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An Investigation into the Differentiating Characteristics Between Car Key Burglars and Regular Burglars

ABSTRACT: Car key burglary has recently become the focus of empirical investigation as offenders, no longer able to steal vehicles without first obtaining their keys, resort to “burgling” target properties. Research surrounding the modus operandi of these offenses is beginning to emerge; however, little attention has been paid to investigating the characteristics of car key burglary offenders. Challenging the assumption that car key burglary offenses are perpetrated by regular burglars, this study aims to differentiate between offenders. Logistic regression analysis of 110 car key and 110 regular burglary offenders revealed that car key burglars are more likely to have previous vehicle theft convictions and are also more likely to be detected on information supplied to the police than regular burglars. Regular burglars are more likely to have previous shoplifting convictions. It was concluded that car key burglars are a distinct sample of offenders and the implications of these findings are discussed.

KEYWORDS: forensic science, offender characteristics, crime scene, burglary, vehicle theft, criminalistics

A car key burglary is defined as a crime in which offenders gain entry to a target property, obtain a set of vehicle keys, and then proceed to steal the vehicle (1). In contrast to regular burglary offenses, the motivation of car key burglars is not the theft of numerous high-profit disposable items (e.g., television sets and jewelry) rather, the offense is perpetrated to secure successful vehicle removal. Under current U.K. Home Office offense classification systems (2), car key burglaries are subsumed within generic domestic/residential burglary statistics, and this is in spite of recent research demonstrating that car key burglaries and “regular” domestic burglaries (those in which a vehicle is not stolen) can be reliably differentiated through modus operandi information (3,4). It is, therefore, likely that offenders who commit car key burglary offenses are a distinct subgroup compared with those who commit regular burglary offenses. The purpose of this study is to provide a novel investigation of the defining characteristics of car key burglars.

Since the mandatory introduction of vehicle immobilizers in 1998, in line with government crime reduction strategies (5), the occurrence of vehicle theft has dramatically declined within the United Kingdom. Immobilizers act to prevent cars from being started without the use of a key. Figures released by the British Crime Survey (BCS) (2) demonstrate a 65% decline in vehicle-related offense committal rates since 1995, with this stabilizing at c. 1500 offenses across the period 2007–2009. Likewise, the BCS

also reports that the proportion of vehicles fitted with security devices has increased over time. Between 1991 and 2006/2007, the presence of immobilizers rose from 23 to 78%. Taken together, these figures suggest that immobilizers (and other security devices such as central locking, fitted in 53% of vehicles across the same time period) have significantly reduced the risk of a vehicle being stolen and that such methods are useful theft prevention devices (6).

However, as previously specified, car key burglaries are categorized by the U.K. Home Office as property-related offenses (2). This classification acts to confound the aforementioned statistics by omitting a significant proportion of vehicle offenses. Burglary offenses have also demonstrated a significant decrease from 1991 to 2006 (58%) but this has started to plateau over recent years (2), with property-related offenses having increased by 1% across the last 2 years (2007–2009). Although this increase appears negligible, it is perhaps indicative of an important, upward trend. Such a trend may be reflective of the classification of car key burglaries as property offenses and may begin to counterbalance the decrease noted across vehicle-related offenses. Figures reported by the Federal Bureau of Investigation (7) act to validate this assertion; American motor vehicle thefts demonstrated a 35.7% decline between 2005 and 2009, while burglary offenses increased by 2% across the same time period. It, therefore, appears that true estimates of vehicle crime are being masked by the misclassification of offenses and a shift in the methods utilized by offenders in targeting vehicles.

Anecdotal evidence compiled by the BCS substantiates this data (6); car thefts in which a key was utilized as part of offense committal increased from 9 to 15% between 1995 and 2006. Furthermore, figures reported by the U.K. Home Office (5) show that 85% of car thefts committed between 1998 and 2001 involved the use of the vehicle’s keys and that burglary was the most common method of obtaining them (occurring in 37% of offenses). Figures

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released by Northamptonshire Police are also suggestive of car key burglaries becoming a proliferate problem within the United Kingdom (T. Loe, personal communication, February 4, 2011). Since 2008, car key burglary offenses have increased by 18% (rising from 285 to 313 recorded offenses), while noncar key burglary offenses have demonstrated a 26% decline across the same time period (falling from 3238 to 2411 recorded offenses).

Using data collated from stolen vehicles, the Maryland Vehicle Theft Prevention Council (8) found that 25–30% of all police-recovered vehicles were discovered with their keys in them. Unfortunately, it cannot be determined with certainty that these keys were sought through burglary as carjacking, the theft of an occupied vehicle using force, is cited as a prevalent vehicle offense type throughout the United States (9). Statistics published by the Bureau of Justice (10) demonstrate that *c.* 38,000 carjacking offenses are committed each year in America. However, more recently (1997–2002), these figures have demonstrated a significant decline (falling from a rate of 2.1 offenses per 10,000 residents to 1.3 offenses per 10,000 residents). Although a rise in car key burglary offenses has yet to be reported within the United States, the two sets of figures may prove to be interrelated. Car key burglary can be construed as a less risky method of car theft than carjacking (it does not typically feature victim interaction, violence, or weapon use) therefore, the noted decline in such offenses may be representative of its potential supposition by car key burglary offenses. It is, therefore, important that research is dedicated to investigating the modus operandi of car key burglary offenses both within the United Kingdom and United States.

