

Volume crime offences such as domestic burglary are commonly assessed for forensic opportunities by the first attending officer (FAO) who is present at the scene. Conversely, less serious volume crime offences such as thefts from motor vehicles (TFMV) are highly numerous and are routinely assessed for forensic opportunities by the victim talking to the police over the telephone. It is not clear whether or not this difference in attendance policy leads to differences in the types and quantity of forensic material recovered. The current study explored whether there was a benefit of evidence recovery for attended as opposed to non-attended assessments. 500 TFMV offences provided by Northamptonshire Police (UK) were analysed from 14<sup>th</sup> January 2010 to the 28<sup>th</sup> February 2011; 250 attended forensic assessments and 250 non-attended assessments. Significant differences were found between the two scenarios, with attended assessments more likely to yield DNA, property and trace substance material. Conversely, fingerprints were more likely to be recovered at non-attended assessments. Despite the fruitful findings of the current study, future research would benefit from establishing the methods of the FAO and forensic investigator when assessing and gathering evidence. Similarly, it is unclear whether these differences in forensic material are reflected in the identification of an offender and subsequently the solving of the crime.

## **INTRODUCTION**

The gathering of forensic intelligence from crime scenes is widely used to investigate and detect various types of offences (Bond & Sheridan, 2007). Although such forensic evidence recovery is primarily been used to detect the perpetrators of serious crimes, such as murder and rape (Bradbury & Feist, 2005), the assessment of forensic material is increasingly being used to aid the investigation of volume crimes (HMIC, 2002). According to official police statistics, volume crimes such as thefts and burglaries make up almost a third of all offences

in the United Kingdom (Walker, Flatley, Kershaw, & Moon, 2009). Although the use of forensic science in major crimes is relatively well informed, it is argued that the use of forensic science in volume crimes is significantly less developed as the material can be notoriously difficult to detect (Tilley & Ford, 1996).

TFMV offences make up 5% of all volume crime (Walker et al., 2009) and are estimated to cost £943 million a year to society (Dubourg & Hamed, 2005). Therefore, exploring current screening policies with regard to a prominent crime such as TFMV is of the upmost importance. Furthermore, analysing such attendance policies may reveal vital information about what is the most effective way to screen TFMV offences.

Much of forensic evidence gathering in the UK is carried out by Scene of Crime Officers (SOCOs), who are generally police civilians specifically trained to identify and recover evidence from a range of different crime scenes. In order to successfully generate this forensic intelligence, it is essential that police resources are used efficiently (Smith & Bond, 2009). A joint report by the Association of Chief Police Officers and Forensic Science Service (1996) recommended that a SOCO should only attend those crime scenes that are likely to yield the most forensic evidence, particularly for crimes that have a high frequency of occurrence.

With respect to volume crimes, it is often the judgment of the first attending officer (FAO) who assesses crime scenes to decide whether it requires a SOCO attendance or not. Despite the importance of such screenings, previous research suggests that FAOs often lack the knowledge and ability to appropriately make this decision. For example, Saulsbury, Hibberd, and Irving (1994) explored the main factors that FAOs relied on when assessing whether a crime scene required SOCO attendance. They found that the most common factor that deterred a decision to send a SOCO to the scene was 'apparent lack of evidence'. Indeed this

was the most common reason given by over three-quarters (76%) of all officers who participated in the study. Although this is in line with the Association of Chief Police Officers and Forensic Science Service (1996) recommendations that were to come in two years time, Saulsbury et al. noted a significant flaw in this decision making process.

Unstructured interviews showed that these officers displayed little forensic awareness and often misjudged how useful certain types of evidence could be. Thus, paradoxically, the scenes that they were sending SOCOs to were the scenes least likely to yield forensic evidence. Furthermore, Tilley and Ford (1996) found that when requests for SOCO attendances were made they were almost always refused, regardless of whether there were clear opportunities to recover forensic evidence. Subsequent police recommendations have attempted to rectify such issues.

