *y* values for drug abusers is 100% and for nondrug abusers is 100%. Figure 2 shows that the range of acquisitive offence types committed by drug abusers is higher than for nonabusers (seven compared with two) and that nondrug abusers are statistically more likely to commit only one type of offence ($p < 0.01$) whereas drug abusers are statistically more likely to commit two offence types ($p < 0.01$). Although it is unwise to infer simple cause and effect relationships between drug abuse and criminality, it has previously been suggested that drug abusers are generally more likely to engage in a greater variety of offences than nonabusers [e.g., Kinlock et al. (14); Robinson et al. (15)].

We next considered the relationship between drug and nondrug abusers and the offences of possession and supply of controlled drugs. For this, we separated out possession and supply of cannabis from possession and supply of HCC. The results are shown in Fig. 3 where the difference in numbers between drug abusers and nondrug abusers for the possession and or supply of HCC was statistically significant ($p < 0.01$). Therefore, significantly more drug abusing offenders are also involved in both the supply and possession of HCC compared with nondrug offenders. This is consistent with the "economic necessity model" that requires heroin users to accelerate their offending to pay for their "habit" (1). Becoming involved in the supply chain for heroin would, for a heroin user, appeal as possibly an "easier" source of income than acquisitive crime.

Forensic Detection of Drug-Related Acquisitive Crime

Having examined acquisitive crime offending and drug abuse for Northamptonshire, we then turned our attention to the relationship between acquisitive crime detected by forensic science and drug abusing offenders. For each of the twelve headings in Table 1, we compared the total number of crimes detected with the number detected by means of forensic science. That is, the number of cases detected by either a "cold" DNA or fingerprint identification, "cold," in this sense, meaning where the offender was unknown. Of the 12 crime headings, only four were found to produce a

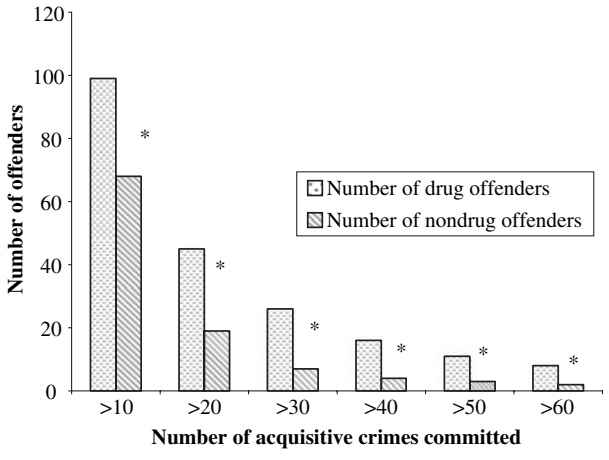

FIG. 1—*Number of drug abuser and nondrug abuser multiple offenders for acquisitive crime. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

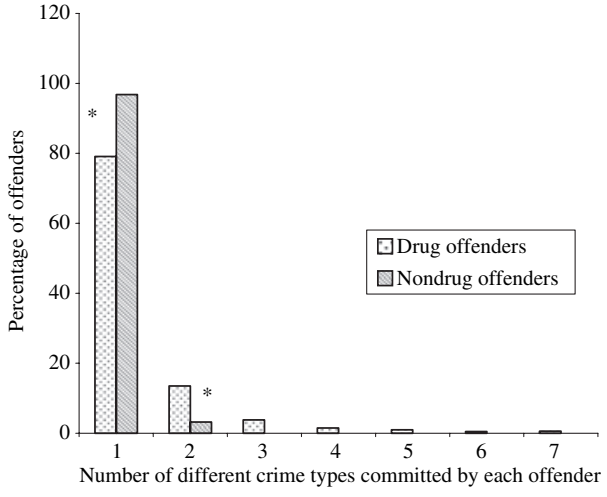

FIG. 2—*Percentage of offenders who commit one or more types of acquisitive crime. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