Donkin and Wellsmith (4) compared samples of U.K. burglary offenses, where the theft of the vehicle was deemed the primary motivation of offenders (e.g., a car key burglary in which few other property items were stolen), and vehicle theft offenses (e.g., the theft of a vehicle did not require offenders to gain unlawful entry to a victim's property). The authors report a significant relationship between increasing car key burglary offense numbers (183%) and decreasing vehicle theft offense numbers (34%) across a 5-year period (1999–2003). This was paralleled by trends in vehicle security and age. Vehicles stolen in car key burglaries were found to be, on average, 4 years younger than those stolen in vehicle thefts, with 65% of the latter being manufactured before the introduction of immobilizers. It is therefore concluded by these authors that car key burglaries are precipitated by a necessary shift in the modus operandi behaviors of vehicle thieves to ensure offense committal. This hypothesis is in opposition to current U.K. Home Office offense classifications (2), whereby car key burglary offenses are considered to be a specific subdivision of regular, residential/domestic burglary. In light of these contradictory assertions it is necessary to consider car key burglary as a unique offense type.

Historical investigations of burglary (those predating the emergence of car key burglary offenses) can be utilized to support a distinction between regular burglar and car key burglar samples. In interviews conducted by Cromwell et al. (11), a sample of American burglars ($N = 30$) reported that their target selection decisions were most frequently assessed alongside cues to occupancy (i.e., a light being on within the property, a vehicle being parked outside), with 95% of the sample stating that they would never intentionally enter an occupied property. As such, a large percentage of the sample (90%) conducted their offenses during daylight hours when it can be assumed that residents were absent from properties owing to employment, etc. This strategy, therefore, serves to reduce burglars' risk of detection. However, this is in direct contrast to the modus operandi of car key burglars who require the keys and vehicle to be simultaneously present at a property to ensure offense committal. Indeed, in a direct investigation of the offense-related

differences between regular burglaries and car key burglaries (a car key burglary was classified as such if it involved the simultaneous theft of a vehicle and its keys from a property), Shaw et al. (3) found evidence to suggest a differentiation between the two offense types across three key variables. First, car key burglaries were found to be significantly more likely to occur during nighttime hours; second, they were more likely to occur in affluent neighborhoods (each incident was assigned an Index of Multiple Deprivation score [12] according to the geographical area in which it occurred); and third, upon gaining entry to a property, car key burglars were more likely to engage in a tidy search of the property (this was assessed alongside attending police officers' crime scene notes). These findings are in direct contrast to the behaviors exhibited by regular burglars, who reportedly demonstrate limited target discrimination on the basis of affluence (11,13,14) and who generally conduct untidy property searches (13).

Differences between the modus operandi of car key burglaries and regular burglaries are likely to reflect not only the nature of the offense being committed, but the characteristics of the offenders committing it. Behavioral evidence analysis is an offender profiling approach, which specifically utilizes crime scene information to predict offender characteristics (15). Evidence surrounding crime committal is utilized to assign individuals to a particular category of offender and, it is assumed, that different offender categories have unique psychological characteristics (15,16). Utilizing disposed status offenses, statistical models can be created to predict the group membership of offenders based on the inclusion of certain variables. Although this has not previously been applied to investigations of car key burglary, it has been successfully utilized within other forensic domains such as differentiating offenses committed by lone versus co-offending burglars (17) and in predicting risk factors for child abuse (18).

Car key burglaries have captured the attention of police forces and insurance companies across the United Kingdom. During May 2010, Northamptonshire Police (19) issued the following warning: "Residents in Northampton and surrounding villages are asked to be on their guard against car key burglary following a recent increase in this type of criminality" (p. 1). Insurer *e-sure* (20) refers to the dramatic increase in car key burglars as the "invasion of the car snatchers" and proceeds to provide information regarding deterrents for such crimes. Although this information is useful in terms of generic crime prevention advice, without knowing details about the type of offender committing car key burglary offenses, it is likely to have limited applied value. Two crime prevention methods highlight this problem. The first, bolster your home security measures, assumes in line with current U.K. Home Office classifications (2) that car key burglars are regular burglars who indirectly and additionally steal vehicles as part of offense committal. Previously cited research is suggestive of significant differences in the target selection criterion utilized by car key burglars and regular burglars (3,11,13,14). The second, if you have a garage use it, implies that car key burglars act as vehicle thieves, purposefully targeting properties based on the type of vehicle parked outside them. The contradictory nature of this preventative advice stems from the lack of consensus which currently exists in the literature regarding car key burglary offenses. It is, therefore, necessary that further research is conducted in this area.

