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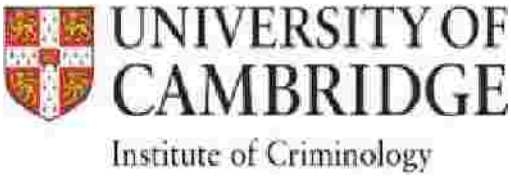


# Car Key Burglaries: An Exploratory Analysis

Submitted in part fulfilment of the requirements for the Masters Degree in Applied Criminology and Police Management

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# Chapter One

# Introduction

## 1.1 Background to the thesis

The emergence of a relatively new phenomenon in which cars are stolen using keys taken during a burglary has been consistently reported in the ACPO National Strategic Assessment since 2003 [National Policing Improvement Agency (NPIA), 2009]. The concerns expressed by forces regarding the emergence of a trend commonly referred to as 'car key urglary' appears to be more than justified. The publication of the ACPO Natio Assessment Car Key Burglary (NPIA, 2009) reported that 6 % of all dwelling burglaries in 2008 involved the taking of a vehicle. Further to this, the report highlighted the dearth of information regarding the scale and context the problem at a national level and also predicted that it was a crime that would continue to increase.

Despite a 31.5% reduction in the number of recorded bu lary dwellings in Merseyside between the financial years 2005/6 to 2010/ 1, car key burglaries have continued to increase in actual terms and as a proportion of the total number of burglary dwellings. In 2010 13.3% of all recorded dwelling burglaries in Merseyside involved the removal of car k ys from within a dwelling and the subsequent theft of a vehicle. In one of the six Basic Command Units (BCU) that form the policing structure of Merseyside Police, car key burglaries accounted for 18.7% of the total number of dwelling burglaries recorded in 2010.

In addition to projecting further increases in the levels of car key burglary, the ACPO National Assessment Car Key Burglary (NPIA, 2009) highlighted the difficulties of producing accurate and consistent data due to inconsistencies in the way police forces define and record car key burglaries. The potential for anomalies in the recording practices of police forces nationally has been highlighted by Shaw et al. (2010). In addition to hindering aspirations of accurately feeding operational resource deployments th ough the realisation of analytical potential (Cope, 2003), this may also have ributed to an underestimation of the threat.

Due to the nuances between the Crime Prosecution Service's Charging Standards [Director of Public Prosecutions (DPP), 2007] and the National Crime Recording Standards (Home Office, 2011), burglaries where threats or violence are used during the commission of the offence are recorded as robberies and charged as aggravated burglary. One coul argue therefore, that car key burglary also suffers from under reportin y virtue of the fact that aggravated car key burglaries are recorded as robbery.

The issue of aggravated car burglary is particularly s nt when one considers that the ACPO National Assessment Car Key Burglary (NPIA, 2009) highlighted the risk of harm to victims in their homes as one of the principal concerns associated with this offence. Given that the nature of car key burglaries is such that there is the potential for offenders to confront victims in

their own homes, it is inevitable that the prospect of the victim being subjected to threats or violence is increased.

There is limited research or published literature rela g specifically to the phenomenon in which offenders enter a house to steal a vehicle. The absence of such a crucial platform for police managers limits he opportunities for an evidence-based approach to a problem that has significant implications r operational policing and policy. There does appear, however, to be an acceptance that further research in relation to this crime has become a necessity, particularly in respect of an understanding of the basic elements of the offence such as the modus operandi (MO), crime pat rns and offender behaviour (Donkin and Wellsmith, 2006).

Whilst considering the practical implications of further research, there is also much to be gained from considering the emergence of car key burglaries in the context of criminological theory; where these crimes occur and why. Criminological theories such as routine activities theory, rational choice theory and crime pattern theory are highly relevant to the ap reciation and interpretation of the complexities of criminal behaviour. A comparison of the characteristics of car key burglaries and regular burglaries would provide a greater understanding of where and why the former take place, thus providing opportunities to consider situational crime prevention activities aimed at increasing the risks to the offender (Laycock, 2005).

In response to what appears to be a deafening call for further research in this area, this thesis offers an exploratory descriptive data analysis of car key burglaries with the aim of improving the understanding of the nature of this offence. The research was conducted through analysis at two levels. The first level of research provides a descriptive analysis of 968 car key burglaries recorded by Merseyside Police in 2010 to examine; temporal, geographical, behavioural and offender specific aspects of the offen The inclusion of aggravated car key burglaries ensures that analysis overcomes the issue of car key burglaries hidden within crimes classified as a robbery.

In addition to this, the section also provides a descriptive analysis of the offender characteristics of 70 car key burglars and in ludes the distance travelled from home base to the offence location in each of the 106 unique car key burglary offences that were committed by this group.

The second level of research offers a comparison of the characteristics of car key and regular burglaries. This research is based on combined dataset of 1936 burglaries recorded by Merseyside Police in 2010 and 140 offenders who were in receipt of either a charge, or admitted an offence 'taken into consideration' (TIC) for a car key burglary or a regular dwelling burglary. Due to the existence of repeat offenders, the journey to crime distance is based on 106 car key burglaries and 74 regular burglaries.

## 1.2 Overview

The introduction has sought to provide an overview of the main issues relating to car key burglaries. Chapter Two offers a summary of the existing literature on car key burglary and considers the complexity of criminal activity in the context of criminological theory as a means of shaping the research and interpreting the results and recommendations.

Chapter Three outlines the research methodology used for conducting the exploratory analysis and discusses the limitations of this ap h. Chapter Four presents the results of the analysis and in Chapter Five the results are discussed. The final chapter draws some conclusions from the research and discusses the implications on policing policy and practice.

## Chapter Two

## Literature Review

### 2.1 Defining burglary

The term 'burglary' covers a range of acts that are based on illegal entry into premises. Properties range from people's homes, commonly referred to as residential or dwelling burglaries, to properties such as garages, off , shops and warehouses, referred to as non-residential burglaries. Section 9(i) of the England and Wales Theft Act 1968 defines burglary as f llows:

> "The illegal entry into premises followed by theft or with the intent to commit an offence."

It is important to point out that the offence of burgl ry is complete at the point the offender enters the property; the theft of propert or the commission of other offences are not necessary. Further sub-classifications of burglary are set out in Appendix One.

### 2.2 The emergence of car key burglaries

Despite the fact that dwelling burglary has fallen by 58% in England and Wales between 1995 and 2008/09 (Tilley et al., 2011), the em gence car key burglary has been consistently reported in the ACPO National Strategic Assessment since 2003 (NPIA, 2009). The ACPO National ment Car Key Burglary (NPIA, 2009) reported that 6 % of all res dential burglaries in 2008 involved the removal of a vehicle and the report predicted that the crime would continue to increase. In 2010 car key burglaries accounted for 13.3% of all residential burglaries recorded in Merseyside.

In addition to the paucity of research available to inform and influence policing strategy and tactics in relation to car key burglary, efforts to understa d the scope of the problem are further hindered by the absen of a nationally recognised definition. The potential for recording anomalies across police forces nationally is raised by Shaw et al. (2010) and this is supported by the research conducted as part of the ACPO National Strate Assessment (NPIA, 2009). The national assessment acknowledges the existence of inconsistent and inaccurate data provided by police forces and suggests this is perpetuated by inconsistencies in the identification and collation of information appertaining to car key burglaries.

The necessity to establish a nationally recognised definition for car key burglary is highlighted as a recommendation within the ACPO National Strategic Assessment (NPIA, 2009). The report offers the following proposed definition:

> "A burglary, or aggravated burglary, (dwelling or comm ) in which the keys are demanded or taken in order to steal a motor vehicle" (NPIA, 2009: p. 9).

Notwithstanding the apparent scale of the problem, the proposed definition highlights the potential for under reporting. As stated earlier, the coding of aggravated burglaries as robbery essentially hides aggravated car key burglaries in another crime classification. If police forces exclude these additional crimes from their summary of recorded car k y burglaries an assessment of the true scale of the problem is problematic.

There does appear to be some agreement that the previous Government's efforts to achieve a vehicle crime reduction target of 30% between 1994 and 2004 has made it more difficult to steal cars (Brown, 2004; Webb et al., 2004; Donkin and Wellsmith, 2006). It has been suggested that one of the main reasons for a reduction in crimes categorised as 'vehicle crime', is the requirement for newly manufactured cars in Europe to be fitted with an immobiliser from 1998 [National Audit Office (NAO), 20 In simple terms, this development made it impossible to start new cars hout their keys (Shaw et al., 2010). As stated earlier, the corollary of this is a f rther incentive for offenders to enter homes and move closer to victims.

This contention is supported by Levesley et al. (2004) who suggest that whilst the fitting of electronic immobilisers to new vehicles has undoubtedly impacted on vehicle theft, there is evidence to suggest there has also been an increase in the acquisition of car keys through burglary. In a udy based on 8,303 recorded incidents of thefts and attempted thefts of cars in Greater Manchester and Northumbria between 1998 and 2001, burglary proved to be the most common method for obtaining the keys and this occurred in 37% of offences. In order to understand the implications of this appare change in offender behaviour it is necessary to consider the complexity of criminal activity in t e context of criminological theory.

## 2.3 Criminological theory and research

Routine activities theory (Cohen & Felson, 1979) intro uces the context of crime as an additional factor affecting crime rates. Underpinned by the belief

that criminals are essentially unremarkable people, the central hypothesis of the theory proposes that three elements are required f a crime to occur: the presence of a motivated offender, the supply of suitab e targets and the absence of capable guardians (Cohen & Felson, 1979). The theory expounds the notion that individuals commit crime based on the ortunities that arise during the course of their daily routine (Bottoms, 2007) and that they do not generally search for opportunities to commit crime outside of this sphere (Bernard et al., 2010).

The assertion that variations in the crime rate can be affected by the routine activities of an individual's life is based on the convergence in time and place of suitable targets and the provision of capable guardians (Adler et al 1995). The variable nature of these elements gives rise to clear situational crime prevention opportunities such as the use of improved s ance (Hirschfield, 2005). Further to this, an exploration of the relationship between the crimes committed by offenders and their routine activities also offers the prospect of investigative advantages such as the search for identified serial offenders in geographical areas (Brantingham and Brantingham, 1984).

In terms of the relevance to this research, the paths n which burglary offenders conduct their routine activities provides a ection of dwellings that could be targeted through criminal activity (Rengert a Wasilchick, 1985; Beavon et al., 1994). Research conducted by Cromwell et al. (1991), suggested that burgled properties were much more likel to be closer to

schools, churches, businesses, traffic lights and main roads, thus demonstrating the link with routine activities.

Rational choice theory (Cornish & Clarke, 1987) is based on the assumption that offenders are rational decision makers and that decisions to commit crime are governed by an assessment of the rewards and risks. The theory proposes that offenders are purposive and that efforts to gain personal benefits are punctuated by decisions based on rational assessments de within the constraints of time and ability (Cornish & Clarke, 1987).

The theory accepts, therefore, that the offenders are nlikely to be in possession of all the information that would contribute to a decision making process based on an assessment of risk, effort and reward (Rock, 2007). There is also an acceptance that the operating environment in which offenders commit crime necessitates quick decisions that could a so be coupled with improvisation for unforeseen circumstances due to the ence of detailed planning (Cornish & Clarke, 2006).

As in the case of routine activities theory, it is possible to influence offender behaviour based on the variable nature of an offender's assessment of risk. This provides further opportunities for situational crime prevention activities aimed at increasing the risks to the offender (Laycock, 2005). As one of the leading exponents of situational crime prevention, Cla ke (1980) described the three main interventions of situational crime prevention as being; target hardening, surveillance and environmental management. he interventions

provide a means of altering the conditions and alleviating vulnerability (Sutton et al., 2008).

Crime pattern theory combines aspects of routine activities theory and rational choice theory and helps to explain how offenders interact with physical and social environments (Eck & Weisburd, 1995). The theory suggests that the distribution of crime is affected by the manner in which targets come to the notice of offenders as part of their daily routine in that are familiar to them (NPIA, 2009). Crime occurs when opportunities arise in familiar surroundings (Brantingham and Brantingham, 2003). Plac is essential to crime pattern theory since it is based on the notion t physical and social environments influence the likelihood of crime (Eck & eisburd, 1995).

It is suggested that an offender's awareness of space nd their routine activities contribute to the creation of a 'cognitive map' of places that they most frequent and the routes they use to travel to them (Brantingham and Brantingham, 1981). Furthermore, the awareness of spac that comes from the repetition of journeys and routine activities is said to contribute to the creation of an 'urban mosaic' that differentiates unfamiliar places from those that are familiar to the offender (Chainey and Ratclif 5). The importance of familiarity with locations is emphasised by Brantin ham and Brantingham (1981) who suggest that familiarity with an area outweighs the risk of being caught.

The discovery by Sherman et al. (1989), that 50% of cr me calls to the police were received from only 3% of Minneapolis addresses, highlighted the existence of disproportionate crime levels in micro locations. The findin of the Jersey City Drug Analysis Experiment (Weisburd & G een, 1994) also provides support for the notion that street-to-street heterogeneity has the potential to characterise neighbourhoods as a high crime areas when many places within that area may have relatively low crime s. This notion is further supported by the longitudinal analysis of street-to-street variability conducted by Groff et al. (2010).

In addition to demonstrating high levels of crime at micro places, the longitudinal study of crime in street segments in Seattle (Weisburd et al., 2004) highlighted the stability of crime over long periods Weisburd, 2008). The study of crime incidents resulting in juvenile arrests in Seattle (Weisburd et al., 2009) found that out of a total of 25,000 street segme ts, 86 street segments accounted for one third of the arrests over a 14 year riod. It is significant that most crimes occurred in shops, malls, restaurants and schools because crimes occurred at locations frequented by juveniles, thus completing the link with routine activities theory (Weisburd, 2010). The suggestion that 'hot spots remain hot' challenges the traditional assumptions that 'crime is weakly coupled to place' Weisburd (2010).

The strength of evidence supporting the systematic ide tification of crime hot spots for the purpose of informing police intervention provides a compelling case for policing hot spots. The systematic review con ucted by Braga (2001)

demonstrated that seven out of nine evaluations yielded statistically si ficant benefits from police interventions at micro locations. In addition to this, of the five studies used by Braga (2007) to conduct a meta-analysis on the effects of hot spots policing on crime and disorder, none were found to have resulted in significant spatial crime displacement to other areas. As further evidence to counter concerns in relation to crime displacement, Weisburd et al. (2006) demonstrated that neighbouring areas were more likely to experience a diffusion of crime control benefits resulting from enforcement initiatives. The notion that 'crime is strongly coupled to place' and t crime is not easily moveable provides a sound basis for further investment in place-based policing Weisburd (2010).

In summary, all three complementary theories have prov ded a platform for developments in the theory of place as a viable alternative to a traditional approach to crime policy that is focused on offenders raga 2007; Weisburd et al., 2010).

## 2.4 The characteristics of car key burglaries and regular urglaries

### 2.4.1 Temporal

According to Bernasco (2009) the temporal distribution of burglaries in relation to seasonality and the time of day the offence takes p e, does appear to be consistent with rational choice theory (Cornish and Clarke, 1987) on the basis that target selections are based on the minimisation of risks to the offender. In England and Wales 61 % of burglaries were committed between 06.00 and 20.00 hours (Budd, 1999) suggesting that burglary is more likely to take place

when residents are not in the premises. In terms of seasonality, burglaries are more likely to take place in England and Wales during he winter months when there are increased hours of darkness.

Although there is limited evidence of weekly time cycles for burglary (Bernasco, 2009), the study conducted by Coupe and Blake (2006) indicated that offenders were more likely to commit burglaries o weekdays. Further to this, the study demonstrated close links between offender behaviour and routine activities theory (Cohen & Felson, 1979) throu h the offender's willingness to contextualise the environment in which hey operate as part of their assessment of the risks. For instance, the study found that offenders were more likely to target 'up-market' properties during daylight hours due to limited natural surveillance opportunities and low occupancy. This provides an altogether more comprehensive interpretation of how the victim's routine activities impact on daylight and darkness targeting behaviour (Coupe and Blake, 2006).

The key findings of the ACPO National Assessment Car Key Burglary (NPIA, 2009) show that there was no seasonality in relation to car burglary offences and that there was also little correlation in respect of the day of the week that offences were committed. However, one of the few studi conducted in relation to car key burglaries indicates that there are significant differences in relation to the time of day that car key burglaries an regular burglaries are committed (Shaw et al., 2010).

Based on a comparison of the characteristics that diff rentiate a car key burglary from a regular burglary, the study focused on four predictor variables, namely: time of day, house security, point of entry an arch by offender. The time of day was split into daytime (08.00-19.59 hours) and night-time (20.00-07.59 hours). The results of the study showed that car key burglaries were approximately five times more likely to occur in the night than regular burglaries (Shaw et al., 2010). Further support for this finding c es from the research conducted as part of the ACPO National Assessment Car Key Burglary (NPIA, 2009). On the basis that vehicles are e likely to be parked in close proximity to the owner's dwelling overnight, it is unsurprising that the temporal aspects of car key burglary are dictated by t ailability of vehicles (Shaw et al., 2010).

### 2.4.2 Geographical

It is generally acknowledged that there are higher burglary rates in urban areas compared to rural areas and that inner city areas suffer higher burglary rates than suburban neighbourhoods (Sampson and Groves, 1989). Empirical research also demonstrates that the highest burglary r occur in the most deprived areas where there is a high residential turnover (Bernasco, 2009). Based on the fact that most offenders reside in deprived areas, it is suggested their criminal domains are restricted to the deprived, unstable areas that feature prominently within familiar locations (Wiles a d Costello, 2000).

However, a study conducted by Shaw et al. (2010) suggests that car key burglaries are more likely to be committed in affluent areas. The study used

deprivation scores taken from the Indices of Multiple  privation (Office of the Deputy Prime Minister, 2004 cited in Shaw et al., 2010, p.453) to reflect deprivation levels in terms of crime, health, educatio  housing, employment, training and the environment. A comparison of the deprivation scores of 514 car key burglaries and 514 regular burglaries found that on average car key burglaries were less likely to take place in deprived areas.

### 2.4.3 Behavioural

Based on the research conducted in relation to the type of property targeted by burglars, there appear to be clear links with routine  ctivities theory. Offender activity is contextualised by routine activities and a framework for target selection that considers proximity and guardianship as risk factors (Miethe and Meier, 1990). It is for this reason that dwellings that are sheltered from natural surveillance through cover or darkness are at greater ri k of being burgled (Coupe and Blake, 2006).

The same principles are said to apply to accessibility. Flats or terraced houses with entry points on the second floor or above are con  red to be less likely to be selected as an offender's target than dwellings  h ground floor access such as detached and semi-detached houses (Osborn and Tseloni, 1998). It would appear that from the research conducted by (Shaw et al., 2010), the offender's point of entry is not a significant predictor characteristic of car key burglary. The research found that the favoured point of entry for both car key burglary offenders and regular burglary offenders was  he rear of the property (Shaw et al., 2010).

In order to increase the risks to the offender situational crime prevention has provided opportunities to householders to improve secu and increase the physical barriers against burglary (Laycock, 2005). The worth of home security is demonstrated by the fact that dwellings without simple security measures such as double locks and deadlocks were ten times more likely to be burgled (Newburn, 2007). Interestingly, the study conducted by Shaw et al. (2010) found that regular burglary offenders were more likely to target secure premises. The study also found that there was no difference in the frequency of secure and insecure premises that were the subject car key burglaries (Shaw et al., 2010).

As part of their efforts to differentiate aspects of t modus operandi for car key burglaries and regular burglaries, the research ca ried out by Shaw et al. (2010) included an assessment of the type of search co ducted by offenders during the commission of the offence. The findings of he research suggest that whilst it was slightly more likely for regular burglary offenders to carry out an untidy search, car key burglary offenders were three times more likely to commit a tidy search of the premises than an untidy se ch (Shaw et al., 2010). This may support the contention that the emergence of car key burglaries is driven by the specific aim of stealing a car (Copes and Cherbonneau, 2006; Donkin and Wellsmith, 2006).

According to victim surveys and police records, cash, ewellery and portable electronic items are the most frequently stolen items during burglaries (Bernasco, 2009). These items would correlate with Cla ke's (1999) CRAVED

framework and the notion that the desirability of the product to a criminal varies over time according to a product's relative position within a consumer life cycle governed by innovation, growth, mass market and saturation (Felson and Clarke, 1998).

In terms of the type of vehicle sought by car key burglars, the ACPO National Strategic Assessment (NPIA, 2009) suggests that the most frequently stolen vehicles are essentially the most common vehicles, such as Ford, Vauxhall, Audi and BMW. It is acknowledged in the report that there is a dearth of information regarding the age of vehicles stolen during the course of a car key burglary. The report does, however, indicate that recovery rate for vehicles stolen in car key burglaries varies between 40% and 85%, with non recovery viewed as an indicator of association with organised crime (NPIA, 2009).

### 2.4.4 Offenders

The absence of any research relating to the age and gender of car key burglars prevents any comparison with the age and gender of regular burglars. However, there is a general consensus within criminological literature that suggests juvenile delinquency is responsible for a disproportionate amount of recorded crime (Maguire et al., 1997; Feldman, 1993). Burglary is described by Soothill et al. (2004, p. 407) as a "young man's game" and it is suggested that peak numbers of new recruits occur before the age of 15 years. Further to this, it is also suggested that there is a sharp decline in both male and female convictions for burglary after a peaking in mid adolescence (Steffensmeier,

1986). This pattern is said to occur in the case of ma s they are exposed to the responsibilities of family life (Feldman, 1993).