Under the Microscope (HMIC, 2002) evaluated the progress that had been made since the publication of the Association of Chief Police Officers and Forensic Science Service (1996), and Under the Microscope (HMIC, 2000) and outlined a number of working recommendations. For example, it was recommended that forces ensure that the forensic science policies regarding volume crime are “up to date, known and understood by operational officers” (Under the microscope, 2002, p 10). In line with this, a regional network committee was set up by the Association of Chief Police Officers (ACPO) to discuss such implementations. Similarly, it was recommended that all forces endorse a scene of attendance prioritisation scheme as a way of accurately determining which scenes are likely to be the most productive, in terms of the recovery of forensic evidence. Furthermore, the introduction of ‘Operation Guardian’ by Northamptonshire police in 2009 attempted to improve the quality of training that first attending officers receive when assessing crimes (Operation

Guardian, 2009). However, subsequent research has suggested that it may be more beneficial to focus on specific crime types.

Bond and Sheridan (2007) explored whether it is beneficial to deploy SOCO attendances based on crime types. They examined the recovery of forensic material from a number of different volume crimes over a period of three years. Deploying a SOCO based on the crime type was shown to have a significant impact on detection rates for dwelling burglaries, commercial burglaries and theft of motor vehicles. Therefore, Bond and Sheridan stipulate that in order to achieve the highest detection rates, dwelling burglaries, commercial burglaries and theft of motor vehicle offences should warrant mandatory SOCO attendance policies.

Whilst this may be true, it would be unfeasible for SOCOs to attend all volume crime scenes. For example, for less serious or more numerous volume crimes such as thefts from motor vehicles (TFMV) it was estimated that between 01 April 2011 and 30 November 2011, Northamptonshire police attended 23% of these crime scenes (personal communication, 2011). It is commonplace for the police to assess a TFMV scene by means of a telephone conversation with the victim (Tilley and Ford, 1996). The police ask the victim to provide a description of the forensic evidence at the scene, and based on this description the police will then decide whether or not to deploy a SOCO. Whether or not a police officer attends a TFMV depends largely on their availability at that time and given the high workload of police officers, telephone assessment is seen as a useful way to assess TFMV scenes, without actually being at the scene. However, a non-attended assessment may result in differences in the type of forensics recovered and the quantity and quality of forensic material recovered, in comparison with an attended screening.

For example, when the FAO is present at the scene, they are able to physically evaluate the available forensic evidence and make an informed decision as to whether the crime scene requires a SOCO attendance. Conversely, when the police are absent from the scene they are essentially 'blind' to the forensic evidence and can only base their assessment on the description provided by the victim at the scene. This description is likely to vary and rely on the victim's expectations, and so the officer may on occasions be less able to make an informed decision whether or not to deploy a SOCO. Whether or not this difference in assessment leads to significant differences in forensic material recovered, remains a prominent question that is yet to be empirically explored (Bond & Hammond, 2009).

The current study explored the differences in forensic material recovered at TFMV crimes scenes which are either assessed by a police officer who is present at the scene or assessed by a police officer who is absent from the scene. This research therefore compared whether an amateur (victim) or a professional (police officer) is better at assessing the presence of forensic evidence from a TFMV crime scene. This will determine whether there are significant differences in the types of forensics that are more likely to be recovered from attended versus unattended screenings. Given that the forensic process in volume crime appears to be significantly less informed than major crime, it is important to explore current crime scene screening policies.

## **METHOD**

### **Design**

An independent group design was used in order to determine whether the forensic material recovered differed between TFMV scenes assessed in person or over the telephone. The dependant (outcome) variable was whether the police officer who assessed the scene was present at the scene (yes/no). The independent (predictor) variables were the recovery of the types of forensic material: DNA, fingerprints, trace substances and property. A full list of all predictors, and their descriptions are shown in Table 1.