The purpose of this study is to conduct a novel investigation of car key burglars and to demonstrate that they can be reliably differentiated from regular burglars. The categorization of car key burglaries as property offenses has led to the assumption that they are being committed by regular burglars who steal vehicles to aid offense committal rather than, as more recent research has

suggested, vehicle thieves who have needed to adapt their behavior in light of recently imposed vehicle security features. The findings of this study can be utilized to generate and inform reliable prevention advice and, more importantly, will aid police practice in terms of investigative efficacy and resource deployment through the identification and prioritization of potential suspects.

Method

Design

An independent-group design was utilized to investigate differences between the characteristics of offenders who had committed a car key burglary offense compared with those who had committed a regular burglary offense. A car key burglary was defined as a residential burglary (burglary dwelling and aggravated burglary dwelling) whereby both the vehicle and vehicle keys had been stolen from a property. This definition was utilized alongside a police data flag which permits investigating officers to mark offenses as being potential car key burglaries. Concerns surrounding the completeness and accuracy of police data have already been raised; however, this methodology has been successfully implemented in previous car key burglary research (3).

The dependent (outcome) variable had two levels; car key burglar versus regular burglar. Offenders who had committed car key burglary offenses were positively coded (1), while regular burglary offenders received a negative coding (0). A series of categorical and continuous independent (predictor) variables were coded (Table 1). The predictor variables selected for inclusion within this study were those, which provided the most comprehensive offender-level descriptions of the two samples. However, owing to a reliance on police database information they were also shaped by data availability, particularly the level of detail reported. Unless specified, categorical variables were coded for their occurrence (0, did not occur; 1, occurred). For example, if an offender was arrested for the sample offense, while under the influence of

drugs and/or alcohol, then the predictor variable “drugs/alcohol” received a positive coding. Continuous variables are denoted in the table with the suffix “CONT.”

The broad division of the variable “ethnicity” into two categories, white and nonwhite, was necessary because of more comprehensive coding systems leading to low data counts across variables. Pallant (21) cites this as a potential problem with logistic regression models. Offenders classified as white were those who were recorded by the police as being “White-British” or of other white backgrounds. All other ethnicities, including dual heritage backgrounds, black African/Caribbean, white and black African/Caribbean and Asian nationalities were classified as nonwhite.

Owing to the interdependence of the detection method data (offenders could only be detected via one detection method), they were combined to form one variable. As reported in Table 1, this variable had four categories. The fourth variable category was included as a result of detection method information not being reported for a substantial proportion of offenders (22.73%). It is not known why these omissions occurred but data loss has been cited as a common problem in police-recorded data (22).

Previous criminal conviction data were positively coded regardless of whether offenses were recorded as having completed or attempted status (e.g., burglary dwelling and attempted burglary dwelling). To account for the current offense, the predictor variable “burglary dwelling” received a positive coding if an offender had committed two such offenses. Where offenders had committed numerous offenses on the same date (occurring in two cases) or, had committed subsequent burglary offenses beyond the time period specified by the data set (occurring in six cases), the variable received a negative coding.

Materials and Data Sources

Data were obtained from the Scientific Support Department of Northamptonshire Police (U.K.). The data set consisted of all persons who had been arrested at least once for being involved in a

TABLE 1—Categorical and continuous predictor variables. Categorical predictor variables are shown with an assignment of (0) or (1) and the right-hand column shows the condition that had to be met for the true for a given description. Continuous variables are denoted in the predictor column with the suffix “CONT.”

Predictor	Description
Gender	Was the offender male (1) or female (0)?
Age_CONT	The age of the offender to the nearest whole number of years at the time of offense committal
Ethnicity	Was the offender of white (1) or nonwhite (0) ethnicity?
Detection method	Was the offense solved through information supplied to the police (e.g., witness or victim reports)? Was the offense solved through information revealed by the offender during police interviews/questioning? Was the offender arrested while committing the offense? Detection information not coded
Drugs/alcohol	Was the offender under the influence of alcohol and/or drugs upon arrest?
Co-offending group	Did the offender commit the current offense as part of a co-offending group (two or more persons)?
On bail	Was the offender serving bail for a previous offense when the current offense was committed?
Previous for burglary dwelling	Does the offender have a previous burglary dwelling conviction?
Previous for burglary nondwelling	Does the offender have a previous burglary nondwelling conviction?
Previous for theft of a motor vehicle	Does the offender have a previous conviction for the theft of a motor vehicle?
Previous for theft from a motor vehicle	Does the offender have a previous conviction for theft from a motor vehicle?
Previous violent offense	Does the offender have a previous conviction for a violent offense (e.g., wounding, harassment, actual bodily harm, grievous bodily harm)?
Previous fraud offense	Does the offender have a previous fraud conviction?
Previous drug-related offense	Does the offender have a previous conviction for a drug-related offense (e.g., possession, trafficking)?
Previous weapon-related offense	Does the offender have a previous conviction for a weapon-related offense (e.g., possession of a bladed implement and/or firearms)?
Previous shoplifting offense	Does the offender have a previous conviction for a shoplifting offense?
Previous serious offense	Does the offender have a previous conviction for a serious offense (e.g., rape/sexual assault, murder, death by dangerous driving)?
Total previous offenses_CONT	The total number of offenses committed by each offender. To account for the current offense this number was subtracted by one

residential burglary across a 2-year time period between January 1, 2008 and December 31, 2009. Cases were restricted to those that had solved status (whereby an offender had been arrested and subsequently charged for the offense) owing to the need for offender information to be known. Across this time period, 23.02% of all suspected car key burglary offenses reported to the police were detected, and this is compared with 14.69% of all suspected noncar key burglary offenses. The disparity in these figures is perhaps reflective of the contained crime scene (the vehicle) which is typical of vehicle-related crimes, including car key burglary offenses, which permits increased detection through forensic methods (e.g., DNA, fingerprints) (23). In 2009, 42% of car key burglary offenses were detected as a result of forensic evidence, compared with 9% of noncar key burglary offenses (T. Loe, personal communication, February 4, 2011).