There has been a considerable amount of research condu d in relation to 'journey to crime', the distance that offenders travel from their home base to crime locations (Amir, 1971). The general consensus wi n criminological literature is that in the majority of cases, journey to crime distances do not amount to more than a few kilometres (Phillips, 1980). As stated earlier, burglary rates tend to be higher in the most deprived reas, the very same locations where the majority of burglars reside. (Baldwin and Bottoms, 1976; and Wiles and Costello, 2000). In a study conducted by Brantingham and Brantingham (1981), 34% of burglars were found to live within one quarter of a mile of the offence location and 60 % of offenders lived within half a mile of the offence location.

The journey to crime distance also appears to be influenced by certain offender characteristics such as the age and the crimi al history of the offender. Research conducted by Baldwin and Bottoms (1976) suggested that younger offenders travelled shorter distances and than older offenders and that offenders with previous convictions travelled fur her distances than those with no previous offending history.

The review of 38 journey to crime studies conducted by Rossmo (2000) adds further support to the notion that juvenile offenders are less mobile than older offender. Although the study highlights crime specific variations in distances

travelled, there is no deviation from the principle that offences occur in close proximity to the home base of the offender.

## 2.5 Overview

In view of the threats posed by the emergence of car key burglaries the need for further research in this area is abundantly clear. Indeed, severe limitations in research or published material appertaining to car key burglaries, essentially invites an exploratory analysis aimed at developing the understanding of the nature of this phenomenon in the context of criminological theory and existing literature.

The following chapter outlines the research methodology used for conducting the exploratory analysis and discusses the limitations of this approach.

# Chapter Three

# Methods

This chapter will outline the samples used within the thesis, the data collection process, the base line analysis and the design and analytical methods used.

## 3.1 Background to research

### 3.1.1 Research question

The purpose of this research is to develop the understanding of a relatively new phenomenon in which cars are stolen using keys taken during a domestic burglary.

The first level of this research is based on a descriptive analysis of the temporal, geographical, behavioural and offender specific aspects of car key burglaries that were recorded and detected in Merseyside in 2010.

The acquisition of this information provides a platform for the second level of research in which car key burglaries are compared to regular burglaries to ascertain whether or not there are any differences in the characteristics of each offence.

### 3.1.2 Research settings

Merseyside covers 249 square miles of both urban and rural land bordering Lancashire to the north, Greater Manchester to the east and Cheshire to the south and south-west. The western side of the County is flanked by the Irish

Sea and North Wales across the Dee Estuary (Appendix Two). The resident population of Merseyside is approximately 1.4 million ple (Office for National Statistics, 2011).

As the County's only city, Liverpool's status as a major seaport has attracted a diverse population that has settled across the County. The city of Liverpool is home to the oldest Chinese community in Europe and the oldest black community in the country (Costello, 2001).

Despite the significant amount of investment and regen ation within the Merseyside region, all five local authorities within Merseyside are ranked in the top half of most deprived in England and Wales. Furthermore, Liverpool was ranked as the 5th most deprived local authority out of a total of 326 authorities (Department for Communities and Local Government, 2011).

The relatively high levels of unemployment combine with he prevailing deprivation levels to provide probable factors for the underlying causes of criminality. Despite the challenges posed by the policing environment each of the six Basic Command Units (BCU) that comprise Merseyside Police have recorded year on year reductions in crime between the nancial years 2005/06 to 2010/11. During this period there has been a 31.5% uction in burglary dwelling and a 66.5% reduction in thefts of motor vehicles across the Force.

### 3.1.3 Definitions

A comprehensive overview of the definitions of terms used within this thesis is set out set out in Appendix One. Guidance in relation the Home Office Counting Rules For Recorded Crime (Home Office, 2011) is set out in Appendix Three.

## 3.2 Sample

### 3.2.1 Population

The main data set used within this thesis consists of 8 offences of burglary and personal robbery, recorded by Merseyside Police in 2010. This represents the full population of offences in Merseyside where vehicles have been stolen during the course of either a domestic burglary or a personal robbery occurring in a dwelling.

This data set has been matched with a random sample of 968 regular domestic burglaries and personal robberies in a dwelling where vehicles were not stolen as part of the offence. The overall dataset for the analysis therefore consists of 1936 crimes.

The second data set used within the thesis consists of 70 offenders recorded as living in Merseyside who were the subject of either a charge or an offence 'taken into consideration' (TIC) in 2010, for offences occurring in Merseyside where vehicles were stolen during the course of either a domestic burglary or a personal robbery occurring in a private dwelling.

This data set has been matched with a random sample of 70 offenders recorded as living in Merseyside who were the subject either a charge or a TIC in 2010 for offences occurring in Merseyside where vehicles were not stolen during the course of either a domestic burglary or a personal robbery occurring in a private dwelling. The overall dataset f the analysis therefore consists of 140 offenders.

The third data set used within the thesis consists of detected crimes recorded by Merseyside Police relating to domestic burglaries and personal robberies in a dwelling where vehicles were stolen as part of the offence. This data set represents the total number of car key burglaries that were detected following either a charge or TIC administered in 2010 the 70 offenders referred to in the second database.

This data set also includes 74 detected crimes recorde by Merseyside Police relating to domestic burglaries and personal robberies occurring in a dwelling where vehicles were not stolen. This data set represen s the total number of regular burglaries that were detected following either charge or TIC administered in 2010 to the 70 offenders referred to i he second database.

### 3.2.2 Data sources

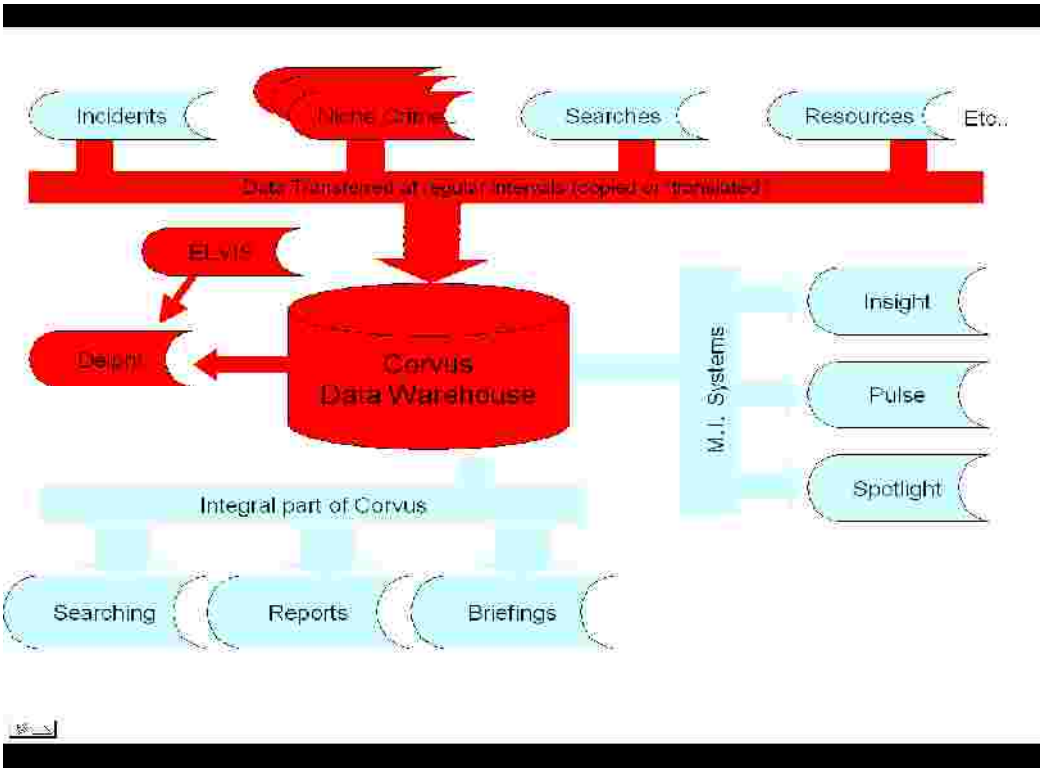
The research is based on archival data held by Merseyside Police that has been collected during the course of routine police practice. In light of the fact that the data had not been specifically collected for he use of this research,

the data should be considered as secondary data (Bachm and Schutt, 2011).

The primary source of the data is Niche RMS, a single, unified and fully integrated record management system for crime, offende s, property, custody and warrants. The elements of Niche that have been used to source the data are crime, offenders and property. The data has been accessed from a data warehouse, CORVUS, which extracts data from Niche each hour of the day. In order to minimise gaps in the data, Niche crime, prope ty and offenders have been accessed directly when the need has arisen.

Vehicle recovery data from the stolen vehicle system, ELVIS, has also been used to supplement the information on vehicles obtaine from Niche property. Due to the fact there is no interface between ELVIS an CORVUS, a manual extract from ELVIS has been uploaded and combined with crime data in the Business Objects Universe. The 'red route' in Figure 3.2.2 (Smith, 2011) outlines how the information required for the analysis has been fed into Delphi, a management information tool developed using Business Objects Web Intelligence.

Figure 3.2.2: Data sources




3.2.3 Limitations of data

Although police data is widely used within research to assess crime trends and evaluate crime reduction programmes (Sherman and Rogan, 1995), it is accepted that there are a number of limitations with p lice data that may affect the reliability of its contents. Firstly, the data on rded crimes is dependent on the victim actually reporting the crime. Although it is acknowledged that there is a significant amount of unreported crime acro s a broad spectrum of crime classifications and countries (Bernasco, 2009), burglary reporting rates in England and Wales are comparatively high. The Inter nal Crime Victimisation Survey for 2004/5 (cited in Bernasco, 2009, p.174) suggests that 88% of burglaries are reported in England and Wales.

Despite the factual, objective nature of the information recorded, the second limitation concerns the accuracy of the report both in terms of missing data and the classification of crime. The accuracy of the data  uffers from absence of information that may have been unknown or simply not r  rded. A dip sample of the dataset taken prior to full extraction confirme  that that this was indeed the case and that some information was missing or inco  tly recorded.

Although there may be some missing data, all operational police officers in Merseyside have access to Niche and have a responsibility to record crimes allocated to them. Compliance with the NCRS (Home Office, 2011) is closely monitored by the Force Crime Registrar and is the subject of frequent external audits. Therefore, the levels of missing data are in fact low for this kind of research.

In order to increase the quality and accuracy of coded data, the free text sections of the crime record have been examined in order to obtain missing data where possible. Notwithstanding the fact that this process has improved the reliability of the data, the coding of the data includes a category of 'unknown' for those records that could not be supplemented. In the case of crimes where there is insufficient data there is the option to discount them in the final analysis. This is considered to be an acceptable solution when using large datasets (Tabachnick and Fidell, 2001).

In terms of the limitations regarding the classification of crimes, the inclusion of 'vehicles stolen during personal robberies' ensures that the analysis

incorporates aggravated car key burglaries that are effectively hidden within crimes classified as a robbery. The disadvantage of ta ing this course of action is that the integrity of the dataset may have been compromised by he inclusion of robberies that were not committed within lings such as 'carjackings'. In order to alleviate this problem a full manual review of the data was completed and personal robbery offences that did not fit the criteria for aggravated burglary were removed.

A further issue concerning data collection was that of the detection rate. The detection rate for car key burglaries in 2010 was 11.6 at the point of collection (which was carried out in 2011). As such, there are 856 offences where there is no information regarding the offender's age, gender or journey to crime distances.

In order to compare the distance travelled from home base to offence location, it was crucial to ensure that each offender had a home and offence location with corresponding geo-codes for each address (x and y map co-ordinates). A manual search of the stolen vehicle system, ELVIS, provided additional information to supplement gaps in the data. A further ss of 'cleaning' took place in relation to home bases recorded as either a p n or hospital. Offenders with home bases recorded as such were removed from the data set (7.9%, $n$ = 6).

An additional limitation of the dataset is the failure to use the British National Grid to determine geographic coordinates for locations where stolen vehicles are recovered. In order to overcome this problem the ELVIS database has

been made available for the purpose of supplementing Niche property records thereby enhancing the information available for analysis. This has, however, prevented any meaningful analysis on vehicle disposal cations commonly referred to as vehicle 'dump sites'.

The issue of generalisability has been considered with n the research. In view of the fact that there is no sample extraction process or selection bias r the dataset of car key burglaries, the prospect of the fin ngs having validity within the population group is improved (Bachman and Schutt, It is accepted, however, that the source of the data is confined to Merseyside and that there may be generalisability challenges outside of this area.

In order to obtain information on crimes occurring out ide Merseyside committed by offenders residing in Merseyside, attempts were made to interrogate the Police National Computer (PNC). It soon became appar , however, that data quality issues and the amount of time required to obtain the information from PNC records were significant blockages. In light of this, the decision was taken to restrict the research to crimes recorded in Merseyside and offenders residing in Merseyside.

The PNC has been used to obtain information to calculate the rate of registered cars stolen by manufacturer type through the use of the Vehicle On-line Descriptive Searching (VODS) facility. The VODS facility has been used to obtain the number of registered owners for each of the car manufacturers recorded as having vehicles produced by them stolen du ing the course of a

car key burglary. It should be noted that this information was obtained in December 2011 and the profile of vehicle ownership may have changed significantly since the vehicles were stolen in 2010.

Due to technical issues, the VODS search facility has it that prevents the acquisition of precise numbers of vehicle ownership above 5,000. Although the author was able to arrange for the VODS limit to be temporarily removed in order to obtain the number of registered owners for so e of the more popular car manufacturers such as Ford, the search was constrained to 'L' postcodes. This was due to the resourcing implications associated with a search on all Merseyside post codes. In order to maintain the accura of calculation of the rate of stolen vehicles for each manufacturer, details of stolen vehicles from areas in Merseyside not covered by 'L' postcodes were removed. Notwithstanding the limitations posed by the restriction on postcodes used for the search, over 80% ($n$ = 816) of the cars stolen during car key burglaries were represented in the analysis.

### 3.2.4 Data protection

Ethical issues have also been considered during the co of this research and authority to access and analyse the data has been ranted by the Assistant Chief Constable Operations, Merseyside Police. Strict adherence to the Data Protection Act has ensured that the final analysis respects the privacy of all concerned. In order to achieve this aim, victim and offender details were anonymised.

## 3.3 Data collection

### 3.3.1 Data extraction and cleaning

#### 3.3.1.1 Car key burglaries

The Delphi system was used to obtain details of all domestic burglaries d robberies where vehicles were stolen as part of the offence between 1st January and 31st December 2010. The process of 'cleaning' the data commenced with the removal of personal robbery offence involving vehicles that did not take place in a private dwelling and the emoval of one burglary incident that had three separate Niche numbers. This reduced the data set from 996 to 902.

Further 'cleaning' then took place in the form of a ma ual key code search of the crime and MO notes on the Niche crime system using the search terms 'car' and 'vehicle'. An additional 66 offences were found that were not included in the original car key burglary data set. This produced a total population of 968 car key burglaries occurring in Merseyside in 2010.

Throughout this process and the subsequent manual examination of the crime and MO notes, no regular burglaries were found in the ar key burglary data set.

#### 3.3.1.2 Regular burglaries

The Delphi System was used to obtain details of all burglaries and all personal robberies where vehicles were not stolen as part of the offence between 1st January and 31st December 2010. This produced a total of 7195 offences. he

process of ‘cleaning’ the data commenced with the removal of personal robbery offences involving vehicles that did not take lace in a private dwelling. This resulted in a reduction in the data set to 6451 offences. At this point, the car key burglary dataset consisted of 902 offences. In order to acquire a random sample of 902 regular burglaries, every seventh nce was elected from the total 6451 offences.

A further process of ‘cleaning’ took place in the form of a manual search that resulted in the discovery of a further 145 offences th consisted of either attempt burglaries or car key burglaries. This resulted in the car key burglary dataset increasing by 66 offences to 968 offences. In order to obtain a random sample of 66 offences from the remaining regular burgl ry dataset, the Microsoft Excel randomisation function was utilised.

The ‘cleaning’ process continued when the variables we e later coded. The manual interrogation of the Niche records enabled gaps in the data to be supplemented by obtaining the information required thr ugh free text entries contained in the Niche crime system.

3.3.1.3 Offenders

The Delphi system was used to search for all offenders recorded as living in Merseyside who were either charged or accepted a TIC in 2010, for offences occurring in Merseyside where vehicles were stolen during the course of a domestic burglary or personal robbery occurring in a p dwelling. 76 offenders were identified through this process. Six of nders were removed

from the sample due to data issues such as the home address being recorded as a hospital or prison, thus resulting in a dataset of 70 offenders.

In order to match this data set, the Delphi system was used to obtain a random sample of 70 offenders recorded as living in Merseyside who were the subject of either a charge or a TIC in 2010 for offences occurring in Merseyside where vehicles were not stolen during the course of either a burglary or a personal robbery occurring in a private dwelling. The overall dataset for the analysis therefore consists of 140 offenders.

#### 3.3.1.4 Detected crimes

Having acquired two equal data sets each containing 70 offenders, the information was then used to obtain the number of detected crimes in each data set that was obtained following either a charge or TIC administered in 2010. This process produced 107 unique car key offences and 74 unique regular burglary offences. A box plot was used to identify an outlier in the data set of detected regular burglaries and the removal of the outlier resulted in a total of 73 detected regular burglary offences (Appendix Four).

### 3.3.2 Coding of variables

In order to ensure consistency in the subsequent descriptive analysis a consistent binary coding scheme was used for each of the variables (Kirkpatrick and Feeney, 2007). The coding scheme is set out in Appendix Five.

### 3.3.3 Variables

The archival data held by Merseyside Police has enable variables to be collected across four main areas, namely; temporal (mo h, day, time), geographical (BCU), behavioural [modus operandi (MO), elling type, point of entry front/rear, dwelling occupied/unoccupied, tidy/untidy search of lling by offender, offender seen/not seen, weapons/no weapons, stolen vehicles] and offender specific aspects (age, gender and distance travelled from home base).

All variables used in the analysis were independent. By way of example, in terms of the MO, 'force/ smashed door/window' could not be recorded as 'aggravated'. Further details of these categories are set out in Appendix Six.

In terms of the distance travelled from the offender's ase to the offence location, the location data was geo-coded from street addresses into x and y co-ordinates. Using Pythagoras' theorem, the distance between the offender's home address and the offence location was calculated u g the equation set out below:

Distance = v ((Offence Easting - Home base Easting)^2 + (Offence Northing - Home base Northing)^2)

## 3.4 Design and research methodology

### 3.4.1 Case control analysis

As a case control study, this research differs from experimental studies on the basis that there has been no random assignment. Since the incipal aim of the second level of this research is to observe the di nces between car key burglaries and regular burglaries, an intervention gro has not been required.

The cases of car key burglary and the regular burglary have been taken from the same population and the regular burglaries were ra omly selected. In order to compare the groups, the author has sought to trol for the offenders' age and gender together with the BCU where he offence took place. Although the author was limited in terms of the availability of other information, it is acknowledged that these variables alone are insufficient to provide adequate controls for the study.

Further to this, the author's assumption that the variables were similar at baseline was not supported by the age of the offenders. Although for both car key burglaries and regular burglaries the majority of fenders were under 25 years, 81.4% (n = 57) of car key burglars were under 24 years compared to 60% (n = 42) of regular burglaries.

It is acknowledged that the limitations in terms of co trols will have an impact on the strength of the results.

### 3.4.2 Research methodology

The research methodology is based on two levels. The first level is a descriptive analysis of` the timing, geographical, behavioural and offender specific aspects of car key burglaries recorded in Merseyside in 2010.

The second level provides a comparison of both car key and regular burglaries. An effect size analysis based on a case control design was used to measure the magnitude of any differences between the variables in both the car key and regular burglaries. The second level also ovides a descriptive analysis of the characteristics of offenders associated with each offence.

The first level of the study was a descriptive analysis of the temporal (month, day and time), geographical (BCU) and behavioural (MO, dwelling type, point of entry, dwelling occupancy at the time of offence, t of dwelling search conducted by offender, offender seen, weapons, stolen vehicles). This section also includes a descriptive analysis of the offender characteristics (age, gender and distance travelled from home base). This information is essentially comprised of nominal, categorical variables that will be displayed using frequency tables, bar charts, line graphs and pie charts. In the interests of efficiency, the Statistical Package for the Social Sciences (SPSS) was used to perform the analysis of the dataset (Field, 2005).

The second level of the analysis was based on a comparison of the nature of car key burglaries with regular burglaries. A case con rol design was utilised to ensure that the two groups were suitable for compariso Following this, an

effect size analysis was used to measure the magnitude of the differences between the variables contained within the two indepen groups. The effect size has been calculated to assess whether the differe ce in the variables is 'practically significant' as well statistically signif nt (Ellis, 2010).

In order to calculate the standardised difference between the two groups using the analysis commonly referred to as Cohen's *d* (1988), the interpretation of the effect sizes generated in the analysis was based o hen's guidance that 0.2 is indicative of a small effect, 0.5 indicative of a medium effect and 0.8 indicative of a large effect size (Ellis, 2010). Whilst it is acknowledged that this somewhat arbitrary classification of the effect is contentious, Cohen's benchmarks at least provide a guide to interpret the practical significance of the results (Ellis, 2010).

In light of the fact that the car key burglary data set represents a full population for Merseyside, it was felt unnecessary to conduct a significance test. Had such a significance test been conducted, a Chi-Square test would be most suitable for the nominal data contained within the distributions.

