Understanding Theft from the Person and Robbery of Personal Property Victimisation Trends in England and Wales, 1994-2010/11

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It seems appropriate to finish with a quote that often got me through some long days of data analysis:

Courage doesn't always roar. Sometimes courage is the quiet voice at the end of the day saying "I will try again tomorrow".

– Mary Anne Radmacher –

Abstract

This thesis explores the changing nature of theft from the person and robbery of personal property over a 17-year period (1994-2010/11) in England and Wales. Between 1995 and 2010/11, all crime recorded by the British Crime Survey (BCS) fell 50 per cent, with a 27 and 17 per cent fall in robbery and theft from the person respectively (Chaplin *et al.*, 2011). Despite widespread attention, consensus regarding *why* we have witnessed these falls in crime has not been reached. Three specific areas are explored in relation to theft and robbery: 1. the goods stolen; 2. the characteristics of the individuals from whom goods are stolen; and 3. the circumstances in which they are taken. Fourteen sweeps of the BCS are employed to discern if any changes in their nature and composition coincide with the falls in crime. Various statistical methods are utilised including binomial logistic, negative binomial and zero-inflated negative binomial regression.

There are a number of proposed contributions to knowledge from this research. Firstly, contrary to other crime types, the fall in theft and robbery since 1996 is largely comprised of a reduction in single victims. Secondly, this overarching trend is composed of two underlying trends: one which mirrors the more general decreases in crime, and one which reflects increased theft due to the greater availability of new, valuable and portable goods that are attractive to thieves, particularly mobile phones. Thirdly, age, sex, marital status, general health, frequency of activity outside the home, area of residence and car ownership/use consistently influence the incidence of theft and robbery over time. Finally, there are clear and significant differences in the characteristics of victims suffering completed and attempted victimisations. In sum, the thesis generates knowledge of the demographic characteristics, lifestyles, consumer goods, environments and circumstances which appear to foster greater exposure to victimisation. Offenders have a clear "repository of crime targets" (Jacobs, 2010: 523) both in terms of the victim and item(s) stolen. With regard to the crime drop, a multi-factor model is proposed with repeat victimisation and target suitability identified as key components.

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Chapter 1: Introduction

The aim of the thesis is to explore the changing nature of theft from the person and robbery of personal property over a 17-year period (1994-2010/11) in England and Wales. This time period coincides with a wider international 'crime drop'. It is proposed that in order to make inferences about *why* such falls in crime have occurred it is necessary to first develop an in-depth understanding of the nature of specific crime types over time. To this end, secondary data analysis is conducted using British Crime Survey (henceforth BCS) data to gain insight into three component parts of theft and robbery victimisation, namely stolen goods, victim and incident characteristics. This endeavour is embarked upon in the hope that potential risk factors can be identified and studied over time which may inform both subsequent theories regarding the fall in crime and future crime prevention strategy.

1.1 Wider Context: the 'Crime Drop'

A considerable body of research has documented a dramatic fall in crime over the last 20 years (van Dijk *et al.*, 2005; Zimring, 2007; Rosenfeld, 2009; van Dijk *et al.*, 2012). A growing number of comprehensive analyses of cross-national crime trends serve to substantiate the existence of similar falls across many industrialised countries (Tonry and Farrington, 2005; van Dijk *et al.*, 2005; Tseloni *et al.*, 2010). Between 1995 and 2010/11, all crime recorded by the BCS fell 50 per cent, with a 72 per cent drop in vehicle-related theft; a 52 per cent drop in other theft of personal property; a 44 per cent fall in other household theft; and a 35 per cent fall in vandalism (Chaplin *et al.*, 2011). Innumerable insights into these trends have been proffered (indeed entire books are dedicated to the topic (Zimring, 2007; van Dijk *et al.*, 2012)) and, as such, this debate occupies a central position in criminological theorising.