### **Material and Data Sources**

This research used archival crime data recorded by Northamptonshire Police (UK) from 14<sup>th</sup> January 2010 to the 28<sup>th</sup> February 2011. The data set was comprised of TFMV offences, defined as “anything stolen off one’s vehicle or out of it i.e. parts of the vehicle, personal possessions or other things” (Home Office counting rules, 2011). The data set contained 500 offences in total; 250 offences whereby the scene had been assessed by a police officer with an attended visit. These were then randomly matched with 250 whereby the scene had been assessed by a police officer without an attended visit. This was based on the availability of the police officer at the time of the offence.

### **Procedure**

The analysis was performed using a logistic regression in SPSS. All of the predictors were categorical, and coded using the values 1 and 0 (denoting forensic material presence or absence, respectively). The dependant (outcome) variable was coded as follows: police officer attended the scene = 1; police officer did not attend the scene = 0.

-----  
**Insert Table 1 about here**  
-----

## **RESULTS**

In order to determine the usefulness of each forensic variable in predicting whether a police officer assessed the scene with an attendance or not, a logistic regression was performed.

Logistic regression is an appropriate technique for this analysis because the outcome variable is dichotomous (police officer attended the scene = yes/no) and the predictor variables are all categorical (Field, 2009). Only those predictors that occurred in more than 10% of the selected 500 incidents were included in the regression. Those that occurred in less than 10% of incidents were too infrequent to contribute in a meaningful way to the regression model distinguishing between TFMV that were screened by an attending or non-attending police officer (Field, 2009). As recommended by Field (2009), the assumption of multicollinearity was satisfied through the assessment of eigenvalues, variance proportions, and VIF and tolerance measures.

Table 2 shows the predictor variables included in the regression with those that significantly predicted whether the scene was assessed by an attending police officer or not. In this table, the value of  $\text{Exp}(B)$  shows, for each predictor variable, the odds of the outcome variable changing when the predictor changes from false to true. Due to the dichotomous nature of the outcome variable (crime scene attended by a police officer = yes/no),  $\text{Exp}(B)$  effectively

demonstrates the change in odds of a crime scene being assessed by an attending by a police officer when that predictor changes from false to true. In this analysis, when  $\text{Exp}(B) > 1$ , the predictor is more likely to be present when that particular crime was assessed by an attending police officer. Conversely, when  $\text{Exp}(B) < 1$ , the predictor is more likely to be true when that particular crime was assessed by a non-attending police officer.

Table 2 illustrates that a TFMV offence was statistically more likely to be assessed by an attending police officer if there was DNA, trace substance or property recovered by the SOCO at that scene. Conversely, a TFMV offence was statistically more likely to be assessed by a non-attending police officer if there were fingerprints recovered by the SOCO at that scene

-----

**Insert Table 2 about here**

-----

A second logistic regression was performed to explore whether the total number of samples recovered in this particular dataset were able to predict whether the scene was assessed by a police officer who attended or not. Table 3 shows that if there was a greater number of trace substances and DNA recovered by the SOCO, then a TFMV offence was statistically more likely to be assessed by an attending police officer at that scene.

-----



**Insert Table 3 about here**

-----

## **DISCUSSION**

The current research explored whether any differences existed in forensic material recovered at TFMV scenes which are assessed by an attending police officer or assessed by a police officer on the basis of a victim's description of the scene taken by telephone. The current study compared differences between amateurs (victim) and professionals (police officer) when assessing the presence of forensic material at a TFMV crime scene.

It was found that when a police officer assessed a TFMV with an attended visit, the SOCO was significantly more likely to recover both trace substance and property exhibits.

Furthermore, there was a significant difference in the quantity of trace substance exhibits depending on whether the police officer attended the scene or not. Trace evidence encompasses a variety of materials recovered from scenes such as glass, fibres, and tool marks. Some of these exhibits may be easier to spot by a (trained) police officer attending the scene. Conversely, such exhibits may be less likely to be seen by an untrained eye (i.e. when the victim 'screens' the scene). Property too, was more likely to be recovered if a police officer attended the scene. Property can, for example, refer to drugs from the offender that are recovered from the scene. Certain drugs may be less apparently visible than others, and so it may be that a police officer is more likely to see these visible items than a victim.