The second level of research also includes a descriptive analysis of the offender characteristics in both car key and regular burglaries. In order to measure the difference between the distances travelled from the home base to the offence location for both crime types, appropriate inferential statistics were used. On the basis that a Kolmogorov-Smirnov test for normality was significant ($p<.05$), the distribution was non-normally distributed and thus

median distances were examined as the appropriate measure of central tendency.

As the distances were found to be non-normally distributed, a Mann-Whitney test was used to find out if there was significant difference in the distribution of the two independent samples. In order to measure the magnitude of any differences between the distances travelled between the two crime types, an effect size was calculated using the formula $r = Z/\sqrt{N}$ from the Mann-Whitney U tests (Newcombe, 2006).

The decision to conduct a test for significance and calculate the effect size for this element of the analysis is based on the relatively small sample size. In view of the fact that the sample size of unique offences committed by car key and regular burglars offenders is small enough to rais questions about normality, the Mann-Whitney test is an appropriate means of allowing the generalisation of the findings (Elliott and Woodward, 07).

As with the first level of the study, SPSS was used to carry out the ana sis of the dataset in order to provide a calculation of the significance level. If the level of significance is 0.05 or less the findings were treated as significant, thus ruling out the potential for findings based on mere chance (Muller-Johnson, 2011).

# Chapter Four

# Results

## 4.1 Introduction

The main focus of this research is to develop the unde anding of the nature of car key burglaries. In support of this, the followi g chapter offers the results of an exploratory descriptive data analysis that is based on three combined datasets relating to car key and regular burglaries recorded by Merseyside Police in 2010, namely; 1936 car key and regular burglaries, 140 offenders who were the subject of either a charge or an offence 'taken into consideration' (TIC) for a car key or regular dwelling burglary and 180 unique offences of car key and regular burglary committed by the 140 offenders.

The first section provides a descriptive analysis of t temporal, geographical, behavioural and offender specific aspects of car key b rglary. The second section offers a comparison of the characteristics of r key and regular burglaries.

## 4.2 Descriptive analysis of car key burglaries

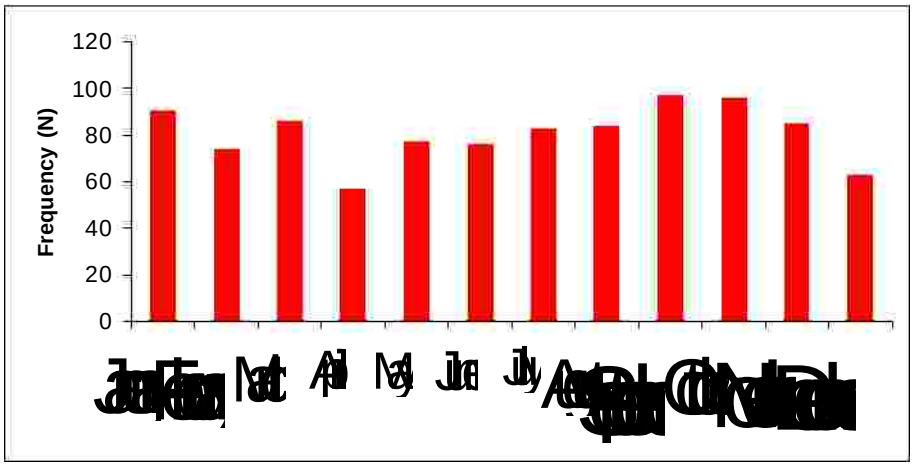
### 4.2.1 Temporal

#### 4.2.1.1 Month

Figure 4.2.1.1 shows the distribution of car key burglaries based on the month in which the offence was committed. The mean average n ber of car key burglaries committed each month is 80.6 (*SD* = ±12.1). Although there is some

variation in the number of offences committed, there does appear to be some evidence of seasonality during the autumn to early winter months with September, October and November all experiencing above average levels of car key burglary.

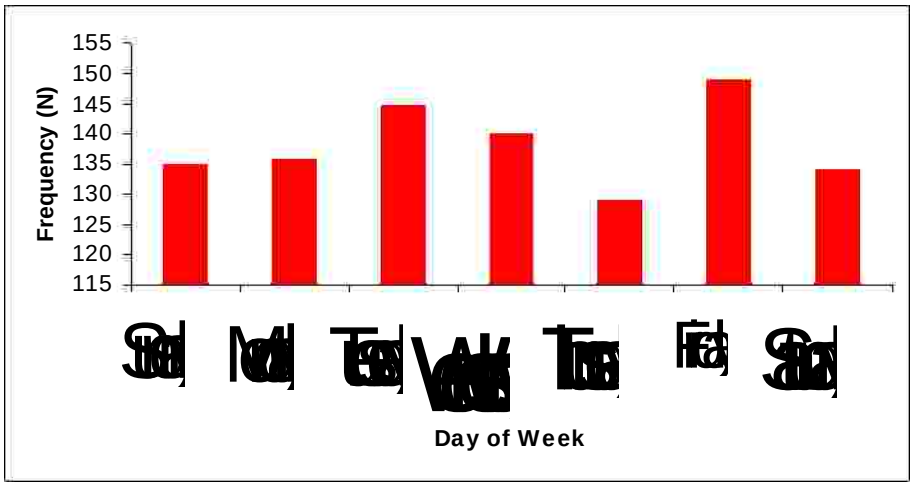
Figure 4.2.1.1: Month of offence




4.2.1.2 Day

Figure 4.2.1.2 shows the distribution of car key burglaries based on the day that the offence was committed. The highest percentage of offences was committed on Tuesday (15%, *n* = 145) and Friday (15.4%, *n* = 149).

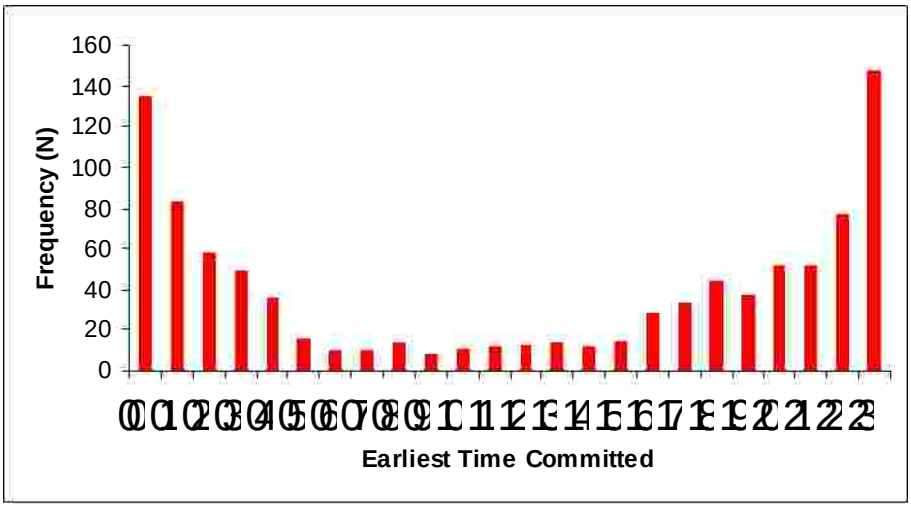
Figure 4.2.1.2: Day of offence



4.2.1.3 Time

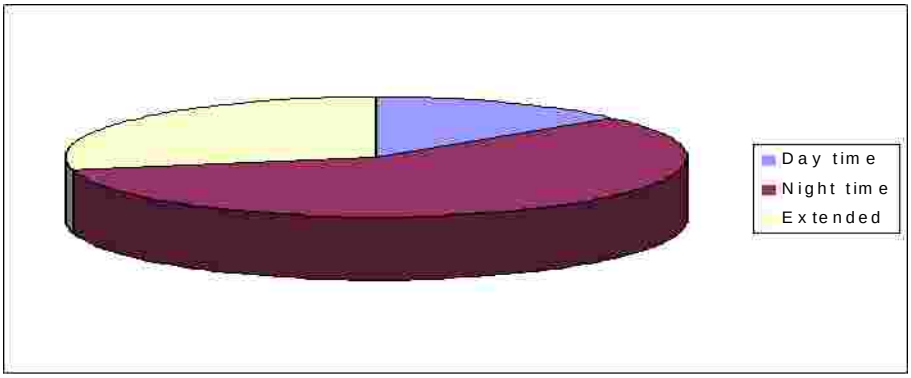
In cases where the exact time that the offence took place is unknown, the earliest and latest times that the offence could have en place are recorded. This temporal analysis was based on the earliest possi time at which the offence occurred. Figure 4.2.1.3a shows that the majority of offences occurred during the night period between 22.00 to 07.59hrs. It is possible that this is due to the increased availability of vehicles located outside dwellings overnight.

Figure 4.2.1.3a: Time of offence




For the purposes of the analysis, the data was broken n into three time categories as featured in Figure 4.2.1.3b. The visualisation indicates that the majority of car key burglaries take place during the hours of 20.00 to 07.59hrs (57.9 %, *n* = 560). In contrast, 13.5% (*n* = 131) of the offences took place during the daytime (08.00 to 19.59hrs).

Figure 4.2.1.3b: Time period of offence




4.2.2 Geographical

The areas in which the car key burglaries were committ d were examined to assess whether there are any areas that experience a higher number of offences.

As Table 4.2.2 shows, two BCUs accounted for over half of the car key burglaries that occurred in Merseyside in 2010. The highest frequency of offences occurred in Liverpool North (25.4%, *n* = 246) followed closely by Sefton (25%, *n* = 242). When one takes in to account the number of households in each BCU the areas that suffer the highest level of car key burglaries per thousand households are Liverpool South (2.24), Liverpool North (2.23) and Sefton (2.05). The lowest frequency of offences occurred in Wirral (7.6%, *n* = 74) and the same BCU also had the lowest level of ca key burglaries per thousand households (0.54).

Table 4.2.2: Car key burglaries per BCU

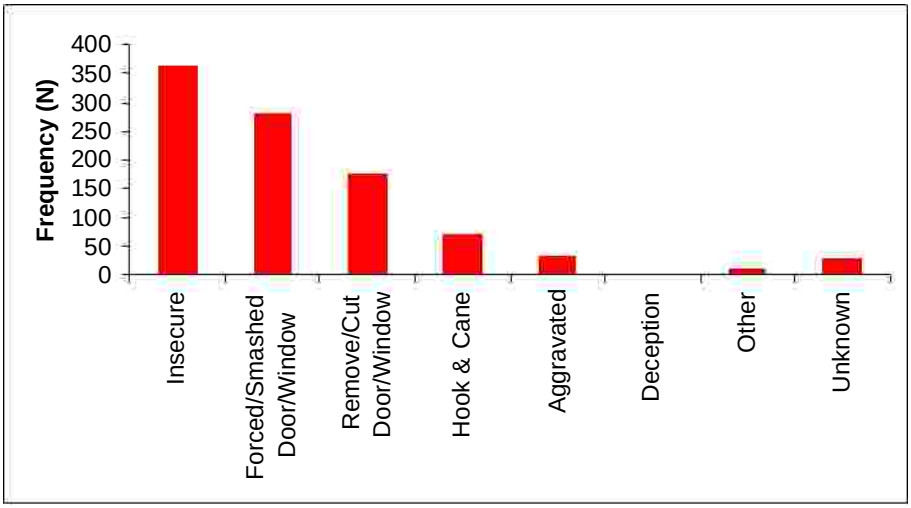
| BCU | Frequency | %age | Freq. / 1,000 households |
|---|---|---|---|
| Wirral | 74 | 7.6% | 0.54 |
| Sefton | 242 | 25.0% | 2.05 |
| Knowsley | 107 | 11.1% | 1.68 |
| St Helens | 111 | 11.5% | 1.47 |
| Liverpool North | 246 | 25.4% | 2.23 |
| Liverpool South | 188 | 19.4% | 2.24 |
| **Grand Total** | **968** | **100.0%** | **1.65** |

### 4.2.3 Behavioural

#### 4.2.3.1 Modus operandi (MO)

The most common MO for offenders conducting car key bu aries, as shown in Figure 4.2.3.1, was the targeting of insecure premises (37.7%, *n* = 365). The crime recording process utilised by Merseyside Police efines insecure premises as including unlocked doors and windows.

Figure 4.2.3.1: MO types




None of the recorded car key burglaries were based on 'deception' that would typically form part of distraction burglary. The Home Office Counting Rules For Recorded Crime (2011) defines distraction burglary as a crime where a falsehood, trick or distraction is used on an ccupant of a dwelling to gain, or try to gain, access to the premises to commit burglary. The absence of any car key burglaries based on deception may be due to the age profile of distraction burglary victims, with offenders typically targeting elderly victims who may be less likely to own a vehicle. The relatively high number of 'hook and cane' offences (7.4%, *n* = 72) is also of interest as this MO provides the

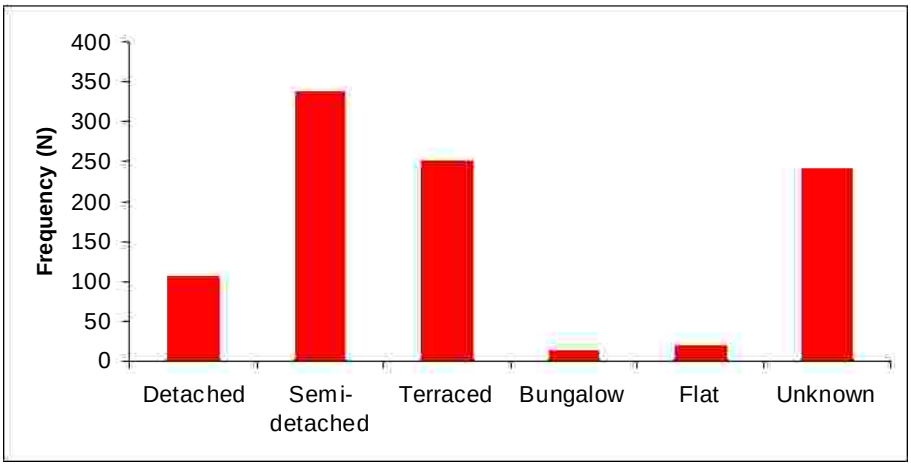
offender with the opportunity to commit a burglary and achieve their aim of removing car keys to steal a vehicle without physically entering the property.

4.2.3.2 Dwelling type

Figure 4.2.3.2 shows that the highest frequency of car y burglaries involved semi-detached houses (34.9%, *n* = 338), followed by terraced houses (25.8%, *n* = 250). The lowest frequency of offences involved flats (2.1%, *n* = 20). One possible explanation for the findings is that the occu nts of semi-detached and terraced houses tend to park their vehicles on a drive or directly outside the property. This minimises the time required to loca and remove the vehicle from the scene, thereby reducing the chances of being apprehended. Communal car parks, that are often a feature of a complex of flats, may make it harder for offenders to match the car keys to the vehicle.

Figure 4.2.3.2 also indicates that there is a low freq ency of car key burglaries that take place in bungalows (1.3%, *n* = 13). This may be linked to the age profile of people residing in bungalows. Since elderly people, who may be less likely to own a vehicle, often favour bungalows (Natio Fraud Authority, 2011), this type of property may be less appealing to car key burglars.

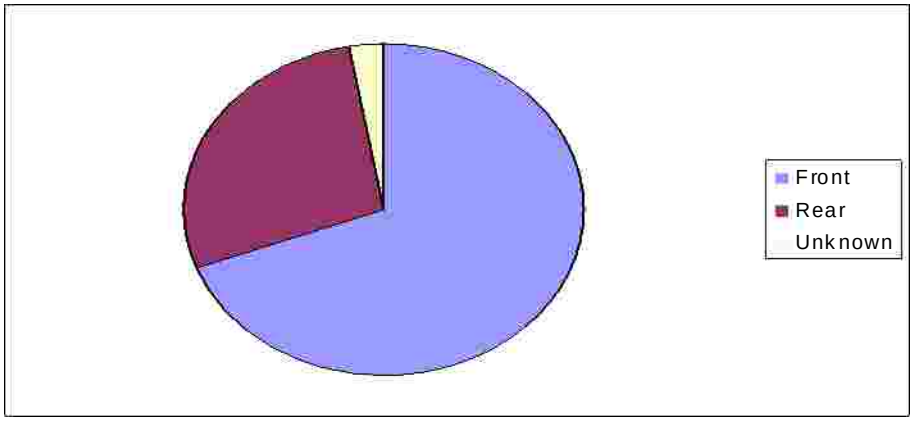
Figure 4.2.3.2: Dwelling type



4.2.3.3 Point of entry

As shown in figure 4.2.3.3, offenders were more likely to enter properties from the front (69.2%, *n* = 670) compared to the rear (27.9%, *n* = 270). In 2.9% of cases the point of entry was unknown (*n* = 28).

Figure 4.2.3.3: Point of entry




4.2.3.4 Dwelling occupancy at the time of offence

Table 4.2.3.4 indicates that in the majority of car key burglaries (85.1%, *n* = 824) the house was occupied. This is perhaps unsurprising when one considers that car keys are more likely to be availabl offenders if the owner of the vehicle is present in the house.

Table 4.2.3.4: Dwelling occupancy at time of offence

| Dwelling Occupied | Frequency | %age |
|---|---|---|
| Yes | 824 | 85.1% |
| No | 49 | 5.1% |
| Unknown | 95 | 9.8% |
| **Grand Total** | **968** | **100.0%** |

4.2.3.5 Type of dwelling search by offender

Table 4.2.3.5 indicates that in 73.8% (*n* = 714) of cases the type of search made was unknown. In terms of the remaining offences, 19.1% (*n* = 185) offences were tidy searches with 7.1% (*n* = 69) being untidy.

Table 4.2.3.5: Type of dwelling search by offender

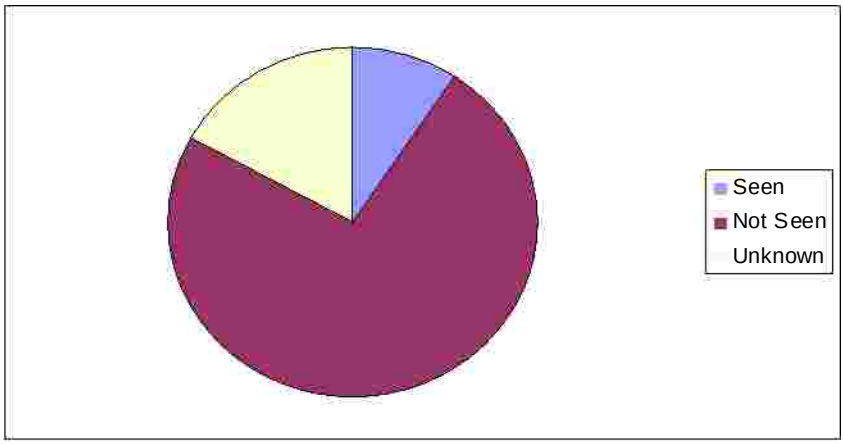
| Search | Frequency | %age |
|---|---|---|
| Tidy | 185 | 19.1% |
| Untidy | 69 | 7.1% |
| Unknown | 714 | 73.8% |
| **Grand Total** | **968** | **100.0%** |

Aside from the limitations posed by the notable number of 'unknown' search types, the majority of offences involved tidy searches. This may suggest that the principal aim of offenders was to steal a car and  hat entry was made with the sole aim of locating car keys.

4.2.3.6 Offender seen

As shown in Figure 4.2.3.6, in the majority of cases (73.5%, *n* = 711), the offender was not seen. This is somewhat surprising whe  one considers the high level of dwelling occupancy that would be associated with overnight burglaries. As mentioned earlier, a relatively high nu  ber of car key burglaries were committed overnight (57.9 %, *n* = 560).

Figure 4.2.3.6: Offender seen




4.2.3.7 Use of weapon

Table 4.2.3.7 provides a breakdown of the weapons used by offenders in the course of car key burglaries that occurred in 2010. Of nders were in possession of weapons in 8.6% (*n* = 47) of offences. It should be noted that there were six offences where two weapons were recorde within the notes of the crime record, thus leading to a total of 974 instead 968. 29 of these cases were recorded as robberies due to the fact that the offence constituted an aggravated burglary. The remaining cases relate to specific MOs, namely: 'force/smash door/window' (8 offences), 'remove/cut do /window' (8 offences) and 'insecure' (2 offences).

Table 4.2.3.7: Use of weapon

| Weapon | Frequency | %age |
|---|---|---|
| Bladed Implement (possession) | 7 | 0.4% |
| Bladed Implement (used/threatened) | 14 | 0.7% |
| Non Bladed Implement | 22 | 1.1% |
| Firearm (possession) | 1 | 0.1% |
| Firearm (used/threatened) | 2 | 0.1% |
| Glass | 1 | 0.1% |
| No Weapon Used | 494 | 25.5% |
| Explosives | 0 | 0.0% |
| Unknown | 427 | 22.1% |
| **Grand Total** | **968** | **100.0%** |

4.2.3.8: Stolen vehicles

A total of 1018 vehicles were stolen during the commission of 968 car burglaries recorded in Merseyside in 2010 with 50 offe ces resulting in the theft of two vehicles. 73 % (*n* = 744) of all vehicles stolen were recovered. Vehicles were the only item stolen in 33% (*n* = 315) of car key burglaries. Figure 4.2.3.8a shows that the most frequently stolen hicles were those manufactured by Ford (23.9%, *n* = 243), Vauxhall (13.7%, *n* = 139), BMW (7.6%, *n* = 77) and Audi (7.4%, *n* = 75). A full breakdown of vehicles registered and stolen based on manufacturing type is provided in Appendices Seven and Eight.