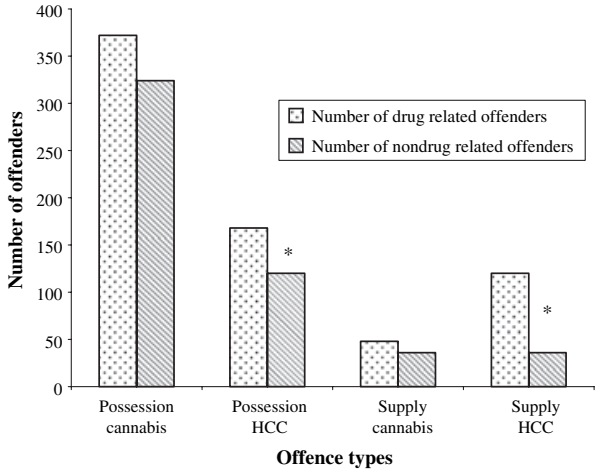

FIG. 3—*Number of drug- and nondrug-related offenders convicted of possession and supply of cannabis and HCC. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

statistically significant difference between the number of drug-related offences detected by forensic science and the number of nondrug-related offences ($p < 0.01$). These four offences were domestic burglary, other burglary, theft of motor vehicle and cheque fraud and are shown in Fig. 4. Of these four, domestic burglary, other burglary and theft of motor vehicle offences show a marked increase in forensic science detection when the offender was a drug abuser. For both domestic burglary and theft of motor vehicle, the percentage of total detections arising from DNA or fingerprints is over 17% for drug abusing offenders compared with less than 1% for nondrug abusers. Such variation and the increased ability of forensic science to identify drug abusers warrants further investigation.

During the study period, all recorded offences of domestic burglary, other burglary and theft of motor vehicle were notified to a Crime Scene Examiner (CSE) for a scene visit and examination for forensic evidence. In reality, this amounted to 92% of recorded domestic burglaries, 91% of recorded other burglaries and 63% of recovered stolen vehicles. The shortfall in all cases was due to crimes not being notified to a CSE or nonpreservation of a scene rather than a conscious decision not to attend. This attendance policy was intended to exclude any artificial "screening" of offences prior to a visit by a CSE. Also, all DNA material recovered from these crimes was sent to a forensic service provider for profiling and all fingerprints recovered were searched against national databases. Any suggestion that variations in DNA or fingerprint recovery and identification may be due to more experienced CSE consistently attending crimes in the same geographical area was overcome by the centralized deployment of CSE. All CSE therefore had an equal probability over the course of the study period of attending crime scenes in all parts of Northamptonshire.

The split between DNA and fingerprint identifications was then examined. No statistical significance was found between the number of drug-related DNA identifications when compared with the number of fingerprint identifications for domestic burglary, other burglary or theft of motor vehicle offences. All cheque fraud forensic science detections were found to be as a result of fingerprint rather than DNA identifications. This was due to the nature of cheques (being printed on paper), which lend themselves more readily to fingerprint rather than DNA examination.

Figure 5 shows the data from Fig. 4, but now broken down into DNA and fingerprint identifications for domestic burglary, other burglary and theft of a motor vehicle.

The difference between the percentage of crimes detected by both DNA and fingerprints for drug abuser offenders compared with nondrug abuser offenders is statistically significant for all three crime types ($p < 0.01$). As discussed above, cheque fraud is omitted from Fig. 5 as all the detections were as a result of fingerprint identifications.

We then considered why the forensic science detection of domestic burglary, other burglary and theft of motor vehicle offences in particular should be significantly greater if the offender is a drug abuser. Possible explanations for this would include:

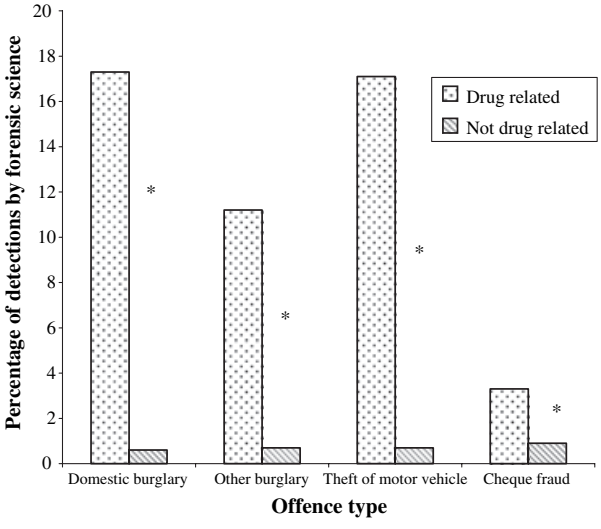

FIG. 4—*Percentage of total crimes detected to drug abusers and nondrug abusers by DNA or fingerprints. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