The data set for car key burglaries comprised 110 offenders involved in 171 offenses. A random sample of 110 regular burglary offenders was selected from 727 possible offenses during the selected time period; these offenders had committed 167 offenses. Owing to these offenses occurring across the same time period and jurisdiction (thus being matched for time and location), no further matching procedures were applied. The final data set for analysis comprised data from a total of 220 offenders.

Northamptonshire is situated within the East Midlands region of the United Kingdom, having a resident population of *c.* 629,676 (24). The county is comprised of both urban and rural areas. Burglary dwelling offenses comprised 8.22% of all recorded crime across the county; the sample utilized in this study, therefore, comprised 23.28% of all possible solved burglaries (T. Loe, personal communication, June 22, 2010).

Procedure

Forty-four offenders (20%) had committed more than one offense within the selected time period. The majority of these offenders had been charged with two offenses (10.45%). One offender had committed 16 offenses. Offenses across serial offenders were collapsed so that each offender was represented in the data set once. This removed unnecessary data replication and ensured the independence of observations across cases (21). Owing to the nature of the data being offender-specific rather than offense-specific, the majority of variables remained consistent across offenses. In the case of an inconsistency, the data selected to represent the offender was always that which comprised the average/typical behavioral response. For example, if an offender had been detected on information across five offenses and on interview for one, then "on information" was selected as the most representative response. If an offender's age varied across offenses then a mean age value was calculated; this only occurred in the case of one offender. If an average behavioral response could not be discerned, whereby the offender had committed two offenses containing varying information, then one offense was randomly selected for inclusion in the sample.

Four offenders (1.81%) had committed both a car key burglary offense and a regular burglary offense across the time period. To preserve data integrity, this subset of offenders appears in the data set twice (within both offender samples).

Results

A logistic regression analysis was conducted with car key burglar versus regular burglar as the dependent (outcome) variable. As recommended by Field (25), variables were entered using the Enter

TABLE 2—Frequency (percentage) of car key burglar and regular burglar offender characteristics using the predictor variables defined in Table 1. Variables that demonstrated little discriminatory potential are denoted with the suffix "omit."

Predictor	Car Key Burglar (<i>n</i> = 110)	Regular Burglar (<i>n</i> = 110)
Detection method		
On information	36 (32.73)	20 (18.18)
On interview	46 (41.82)	50 (45.45)
Found committing	8 (7.27)	10 (9.09)
Unknown	20 (18.18)	30 (27.27)
Drugs/alcohol (omit)	7 (6.36)	11 (10.0)
Co-offending group	51 (46.36)	46 (41.82)
On bail (omit)	14 (12.73)	16 (14.55)
Previous for burglary dwelling	62 (56.36)	54 (49.09)
Previous fraud offense nondwelling	65 (59.09)	46 (41.82)
Previous for theft of a motor vehicle	65 (59.09)	35 (31.82)
Previous for theft from a motor vehicle	44 (40.0)	30 (27.27)
Previous violent offense	66 (60.0)	74 (67.27)
Previous fraud offense (omit)	27 (24.55)	23 (20.91)
Previous drug-related offense	34 (30.91)	42 (38.18)
Previous weapon-related offense	16 (14.55)	24 (21.82)
Previous shoplifting offense	57 (51.82)	66 (60.0)
Previous serious offense (omit)	5 (4.55)	2 (1.82)

method and all logistic regression assumptions were met. Multicollinearity assumptions were tested alongside the assessment of tolerance and variance inflation factor (VIF) values; all variables had tolerance values >0.1 and VIF values below 10. Eigenvalues were also found to be similar across variables. All data were entered and analyzed using SPSS version 16 (IBM Corp., Armonk, NY), a statistical analysis software package.

Sample size requirements were calculated using a formula supplied by Tabachnick and Fidell (26) whereby $N > 50 + 8m$ (*m* corresponds to the total number of predictor variables). The current sample size ($N = 220$) was, therefore, calculated to be adequate for the needs of this study. The sample consisted of 206 (93.64%) male offenders and 14 (6.36%) female offenders. Offender ages ranged from 11 to 63 years (mean = 21.15, SD = 7.28). In terms of the ethnic background of the sample, 204 (92.73%) offenders were categorized as being of white ethnicity, while the remaining 16 (7.27%) offenders were coded as nonwhite.