Figure 4.2.3.8a: Frequency of cars stolen based on man urer type

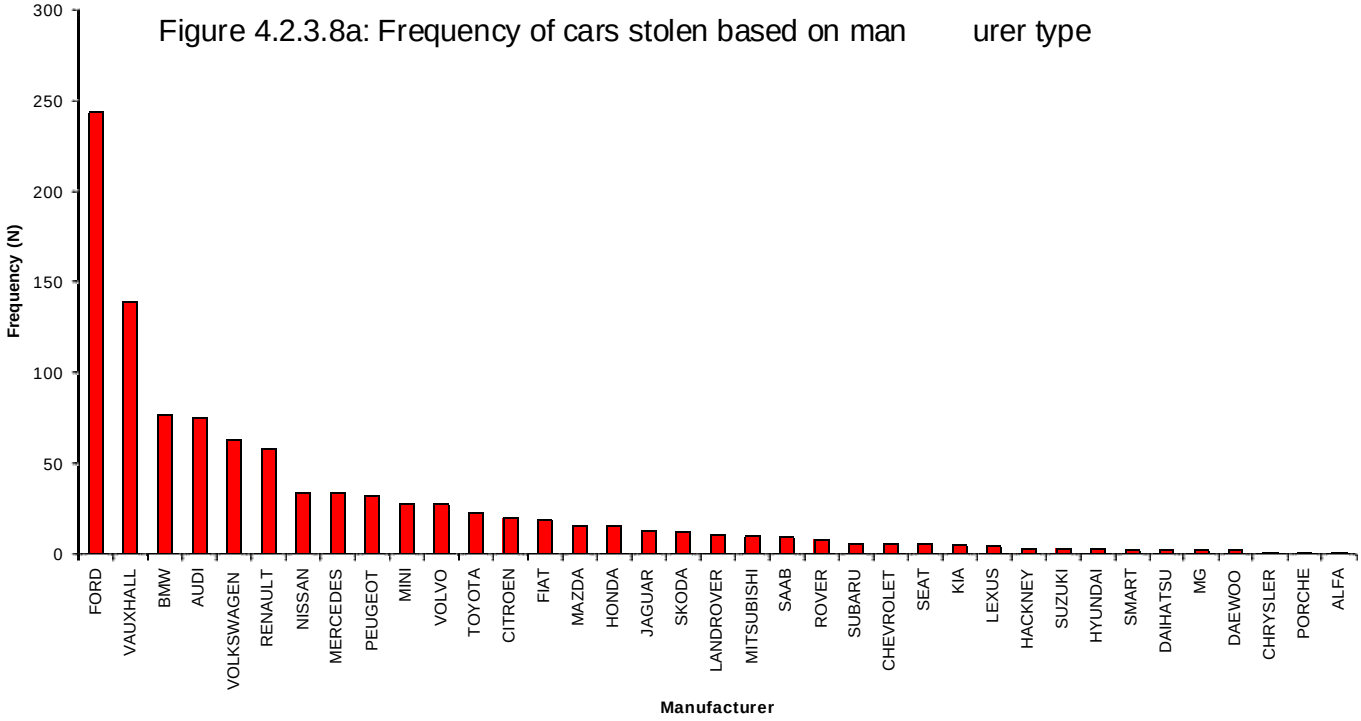
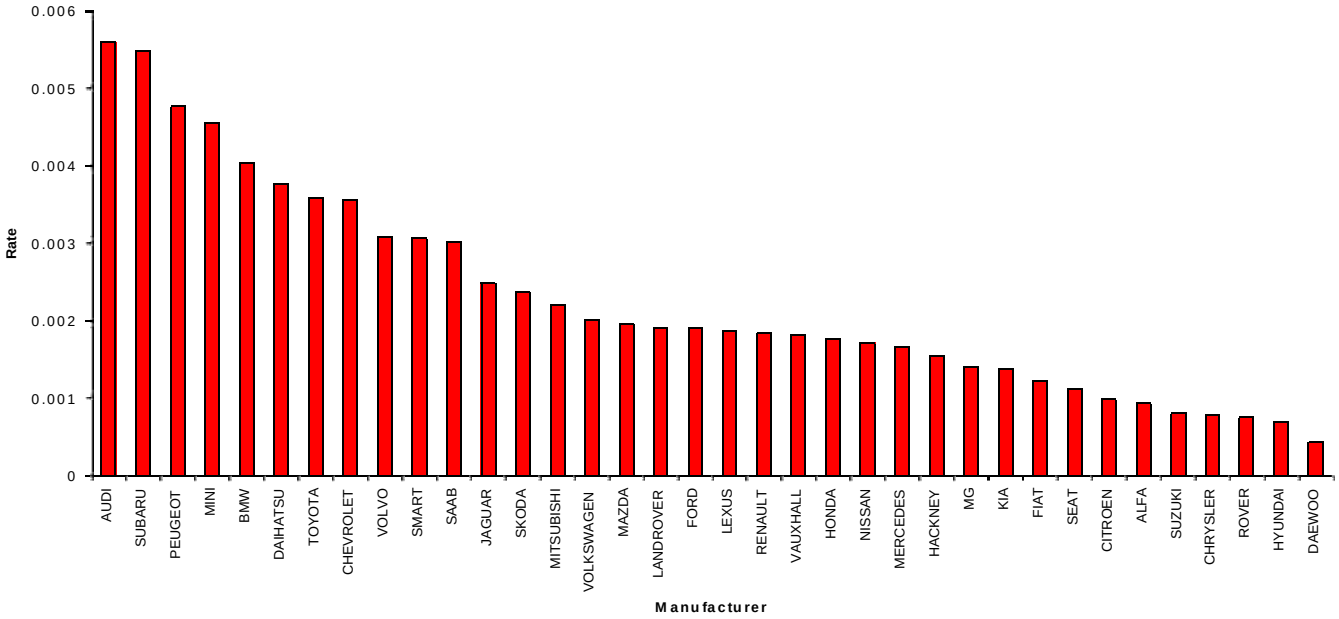



Figure 4.2.3.8b takes into account the rate of stolen hicles by manufacturer for registered vehicle owners in areas covered by 'L' postcodes. Although this excludes St Helens, Wirral and parts of Sefton, over 80% (*n* = 816) of the cars stolen during car key burglaries were represented in t analysis. The highest

rate of stolen vehicles was manufactured by Audi (0.0056) and Suba (0.0054). Both manufacturers produce high performance rs that could be favoured by offenders for use in further criminality.

Figure 4.2.3.8b: Rate of registered cars stolen by man facturer type




## 4.2.4 Offenders

This section offers a descriptive analysis of 70 offen ers based on gender, age and journey to crime distances.

### 4.2.4.1 Gender

As shown in Table 1.4.1a, 97.1% (*n* = 68) of offenders were male. There were only 2 (2.9%) female offenders.

Table 4.2.4.1: Gender of offender

| Gender | Frequency | %age |
|---|---|---|
| Male | 68 | 97.1% |
| Female | 2 | 2.9% |
| **Grand Total** | **70** | **100.0%** |

4.2.4.2 Age

Table 4.2.4.2 shows that the majority of the offenders were less than 24 years old (60.0%). The mean age of the offenders was 23.6 (*SD* = ±9.9) years old with an age range between 14 and 48 years.

Table 4.2.4.2: Age of offender

| | Frequency | %age |
|---|---|---|
| **Under 17 Years** | 15 | 21.4% |
| **18 - 24 Years** | 42 | 60.0% |
| **25 - 40 Years** | 10 | 14.3% |
| **Over 40 Years** | 3 | 4.3% |
| **Total** | 70 | 100.0% |

The highest frequency of offenders (60%, *n* = 42) fell into the 18-24 years category, with over 81% (*n* = 57) offenders were under 25 years. The lowest frequency of offenders (4.3%, *n* = 3) fell into the 'over 40' years category.

4.2.4.3 Distanced travelled from home base

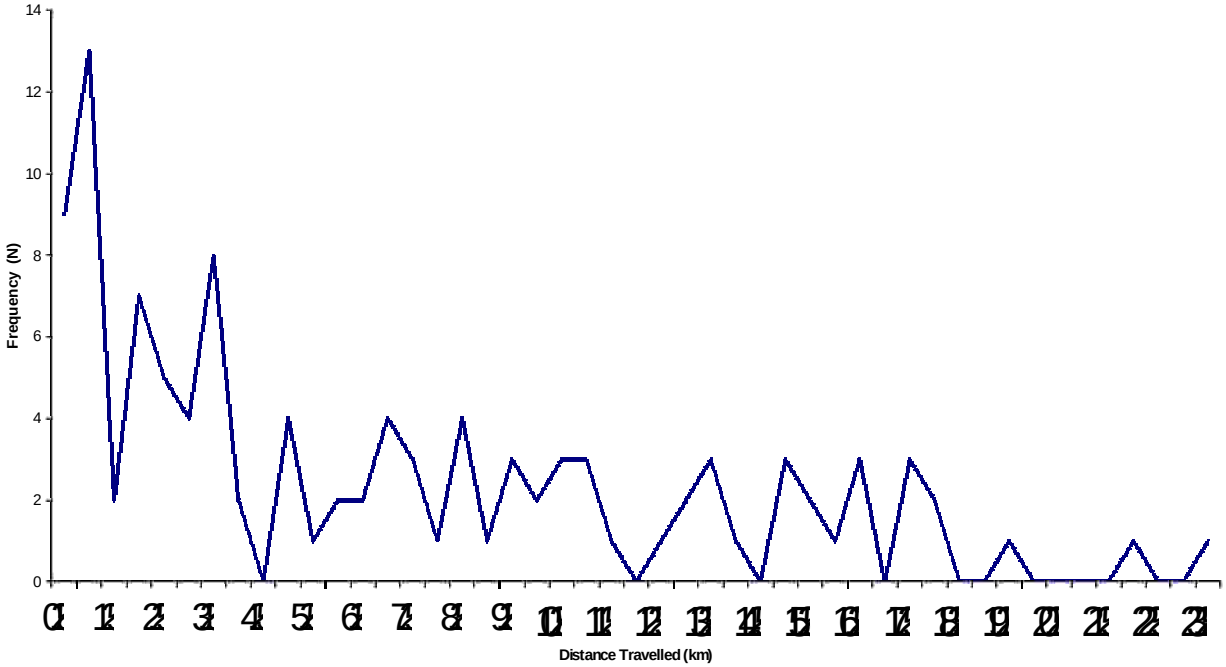
Due to the existence of repeat offenders, the journey to crime distance for car key burglaries is based on 106 unique offences.

Interestingly, prior to the 'cleaning' process a numbe of multiple offenders were identified for single offences. One such example was group of seven offenders who operated as part of a 'gang'. Each membe of the group received a charge or TIC for 27 unique offences, thus nerating a total of 189 charges or TICs. As part of the data cleaning process, the shortest journey to crime distance was selected for each of the 27 unique offences.

A Kolmogorov–Smirnov test for normality ($p < .05$) confirmed that the distribution was non-normally distributed and median distances were examined as the appropriate measure of central tendency.

The median distance travelled was 5.10 km. As shown in Figure 4.2.4.2, the shortest distance travelled was 0 km and the maximum distance travelled was 23.41 km. The shortest distance (0 km) relates to an offender who committed a car key burglary at a close neighbour's house.

Figure 4.2.4.3: Distance travelled from home base




The car key distance decay curve set out in Figure 4.2.4.3 and the journey to crime distances set out in Table 4.2.4.3 show that 20. ($n$ = 22) of offenders travelled less than 1 km. The majority of car key burglaries (51%, $n$ = 54) offenders had travelled less than 5 km to the commit t offence. However, in over 21.7% ($n$ = 23) of car burglaries, the offender had travelled over 12.49 km.

Table 4.2.4.3: Distance travelled from home base

| Distance | Car Key | |
|---|---|---|
| **Under 1km** | 22 | 20.8% |
| **1.0 - 2.49 km** | 14 | 13.2% |
| **2.5 - 4.99 km** | 18 | 17.0% |
| **5.0 - 7.49 km** | 10 | 9.4% |
| **7.5 - 9.99 km** | 11 | 10.4% |
| **10.0 - 12.49 km** | 8 | 7.5% |
| **12.5 - 14.99 km** | 9 | 8.5% |
| **15.0 - 17.49 km** | 9 | 8.5% |
| **17.5 - 19.99 km** | 3 | 2.8% |
| **20 km +** | 2 | 1.9% |
| **Total** | **106** | **100.0%** |

## 4.3 Comparison of the characteristics of car key and resid ntial burglaries

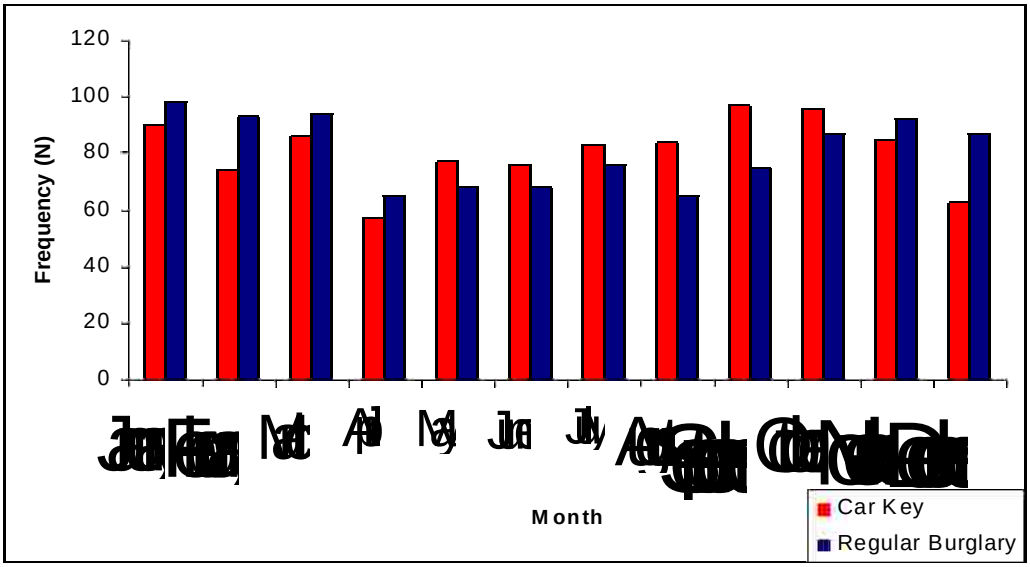
### 4.3.1 Temporal

#### 4.3.1.1 Month

Figure 4.3.1.1a shows the distribution of car key burg aries and regular burglaries based on the month in which the offence was committed. The mean average number of car key burglaries committed each mo h was 80.6 (*SD* = ±12.1). A higher frequency of car key burglaries compared to regular burglaries occurred in May (8%, *n* = 77), June (7.9%, *n* = 76), July (8.6%, *n* = 83), August (8.7%, *n* = 84) and October (10%, *n* = 96).

Although there are variations in the volume of offences committed, there does appear to be some evidence of seasonality in both crime types during the autumn to early winter months with September, October and November all experiencing above average levels of car key burglary.

Figure 4.3.1.1a: Car key and regular burglary - month of offence

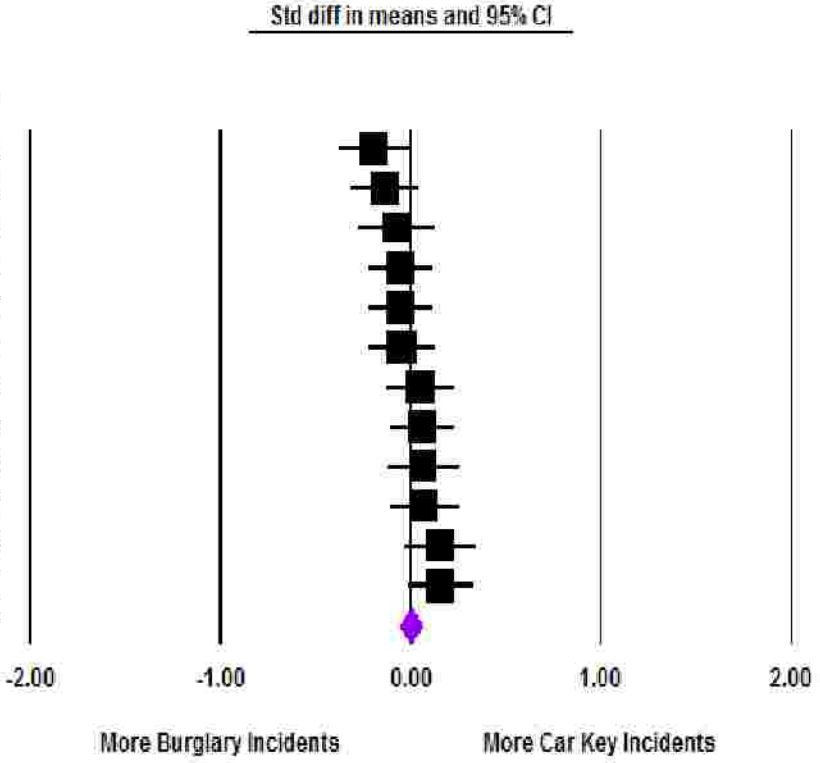



The effect sizes (standardised difference in the means are set out in Figure 4.3.1.1b in numeric form and as a visualisation in the form of a forest plot. The effect sizes were greater for car key burglary in May, June, July, August, September, but less for car key burglary in January, February, March, April, November and December.

The largest effect size for the months was the Month of December (Cohen's *d* = –0.19, *SE* = 0.10). This was followed by the months of September (Cohen's *d* = 0.16, *SE* = 0.09) and August (Cohen's *d* = 0.015, *SE* = 0.10). The lowest effect size for the months was November (Cohen's *d* = –0.05, SE = 0.09), January (Cohen's *d* = –0.05, SE = 0.09) and July (Cohen's *d* = –0.05, SE = 0.09). The effect sizes were found to be small for all months indicating a small difference between car key burglaries and regular burg ries in terms of the month in which the offence occurs.

Figure 4.3.1.1b: Effect size analysis - month of offence

| Variable | Theme | Std diff in means | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
|---|---|---|---|---|---|---|---|---|
| December | Month | -0.193 | 0.095 | 0.009 | -0.379 | -0.007 | -2.032 | 0.042 |
| February | Month | -0.138 | 0.090 | 0.008 | -0.314 | 0.038 | -1.535 | 0.125 |
| April | Month | -0.077 | 0.103 | 0.011 | -0.280 | 0.125 | -0.748 | 0.455 |
| March | Month | -0.054 | 0.086 | 0.007 | -0.223 | 0.115 | -0.626 | 0.531 |
| January | Month | -0.052 | 0.085 | 0.007 | -0.218 | 0.114 | -0.614 | 0.539 |
| November | Month | -0.048 | 0.087 | 0.008 | -0.219 | 0.123 | -0.552 | 0.581 |
| July | Month | 0.053 | 0.091 | 0.008 | -0.126 | 0.232 | 0.579 | 0.562 |
| October | Month | 0.060 | 0.086 | 0.007 | -0.108 | 0.228 | 0.699 | 0.485 |
| June | Month | 0.066 | 0.096 | 0.009 | -0.121 | 0.254 | 0.693 | 0.489 |
| May | Month | 0.074 | 0.095 | 0.009 | -0.113 | 0.261 | 0.777 | 0.437 |
| August | Month | 0.153 | 0.095 | 0.009 | -0.033 | 0.339 | 1.616 | 0.106 |
| September | Month | 0.156 | 0.089 | 0.008 | -0.018 | 0.330 | 1.753 | 0.080 |
| | | 0.000 | 0.031 | 0.001 | -0.062 | 0.062 | 0.004 | 0.997 |

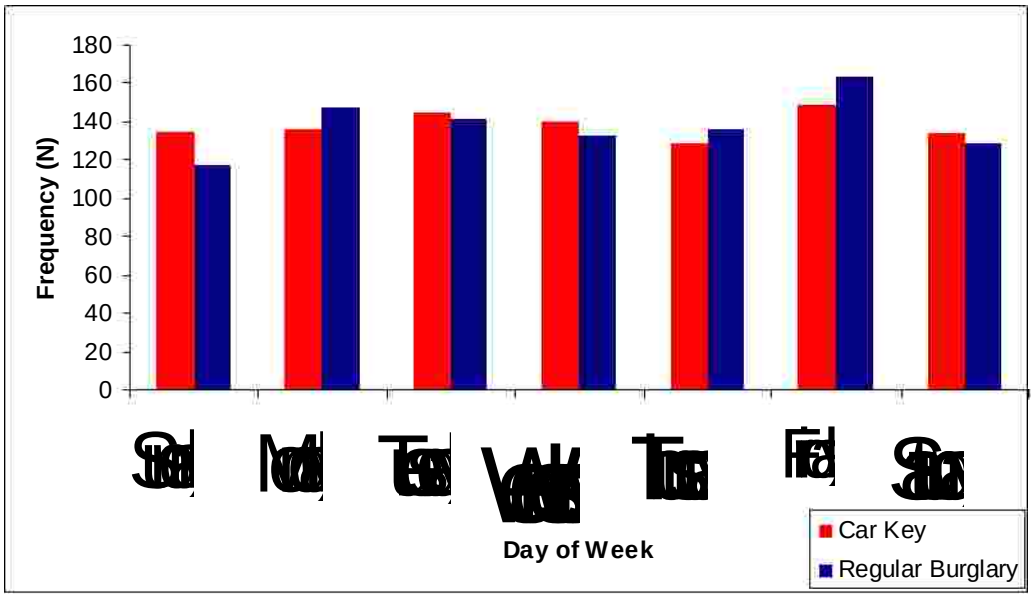


4.3.1.2 Day

Figure 4.3.1.2a shows the distribution of car key burg aries and regular burglaries based on the time that the offence was committed. The most prominent day for both offences is Friday: car key bur ry (15.4%, *n* = 149) and regular burglary (16.8%, *n*= 163).