Despite widespread attention, it would not be erroneous to state that consensus regarding *why* we have witnessed international falls in crime has been far from reached. Farrell *et al.* (2010) suggest it is "...arguably the biggest unsolved puzzle of modern-day criminology" which represents "a fundamental failing of theory and empirical study" (ibid: 25). Current interpretations of the drop are largely focused on data from the USA and are heavily reliant upon figures relating to homicide (LaFree, 1999; Levitt, 2004; Rosenfeld, 2009; Farrell, 2013). In addition, many explanations are not transferable across countries or are unable to explain why some crimes have

gone up (e.g. mobile phone theft) whilst others have seen a decline. Many lack a clear explanatory mechanism and others have not been subject to empirical testing at all. The most commonly cited explanations include: demographic change (Blumstein, 2000); increasing prison populations (Langan and Farrington, 1998); methods of policing (Levitt, 2004); changes in the crack cocaine market (Blumstein and Rosenfeld, 1998; Levitt, 2004); the legalisation of abortion (Levitt and Dubner, 2005); a strengthening economy (Field, 1999; Fielding *et al.*, 2000; Rosenfeld and Messner, 2009); and gun ownership policies (Duggan, 2001). Although each theory is interesting and certainly has some merit in its own right (see Section 2.3), the potential utility of further developing our understanding of falling rates of theft from the person and robbery in England and Wales between 1994 and 2010/11 is significant and is a major justification for this thesis.

This PhD forms part of a four-phase research agenda led by Andromachi Tseloni, Graham Farrell and Nick Tilley (see Tseloni *et al.*, 2012). The aim being to generate discussion and, ultimately, a more comprehensive understanding of the role of opportunity changes in generating international crime falls. To this end, this group of academics have explored crime specific changes in security, routine activities and crime signatures to name but a few. This body of work has been heavily influenced by van Dijk's original analysis of the International Crime Victims Survey (2006; van Dijk *et al.*, 2007) which documented that dramatic, universal increases in private security and precautionary measures coincided with the international crime drop. This work has led to the development of the 'security hypothesis' (Farrell *et al.* 2008; 2010; 2011a; 2011b; Tseloni *et al.* 2010) for which there is a growing body of evidence suggesting that security improvements have driven overall reductions in crime. A fall in vehicle theft in England and Wales and Australia was attributed to more and better quality security, particularly central locking systems and electronic immobilisers (Farrell *et al.*, 2011a). The security hypothesis also has a number of interlinking theories nestled within it which hold potentially important links between crime types, namely the 'keystone crime hypothesis' (reductions in one crime type may facilitate falls in others) and the 'debut crime hypothesis' (fewer criminal opportunities may stifle the length of criminal careers). These theories form part of the theoretical base of this body of work and, as such, will be referred to throughout the thesis.

To date, the project has utilised BCS data concerning vehicle crime and residential burglary (phases one and two of the research agenda) within the context of the crime drop (Farrell *et al.* 2008; 2010; 2011a; 2011b; Tseloni et al. 2010). Separating the project into phases focusing on different crime types is a very deliberate choice on the part of the researchers; largely because analysis based on aggregate or composite measures of 'crime' can be rather misleading (Maxfield, 1987; Trickett *et al.*, 1995; Naylor, 2003). The motivation behind, risk factors, and protective measures associated with individual crime types are likely to be diverse, for example factors that increase the risk of assault are likely to be very different to those for household burglary. By conducting the research in phases it is hoped these nuances and intricacies may be teased out.

In the interests of pursuing a crime specific approach, the focus of the thesis is theft from the person and robbery of personal property; having been identified as important crime types that remain under-researched in relation to the crime drop (and thus forming phase three of the wider research agenda). Following vehicle crime and residential burglary, theft was viewed as the next logical acquisitive crime choice for analysis. The order of selection was informed by the timing of the international crime falls (Tseloni *et al.*, 2010); reductions were first apparent for burglary, followed by car theft, personal theft and lastly, assault (van Dijk and Tseloni, 2012). This work also fulfils a passion to utilise BCS data – identified as a world-leading, informative and massively underutilised data source. The BCS offers a wide range of information over a time period sufficient to comment on the crime drop in England and Wales. In addition, unlike police recorded crime, BCS recording practices have remained relatively consistent over time. To the author's knowledge, theft from the person and robbery have not previously been explored to this level of detail over such an expansive time period.