Table 2 reports the frequencies of variable occurrences across the two offender samples. For example, regular burglars are more frequently detected during offense committal than car key burglars, while car key burglars are more likely to commit their offenses as part of a co-offending group (two or more persons). After inspecting the distributions of the predictor variables, it was decided that four variables, those which demonstrated little discriminatory potential (a difference of less than five occurrences between samples), would be omitted from further analyses. These variables are denoted in Table 2 with the suffix *omit*.

Inferential Statistics

An independent samples *t*-test was conducted to compare the number of previous offenses committed by the two samples. There was no significant difference in the number of previous offenses committed by regular burglars (mean = 38.61, SD = 73.37) and car key burglars (mean = 42.22, SD = 62.39; $t(218) = -0.393$, $p \geq 0.05$).

Table 3 reports the results of the logistic regression analyses for each of the independent variables entered into the model. In the table, the value of Exp(B) shows, for each predictor, the odds of the outcome variable changing (whether an offender is a car key

TABLE 3—Results from logistic regression analysis. Exp(B) shows, for each predictor, the odds of the outcome changing (whether an offender is a car key burglar or regular burglar) as the predictor changes from false to true. If Exp(B) is >1, then the predictor is more likely to be true when the offender is a car key burglar, while an Exp(B) value of <1 indicates that a predictor is more likely to occur when an offender is a regular burglar.

Predictor	Exp(B)	B (SE)	Sig.	95.0% CI for Exp(B)	
				Lower	Upper
Age	0.16 (0.02)	0.44	1.02	0.98	1.06
Gender	0.68 (0.62)	0.27	0.50	0.15	1.70
Ethnicity	-0.59 (0.57)	0.30	0.55	0.18	1.68
Detection method					
On information	1.18 (0.45)	0.01**	3.27	1.34	7.94
On interview	0.42 (0.42)	0.31	1.52	0.67	3.43
Found committing	0.40 (0.64)	0.54	1.48	0.42	5.23
Unknown		0.06			
Co-offending group	0.28 (0.33)	0.39	1.33	0.70	2.52
Previous for burglary dwelling	-0.06 (0.38)	0.88	0.94	0.45	2.00
Previous for burglary nondwelling	0.56 (0.41)	0.17	1.76	0.78	3.94
Previous for theft of a motor vehicle	1.30 (0.40)	0.001**	3.66	1.68	7.96
Previous for theft from a motor vehicle	0.37 (0.38)	0.33	1.44	0.69	3.04
Previous violent offense	-0.59 (0.35)	0.09	0.55	0.28	1.10
Previous drug-related offense	-0.40 (0.36)	0.26	0.67	0.33	1.34
Previous weapon-related offense	-0.59 (0.43)	0.17	0.55	0.24	1.28
Previous shoplifting offense	-0.82 (0.37)	0.02*	0.44	0.21	0.90
Constant	-0.32 (1.02)	0.76	1.37		

R²_L = 0.14 (Hosmer-Lemeshow), 0.18 (Cox & Snell), 0.24 (Nagelkerke). Model $\chi^2(15) = 42.88, p < 0.001$.
 p* < 0.05, *p* ≤ 0.01, ****p* ≤ 0.001.

burglar or regular burglar) as the predictor variables change from false to true (15,18). If Exp(B) is >1, then the predictor is more likely to be true when the offender is a car key burglar, while an Exp(B) value of <1 indicates that a predictor is more likely to occur when an offender is a regular burglar.

Statistically significant predictor variables of a car key burglar were being detected on information and having a previous criminal conviction for the theft of a motor vehicle. If an offender was detected through information provided to the police, then they were 3.25 times more likely to be a car key burglar than a regular burglar. Similarly, if an offender had a previous conviction for theft of a motor vehicle, they were 3.69 times more likely to be a car key burglar.

Only one variable was predictive of an offender being a regular burglar; if an offender had a previous shoplifting conviction then they were 2.3 times (1/0.43) more likely to be a regular burglar than a car key burglar.

Discussion

The aim of this study was to conduct a novel investigation of the defining characteristics of offenders who commit car key burglary offenses and to demonstrate that they can be reliably differentiated from regular burglary samples. In support of this distinction, car key burglars and regular burglars predominantly differed according to their criminal histories and the methods by which they were detected by the police. These results support the previously made assumption that car key burglaries should not be categorized as property-related offenses. Rather, car key burglary offenses are being committed by a separate subsample of offenders with their own unique characteristics and offense histories.

In terms of offenders' criminal histories, it was found that car key burglars were more likely to have a previous conviction for theft of a motor vehicle compared with regular burglars. This is suggestive of car key burglary offenses being committed by car thieves who, through processes of tactical displacement, have modified their behaviors to ensure offense committal. Indeed, the mandatory introduction of immobilizers has limited car thieves to

accessing vehicles by first seizing their keys and thus has created a need to unlawfully enter vehicle owner properties. Car key burglaries are, therefore, not being committed by regular burglars who indirectly steal vehicle keys; they are being committed by a differential subset of vehicle theft offenders who purposefully target properties with the view to steal vehicles. Further support for this distinction can be found in previous research focusing on regular domestic burglary offenders (11), who exhibited contradictory modus operandi behaviors compared with the car key burglary offenders in these recent samples. In particular, target selection decisions fundamentally differ between regular and car key burglary offenders, which supports the argument that car key burglaries should be classified as vehicle crime rather than property offenses.