Figure 4.3.1.2a shows a higher frequency of car key bu glaries compared to regular burglaries occurred on Tuesday (15%, *n* = 145), Wednesday (14.5%, *n* = 140), Saturday (13.8%, *n* = 134) and Sunday (14%, *n* = 135).

Figure 4.3.1.2a: Car key and regular burglary - day of offence

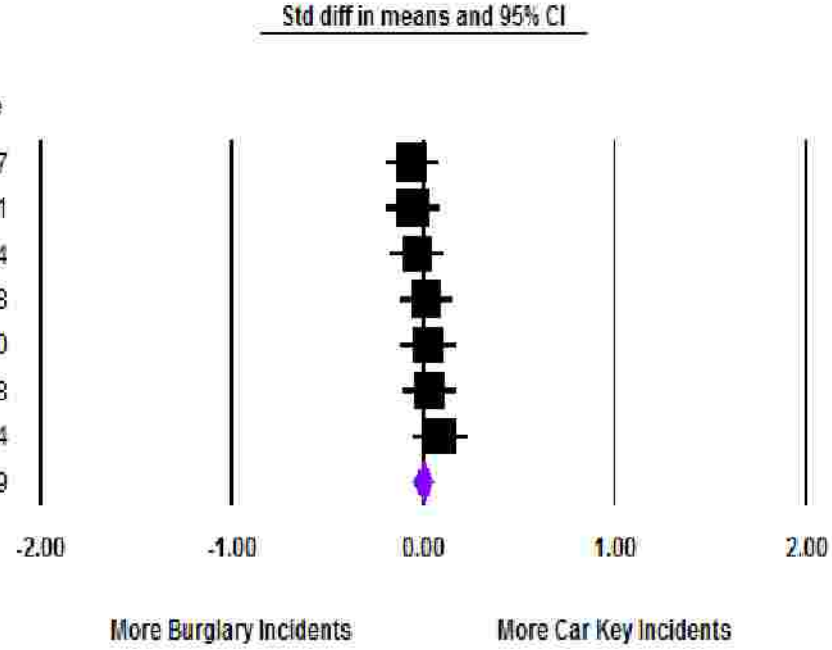



The effect sizes (standardised difference in the means are set out in Figure 4.3.1.2b in numeric form and as a visualisation in the form of a forest plot. The effect sizes were greater for car key burglary on Tues y, Wednesday, Saturday and Sunday but less for car key burglary on Monday, Thursday and Friday.

The largest effect size for the day of the week on which car key burglaries and regular burglaries occurred was Sunday (Cohen's *d* = 0.09, SE = 0.08). This was followed by Friday (Cohen's *d* = -0.06, SE = 0.07) and Monday (Cohen's *d* = -0.06, SE = 0.07). The lowest effect size for the day o the week on which regular burglaries and regular burglaries took place was Tuesday (Cohen's *d* = 0.01, SE = 0.07). The effect sizes were found to be small for all days of the week indicating a small difference between car key burglaries and regular burglaries in terms of the day of the week on which the offence occurs.

Figure 4.3.1.2b: Effect size analysis - day of offence

| Variable | Theme | Statistics for each study | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Std diff in means | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
| Friday | Day | -0.059 | 0.068 | 0.005 | -0.193 | 0.075 | -0.865 | 0.387 |
| Monday | Day | -0.055 | 0.071 | 0.005 | -0.194 | 0.084 | -0.771 | 0.441 |
| Thursday | Day | -0.034 | 0.073 | 0.005 | -0.177 | 0.109 | -0.463 | 0.644 |
| Tuesday | Day | 0.014 | 0.071 | 0.005 | -0.125 | 0.152 | 0.192 | 0.848 |
| Saturday | Day | 0.024 | 0.073 | 0.005 | -0.119 | 0.168 | 0.332 | 0.740 |
| Wednesday | Day | 0.033 | 0.072 | 0.005 | -0.108 | 0.174 | 0.457 | 0.648 |
| Sunday | Day | 0.091 | 0.075 | 0.006 | -0.056 | 0.237 | 1.215 | 0.224 |
| | | -0.000 | 0.027 | 0.001 | -0.053 | 0.053 | -0.001 | 0.999 |



4.3.1.3 Time

Figure 4.2.3.1.3a shows that for each hour between 20.00 and 05.00hrs there is a higher frequency of car key burglaries committed pared to regular burglaries.

Figure 4.3.1.3a: Car key and regular burglary - time of offence

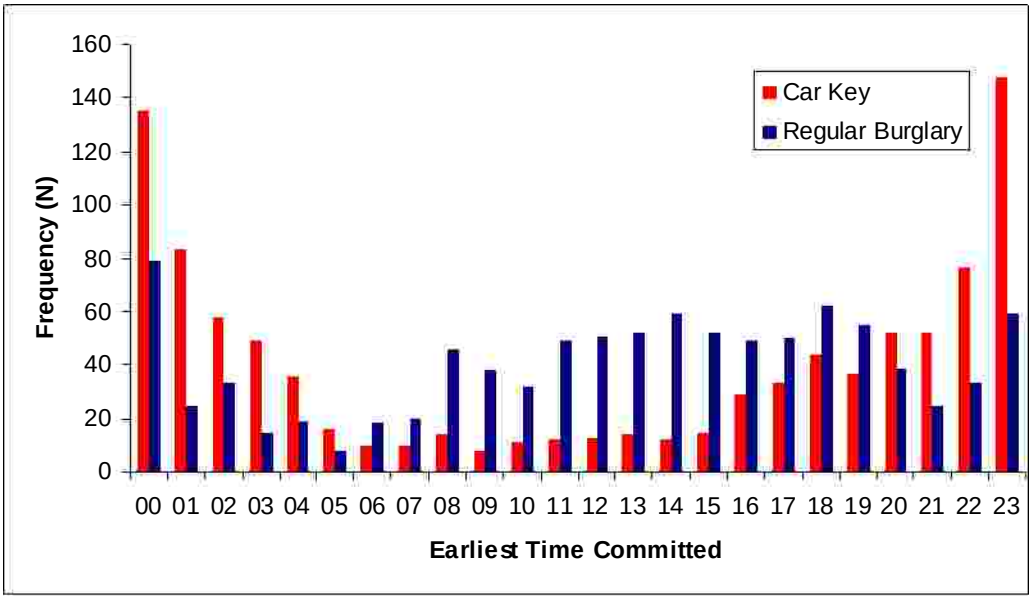
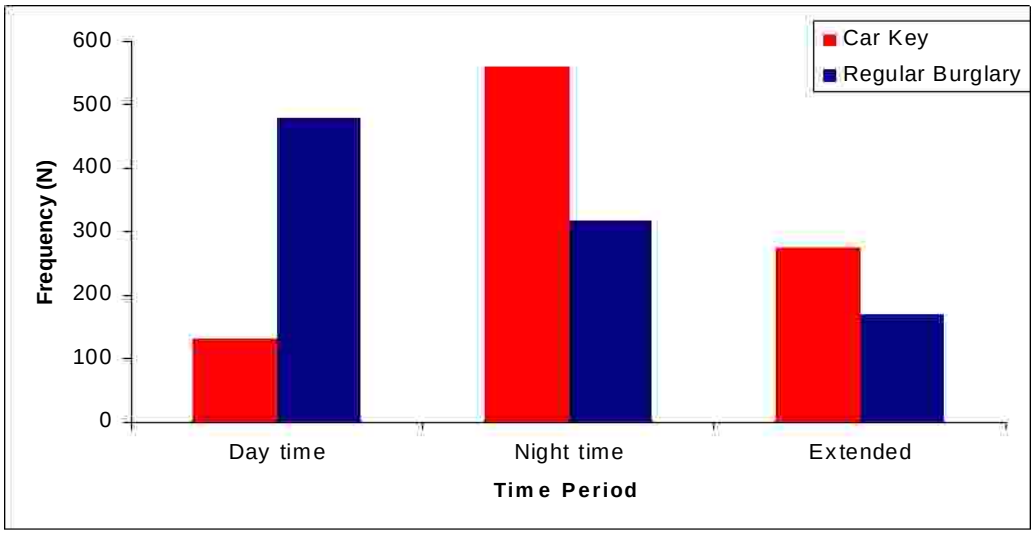



Figure 4.3.1.3b shows that the majority of car key bur aries take place during the hours of 2000 to 07.59hrs (57.9 %, *n* = 560). This is a higher percentage than the 39.9% (*n* = 318) of regular burglaries that are committed during the same time period. In contrast, 60.1% (*n* = 479) of regular burglaries took place during the daytime (08.00 to 19.59hrs), compared to on (*n* = 131) of car key burglaries. As stated previously, it is possible that more car key bu aries are committed overnight because there are more vehicle located outside residential premises, thus providing more opportunities for car key burglars.

Figure 4.3.1.3b: Car key and regular burglary - time period of offence




The effect size (standardised difference in the means) is set out in Figure 4.3.3.3 in numeric form and as a visualisation in the orm of a forest plot. A very large effect was apparent in terms of night-time offences (Cohen's *d* = 1.03, *SE* = 0.07) favouring car key burglaries. This suggests a la difference between car key burglaries and regular burglaries with car key burglaries more likely to take place overnight. The difference in the means was also significant (z = 15.39, $p < .001$) suggesting that the difference between car key and regular burglaries was not a chance finding.

4.3.2 Geographical

As Table 4.3.2 shows that two BCUs accounted for over If of the car key burglaries that occurred in Merseyside in 2010. The highest frequency of offences occurred in Liverpool North (25.4%, *n* = 246) followed closely by Sefton (25%, *n* = 242). However, as a proportion of all burglary offences, St Helens has the highest proportion of car key burglaries (18.7%, *n* = 111)

followed by Sefton (16.4%, *n* = 242). Both BCUs are located on the outskirts of Liverpool and are well served by fast road networks.

Table 4.3.2: Car key and regular burglaries per BCU

| BCU | Frequency Car Key Burglary | %age | Freq. / 1,000 households | Frequency Regular Burglary | Total Burglary | % Car Key Burglary |
|---|---|---|---|---|---|---|
| Wirral | 74 | 7.6% | 0.54 | 819 | 893 | 8.3% |
| Sefton | 242 | 25.0% | 2.05 | 1,234 | 1,476 | 16.4% |
| Knowsley | 107 | 11.1% | 1.68 | 657 | 764 | 14.0% |
| St Helens | 111 | 11.5% | 1.47 | 484 | 595 | 18.7% |
| Liverpool North | 246 | 25.4% | 2.23 | 2,020 | 2,266 | 10.9% |
| Liverpool South | 188 | 19.4% | 2.24 | 1,092 | 1,280 | 14.7% |
| **Grand Total** | **968** | **100.0%** | **1.65** | **6,306** | **7,274** | **13.3%** |

### 4.3.3 Behavioural

#### 4.3.3.1 Modus Operandi (MO)

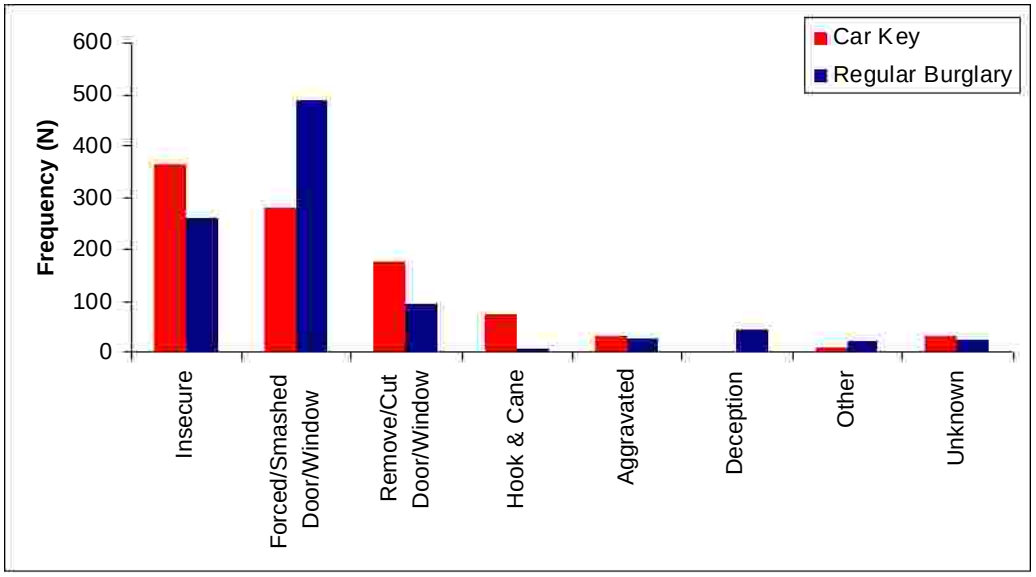
The most common MO for offenders conducting car key burglaries, as shown in Table 4.2.3.3.1 and Figure 4.2.3.3.1a, was the targeting of insecure premises (37.7%, *n* = 365). This was followed by 'force/smashed door/ window' (29.0%, *n* = 281) and 'remove/cut door/window' (18.3%, *n* = 177). The lowest frequency of MOs for offenders committing c key burglars was deception. This MO was not used in any of the car key burglaries recorded in Merseyside in 2010 where the MO was recorded and thus nown' for the purposes of this research (*n* = 922). This MO was used, however, on 44 occasions during regular burglaries (4.5%).

The frequency of 'hook and cane' as a means of entry for offenders occurred on 72 occasions, representing 7.4% of all Mos. Conversely, this MO was rarely used during regular burglaries (0.01%, *n* = 6).

Table 4.3.3.1: Car key and regular burglary MO types

| | Car Key MO | | Regular Burglary MO | |
|---|---|---|---|---|
| | **Frequency** | **%age** | **Frequency** | **%age** |
| Insecure | 365 | 37.7% | 259 | 26.8% |
| Forced/Smashed Door/Window | 281 | 29.0% | 489 | 50.5% |
| Remove/Cut Door/Window | 177 | 18.3% | 95 | 9.8% |
| Hook & Cane | 72 | 7.4% | 6 | 0.6% |
| Aggravated | 33 | 3.4% | 29 | 3.0% |
| Deception | 0 | 0.0% | 44 | 4.5% |
| Other | 9 | 0.9% | 21 | 2.2% |
| Unknown | 31 | 3.2% | 25 | 2.6% |
| **Grand Total** | 968 | 100.0% | 968 | 100.0% |

Figure 4.3.3.1a: Car key and regular burglary MO types




The effect sizes are set out in Figure 4.3.3.1b in numeric form and as visualisation in the form of a forest plot. Large effects were apparent in two MO types: deception (Cohen's *d* = -2.51, *SE* = 0.78) and 'hook and cane' (Cohen's *d* = 1.41, *SE* = 0.24). This suggests very strong differences between car key burglaries and regular burglaries with deception more likely to be used in regular burglaries and the 'hook and cane' entry MO more likely in car key burglaries. The difference in the means was also significant for both deception

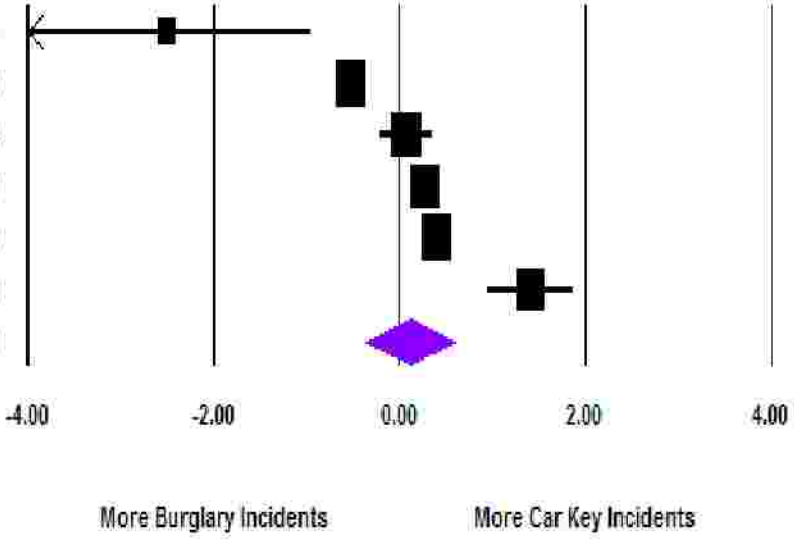
(z = -3.19, $p < .01$) and 'hook and cane' (z = 5.97, $p < .001$) suggesting that the differences in car key and regular burglaries were not chance findings.

Medium effects were apparent in two MO types: 'forced/ shed door/window' (Cohen's $d = – 0.53$, $SE = 0.05$) and 'remove /cut door/window' (Cohen's $d = 0.40$, SE = 0.08). This suggests moderate size differences between car key and regular burglaries with 'forced/smashed door/window' more likely to be used in regular burglaries and 'remove /cut door/window' more likely to be used in car key burglaries. The difference in the means was significant for both 'forced/smashed door/window' (z = -9.83, $p < .001$) and 'remove /cut door/window' (z = 5.25, $p < .001$), suggesting that the differences in car key and regular burglaries were not chance findings.

Small effects were apparent in two MO types: 'insecure' (Cohen's $d = 0.28$, SE = 0.06) and 'aggravated' (Cohen's $d = 0.07$, SE = 0.14) indicating that there was a small difference between the car key and r gular burglaries with insecure dwellings favoured by car key burglars. The effect size for 'aggravated' indicated very little difference between either forms of burglary.

Figure 4.3.3.1b: Effect size analysis – MO types

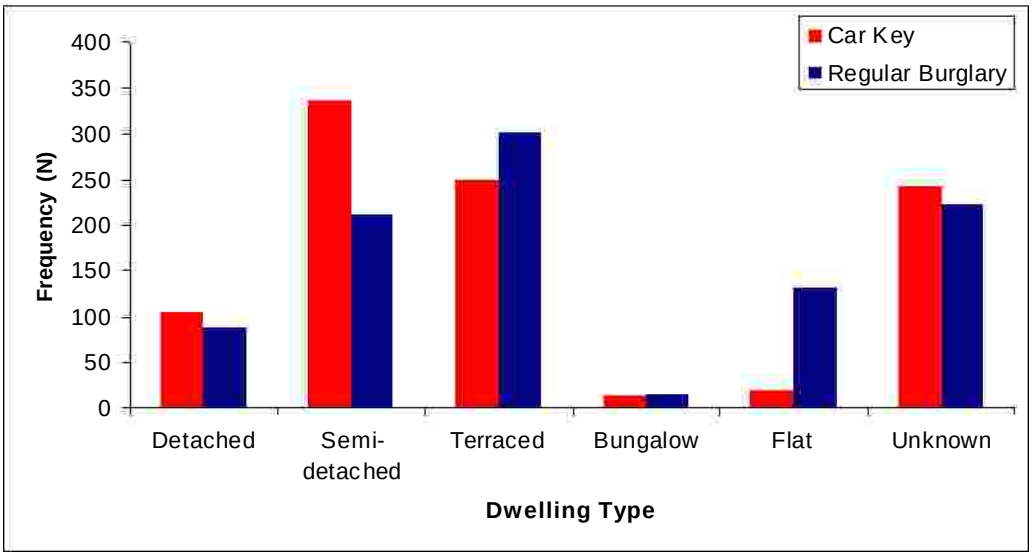
| Variable | Theme | Std diff in means | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
|---|---|---|---|---|---|---|---|---|
| Deception | MO | -2.505 | 0.784 | 0.615 | -4.043 | -0.968 | -3.193 | 0.001 |
| Forced/Smashed Door/ Windo | MO | -0.527 | 0.054 | 0.003 | -0.632 | -0.422 | -9.826 | 0.000 |
| Aggravated | MO | 0.070 | 0.143 | 0.020 | -0.210 | 0.350 | 0.490 | 0.624 |
| Insecure | MO | 0.279 | 0.055 | 0.003 | 0.172 | 0.387 | 5.095 | 0.000 |
| Remove/Cut Door/Window | MO | 0.396 | 0.075 | 0.006 | 0.248 | 0.544 | 5.253 | 0.000 |
| Hook & Cane | MO | 1.407 | 0.236 | 0.056 | 0.945 | 1.869 | 5.970 | 0.000 |
| | | 0.114 | 0.243 | 0.059 | -0.363 | 0.590 | 0.468 | 0.640 |



4.3.3.2 Dwelling type

Figure 4.3.3.2 shows that a higher frequency of car key burglaries com red to regular burglaries took place in semi-detached houses (46.5%, *n* = 338) and terraced houses (34%, *n* = 250). The lowest frequency of property types targeted by both car key burglars (1.8%, *n* = 13) and regular burglars were bungalows (2.0%, *n* = 15). The next lowest frequency of property types targeted by car key burglars were flats (0.03%, *n* = 20) and this compares with 17.7% (*n* = 132) of regular burglaries.