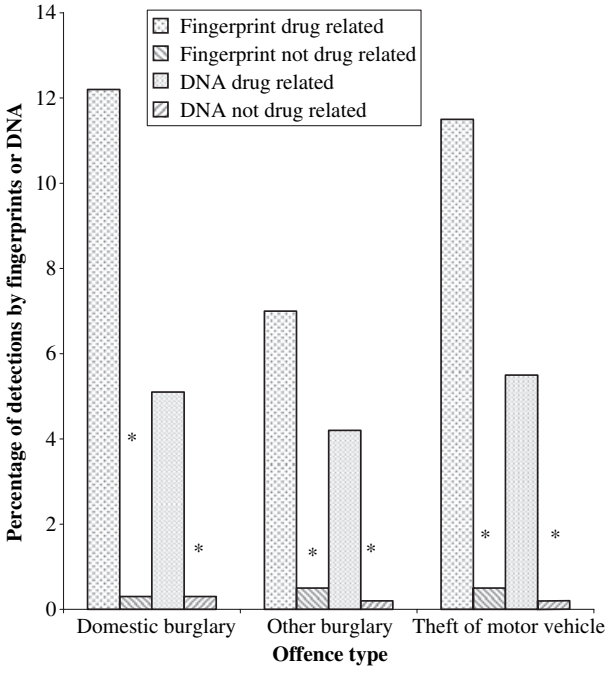

FIG. 5—*Percentage of total crimes detected to drug abusers and nondrug abusers by DNA and fingerprints. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

1. Drug abusers commit more acquisitive crime than nondrug abusers, resulting in a larger number of crime scenes that might yield forensic evidence, which would therefore increase the opportunity to detect the crime forensically. Acquisitive crimes (such as burglary and auto crime) are potentially good sources of both DNA and fingerprint material.
2. Drug abusers are more prolific offenders for acquisitive crime than nondrug abusers and so will be more easily identified on national DNA and fingerprint databases as, the first time the offender is arrested, their DNA and fingerprints become available for future speculative searching.
3. Drug abusers leave more DNA and fingerprint material at crime scenes because they excrete more material able to provide a DNA or fingerprint identification than nondrug abusers.
4. Drug abusers leave more DNA and fingerprint material at crime scenes because they are less careful than nondrug abusers about being identified.
5. A combination of the above.

In considering the above hypotheses, we first of all examine option 1. It is clear that whilst a large proportion of domestic burglary, other burglary and theft of motor vehicle offences are committed by drug abusers, the majority are not. From Table 1 we can see that drug abusers commit only 36.6%, 26.4%, and 31.9% respectively of these offences. Therefore, overall, one would expect (if this were a relevant factor) that more nondrug abuser offences would be detected with forensic science techniques.

For option 2, we return to Fig. 1 that compared the number of drug abuser offenders who committed multiple offences with the number of nondrug abusers. We need to refine Fig. 1 to take account of just domestic burglary, other burglary and theft of motor vehicle offences and this refinement is shown as Fig. 6.

From Fig. 6, we can see that for offenders committing between 11 and 20 offences (in any of the three crime types domestic burglary, other burglary and theft of motor vehicle) there are significantly more nondrug abuser than drug abuser offenders ($p < 0.01$). For more than 21 offences, there are more drug abuser offenders than nondrug abuser. Whilst this difference is statistically significant up to 60 offences per offender ($p < 0.01$), it can clearly be seen that the actual number of offenders diminishes with increasing offences per offender (for both drug abuser and nondrug abuser). There are only five offenders committing >60 offences (three drug abuser and two nondrug abuser).

Thus, whilst the number of multiple offence offenders is greater for drug abusers (which would support the hypothesis) we need to consider the actual number of offences detected to test whether there is sufficient difference between drug abuser and nondrug abuser offenders to account for the observed increase in forensic identifications from drug abusers. Figure 7 shows the number of detections accounted for by offenders who commit multiple offences for both drug abuser and nondrug abuser offenders.

It can be seen in Fig. 7 that over 60% of nondrug abuser and over 70% of drug abuser offences are committed by those offenders who commit six or less offences. Therefore, the vast majority of offences are not committed by prolific offenders as six offences amounts to an average of only one offence per year for the study period. Therefore, it is difficult to see how this might explain the increased ability of forensic science to identify drug abusers.