Furthermore, it may be that having a police officer present at the scene informs the SOCO

what to look for on arriving. Conversely, it may be that the description from a victim is less likely to inform the SOCO what to look for as they are less able to spot certain trace substance and property material.

Whilst this may be true, the visibility of trace substance and property will differ from crime scene to crime scene. For example, it may be that victims are more likely to report broken glass at the scene, but they may be less likely to report fibres. Future research would therefore benefit in exploring what types of trace substance and property are more likely to be recovered from an attended or unattended assessment. This may provide some insight as to whether or not victims are worse at identifying certain 'less visible' forensic material.

Another key finding in this study was that DNA was also more likely to be recovered from a scene which was assessed by an attending police officer. Once again, there was a significant difference in the quantity of DNA exhibits depending on whether the police officer attended the scene or not. It may be that the police officer assessing the scene with an attendance is able to see what DNA evidence there is to recover from the scene. For example, it could be that an officer is more likely to acknowledge the importance of a drink can or cigarette end outside the vehicle. Conversely, a victim of crime may be more prone to fixate on 'traditional' forms of DNA, such as blood found in the car after the offender has gained access to the inside of the vehicle. Once again, this interpretation is speculative. Future research needs to explore exactly what types of DNA are more likely to be recovered from an attended assessment. This would give us more insight into how DNA might be perceived differently by victims and police officers.

Whilst exhibits of trace substance, property and DNA were statistically more likely to be recovered from TFMV scenes which had been screened by an attending police officer, the

opposite was true of fingerprint exhibits. Fingerprints were significantly more likely to be recovered from a scene a police officer had assessed by talking to the victim over the phone. This is an intriguing finding and one which requires further interpretation. At a crime scene in which the officer does not attend, it is merely the description of the crime scene from the victim that will determine whether or not a SOCO will attend. Therefore, it is logical that victims are less able to identify less visible items such as DNA, trace substance or property. However, it seems unlikely that victims will have a superior knowledge of fingerprint identification in comparison with a police officer who is at the scene. Rather, it may be that the SOCO feels more obliged to assure the victim that they are trying to recover forensic evidence.

For example, when a victim is present at the scene, the SOCO may feel obliged to be more thorough in attempting to find fingerprints, and so they recover more in doing so. Conversely, an attending officer may be more likely to give the SOCO some direction as to what to look for. Therefore, the SOCO may be more focused on assessing the presence of other forensic material and so less fingerprints are recovered. However, some may question why exhibits other than fingerprints did not also increase at an unattended assessment. This may in part be explained by the *CSI Effect*.

The *CSI effect* is a term used to describe the influence that forensic fiction supposedly has on individuals, leading them to have unrealistic expectations about the way in which forensic science is used in investigations. With this in mind, it may be that dusting for fingerprints is perceived by a victim as a standard technique for recovering forensic evidence, which is likely to lead to the detection of a crime. Reisig and Chandek (2001) found that when citizens felt some kind of disparity between expectations of police performance and actual service, they reported lower satisfaction with the police. So, it may be that if victims have high

expectations for the recovery of forensic evidence by SOCOs (e.g. because of forensic fiction), then this could result in them being dissatisfied with the service provided by the police/SOCO if they do not meet these expectations. Indeed, public satisfaction is the main measure of police performance (Under the Microscope, 2002). Therefore, to rectify such 'expectancy disconfirmation' (Festinger, Riecken, & Schachter, 1956) a SOCO may conform to victim's beliefs about forensic science by doing something that is quintessential to CSI, and dust for fingerprints.