This level of offense-offender specialism has important implications in terms of the prevention of car key burglary offenses. It is no longer appropriate to consider car key burglaries as a subsidiary of regular burglary offenses. After all, it has already been demonstrated that car key burglars utilize different target selection cues (e.g., cues to occupancy) and exhibit differential behavioral patterns on securing entry to properties (3,11) than regular burglars. These findings indicate an important motivational difference between these offense types. It is, therefore, necessary for additional modus operandi research to be conducted surrounding car key burglary offenses. Primarily, it is important to assess the types of vehicles being targeted by car key burglars as this appears to be the impetus behind offense committal. This information will permit the formation of evidence-based preventative advice geared toward methods, which act to inhibit the identification and removal of potential target vehicles (e.g., advising car owners to utilize garages). Knowledge regarding the criminal histories of car key burglary offenders can also aid the police in the identification and prioritization of potential suspects during criminal investigations.

In support of this specialism, regular burglars were found to be significantly more likely to hold previous convictions for shoplifting than car key burglars. Shoplifting and burglary share some psychological characteristics; both offenses involve property being removed from inside a target premises with the purpose of securing

financial gain. Although they can perhaps be differentiated according to their level of risk (with it being more risky to enter a residential dwelling), the predominance of shoplifting in the criminal careers of burglars has been documented by Schneider (27). This is suggestive of shoplifting being a common antecedent or supplementary activity to burglary and further highlights a level of offender-offense specialism between the two samples.

However, in opposition to these findings, regular burglars were found to be no more likely to have committed previous burglary offenses than car key burglars (under this presumption it is assumed that regular burglars would predominantly have committed previous burglary-dwelling offenses). This result may reflect the misclassification of car key burglary offenses or alternatively, a generic blurring of the two offense categories. Although the methodology utilized within the current study has been successfully employed elsewhere (3), it is important to acknowledge that the findings are reliant on data obtained from solved offenses. First, it is possible that offender samples have committed offenses for which they have not been convicted. Second, it is not possible to determine the true motivations of offenders when entering properties; it is unclear whether regular burglary offenses constitute true burglary offenses or whether they represent unsuccessful car key burglary attempts. For example, if an offender was intent on committing a car key burglary but was only successful in stealing vehicle keys from within a property (i.e., was disturbed before additionally stealing the vehicle) then under the strict dichotomy utilized within this study, the offense would be classified as a regular burglary. This is in spite of the motivations of the offender being otherwise. Shaw et al. (3) have demonstrated the hybrid nature of burglary, namely, that car key burglars steal items other than vehicle keys from within properties. However, car key burglaries and regular burglaries were found to be discriminable on this basis. Therefore, to increase the validity of future burglary offense classification systems and to more accurately determine offender motivations, this research should be employed in future car key burglary research.

The nonsignificant findings across the remaining criminal history variables may also be reflective of the methodology utilized within this study. A positive variable coding was assigned regardless of how many offenses within each category were committed by an offender. In this manner, a car key burglar who had committed one drug-related offense and a regular burglar who had committed 15 drug-related offenses both received the same variable coding. Therefore, to increase the validity of these results, future research should be directed at coding the number of offenses committed per offense category rather than their presence/absence.

The finding that car key burglars are more likely to be detected on information than regular burglars can be equated to the differential levels of complexity underpinning the two offenses. A car key burglary is likely to involve significantly more individuals in terms of successfully disposing of the stolen property (the vehicle) than a regular burglary. Therefore, as each individual is added to the offense chain, it is likely that the risk of the offender being detected increases. Despite a lack of research examining the criminal networks of car key burglars, recent police reports are suggestive of car key burglars being part of highly organized, complex car theft rings (28,29). Surrey Constabulary (28) report that three men were charged with committing 17 car key burglary offenses across a 7-month period. The offenses included the theft of high-powered vehicles across eight U.K. counties. The vehicles were driven to addresses in East London whereby they had their identities altered and were later re-sold on the Internet or exported to Europe. Similarly, in an article published by the Croydon Guardian (29), a

10-man criminal network commissioned the theft of 50 vehicles, removing their identification numbers, replacing their number plates with those from identical vehicles and then selling them on for below-market prices. This is in contrast to regular burglaries who primarily offend alone or, when co-offending, predominantly act in small groups of *c.* 2 or 3 persons (30) and dispose of stolen goods locally (e.g., family and friends) (31). Indeed, in a small scale burglary study conducted by Nee and Meenaghan (32), only 10% of burglars ($N = 5$) stole items which required a specialist receiver to dispose of (e.g., paintings and antiques).