Option 3 is an interesting hypothesis, as this would require drug abuser offenders to deposit more DNA and fingerprint material than nondrug abusers. It has been reported that drugs such as heroin, codeine, morphine and cocaine have been detected in sweat (see DUI Attorneys, (http://www.dui-dwi.com/) for a review of literature on this topic) and that the excretion will persist for some weeks after the drug has been taken (16). Also, "sweat patches" are routinely used as a means of testing for drug use or for collecting drugs of abuse from human skin (17). Although there is clear evidence that drugs of abuse are excreted in sweat, no research has been carried out to establish whether this excretion would favor enhancement of fingerprints or the recovery of DNA in sweat and therefore we discount this hypothesis at this time. Certain popular methods of fingerprint enhancement rely on either physical adherence or a reaction between the reagent and amino or carboxyl groups present in the residue (18). It would be of interest to consider what effect, if any, the presence of drugs has on these reactions and others, for example cyanoacrylate fuming.

For option 4 to be true would require drug abuser offenders to be much less concerned about leaving DNA and fingerprint material at the crime scene. Much indirect evidence exists to support this view. The behavioral, mental and physical sequelae of substance-induced intoxication and withdrawal are broad-ranging. Substance-related diagnoses commonly include: intoxication and withdrawal deliriums, amnestic (memory disturbance) disorder, psychotic disorders, mood disorders and anxiety disorders. Behavioral, psychological and physiological changes associated with intoxication include cognitive impairment, mood swings,

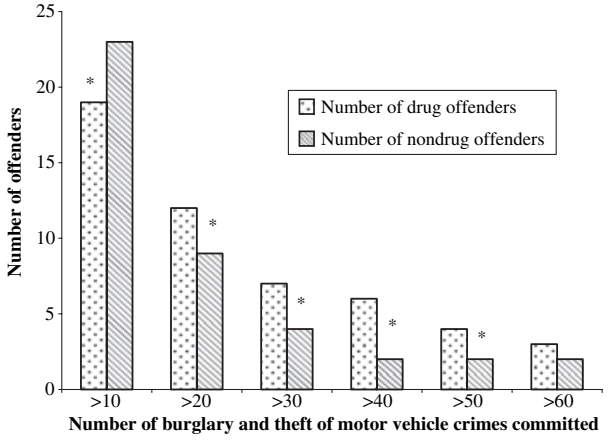

FIG. 6—*Number of drug abuser and nondrug abuser multiple offenders for domestic burglary, other burglary and theft of motor vehicle offences. The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).*

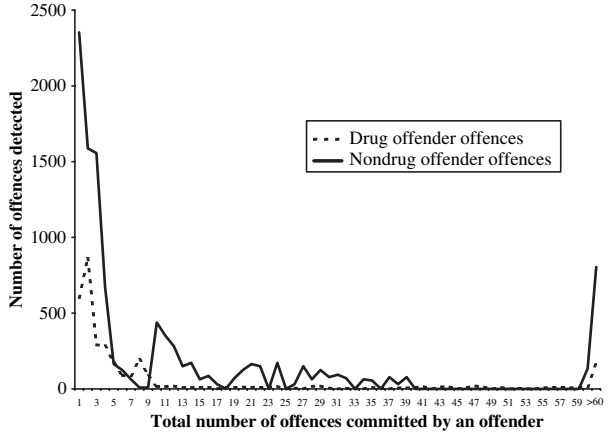

FIG. 7—*Number of offences of domestic burglary, other burglary and theft of motor vehicle detected compared with the total number of offences committed by drug- and nondrug-related offenders.*

reduced judgment, psychomotor agitation or retardation, confusion, perspiration, excitement, rambling flow of thought or speech, incoordination, euphoria, and fever. Withdrawal-related disturbances include hallucinations, tremors, anxiety, insomnia, anger, restlessness and agitation (19). It is unlikely that such symptoms would contribute toward a "clean" crime scene. Furthermore, past studies from psychiatric and psychological perspectives have found substance abusers to engage more often in risky behavior than nonabusers [e.g., Kinlock et al. (20)], and to be more impulsive [Brotchie et al. (21)]. Although these studies do not provide unequivocal evidence in support of option 4, it may be argued that drug abusing offenders have a greater likelihood of engaging in more disorganized offending than non drug abusing offenders.