Future research may benefit from exploring whether or not the fingerprints recovered from unattended TFMV screenings were recovered from inside or outside the car. Recovering fingerprints from outside the car would arguably require less effort than recovering fingerprints from inside the car. Furthermore, these fingerprints recovered from outside the car would be of less probative value. If such forensic material were predominately recovered from outside the car, this would suggest that the SOCO is merely doing this in order to conform to the victim's expectations.

Despite these interesting findings, there are a number of limitations in the current study, that future research should be address. Firstly, the current study was not able to empirically explore the motives of the police officer, or SOCO when assessing and attending these TFMV offences. As a result, much of the interpretation of the findings is naturally speculative. Therefore, future research would benefit from interviewing the relevant staff, in order to be able to pinpoint why certain forensics are more likely to be recovered with respect to attended or non-attended screenings.

Furthermore, the current study did not explore the outcome value of the forensic evidence that was recovered. In other words, it was not possible to tell whether these exhibits lead to the identification of an offender and subsequently the solving of the crime. Future research

would benefit from replicating this study, by exploring not only the potential of the recovery of forensic material, but the likelihood of it leading to the identification of an offender. This is likely to provide a clearer picture as to whether there is a real discrepancy between attended and non-attended TFMV screenings. If this discrepancy does exist, whereby some forensic evidence is significantly more likely to be recovered from an attended screening, it may be useful to explore whether detection rates increase when high deprivation TFMVs are prioritised with an attended visit. Previous research by Smith and Bond (2009) found that although more forensic material was recovered from theft of motor vehicle crime scenes in highly deprived areas, this did not lead to more solved cases. Whether or not this is the case for TFMV crime scenes, is a prominent question for future research.

To conclude, the current study explored a random selection of TFMV attended and non-attended forensic assessments. Attended assessments more likely to yield DNA, property and trace substance material, whereas fingerprints were more likely to be recovered at non-attended assessments. Although this may be a useful method of assessing crimes that occur so often, current assessment policies appear to result in significant differences in the presence of forensic material. It is unclear whether these differences in forensic material are reflected in the identification of an offender and subsequently the solving of the crime.

## **REFERENCES**

Association of Chief Police Officers and Forensic Science Service (1996). *Using forensic science effectively*. London: Forensic Science Service.

Bond, J. W. & Hammond, C. (2008). The value of DNA material recovered from crime scenes. *Journal of Forensic Science*, 53, 797-801. doi: 10.1111/j.1556-4029.2008.00746.x

Bond, J. W., & Sheridan, L. (2007). A novel approach to maximising the detection of volume crime with DNA and fingerprints. *International Journal of Police Science and Management*, 10, 326-338. doi: 10.1350/ijps.2008.10.3.88.

Bradbury, S. A., & Feist, A. (2005). *The use of forensic science in volume crime investigations: a review of the research literature*. London: Home Office. Retrieved May 25, 2010 from <http://www.homeoffice.gov.uk/publications/science-research-statistics/research-statistics/police-research/hoor4305?view=Binary>

Dubourg, R., & Hamed, J. (2005). *Estimates of the economic and social costs of crime in England and Wales: Costs of crime against individuals and households, 2003/04*. London: Home Office. Retrieved May 25, 2010 from <http://webarchive.nationalarchives.gov.uk/20110218135832/rds.homeoffice.gov.uk/rds/pdfs05/rdsolr3005.pdf>

Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When prophecy fails*. Minneapolis: University of Minnesota Press.

Field, A. (2009). *Discovering Statistics using SPSS, 3rd Edition*. London: Sage.

Hammond, C. J., Bond, J. W., & Grant, T. D. (2009). The effects of substance use on offender crime scene behaviour. *Journal of Forensic Science*, 54, 376–381. doi: 10.1111/j.1556-4029.2008.00974.x.

Her Majesty's Inspectorate of Constabulary (2000). *Under the microscope*. London: Forensic Science Service.