It is, therefore, necessary that car key burglary investigations are directed toward vehicle outlets and garages, which could potentially be involved with car ringing, for example, independently owned garages which are involved in the frequent selling of high-power, "desirable" vehicles. It may also be necessary for the police to employ foreign intelligence to determine the routes and means by which vehicles, stolen as a result of car key burglary offenses, are being trafficked to locations outside of the United Kingdom. The collation of this data may prove to be difficult as it requires a car key burglar to accurately disclose information pertaining to the identity of other persons involved in the offense (either direct or indirect involvement). However, if successfully collated, the data would permit an accurate determination of the composition of car key burglary offenses as well as providing more generic offense-related information.

Within the current study, the variable "co-offending" (two or more persons involved in offense committal) did not reach statistical significance. It is common sense to presume that regular burglars and car key burglars would commit offenses individually to reduce their risk of detection. This finding is supported by research demonstrating that significant proportions of regular burglaries are committed by lone perpetrators (30), but not with reports suggestive of the large-scale composition of key burglary theft rings (28,29). However, owing to the aforementioned lack of research surrounding their composition, what cannot be ascertained is the proportion of such offenders whom are actively involved in offense committal (i.e., the physical removal of a vehicle from a property). It may be the case that this would also be a lone individual because of concerns surrounding detection. Therefore, owing to the complexity of car key burglary offenses, more individuals would be involved in the successful distribution of the stolen vehicle. Such individuals, the property receivers, will be less susceptible to police detection (as they are not present during offense committal) and may thus cause a biased interpretation of the level of co-offending within car key burglary offenses.

Alternatively, the null finding may be reflective of limitations associated with the data. As previously mentioned, the data are based on solved status offenses, and therefore, those offenses listed as "lone" offenses are likely to include a significant proportion of co-offenses in which only one offender was detected. The completeness of police data is a major threat to its validity, one that has already been recognized within this study and referenced throughout other co-offending literature (17). Unfortunately, this problem cannot be rectified in terms of the current data set. It is also acknowledged that the findings presented in this study are based on data generated by combining offenders' average behavioral offense responses. The behavioral consistency of car key burglars and regular burglars has not yet been empirically demonstrated, providing an avenue for future research in this area.

Despite the increasing prevalence of car key burglary (6,11,33), this study was the first to investigate the characteristics of car key burglars. It has been demonstrated that car key burglars and regular burglars are distinct samples of offenders. The most prominent

finding, that car key burglars are predominantly car thieves, has important implications in terms of the categorization, prevention, and detection of this offense type. Car key burglaries should no longer be classified as generic burglary offenses or property-related offenses (2), they should be considered a unique subcategory of vehicle-related offenses. In this manner, statistics purporting a recent decline in the incidence of vehicle crime (2,6,7) are inaccurate and are reflective of a lack of understanding surrounding this emerging offense type. Car key burglary preventative advice should be directed toward methods, which act to inhibit the identification and removal of potential target vehicles (e.g., advising car owners to utilize garages) rather than generic burglary crime prevention advice (20). Indeed, these findings suggest that changes to vehicle ignition security, such as immobilizers and the increasing use of electronic keys are unlikely to act as a deterrent for car key burglary offenders. Through the evolution of the modus operandi of these offenders, vehicle-based crime prevention measures have been overcome allowing for the continued commission of this type of vehicle offense. Police resources should also be focused on intelligence-gathering approaches; specifically in determining the composition of car key burglary groups and the methods by which stolen vehicles are transported both within the United Kingdom and to Europe.

Clearly, substantial research still needs to be conducted surrounding car key burglaries. Owing to the rising prevalence of this offense type within the United Kingdom (6,11,33) and the potential for increase across the United States (7), it is recommended that further research concerning this crime type be carried out. Although the current findings provide a necessary basis on which to build upon, it is important that they are validated through replication. After all, without a fuller understanding of the types of offender committing car key burglaries, it is difficult to envisage how police forces could develop successful investigative and preventative strategies.