Logistical Regression

To consider the combined influence of a number of predictors on the detection of domestic burglary, other burglary and theft of motor vehicle offences with DNA and fingerprints, a logistical regression was performed using an equation of the form:

$$P(y) = \frac{1}{1 + e^{-(b_0 + b_1x_1 + b_2x_2 + \ldots + b_nx_n + \varepsilon)}}$$

where $P(y)$ is the probability of y occurring given known values of x_i, b_0 is the y intercept and b_i is the regression coefficient of the corresponding variable x_i . ϵ represents a residual term (13).

Here, values of x (predictors) considered for each crime detected were:

- Whether the offender was a prolific offender (yes or no). In this context, 'prolific' was taken as committing >50 offences over the 6-year period under consideration. This is not an unreasonable definition as 50 offences averages to less than one per month.
- Whether the offender was a drug abuser at the time the offence was committed (yes or no).
- Whether the offender was male (yes or no).
- Whether the offender was employed at the time the offence was committed (yes or no).
- The age of the offender at the time the offence was committed (in years).
- The ethnicity of the offender. For this predictor, four basic codes were used corresponding to:

  1 = White
  2 = Asian
  3 = Black
  4 = Other

These predictors were selected as the data was readily available for all offences and also because we felt that they represent a broad range of characteristics likely to influence forensic detection of crime. The probability $P(y)$ was taken to be whether or not the crime was detected with DNA or fingerprints (yes or no). Such a regression is well suited to this analysis as the outcome variable is a categorical dichotomy as are several of the predictors. The regression was performed using over 14,000 crimes detected over the 6-year study period.

Table 2 shows the results of the regression in terms of Exp(B), which is an indicator of the change in odds of the outcome variable from a unit change in each predictor (13). For each dichotomous predictor, the unit change in the predictor is equivalent to the predictor changing from *false* to *true* or vice versa. That is, the value of Exp(B) shows, for each predictor, the odds of the outcome variable changing when the predictor changes from *false* to *true*. As the outcome variable is also dichotomous, Exp(B) is effectively showing the change in odds of detecting a crime with DNA or fingerprints when the predictor is true.

As expected, the most influential predictor is whether the offence is drug related. For domestic burglary there is 53.9 times more likelihood of detecting the crime with DNA or fingerprints if the offender is a drug abuser. For other burglary and theft of motor vehicle, the figure is 15.2 and 38.2 times, respectively. Interestingly, the age of the offender was not significant for any offence. Also, the ethnicity is interesting as the regression shows that, for both burglary offences, as the ethnicity coding increases (from 1 to 4) the likelihood of detecting the crime forensically diminishes. Such a finding would support option 3 above with the opportunities to recover DNA and fingerprint material being dependent on the ethnicity of the offender and hence their readiness to deposit suitable material.

Table 3 shows the coefficients calculated by the logistical regression (13).

Discussion

We have examined the association between acquisitive crime, drug possession and supply and drug abuse in the study force (Northamptonshire) over a 6-year period. Consistent with the national picture within the U.K., a large percentage of priority acquisitive crime offending is drug related, particularly domestic burglary and theft of a motor vehicle where over 30% of recorded crime was found to be drug related. Drug abusers have been shown to commit multiple acquisitive crime offences with a statistically significant difference between multiple offending for drug abusers compared with nondrug abusers. There was also a statistically significant difference between drug abusers and nondrug abusers for the possession and supply of HCC.

We then examined the link between drug-related acquisitive crime and its detection by DNA or fingerprints. For domestic and other burglary, theft of motor vehicle and cheque fraud, a statistically significant difference was observed between those offences detected by DNA or fingerprints when the offender was a drug abuser compared with detections when the offender was not a drug

TABLE 2—*Logistical regression model for each of the three offence types showing the values of Exp(B).*

	Predictor Exp(B)					
Offence	Prolific offender	Drug related	Male	Employed	Age	Ethnicity
Domestic burglary	Not significant	53.9*	9.5*	0.42*	Not significant	0.37*
Other burglary	Not significant	15.2*	Not significant	1.8*	Not significant	0.48*
TWOC	Not significant	38.2*	0.4*	Not significant	Not significant	Not significant

The asterisk (*) indicates a significant difference at the 99% confidence interval ($p < 0.01$).