Her Majesty's Inspectorate of Constabulary (2002). *Under the microscope*. London: Association of Chief Police Officers (ACPO). Retrieved May 26, 2010 from [http://www.hmic.gov.uk/SiteCollectionDocuments/Archive/ARC\\_20020601.pdf](http://www.hmic.gov.uk/SiteCollectionDocuments/Archive/ARC_20020601.pdf)

Home Office counting rules (2011). *Theft and handling stolen goods*. London: Home office Retrieved May 26, 2010 from <http://www.homeoffice.gov.uk/publications/science-research-statistics/research-statistics/crime-research/counting-rules/count-theft?view=Binary>

Operation Guardian (2009). What is Operation Guardian? London: Home office Retrieved December 1, 2011 from <http://www.northants.police.uk/default.aspx?id=guardian&opgid=3125>

Reisig, M. D., & Chandek, M. S. (2001). The effects of expectancy disconfirmation on outcome satisfaction in police-citizen encounters. *Policing: An International Journal of Police Strategies and Management*, 24, 88-99. doi: 10.1108/13639510110382278.

Saulsbury, B., Hibberd, M., & Irving, B (1994). *Using physical evidence*. London: The Police Foundation.

Smith, L. L., Bond, J. W. (2009). The relationship between deprivation and forensic opportunities with stolen vehicles. *Journal of Forensic Science*, 54, 1077-1080. doi: 10.1111/j.1556-4029.2009.01117.



Tilley, N., & Ford, A. (1996). *Forensic science and criminal investigation. Crime detection and prevention paper 73*. London: Home Office. Retrieved June 2, 2010 from <http://library.npia.police.uk/docs/hopolicers/fcdps73.pdf>

Walker, A., Flatley, J., Kershaw, C., & Moon, D. (2009). *Crime in England and Wales 2008/09. Volume 1: Findings from the British Crime Survey and police recorded crime*. London: Home Office. Retrieved May, 27, 2010 from <http://rds.homeoffice.gov.uk/rds/pdfs09/hosb1109vol1.pdf>

## TABLES

**Table 1: List of forensic predictors and descriptions**

<i>Predictor variable</i>	<i>Description</i>
*DNA	DNA recovered from the scene
Glovemarks	Glovemarks recovered from the scene
*Fingerprints	Fingerprints recovered either from the scene (fingerlifts) or laboratory (digital images)
Footwear	Footmarks recovered from the scene
*Property	General exhibits for chemical treatment for fingerprints e.g. drugs
*Trace substances	Trace substances recovered from the scene e.g. glass, fibres, tool marks

---

\*occurred in more than 10% of cases

**Table 2: Logistic regression with the recovery of DNA, fingerprints, trace substance and property, as predictors of assessing SOCO attendance**

---

<i>Predictor</i>	<i>B</i>	<i>SE</i>	<i>Sig</i>	<i>Exp(B)</i>
DNA	1.27	.32	.00	3.57**
Fingerprints	-1.10	.28	.00	.33**
Trace substance	1.02	.29	.00	1.47*
Property	.66	.31	.04	1.92*

---

Note:  $R^2 = .10$  (Cox & Snell),  $.13$  (Nagelkerke). Model  $\chi^2 (5) = 50.66, p < .001$ .

\* $p < .05$ , \*\* $p < .001$

**Table 3: Logistic regression with the total number of DNA, fingerprints, trace substance and property samples recovered, as predictors of a screening attendance**

---

<i>Predictor</i>	<i>B</i>	<i>SE</i>	<i>Sig</i>	<i>Exp(B)</i>
DNA	.92	.24	.00	2.50*
Fingerprints	-.09	.07	.21	.92
Trace substance	.93	.26	.00	2.60*
Property	.13	.21	.52	1.14

---

Note:  $R^2 = .08$  (Cox & Snell),  $.10$  (Nagelkerke). Model  $\chi^2(4) = 39.36, p < .001$ .

\* $p < .001$