Figure 4.3.3.2a: Car key and regular burglary - dwelling type




The effect sizes are set out in Figure 4.3.3.2b in numeric form and as a visualisation in the form of a forest plot. A large effect was apparent in the case of flats (Cohen's *d* = -1.12, *SE* = 0.14). This suggests a large difference between car key burglaries and regular burglaries with regular burglaries much more likely to occur in flats than car key burglaries. The difference in the

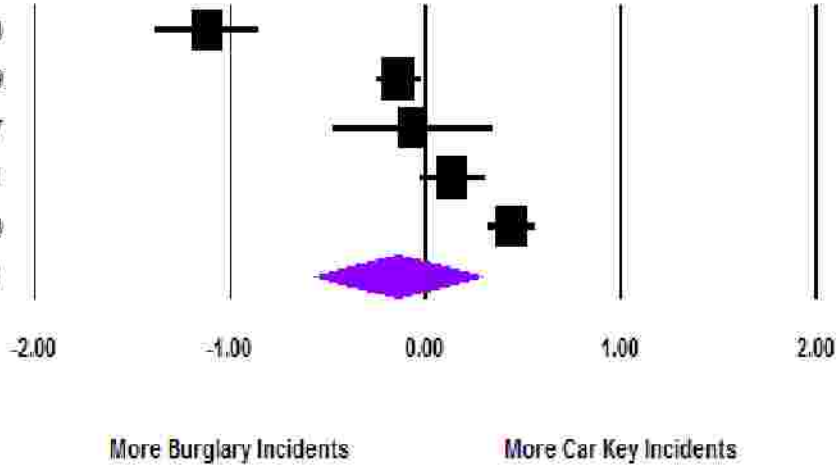
means was also significant (z = -8.23, $p < .001$) indicating that the difference between car key and regular burglaries was not a chance finding.

A medium effect was apparent in the case of semi-detached houses (Cohen's $d = 0.44$, $SE = 0.06$). This suggests a moderate size difference between car key and regular burglaries with car key burglaries more likely to occur in semi-detached houses than regular burglaries. The difference in the means was also significant (z = 7.19, $p < .001$) indicating that the difference between car key and regular burglaries was not a chance finding.

A small effect was apparent in three dwelling types: detached houses (Cohen's $d = 0.14$, SE = 0.09), terraced houses (Cohen's $d = -0.14$, SE = 0.06) and bungalows (Cohen's $d = -0.07$, SE = 0.21). This suggests a small size difference between car key burglaries and regular burglaries with car key burglaries more likely to take place in detached houses and regular burglaries more likely to take place in terraced houses and bungalows. The difference in the means was significant in the case of terraced houses (z = -2.34, $p < .05$) indicating that the difference between car key and regular bu glaries was not a chance finding.

Figure 4.3.3.2b: Effect size analysis - dwelling type

| Variable | Theme | Std diff in means | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
|---|---|---|---|---|---|---|---|---|
| Flat | Dwelling Type | -1.117 | 0.136 | 0.018 | -1.383 | -0.851 | -8.231 | 0.000 |
| Terraced | Dwelling Type | -0.139 | 0.060 | 0.004 | -0.256 | -0.023 | -2.342 | 0.019 |
| Bungalow | Dwelling Type | -0.065 | 0.211 | 0.044 | -0.479 | 0.348 | -0.309 | 0.757 |
| Detached | Dwelling Type | 0.136 | 0.086 | 0.007 | -0.031 | 0.304 | 1.592 | 0.111 |
| Semi-Detached | Dwelling Type | 0.437 | 0.061 | 0.004 | 0.318 | 0.556 | 7.191 | 0.000 |
| | | -0.141 | 0.220 | 0.048 | -0.572 | 0.290 | -0.642 | 0.521 |



4.3.3.3 Point of entry

As shown in Figure 4.3.3.3 a medium size effect was ap rent for 'point of entry front' (Cohen's *d* = 0.54, SE = 0.05) in favour of car key burglaries. This indicates a moderate size difference between car key b rglaries and regular burglaries with car key burglars more to likely to gain access to the property from the front of the building. The difference in the means was significant (z = 10.13, *p* < .001) indicating that the difference between car key and regular burglaries was not a chance finding.

4.3.3.4 Dwelling occupancy at the time of the offence

As shown in Figure 4.3.3.3 a large size effect was apparent for 'house occupied' (Cohen's *d* = 1.07, SE = 0.09) in favour of car key burglaries. This indicates a large difference between car key burglaries and regular burglaries with car key burglaries more to likely to take place w n the dwelling is occupied. The difference in the means was significant z = 11.81, *p* < .001) indicating that the difference between car key and reg ar burglaries was not a chance finding.

4.3.3.5 Type of property search by offender

As shown in Figure 4.3.3.3 a large size effect was apparent for 'tidy search' (Cohen's *d* = 0.89, SE = 0.10) in favour of car key burglaries. This indicates a strong difference between car key burglaries and regular burglaries with car key burglars more likely to conduct a tidy search of the dwelling. The

difference in the means was significant (z = 8.98, $p < .001$) indicating that the difference between car key and regular burglaries was a chance finding.

4.3.3.6 Offender seen

As shown in Figure 4.3.3.3 a medium size effect was apparent for 'offender not seen' (Cohen's $d$ = 0.39, SE = 0.08) in favour of car key burglaries. This indicates a moderate size difference between car key burglaries and regular burglaries with car key burglaries more likely to un-witnessed. The difference in the means was significant (z = 5.09, $p < .001$) indicating that the difference between car key and regular burglaries was not a chance finding.

4.3.3.7 Use of weapon

As shown in Figure 4.3.3.3 a small effect size was apparent for 'weapons used' (Cohen's $d$ = -0.17, SE = 0.13) in favour of car key burglaries. This indicates a small difference between car key burglaries and regular burglaries with the former more likely to involve the use of weapons. The difference in the means was not found to be significant (z = 1.30, $p < .195$).

The summary effect size (weighted mean of six dichotomous behavioural characteristics) is set out in Figure 4.3.1.2b in numeric form and as a visualisation in the form of a 'diamond' on the forest plot. A medium summary effect size (Cohen's $d$, = 0.69, SE = 0.14) indicates that there were moderate differences between car key burglaries and regular burglaries with the average effect for all the comparisons favouring car key burglary. The

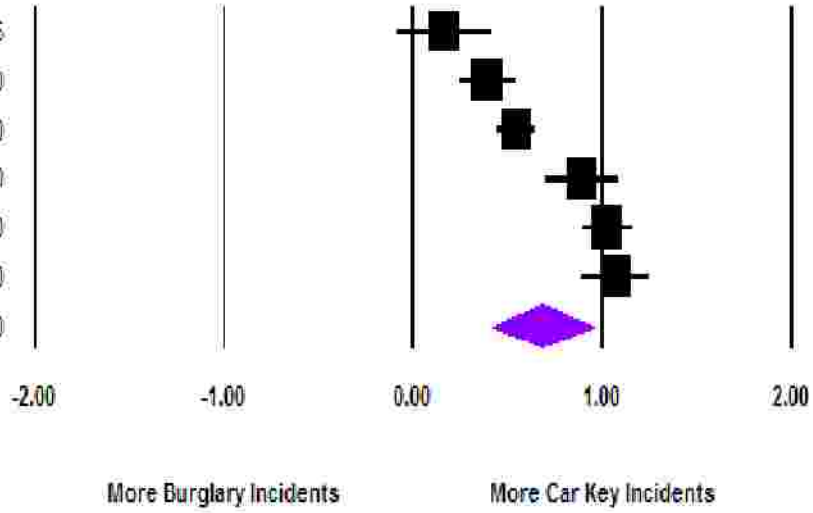
difference in the means was also found to be significant ($z = 5.08$, $p < .001$) indicating that the difference between car key and reg ar burglaries was not a chance finding. The summary effect size provides support to the notion that certain factors differentiate car key burglaries from egular burglaries (Shaw et al., 2010).

Figure 4.3.3.3: Effect size analysis – behavioural

| Variable | Theme | Std diff in means | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
|---|---|---|---|---|---|---|---|---|
| Weapon Used | Offender Behaviour | 0.165 | 0.127 | 0.016 | -0.084 | 0.413 | 1.296 | 0.195 |
| Offender Not Seen | Offender Behaviour | 0.392 | 0.077 | 0.006 | 0.241 | 0.543 | 5.092 | 0.000 |
| Point of Entry Front | Offender Behaviour | 0.543 | 0.054 | 0.003 | 0.438 | 0.649 | 10.130 | 0.000 |
| Tidy Search | Offender Behaviour | 0.893 | 0.099 | 0.010 | 0.698 | 1.088 | 8.978 | 0.000 |
| Night Time Offence | Offender Behaviour | 1.027 | 0.067 | 0.004 | 0.896 | 1.158 | 15.386 | 0.000 |
| Dwelling Occupied | Offender Behaviour | 1.070 | 0.091 | 0.008 | 0.892 | 1.247 | 11.811 | 0.000 |
| | | 0.687 | 0.135 | 0.018 | 0.422 | 0.951 | 5.084 | 0.000 |

Statistics for each study

Std diff in means and 95% CI



### 4.3.4 Offenders

#### 4.3.4.1 Gender

As shown in Table 4.3.4.1 the majority of offenders for both car key burglaries (97.1%, *n* = 68) and regular burglaries (91.4%, *n* = 64) were male.

Table 4.3.4.1: Car key and regular burglary - gender

| | Car Key | | Regular Burglary | |
|---|---|---|---|---|
| **Gender** | **Frequency** | **% of offenders** | **Frequency** | **% of offenders** |
| **Male** | 68 | 97.1% | 64 | 91.4% |
| **Female** | 2 | 2.9% | 6 | 8.6% |
| **Total** | **70** | **100.0%** | **70** | **100.0%** |

#### 4.3.4.2 Age

As shown in Table 4.3.4.2 the age profiles between the two samples of offenders vary slightly. Although in both cases the majority of offenders are under 25 years, 81.4% (*n* = 57) of car key burglars were under 24 years compared to 60.0% (*n* = 42) of regular burglars. Further to this, the majority of car key burglars (60%, *n* = 42) were between 18 to 24 years. The lowest frequency of offenders for both car key burglars (4.3%, *n* = 3) and regular burglars (12.9%, *n* = 9) fell into the 'over 40' years category.

Table 4.3.4.2: Car key and regular burglary - age

| | Car Key | | | Regular Burglary | | |
|---|---|---|---|---|---|---|
| **Age** | **Frequency** | **% of offenders** | **Cumulative %** | **Frequency** | **% of offenders** | **Cumulative %** |
| **Under 17** | 15 | 21.4% | 21.4% | 17 | 24.3% | 24.3% |
| **18 - 24** | 42 | 60.0% | 81.4% | 25 | 35.7% | 60.0% |
| **25 - 40** | 10 | 14.3% | 95.7% | 19 | 27.1% | 87.1% |
| **Over 40** | 3 | 4.3% | 100.0% | 9 | 12.9% | 100.0% |
| **Total** | **70** | **100.0%** | **-** | **70** | **100.0%** | **-** |

4.3.4.3 Distanced travelled from home base

A Kolmogorov–Smirnov test for normality was carried out and this was found to be significant ($p < .05$), therefore the distribution was non-normally distributed and median distances were examined as the ppropriate measure of central tendency.

Table 4.3.4.3 shows that the median distance travelled for car key burglars was further (4.9km) when compared to regular burglars (2.09km).

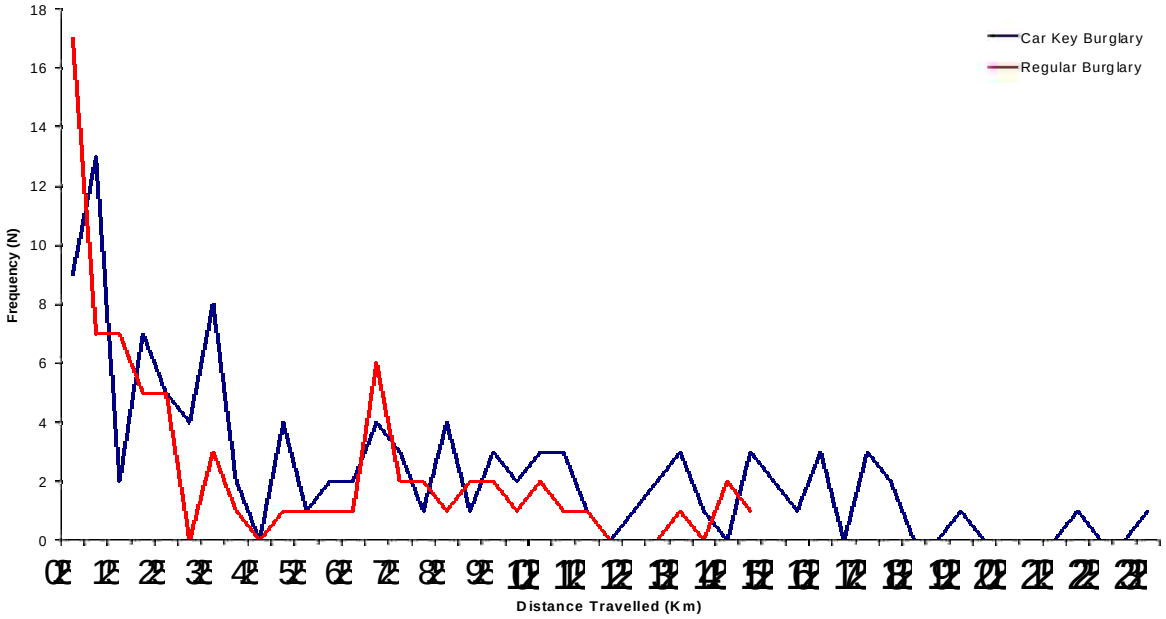
Table 4.3.4.3: Car key and regular burglary – distance travelled form home base

| Offender Type | No. Offenders | No. of Offences | Av. Journey to Crime (km) | Std Dev. (km) | Median (km) | Range (km) | |
|---|---|---|---|---|---|---|---|
| Car Key | 70 | 106 | 6.78 | 5.98 | 4.9 | 0 | 23.41 |
| Regular | 70 | 73 | 4.06 | 4.2 | 2.09 | 0.01 | 14.67 |

As shown in Figure 4.3.4.3 the median journey to crime distance for offenders committing car key burglaries was 4.9 km (minimum distance travelled was 0 km, maximum distance travelled was 23.41 km). The median journey to crime distance for offenders committing regular burglaries was 2.09 km (minimum distance travelled was 0.01 km, maximum distance travelled was 14.67 km).

To compare whether the median distances were significantly differ nt between the two crime types, a Mann Whitney U test was carried out. This showed that the median distance travelled by offenders responsible for car key burglaries was significantly further than those carrying out regular burglaries ($Z = -3.32$, $p < .01$). Using the formula $r = Z/\sqrt{N}$, the effect size was calculated. This was found to be -0.25, showing a medium effect size for r.

Figure 4.3.4.3: Car key and regular burglary – distance travelled from home base



# Chapter Five

# Discussion

## 5.1 Summary of results

The research provides an insight into the nature of ca key burglaries and shows that there are distinct differences in the chara s of car key burglaries and regular burglaries. The findings from the thesis a summarised as follows:

### 5.1.1 Temporal

The results of the thesis show that car key burglary i re likely to take place overnight compared to regular burglary. Although there were slight variations in relation to the month of the year and the day of the week in which car burglaries and regular burglaries took place, there we no notable differences.

### 5.1.2 Geographical

The highest frequency of offences took place in Liverpool North and Sefton. However, as a proportion of all burglary offences St Helens and Sefton experienced the highest levels of car key burglary.

### 5.1.3 Behavioural

In terms of the modus operandi (MO) the research found that car key burglars were more likely to use 'hook and cane' and 'remove/cut door/window' techniques to enter dwellings than regular burglars. Conversely, car key

burglars were much less likely than regular burglars t use deception or 'force/smash door/window' as a means of gaining entry dwellings.

The research also found that car key burglars were more likely t gain entry from the front of dwellings, compared to regular burglars who appear to favour entry from the rear of dwellings. In terms of their co duct whilst inside dwellings, car key burglars were more likely to conduct a tidy search of the property than regular burglars. Despite the research s g that car key burglaries were more likely to take place in occupied llings than regular burglaries, car key burglars were less likely to be seen than regular burglars.

The research also found that flats had a lower risk of burglary victimisation from car key burglars than regular burglars. Conversely, semi-detached houses had a higher risk of burglary victimisation from car key burglars than regular burglars. The findings from the thesis also show that vehicles were the only item of property stolen in approximately one thir of recorded car key burglaries in 2010. The highest rates of registered cars stolen by manufacturer type were manufactured by Audi and Subaru.

### 5.1.4 Offenders

The results of the thesis showed that the majority of enders for both car key and regular burglary were male. Although the majority offenders for both burglary types were under 25 years, the majority of ca key burglars could actually be constrained further to the '18 to 24 years age range.

The research also found that car key burglars were prepared to travel further distances to commit crime than regular burglary offenders.

## 5.2 Relationship with existing literature

### 5.2.1 Temporal

In terms of the temporal aspects of car key burglary, he research did not offer any contrary findings to the ACPO National Assessment Key Burglary (NPIA, 2009). There appeared to be no seasonality and tle in the way of a correlation for the day of the week that car key burglary offences were committed. The findings did, however, provide support r the National Assessment's (NPIA, 2009) assertion that car key burglaries are more likely to take place overnight.

Further support for this temporal characteristic of car key burglary comes f om the research conducted by Shaw et al. (2010) who demonstrated that car key burglaries were approximately five times more likely t occur in the night than regular burglaries. The findings from the thesis support the notion that car key burglaries are more likely to take place overnight, wh lst regular burglaries are more likely to occur in the daytime. In supporting the overnight aspect of car key burglary, this thesis thereby acknowledges the vie put forward by Shaw et al. (2010) that certain characteristics of car key d regular burglaries are different.

### 5.2.2 Geographical

The findings from the thesis do not offer any evidence to support the assertion that car key burglaries differ from regular burglaries in terms of the neighbourhood in which they are committed (Shaw et al., 2010). Whilst it is acknowledged that this thesis did not use the deprivation scores employed by Shaw et al. (2010) in their research, the two Merseyside BCUs with the highest frequency of car key burglaries, Liverpool North and Sefton, are both very different in terms of their geography and deprivation levels. The findings of the thesis reject the notion that car key burglaries are more likely to occur in affluent areas since the two BCUs with the highest rate of car key burglaries per 1,000 households (Liverpool North and Liverpool South) combine to form the 5th most deprived local authority out of the 326 authorities in England and Wales. The ACPO National Assessment Car Key Burglary (NPIA, 2009) does, however, suggest that the proximity to arterial routes is an important factor for car key burglars targeting urban and rural areas. Both St Helens and Sefton are well served by fast road networks.

### 5.2.3 Behavioural

In terms of the behavioural aspects of car key burglary such as entry MO, the absence of any criminological literature relating to this aspect of car key burglary prevents a direct comparison. However, the findings from the thesis contrast sharply with the research conducted by Shaw et al. (2010) in terms of the point of entry selected by the offender. Whereas the study conducted by Shaw et al. (2010) suggested that both car key and regular burglars were more likely to enter the property from the rear of the dwelling, the findings from this

study suggest that car key offenders are much more lik y to enter the property from the front of the premises compared to regular burglars. In terms of their conduct inside the premises, the findings from the the support the conclusions drawn by Shaw et al. (2010) in relation to the type of search carried out by car key burglars whilst inside the prem s. Both research studies concur that car key burglars are more likely t carry out a tidy search of dwellings than regular burglars.

The findings from the thesis also differ slightly from the findings of Shaw et al. (2010) in respect of the security of the dwelling. The latter found that regular burglars were more likely to target secure dwellings a d that car key burglars showed no preference in security status of the properties that they targeted. The findings from the thesis, however, suggested that key burglars are slightly more likely to target insecure premises than ular burglars.

The findings of the thesis also indicate that car key burglars are less likely to target flats and bungalows than other types of propert Although there is a similar correlation in terms of the selection of bunga for burglary victimisation, car key burglaries were much less likely to take place in flats than regular burglaries. It is possible that the reluctance of car key burglars to target flats may be due to Osborn and Tseloni's (1998) assessment that accessibility to the premises is more problematic if t flat is located on the second floor. Although there is no evidence to substantiate this, it is also possible that there are additional difficulties for ca key burglars such as the

requirement to match car keys to cars that may be situated in communal car parks typically associated with a complex of flats.

In terms of the recovery of stolen vehicles from car key burglaries, the ACPO National Assessment Car Key Burglary (NPIA, 2009) suggests that recovery rates very between 40 and 85%. The recovery rate (73%) in Merseyside falls within this range. The assessment (NPIA, 2009) also su gests that the most commonly targeted vehicles are essentially the most co monly owned cars and thus highlight manufacturers such as Ford, Vauxhall, Audi, BMW and Volkswagen. The research offers support for this view with the aforementioned five manufacturers showing the highest frequency of stolen vehicles during car key burglaries. However, when one considers the rate of registered cars stolen by manufacturing type, there appears to be more of an emphasis on performance cars with Audi, Subaru and BMW featuring in the top five vehicle manufacturers.

The findings found little difference between car key a d regular burglaries in relation to the 'aggravated' entry MO to dwellings and the use of weapons. Although, this may offer some reassurance in relation the concerns expressed in the ACPO National Assessment Car Key Burg ary (NPIA, 2009) regarding the increased risk of confrontation and risk to the occupant, it is acknowledged that the reliability of the findings in the effect size analysis may have been affected by the small sample size.