TABLE 3—*Logistical regression model for each of the three offence types showing the values of the coefficients b_0 and b_i.*

		Coefficient b_i (SE)					
Offence	b_0 (SE)	Prolific offender	Drug related	Male	Employed	Age	Ethnicity
Domestic burglary	−3.8 (0.3)	Not significant	4.0 (0.3)	2.3 (0.3)	−0.9 (0.2)	Not significant	−1.0 (0.1)
Other burglary	−4.3 (0.3)	Not significant	2.7 (0.2)	Not significant	0.7 (0.2)	Not significant	−0.7 (0.1)
TWOC	−4.3 (0.4)	Not significant	3.7 (.02)	−0.9 (0.3)	Not significant	Not significant	Not significant

abuser. There was no statistical significance between detection by DNA as opposed to fingerprints. A logistical regression on domestic and other burglary and theft of motor vehicle underlined the significance that drug abuse has in detecting these offences with either DNA or fingerprints.

These findings led us to consider a number of possible explanations for the observations. We consider the most likely explanation to be a combination of the physical and mental state of the offender at the time of committing the offence rather than drug abusers being more prolific offenders. Whilst previous chemical analysis of fingerprint residue has revealed that drugs can be detected in sweat, there is a clear requirement for more work in this area to quantify the circumstances and factors affecting such drug detection. Furthermore, given that drug-abusing offenders are more likely to be in a state of substance intoxication or withdrawal at the time of their offending, we may infer that the psychological sequelae of drug use will contribute to disorganized offender behavior at the crime scene. Furthermore, drug users were seen to engage in a wider variety of crime types, perhaps providing further support for our "indiscriminate behavior" hypothesis. Again, more work is necessary to explore this argument, particularly given that assessment of mental state is rather more subjective than is much of the work of forensic scientists. One opportunity would be to consider the amount of forensic material available at the crime scene and the level of disturbance. It is proposed that the best way of developing practically oriented research in this arena would be to combine expertise from the fields of forensic science and forensic psychology. In the U.K., psychologists rarely visit crime scenes and almost never visit the scenes of volume crimes.

In Finland, Häakkänen and Laajasalo (22) examined homicide crime scene behaviors among five groups of offenders (schizophrenics, those diagnosed with personality disorder, drug addicts, alcoholics, and those with no diagnosis). Schizophrenics and drug addicts were found to demonstrate particularly significant departures from the other groups in terms of their crime scene behavior and victim choice. Drug addicts more frequently stole from their victims and attempted to cover the body, and drug addicts were the only group who did not kill females, relatives or a current or ex-intimate partner. This recent work is cited here as it highlights the need to identify differences in offender characteristics. It is suggested that this type of study be extended into volume crime. The ultimate aim is to progress research into acquisitive crime further than the provision of statistical relationships by examining how certain distinguishing factors may influence crime scene behavior. Of course, some literature already exists on how techniques from the psychological realm may assist the investigation of volume crimes [e.g., Merry and Harsent, (23)]. However, this literature is usually highly specific (e.g., discussing the applications of geographical profiling) and to our knowledge there exists no work on the benefits of collaborations between crime scene examiners and forensic psychologists.

It is imperative that different disciplines combine their efforts, particularly as criminals continue to embrace new methods and technologies. It is suggested that psychologists can work with forensic scientists to study more probabilistic concepts (such as motivation and mental state) and to interpret research data based on psychological constructs. For instance, a forensic psychologist with knowledge of stalker behavior could help guide forensic investigators who are seeking DNA evidence from a loitering stalker by suggesting viable search locations. Similarly, forensic science and psychology could reinterpret existing hard data to establish cross-cultural behavioral patterns. The authors are currently researching the feasibility of these are other collaborations.

To conclude, results such as those provided by the present work can contribute to informing the U.K. police service about how best to use resources to tackle burglary and theft of motor vehicle offences not just in relation to crime scene examiner deployment to these offences but also, for example, by ensuring that all drug abusers who are arrested (for any offence) have DNA and fingerprints taken. Furthermore, we have proposed that psychological input into the interpretation of data relating to volume crime can add a valuable new dimension.

Acknowledgments

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