References

- West Yorkshire Police. Car key burglaries, 2010, <http://www.westyorkshire.police.uk/?Page=156%7CCar+Key+Burglaries> (accessed July 5, 2010).
- Walker A, Flatley J, Kershaw C, Moon D. Crime in England and Wales 2008/09: Volume 1. Findings from the British Crime Survey and police recorded crime. Home Office Statistical Bulletin, 2009, <http://rds.homeoffice.gov.uk/rds/pdfs/09/hosb1109vol1.pdf> (accessed July 5, 2010).
- Shaw S, Smith LL, Bond JW. Examining the factors that differentiate a car key burglary from a regular domestic burglary. *Int J Police Sci Manag* 2010;12:450–9.
- Donkin S, Wellsmith M. Cars stolen in burglaries: the Sandwell experience. *Secur J* 2006;19:22–32.
- Home Office. Crime reduction: crime prevention advice—tackling vehicle crime: a five year strategy, 2000, <http://www.nationalarchives.gov.uk/ERORecords/HO/421/2/carcrime/vrca2.htm> (accessed July 5, 2010).
- Nicholas S, Flatley J, Hoare J, Patterson A, Southcott C, Moley S, et al. Circumstances of crime, Neighbourhood Watch membership and perceptions of policing: Supplementary Volume 3 to Crime in England and Wales 2006/07. Findings from the 2006/07 British Crime Survey. Home Office Statistical Bulletin, 2008, <http://webarchive.nationalarchives.gov.uk/20110218135832/rds.homeoffice.gov.uk/rds/pdfs/08/hosb0608.pdf> (accessed July 4, 2010).
- Federal Bureau of Investigation. Crime in the United States, 2009. Washington, DC: U.S. Department of Justice, 2010, <http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2009/crime2009?searchterm=crime> (accessed September 30, 2010).
- Maryland Vehicle Theft Prevention Council. 2008 Annual Report, 2009, <http://www.mdautotheft.org/forms/docs/2008annualreport.pdf> (accessed September 30, 2010).
- U.S. Department of State. The Bureau of Diplomatic Security. Carjacking—don't be a victim, 2002, <http://www.state.gov/m/ds/rls/rpt/19782.htm> (accessed September 30, 2010).
- Bureau of Justice. Carjacking, 1993–2002. National Crime Victimization Survey, 2004, <http://bjs.ojp.usdoj.gov/index.cfm?ty=pbdetail&iid=476> (accessed September 30, 2010).
- Cromwell PF, Olson JN, Avary DW. Breaking and entering: an ethnographic analysis of burglary. Studies in crime, law, and justice, Vol. 8. London, UK: Sage Publications Ltd, 1991.
- Office of the Deputy Prime Minister. The English indices of deprivation 2004: summary (revised), 2004, <http://www.communities.gov.uk/archived/publications/communities/indicesdeprivation> (accessed February 21, 2011).
- Wright RT, Decker S. Burglars on the job: streetlife and residential break-ins. Boston, MA: Northeastern University Press, 1994.
- Bennett T, Wright R. Burglars on burglary: prevention and the offender. Brookfield, VT: Gower Publishing Co, 1984.
- Petherick WA, Turvey BE. Behavioural evidence analysis: ideo-deductive method of criminal profiling. In: Turvey BE, editor. Criminal profiling: an introduction to behavioural evidence analysis, 3rd edn. London, UK: Elsevier, Academic Press, 2008;133–54.
- Sammons A. Typological offender profiling, 2009, http://www.psycholtron.org.uk/newResources/criminological/A2_AQB_crim_typoProfiling.pdf (accessed July 11, 2010).
- Bernasco W. Co-offending and the choice of target areas in burglary. *J Investig Psych Offender Profil* 2006;3:139–55.
- Tajima EA. The relative importance of wife abuse as a risk factor for violence against children. *Child Abuse Negl* 2000;24:1383–98.
- Northamptonshire Police. Northampton and surrounding villages: police issue warning regarding car key burglaries, 2010, <http://www.northants.police.uk/default.aspx?id=4755&datewant=yes> (accessed July 5, 2010).
- e-sure. Invasion of the 'car key' snatchers, 2010, http://www.esure.com/media_centre/invasion_of_the_car_key_snatchers.html (accessed July 5, 2010).
- Pallant J. SPSS survival manual, 2nd edn. Berkshire, UK: Open University Press, 2005.
- Canter D, Alison L. Profiling property crimes. In: Canter D, Alison L, editors. Profiling property crimes. Aldershot, UK: Dartmouth Publishing Company Limited, 2000;1–30.
- Bond JW, Sheridan LA. A novel approach to maximising the detection of volume crime with DNA and fingerprints. *Int J Police Sci Manag* 2008;10:326–38.
- Northamptonshire County Council. Latest population estimates and trends, 2010, <http://www.gov.uk/en/councilservices/Council> (accessed July 10, 2010).
- Field A. Discovering statistics using SPSS, 3rd edn. London, UK: Sage Publications Limited, 2009.
- Tabachnick BG, Fidell LS. Using multivariate statistics, 4th edn. New York, NY: Harper Collins, 2001.
- Schneider JL. The link between shoplifting and burglary: the booster burglar. *Br J Criminol* 2005;45:395–401.
- Surrey Police. Prolific car key burglar sentenced to seven years in jail, 2010, http://www.surrey.police.uk/media/news_item.asp?area=12&itemID=12621 (accessed November 18, 2010).
- Croydon Guardian. Car theft gang jailed for a total of 20 years, 2010, http://www.croydonguardian.co.uk/news/localnews/8352974.Car_theft_gang_jailed_for_total_of_20_years (accessed March 09, 2011).
- Farrington DP. What has been learned from self-reports about criminal careers and the causes of offending? Report for the Home Office, 2001, http://www.crim.cam.ac.uk/people/academic_research/david_farrington/srdrep.pdf (accessed January 23, 2012).
- Forsythe LMV. The stolen goods market in New South Wales: an interview study with imprisoned burglars. *New South Wales Bureau of Crime Statistics and Research. Br J Criminol* 2001;41:101–18.
- Nee C, Meenaghan A. Expert decision making in burglars. *Br J Criminol* 2006;46:935–49.
- Levesley T, Braun G, Wilkinson M, Powell C. Emerging methods of car theft—theft of keys. Home Office Findings 239, 2004, <http://rds.homeoffice.gov.uk/rds/pdfs/04/r239.pdf> (accessed July 4, 2010).

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