### 5.2.4 Offenders

The findings from the thesis are consistent with a general consensus within criminological literature that suggests burglary is a ng mans' game" (Soothill et al., 2004, p.407). However, on the basis hat the majority of offenders engaged in car key burglaries were part of a lightly older age range (18 to 24 years) than regular burglars, the results of the thesis may give some support to the notion that the age of the offender is linked to the sophistication of their criminality (Shover, 1991).

Due to limitations in criminological literature relati to journey to crime distances specifically by car key burglars, a direct c parison with the distances travelled by regular burglars outside of this research has not been possible. The findings from the thesis found that the dian journey to crime distance travelled by regular burglars was 2.09km. This supports the general consensus in criminological literature that in the majority of cases, journey to crime distances do not amount to more than few kilomet s (Phillips, 1980; Brantingham and Brantinhgham, 1981; Wiles and Costello 2000). The findings from the thesis did, however, reveal that car key burglars had travelled significantly further than regular burglars thereby su gesting a greater criminal mobility for car key burglars than regular burglars. T may also indicate the presence of multiple offenders if car key burglars are reliant on transportation to offence locations.

## 5.3 Relationship with criminological theory

The relationship of the findings with existing crimino gical literature indicates that the characteristics of car key burglaries offer a new dimension to more traditional perspectives on residential burglary. In order to understand these developments and make sense of the implications for po g policy it is necessary to consider the findings in the context of c iminological theory.

There does appear to be a consensus that the emergence of car key burglary has evolved in response to the mandatory introduction electronic immobilisers to newly manufactured cars from 1998 (Lev y et al., 2004; NAO, 2005; Donkin and Wellsmith, 2006; Shaw et al., 2010). A study comparing car thefts and thefts of keys in Manchester and Northumbria between 1998 and 2001, suggests that the effectiveness of immobilisation has resulted in a gradual learning process for offenders (Levesley et al., 2004). This contention is supported by Shaw et al. (2010) who suggest that a new modus operandi may have developed in response to the t get hardening of vehicles. This development is consistent with the principles of rational choice theory (Cornish & Clarke, 1987), with offenders reviewing their activity based on the impact on their ability to steal vehicles.

Paradoxically, based on the fact that both rational choice theory (Cornish & Clarke, 1987) and routine activities theory (Cohen & F on, 1979) allow for the possibility of influencing offender behaviour based on the variable nature of an offender's assessment of risk, the prospect of offe ders moving from vehicle crime to the more serious offence of burglary s raise questions. It is

the view of the author, however, that it is the offend r's assessment of the risks associated with car key and regular burglaries t has shaped the changes in the characteristics of car key burglary. In simple terms, car key burglaries are higher risk crimes than vehicle crime, ut they may also be higher risk crimes than regular burglary. In light of this, car key burglars appear to have reviewed burglary strategies to rebalance the greater risks associated with car key burglary.

The additional risks associated with car key burglary essentially based around the property sought by the offender, namely the car. The removal of a car away from the premises requires additional activities over and above those required for items typically craved by regular burglars such as, cash, jewellery and portable electronic devices (Bernasco, 2009). The removal of a car requires the offender to locate the car keys, match the keys to the correct vehicle, gain access to the vehicle, start the engine nd drive the car away from the premises. These additional activities increase the risks to the offender by providing opportunities for them to be apprehended or witnessed during the commission of the offence. It is unsurprising therefor hat deception appears to be an unpopular MO for car key burglars if one considers the level of victim contact associated with this MO.

The risks are elevated further for the car key offende by the increased likelihood of the target premises being occupied by the owner of the vehicle. Since the availability of vehicles increase when owners are at home, it is understandable that most burglaries take place overnig hen the majority of

dwellings are occupied. This inevitably increases the risk of confrontation with the occupants of the property.

Rational choice theory (Cornish & Clarke, 1987) advocates the notion that offenders are rational decision makers and that decisions to commit crime are governed by an assessment of the rewards and risks. Based on the obvious risks posed by car key burglary, the offender's rational assessments and purposive efforts to gain personal advantage require modifications to the tactics typically utilised by regular burglars. The aspects of car key burglary that have broadly shifted away from approach harnessed by regular burglars are consistent with seeking opportunity and risk minimisation in other facets of the burglary process.

The findings from the thesis suggest that the 'hook and cane' entry MO is much more likely to be used by car key burglars than regular burglars. It is quite possible that this is based on the minimisation of risks to the offender. Car key burglaries committed using the 'hook and cane' technique provide offenders with the opportunity to obtain car keys without ever physically entering the property. If the object of the burglary is solely to steal a car, offenders can achieve their aim and also reduce the risk of disturbing the victim. The same principle may apply to 'remove/cut door/window' and 'force/smash door/window'. It is likely that the former is a quieter form of entry to the latter and is thus comparatively more popular with car key burglars who appear to favour committing offences overnight. The latter is likely to be a

louder form of entry and may be more suited to regular burglaries committed during the day when dwellings are more likely to be unoccupied.

The research conducted by Shaw et al. (2010) found that car key burglars and regular burglars were both more likely to select an entry point at the rear of the property. It was suggested that this was based on the e to reduce the chance of being observed. The findings from the thesis s ggest that car key burglars are more likely to enter the dwelling at the ront of the property. Entry, from the front of the dwelling is more likely to reduce the distance the offender moves away from the vehicle, all of which impacts on speed and risk. This is a reflection of the operating environment in which offenders commit crime and the need for quick decisions that could also be coupled with improvisation for unforeseen circumstances (Cornish & Clarke, 2006).

The same principle may apply to the finding that car k burglars are much more likely to conduct a conduct a tidy search of the ling than regular burglars. Shaw et al. (2010) suggest that the propensity for car key burglars to commit tidy searches of dwellings may be linked to the increased likelihood of the premises being occupied. It is suggested that tidy searches reduce the likelihood of disturbing the victim and is therefore consistent with the offender's assessment of risk (Shaw et al., 2010). This aspect of criminal behaviour could also be explained by the existence of offenders who commit a burglary with the sole aim of stealing a car. Furthermore, if car keys are left in predictable and easily accessible locations, the need for an untidy search is negated.

Despite the increased risks posed by the process of ca key burglary it is interesting that the findings of the thesis show that ar key burglars were much less likely to be seen during the commission of the offence than regular burglars. This may be an endorsement of the swifter, target specific actions of car key burglars who have adapted their criminal behaviour to rebalance the risks associated with an increase in the number of cap ble guardians (Cohen and Felson, 1979).

The availability of suitable targets may provide an explanation for the finding that car key burglars were prepared to travel greater ourney to crime distances than regular burglars. It is possible that the availability of specific vehicles may influence an offender's search parameters, thus explaining the greater criminal mobility of car key burglars.

As stated earlier the findings from the thesis are broadly consistent with the age and gender profile of offenders who engage in burglary (Soothill et al., 2004). However, on the basis that the majority of offen rs engaged in car key burglaries were part of a slightly older age range (18 to 24 years) it is possible that an explanation of criminal maturation and sophistication could be offered by Criminal Development Theory (Canter, 1995). The theory suggests that specialist tendencies evolve as a function of experience as individuals are attracted to develop an appreciation of the criminal activity that they favour through either attraction or success. In light of this, over a period of time individuals actively engage in behaviours that maximis personal rewards

based on rational choices in relation to criminal activity (Cornish and Clarke, 2006).

## 5.4 Limitations and Future Research

Whilst the research has achieved the objective of developing the understanding of car key burglaries, it does have limitations. This section outlines some of the key limitations that should be co sidered when applying the findings of this research and suggests improvement and opportunities for future research.

### 5.4.1 Case control

It is acknowledged that there are limitations in terms of the case control analysis and that this is particularly important in terms of the conclusion that can be drawn from the thesis. The strength of the findings should be considered in the context that the analysis has only controlled for age, gender and site. These variables are considered to be insufficient for purpose on the basis that there are not enough. Further to this, the line assumption of similarity in terms of age and site were incorrect. These problems could have been overcome by defining a wider group of controls using additional variables such as the ethnicity of offenders.

### 5.4.2 Data Source

The limitations of the data set are outlined in Chapter Three and include data accuracy and consistency, validity and generalisability. Whilst it is acknowledged that the use of police data does have drawbacks, efforts have

been made to alleviate some of these problems through the 'cleaning process'. However, in order to triangulate the results, other re rch methods such as interviews with car key burglars could have been utilised. Further to this, similar research in other police forces could be used assess the generalisability of the results obtained during this research.

It is also acknowledged that limitations in the data have also prevented a more detailed analysis of the offenders who engage in car k y burglaries. The research was restricted to crimes detected within Mers de and it is possible that the conclusions drawn may not be applicable to un cted crimes. The sample size could have been increased by examining a wider time frame and over different geographic areas.

### 5.4.3 Multiple offenders

As stated earlier, prior to the 'cleaning' process, a number of multiple offenders were identified for single offences, notably a group of seven offenders operated as part of a 'gang' and were responsible for itting 27 unique offences. Based on the longer journey to crime distances travelled by car key burglars in comparison with regular burglaries, it is ssible that co-offending may be based on the need for transportation to the offence location. Further research in this area would provide an insight in to t typology of car key burglars and the impact of organised crime groups on car key burglary.

### 5.4.4 Distance travelled from home base

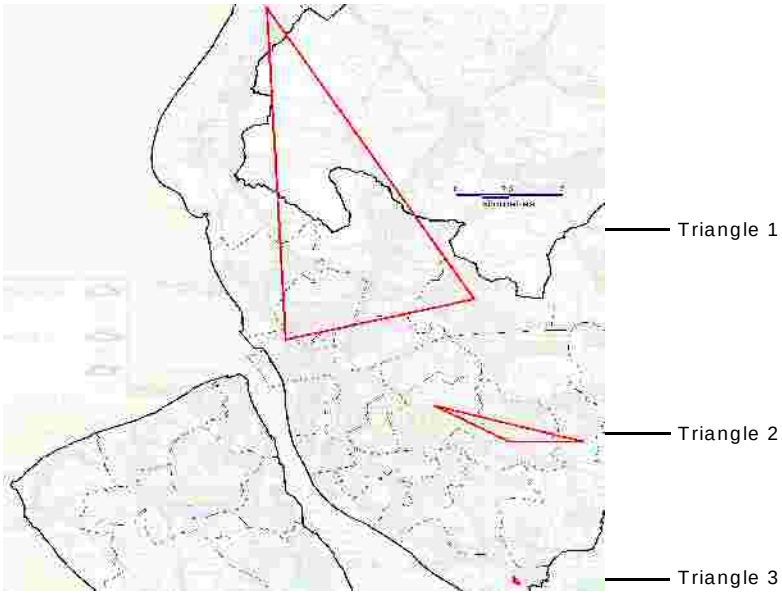
The findings in relation to the journey to crime dista ces are based on the Euclidian distance. In light of the fact that the distance measured is a straight line between the home base and offence locations, it does not take into account the pathways used by the offender. An understanding of the pathways used by offenders would provide an invaluable insight nto the offender's awareness of space and how their routine activities impact on crimes committed over extended distances. A further limitation relating to the accuracy of journey to crime distances is the reliance on information relating to the home base of the offender as being the point from which the journey to crime commences. The transient lifestyles of many criminals and the accuracy of police records may render this assumption problematic.

### 5.4.5 Vehicle 'dump sites' and mobility triangles

As discussed earlier, inconsistencies and inaccuracies in the way in which vehicle disposal locations (vehicle 'dump sites') have been recorded has prevented any detailed research in this area. The three mobility triangles shown in Figure 5.4.5 have been created using the offe ders' home base, offence locations and vehicle 'dump sites'.

Further research in this area would provide an opportu y to explore the criminal spatial behaviour of car key burglars and provide police forces with advantages in terms of crime prevention and detection.

Figure 5.4.5: Offender mobility triangles




### 5.4.6 Motivation

It is unclear if the car key burglaries have taken place with the principal aim of stealing a vehicle, particularly as in over 67 % (*n* = 653) of car key burglaries additional items of property were also stolen from dwellings. In or r to ascertain the motivation for offending Shaw et al. (2010) suggest that detected crimes would need to be based on an admission that includes the offender revealing the motivation for committing the crime. Although it is acknowledged that these cases would be limited in numbers, they would provide further opportunities to compare and understand the differences between car burglaries and regular burglaries (Shaw et al., 2010).

Constraints in time and resources have prevented this research from exploring the motivations for car key burglary. The ACPO National Assessment Car Key Burglary (NPIA, 2009) indicates that the motivations for car key burglary

include: transportation away from a burglary, financial gain and use in further criminality. It would be useful to conduct further research into this area with the aim of gaining a clearer understanding of this aspect of the crime.

### 5.4.7 Overview

Notwithstanding the limitations of this work, the research does provide a welcome contribution to developing the understanding of car key burglaries. In addition to exploring temporal, geographic, behavioura and offender specific aspects of car key burglary, the thesis also shows that there are distinct differences in the characteristics of car key burglaries and re ular burglaries.

## Chapter Six

## Conclusion

Evidence-based policing advocates the use of research and best nce to inform police practice and policy (Sherman, 1998). In ddition to the trade-off that would see 'professional judgement' exchanged for scientific knowledge (Lum, 2009), there would also be the provision of cost effective, informed decision-making (Sherman, 2009). As highlighted in Chapters One and Two, there is little in the way of published material that could raise the prospect of an evidence-based approach to tackling the challenges posed by the emergence of car key burglaries. This thesis has sought to contribute to this gap in research by exploring the nature of car key burglaries.

Notwithstanding the fact that the strength of the findings from the thesis should be considered against the limitations highlighted in C ers Three and Five, the findings of the thesis set out in Chapter Four, do offer an insight into the temporal, geographical, behavioural and offender specific aspects of car key burglary. Further to this, the findings from the thesis also suggest that there are distinct differences in some of the characteristic of car key and regular burglaries.

In order to understand the nature of car key burglary and the implications for policing policy and tactics, Chapter Five considered t findings of the thesis in the context of criminological theory and existing literature. The notion of offenders as rational decision makers (Cornish & Clarke, 1987) is particularly

interesting when one considers the suggestion that offenders have moved away from vehicle crime to the more serious offence of burglary. Indeed, car key burglaries appear to demonstrate a new dimension t imes classified as 'burglary'. If one considers the process of car key burglary, it is possible that offenders have changed their tactics based on the vari ble nature of their assessment of risk (Cornish & Clarke, 1987). In essence, offenders have conducted their own form of research and compensated for elevations in risk, which are due, in part, to the link between dwelling occupancy and the availability of cars. The product of this change in criminality reveals itself in the different characteristics in car key and regular burglaries.

The predictability of when and where crime occurs prov des real opportunities to direct policing activity in a way that delivers crime reduction, victim focus and improves public confidence (Sherman, 2010). The fi dings from the thesis do take Merseyside Police one step closer to unlocking the secrets of car key burglaries and in doing so, provide a number of opport nities for prevention and detection. For instance, situational crime prevention measures aimed at preventing the use of the 'hook and cane' would limit opportunities for car key burglaries. Similarly, crime pattern analyses enriched with the results from further research in relation to vehicle dump sites and the locations of fixed site Automatic Number Plate Recognition cameras could be used to create 'crime corridors' to enable a more effective use of police resources overnight.

It should be noted, however, that the findings of this thesis have been based on the definition of car key burglary applied by Merse de Police. Although

the definitions of car key burglary used by other forces are broadly similar (Shaw et al., 2010), the absence of a nationally recog ised definition has hindered efforts to understand the scale and context of the problem (NPIA, 2009). It is important that future research is underpinned by a nationall recognised definition of car key burglary. It is acknowledged that in seeking to explore the nature of car key burglaries, this researc has raised as many questions as it has sought to answer. Furthermore, such are the severe limitations in the research relating to car key burgla that further research is a necessity.

The emergence of car key burglary appears to demonstrate that criminality is responsive to changing circumstances and the environments in which offenders operate (Cornish and Clarke, 2006). As the n ber of vehicles that are fitted with electronic immobilisers continues to increase, the corollary of this is an incentive for offenders to seek alternative opportunities to steal vehicles. In the case of car key burglary, it would seem that 'when one door closes, another opens', only in this case it has quite literally been the door to people's homes.

In extolling the virtues of evidence-based policing Sherman (2010) suggests that this should be the approach to policy and practice for all publ services. The uncertainty of the current economic climate should surely make this an appealing proposition. In order to keep pace with car burglars, however, there is appears to be little choice in the matter.

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# APPENDICES

## Appendix 1: Definitions/terms used

Burglary

Theft Act 1968 Sec 9(1,2)

(1)

A person is guilty of a burglary if (a) he enters any lding or part of a building as a trespasser and with intent to commit any such offence as is mentioned in subsection (2) below; or (b) having entered any buildi g or part of a building as a trespasser he steals or attempts to steal anything in the building or that part of it or inflicts or attempts to inflict on any person therein any grievous bodily harm.

(2)

The offences referred to in subsection (1)(a) above ar offences of stealing anything in the building or part of a building in question, of inflicting on any person therein any grievous bodily harm or of doing un ul damage to the building or anything therein.

Aggravated Burglary

Theft Act 1968 Sec 10(1).

A person is guilty of aggravated burglary if he commits any burglary and at the time he has with him any firearm or imitation firearm, any weapon of offence, or any explosive

Attempted Burglary

Where the offender is considered to have acted in a ma ner that is more than preparatory to the commission of the offence, but has actually gained entry.

Distraction Burglary

Any crime where a falsehood, trick or distraction is u ed on an occupant of a dwelling to gain, or try to gain, access to the premises to commit burglary. It includes cases where the offender first enters premise and subsequently

uses distraction burglary methods in order to remain o the premises and/or gain access to other parts of the premises in order to commit burglary.

Offender

The individual identified as the person against whom c iminal proceedings have been instigated, i.e. charged with a burglary off ce.

Victim

Identified as the person owning the dwelling

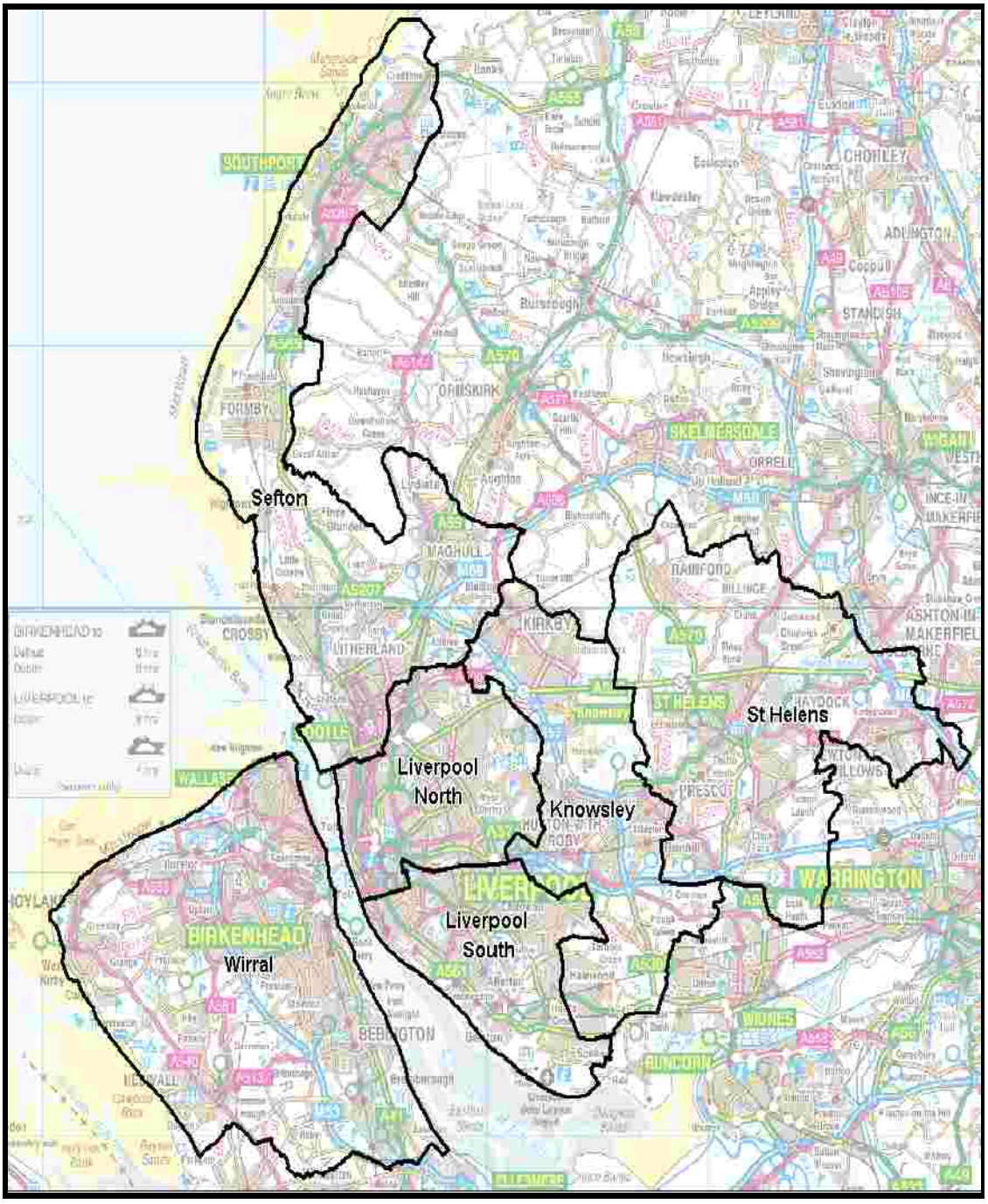
Offences taken into consideration (TIC)

The taking of offences into consideration has no legal foundation. It is essentially a process by which Courts may consider other offences admitted by defendants. Individuals placed before a Court are made aware of the option to admit other offences they have committed and that s h offences could be taken into consideration by the Court in particular circumstances.

Carjacking

Carjacking is a form of hijacking where a car is stole from the owner. The crime can be classified as a theft or unauthorised taking of a motor vehicle. A violent carjacking would be classified as robbery.

Appendix 2: Map - Merseyside Police BCU boundaries



## Appendix 3: Guidance – Home Office Counting Rules

General Rule: One crime for each household burgled.

Example 1: A person burgles five houses in a street. Five crimes (class 28A).
Example 2: A person caught burgling a house has cannabis in his possession. One crime (class 28A) and one crime possession of cannabis (class 92E).
Example 3: A person reports having the front door to his house kicked in, keys to his car taken, and his car driven away. The car is found a few days later. One crime of burglary (class 28A)

Application of the rule
If a household is victim to more than one burglar, count crimes separately only if each burglar is acting independently.

Example 1: A house inhabited by one person is burgled y a group of five people. One crime (class 28A).
Example 2: Four people sharing a house (a family or house-mates without separately lockable rooms) burgled by a group of five people. One crime (class 28A).

A guest staying in a household is treated as part of t e household.

Example 1: Two relatives of the householder who are st ying overnight have property stolen when the house is burgled. One crime of burglary in a dwelling (class 28A).

If force or the threat of force is used in order to steal during the course of a burglary then it should be classified as a robbery.

Example 1:

During the course of a burglary, an offender uses force in order to steal a mobile phone from a guest staying at the house. One crime of robbery (class 34B).

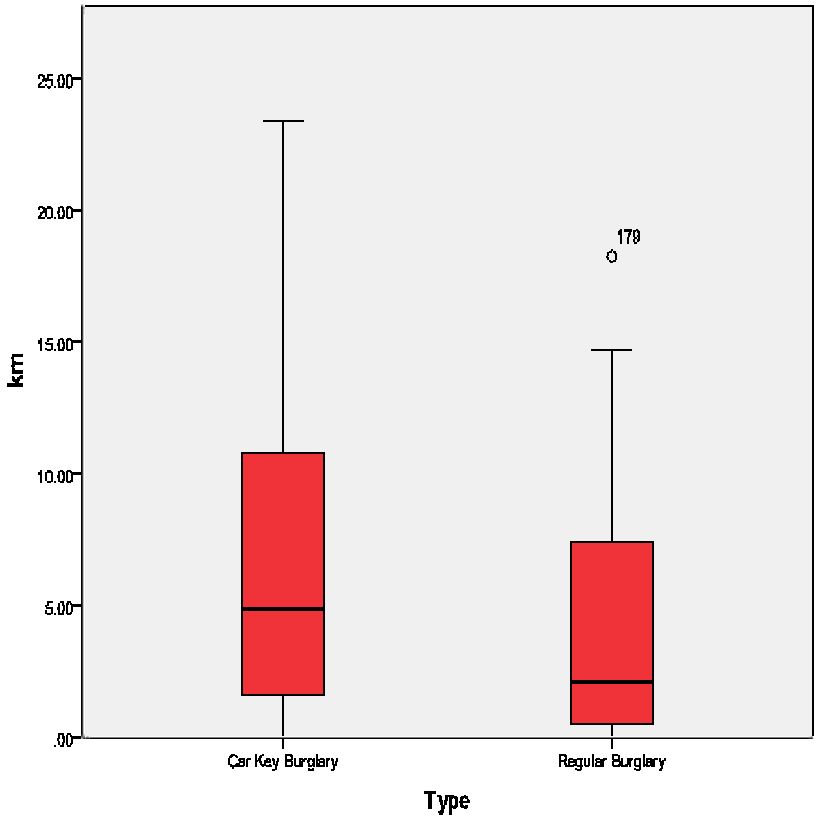
Example 2:

A person enters a house as a trespasser while the vict is present. He uses a weapon to threaten the victim to keep quiet so he can continue with the burglary. One crime of robbery (class 34B).

Example 3:

A person enters a house as a trespasser while the vict is present. He uses a weapon in order to steal items from the house and items from the three victims present. Three crimes of robbery (class 34B).

Appendix 4: Box plot




The above box plot was created to assess the level of dispersion of the datasets. An outlier for distance travelled from home for regular burglaries was highlighted and withdrawn from the dataset.

Appendix 5: Coding scheme

| | |
|---|---|
| Niche Number | |
| Offence | 1=Burglary Dwelling, 2=Robbery, 777=MISSING,888=UNKNOW 999=N/A |
| BCU | 1=A, 2=B, 3=C, 4=D, 5=E, 6=F, 777=MISSING,888=UNKNOWN, 999=N/A |
| Neighbourhood | 1=A1, 2=A2, 3=A3, 4=A4, 5=A5, 6=A6, 7=A7, 8=A8, 9=B1, 10=B2, 11=B3, 12=B4, 13=B5, 14=B6, 15=B7, 16=C1, 17=C2, 18=C3, 19=D1, 20=D2, 21=D3, 22=D4, 23=D5, 24=E1, 25=E2, 26=E3, 27=E4, 28=E5, 29=E6, 30=E7, 31=F1, 32=F2 33=F3, 34=F4, 35=F5, 777=MISSING,888=UNKNOWN, 999=N/A |
| Start Date | NUMERCIAL DATA |
| Start Month | 1=January, 2=February, 3=March, 4=April, 5=May, 6=June, 7=July, 8=August, 9=September, 10=October, 11=November, 12=December, 777=MISSING,888=UNKNOWN, 999=N/A |
| Start Day | 1=Sunday, 2=Monday, 3= Tuesday, 4=Wednesday, 5=Thursday, 6=Friday, 7=Saturday, 777=MISSING,888=UNKNOWN, 999=N/A |
| Start Time | NUMERCIAL DATA |
| End Date | NUMERCIAL DATA |
| End Month | 1=January, 2=February, 3=March, 4=April, 5=May, 6=June, 7=July, 8=August, 9=September, 10=October, 11=November, 12=December, 13= January 2011, 14= March 2011, 777=MISSING, 888=UNKNOWN, 999=N/A |
| End Day | 1=Sunday, 2=Monday, 3= Tuesday, 4=Wednesday, 5=Thursda 6=Friday, 7=Saturday, 777=MISSING,888=UNKNOWN, 999=N/A |
| End Time | NUMERCIAL DATA |

| | |
|---|---|
| Time period | 1=Daytime, 2=Night time, 3=Extended, 777=MISSING,888=UNKNOWN, 999=N/A |
| Crime notes (Free text) | STRING TEXT |
| Crime MO (Free text) MO | STRING TEXT |
| MO | 1= Insecure, 2= Forced/Smashed Door/Window, 3=Remove/Cut Door/Window, 4=Hook & Cane, 5=Aggravated, 6=Deception, 7=Other, 777=MISSING,888=UNKNOWN, 999=N/A |
| House security | 1= Secure, 2=Insecure, 777=MISSING,888=UNKNOWN, 999=N/A |
| Point of entry | 1=Front, 2=Rear, 777=MISSING,888=UNKNOWN, 999=N/A |
| Search by offender(s) | 1=Tidy, 2=Untidy, 777=MISSING,888=UNKNOWN, 999=N/A |
| House occupied | 1=Yes, 2=No, 777=MISSING,888=UNKNOWN, 999=N/A |
| Offenders seen | 1=Seen, 2=Not Seen, 777=MISSING,888=UNKNOWN, 999=N/A |
| Type/pos house | 1=Detached, 2=Semi-detached, 3=Terraced, 4=Bungalow, 5=Flat, 777=MISSING,888=UNKNOWN, 999=N/A |
| Distraction | 1=Yes, 2=No, 777=MISSING,888=UNKNOWN, 999=N/A |
| Weapon Type | 1= BLADED IMPLEMENT (POSSESSION) 2= BLADED IMPLEMENT (USED/THREATENED)<br>3= NON BLADED IMPLEMENT 4 = FIREARM (POSSESSION) 5 = FIREARM (USED/THREATENED)<br>6 = GLASS 7 = NO WEAPON USED, 8= Explosives, 777=MISSING,888=UNKNOWN, 999=N/A |

| | |
|---|---|
| 2nd Weapon Type | 1= BLADED IMPLEMENT (POSSESSION) 2= BLADED IMPLEMENT (USED/THREATENED)<br>3= NON BLADED IMPLEMENT 4 = FIREARM (POSSESSION) 5 = FIREARM (USED/THREATENED)<br>6 = GLASS 7 = NO WEAPON USED, 777=MISSING,888=UNKNOWN, 999=N/A |
| Weapon Usage | 1= CONCEALED IN CLOTHING/FOOTWEAR 2= HELD BY ACCOMPLICE 3= HELD IN – HAND<br>4= OTHER, 777=MISSING,888=UNKNOWN, 999=N/A |
| Count of property items | NUMERCIAL DATA |
| Property Stolen | STRING TEXT |
| Disposal | 1= CHARGED 2= CHARGED - LESSER OFFENCE 3= TIC RECORDED 4= NEW 5= UNDETECTED, 6= Summonsed, 7= Simple Caution, 8= Juvenile Reprimand/Final warning, 9= Tic not recorded, 777=MISSING,888=UNKNOWN, 999=N/A |
| Nos of Vehicles Stolen | NUMERCIAL DATA |
| Vehicle make | 1=AUDI, 2=BMW, 3=CHEVROLET, 4=CHRYSLER, 5=CITROEN, 6=DAEWOO, 7=DAIHATSU. 8=FIAT, 9=FORD, 10=HACKNEY, 11=HONDA, 12=HYUNDAI, 13=JAGUAR, 14=KIA, 15=LANDROVER, 16=LEXUS, 17=MAZDA, 18=MERCEDES, 19=MG, 20=MINI, 21=MITSUBISHI, 22=NISSAN, 23=PEUGEOT, 24=PORCHE, 25=RENAULT, 26=ROVER, 27=SAAB, 28=SEAT, 29=SKODA, 30=SMART, 31=SUBARU, 32=SUZUK, I33=TOYOTA, 34=VAUXHALL, 35=VOLKSWAGEN, 36=VOLVO, 37=Range Rover, 38= Alfa, 777=MISSING,888=UNKNOWN, 999=N/A |
| Vehicle model | STRING TEXT |
| Colour | 1= BEIGE 2= BLACK 3= BLUE 4= BLUE, DARK 5= BLUE, LIGHT 6= BRONZE 7= GOLD 8= GREEN |

| | |
|---|---|
| | 9= GREY 10= MAROON 11= ORANGE 12= PURPLE, MAUVE 13= RED 14= SILV., ALUM., ST. STEEL 15= TURQUOISE 16= WHITE 17 YELLOW, 18+LILAC, 19+ CREAM, IVORY, 777=MISSING,888=UNKNOWN, 999=N/A |
| VRM | STRING TEXT |
| VRM | STRING TEXT |
| 2nd Vehicle make | 1=AUDI, 2=BMW, 3=CHEVROLET, 4=CHRYSLER, 5=CITROEN, 6=DAEWOO, 7=DAIHATSU. 8=FIAT, 9=FORD, 10=HACKNEY, 11=HONDA, 12=HYUNDAI, 13=JAGUAR, 14=KIA, 15=LANDROVER, 16=LEXUS, 17=MAZDA, 18=MERCEDES, 19=MG, 20=MINI, 21=MITSUBISHI, 22=NISSAN, 23=PEUGEOT, 24=PORCHE, 25=RENAULT, 26=ROVER, 27=SAAB, 28=SEAT, 29=SKODA, 30=SMART, 31=SUBARU, 32=SUZUK, I33=TOYOTA, 34=VAUXHALL, 35=VOLKSWAGEN, 36=VOLVO, , 37=Range Rover , 38= Alfa, 777=MISSING,888=UNKNOWN, 999=N/A |
| 2nd Vehicle model | STRING TEXT |
| 2nd Colour | 1= BEIGE 2= BLACK 3= BLUE 4= BLUE, DARK 5= BLUE, LIGHT 6= BRONZE 7= GOLD 8= GREEN<br>9= GREY 10= MAROON 11= ORANGE 12= PURPLE, MAUVE 13= RED 14= SILV., ALUM., ST. STEEL 15= TURQUOISE 16= WHITE 17 YELLOW, 18+LILAC, 19+ CREAM, IVORY, 777=MISSING,888=UNKNOWN, 999=N/A |
| 2nd vehicle VRM | STRING TEXT |
| 2nd vehicle VRM | STRING TEXT |
| Offenders identified | 1=Yes, 2=No, 777=MISSING,888=UNKNOWN, 999=N/A |
| Nos of identified offenders | NUMERCIAL DATA |
| Offender Surname | STRING TEXT |
| Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |

| | |
|---|---|
| Offender age | NUMERCIAL DATA |
| Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 2nd Offender Surname | STRING TEXT |
| 2nd Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 2nd Offender age | NUMERCIAL DATA |
| 2nd Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 2nd Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 3rd Offender Surname | STRING TEXT |
| 3rd Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 3rd Offender age | NUMERCIAL DATA |
| 3rd Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African |

| | |
|---|---|
| | 777=MISSING,888=UNKNOWN, 999=N/A |
| 3rd Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 4th Offender Surname | STRING TEXT |
| 4th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 4th Offender age | NUMERCIAL DATA |
| 4th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 4th Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White Irish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 5th Offender Surname | STRING TEXT |
| 5th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 5th Offender age | NUMERCIAL DATA |
| 5th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 5th Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, |

| | |
|---|---|
| | 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 6th Offender Surname | STRING TEXT |
| 6th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 6th Offender age | NUMERCIAL DATA |
| 6th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 6th Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 7th Offender Surname | STRING TEXT |
| 7th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 7h Offender age | NUMERCIAL DATA |
| 7th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or No h African 777=MISSING,888=UNKNOWN, 999=N/A |
| 7th Offender self defined ethnicity | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A |
| 8th Offender Surname | STRING TEXT |
| 8th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 8h Offender age | NUMERCIAL DATA |

| | |
|---|---|
| 8th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 8th Offender self defined ethnicity<br><br>9th Offender Surname | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White Irish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A<br>STRING TEXT |
| 9th Offender gender | 1=Male 2=No, 3= U 777=MISSING,888=UNKNOWN, 999=N/A |
| 9h Offender age | NUMERCIAL DATA |
| 9th Offender ethnicity | 1 - White - North European 2 - White - South European 3 – Black 4 – Asian 5 - Chinese, Japanese, Or Any Other South East Asian, 6=Arabic or North African 777=MISSING,888=UNKNOWN, 999=N/A |
| 9th Offender self defined ethnicity<br><br>Vehicle recovered | 1=White British, 2=Black Caribbean, 3= Any other black background, 4=Asian Bangladeshi, 5=Any other Asian background, 6=Any other mixed background, 7=Black African, 8=Chinese, 9=Not stated, 10= White & asian, 11=White I ish, 12= Any other ethnic group, 13=white & black Caribbean 777=MISSING,888=UNKNOWN, 999=N/A<br>1=Yes, 2=No, 777=MISSING,888=UNKNOWN, 999=N/A |
| Location recovered vehicle | STRING TEXT |
| Date stolen | NUMERCIAL DATA |
| Date recovered | NUMERCIAL DATA |
| Days outstanding | NUMERCIAL DATA |
| 2nd Vehicle recovered | 1=Yes, 2=No, 777=MISSING,888=UNKNOWN, 999=N/A |

## Appendix 6: Modus Operandi (MO) definitions

Insecure

Where an offender has entered a property through an op n/unlocked door, window or other entrance.

Forced/Smashed/Door/Window

Where an offender has entered a secure property through bodily physical force. Examples of this MO would be the use of physical force to smash a window or damage a door to gain access to the property.

Remove/Cut/Implement/Door/Window

Where an offender has entered a secure property by removing or cutti g a door or window. Examples of this MO would include the moval of beading around a window or the use of an implement to force a ck on a door or window.

Hook & Cane

Where an offender has placed a long handled hooked implement into a property through a letterbox or open window to hook an remove unattended keys to a motor vehicle.

Aggravated

Where an offender has confronted the occupants of the roperty and used violence, or the threat of violence, to obtain the keys of the motor vehicle.

Deception

Where an offender has approached the occupant in their property and has distracted them in some way. Examples would include 'bogus officials'.

Other

Other methods offenders have gained access to keys to motor vehicles have included accessing a property through another means for example by using a dog/cat flap or by obtaining keys to the property.

Appendix 7: Cars stolen (Merseyside)

| Rank | Manufacturer | No. Stolen | %age Stolen |
|---|---|---|---|
| 1 | FORD | 243 | 23.9% |
| 2 | VAUXHALL | 139 | 13.7% |
| 3 | BMW | 77 | 7.6% |
| 4 | AUDI | 75 | 7.4% |
| 5 | VOLKSWAGEN | 63 | 6.2% |
| 6 | RENAULT | 58 | 5.7% |
| 7 | NISSAN | 34 | 3.3% |
| 8 | MERCEDES | 34 | 3.3% |
| 9 | PEUGEOT | 32 | 3.2% |
| 10 | MINI | 28 | 2.8% |
| 11 | VOLVO | 28 | 2.8% |
| 12 | TOYOTA | 23 | 2.3% |
| 13 | CITROEN | 20 | 2.0% |
| 14 | FIAT | 19 | 1.9% |
| 15 | MAZDA | 16 | 1.6% |
| 16 | HONDA | 16 | 1.6% |
| 17 | JAGUAR | 13 | 1.3% |
| 18 | SKODA | 12 | 1.2% |
| 19 | LANDROVER | 11 | 1.1% |
| 20 | MITSUBISHI | 10 | 1.0% |
| 21 | SAAB | 9 | 0.9% |
| 22 | ROVER | 8 | 0.8% |
| 23 | SUBARU | 6 | 0.6% |
| 24 | CHEVROLET | 6 | 0.6% |
| 25 | SEAT | 6 | 0.6% |
| 26 | KIA | 5 | 0.5% |
| 27 | LEXUS | 4 | 0.4% |
| 28 | HACKNEY | 3 | 0.3% |
| 29 | SUZUKI | 3 | 0.3% |
| 30 | HYUNDAI | 3 | 0.3% |
| 31 | SMART | 2 | 0.2% |
| 32 | DAIHATSU | 2 | 0.2% |
| 33 | MG | 2 | 0.2% |
| 34 | DAEWOO | 2 | 0.2% |
| 35 | PORCHE | 1 | 0.1% |
| 36 | ALFA | 1 | 0.1% |
| 37 | CHRYSLER | 1 | 0.1% |
| Total | | 1,015 | 100.0% |

Appendix 8: Cars stolen/registered ('L' postcodes)

| Rank | Manufacturer | No. Stolen | No. Registered | Rate |
|---|---|---|---|---|
| 1 | AUDI | 55 | 9817 | 0.0056 |
| 2 | SUBARU | 3 | 547 | 0.0055 |
| 3 | PEUGEOT | 23 | 4822 | 0.0048 |
| 4 | MINI | 21 | 4606 | 0.0046 |
| 5 | BMW | 58 | 14335 | 0.0040 |
| 6 | DAIHATSU | 2 | 531 | 0.0038 |
| 7 | TOYOTA | 15 | 4174 | 0.0036 |
| 8 | CHEVROLET | 6 | 1680 | 0.0036 |
| 9 | VOLVO | 24 | 7764 | 0.0031 |
| 10 | SMART | 1 | 325 | 0.0031 |
| 11 | SAAB | 8 | 2640 | 0.0030 |
| 12 | JAGUAR | 10 | 4019 | 0.0025 |
| 13 | SKODA | 11 | 4627 | 0.0024 |
| 14 | MITSUBISHI | 8 | 3612 | 0.0022 |
| 15 | VOLKSWAGEN | 48 | 23770 | 0.0020 |
| 16 | MAZDA | 10 | 5097 | 0.0020 |
| 17 | LANDROVER | 11 | 5720 | 0.0019 |
| 18 | FORD | 214 | 111,628 | 0.0019 |
| 19 | LEXUS | 4 | 2133 | 0.0019 |
| 20 | RENAULT | 48 | 26035 | 0.0018 |
| 21 | VAUXHALL | 110 | 60511 | 0.0018 |
| 22 | HONDA | 10 | 5648 | 0.0018 |
| 23 | NISSAN | 29 | 16798 | 0.0017 |
| 24 | MERCEDES | 29 | 17395 | 0.0017 |
| 25 | HACKNEY | 3 | 1933 | 0.0016 |
| 26 | MG | 2 | 1421 | 0.0014 |
| 27 | KIA | 4 | 2864 | 0.0014 |
| 28 | FIAT | 16 | 13132 | 0.0012 |
| 29 | SEAT | 3 | 2675 | 0.0011 |
| 30 | CITROEN | 16 | 16275 | 0.0010 |
| 31 | ALFA | 1 | 1071 | 0.0009 |
| 32 | SUZUKI | 2 | 2469 | 0.0008 |
| 33 | CHRYSLER | 1 | 1257 | 0.0008 |
| 34 | ROVER | 6 | 7948 | 0.0008 |
| 35 | HYUNDAI | 3 | 4276 | 0.0007 |
| 36 | DAEWOO | 1 | 2264 | 0.0004 |
| Total | | 816 | 395,819 | |