1.2 Definition of Theft from the Person and Robbery

A criticism of much previous research lies in the inconsistent operationalisation of crime categories (Lauritsen 2001; Naylor, 2003; Stein, 2010: 41). In particular, theft from the person (or larceny in the United States) has been differentially categorised as 'violent crime' (Miethe *et al.*, 1987), 'predatory victimisation' (Cohen *et al.*, 1981), 'predatory street crime' (Maxfield, 1984), 'property crime' (Bennett, 1991) and 'personal crime' (Sampson and Wooldredge, 1987). Many other terms, such as 'street robbery' and 'mugging', are employed interchangeably within existing literature and

are considered to be synonymous with robbery or theft from the person. However, as Smith (2003) notes, these terms differ widely in their application. It is thus important to exercise caution in generalising from this body of research where authors have utilised different terms for the same concept or grouped a range of offences under a particular category. Cross-national differences in crime categorisation also pose inferential difficulties. It is therefore necessary to remain cautious when comparing empirical findings across studies.

As mentioned, crimes are frequently analysed in groups and labelled inconsistently which makes accurate comparability much more problematic. The importance of crime specific analysis and prevention is emphasised by the example of vehicle crime. This overarching offence is comprised of a number of subtypes (theft *of a* vehicle, theft *from a* vehicle etc.) each requiring very different interventions to reduce its occurrence (Clarke, 1997; Maxfield and Clarke, 2004). Previous research highlighting differences in victimisation predictors according to crime type (Sampson and Wooldredge, 1987; Trickett *et al.*, 1995; Ellingworth *et al.*, 1997; Stein, 2010) serve to emphasise the importance of such definitional clarity.

To ensure definitional clarity and that the nature and scope of the thesis is clearly outlined the crime types under investigation (theft from the person and robbery) are defined here. The Theft Act 1968 states: "A person is guilty of theft if he dishonestly appropriates property belonging to another with the intention of permanently depriving the other of it" (Section 1(1)). Robbery is defined as: "an incident in which force or threat of force is used in a theft…" (Home Office, 2010: 23). For the purposes of this research 'robbery' shall be taken to refer only to robbery of personal property: "…where the goods stolen belong to an individual or group of individuals, rather than a corporate body…" (Home Office, 2013: 4). Robbery of personal property accounted for 89 per cent of all robberies recorded by the police in 2009/10 (Flatley *et al.*, 2010: 56). To include robbery of business property would widen the remit of the study into the realms of commercial victimisation which is deemed outside the scope of the current project.

There are five[1] BCS offence codes used in this thesis which relate to theft from the person and robbery. These are:

41: Robbery;

42: Attempted Robbery;

43: Snatch Theft from the Person;

44: Other Theft from the Person; and

45: Attempted Other Theft from the Person.

The overarching category of theft from the person is comprised of offence codes 43, 44 and 45 and are defined by the BCS as follows:

- **snatch theft (code 43)** where the respondent is holding items or carrying them on their person. There may be an element of force involved but just enough to snatch the property away; and

- **stealth theft (codes 44 and 45)** where the respondent is holding items or carrying them on their person but no force is used and the victim is unaware of the incident (pick pocketing).

When the thesis discusses 'completed' theft from the person or robbery this is referring to offence codes 41, 43 and 44, whereas attempts refer to codes 42 and 45. It is acknowledged that it may not be ideal to analyse offences of theft from the person and robbery in combination. The decision to combine these offence types was predominantly based upon the relatively small number of robbery incidents and subsequent issues with regard to data reliability. The decision was also influenced by the fact that both theft from the person and robbery are direct contact, acquisitive crimes happening largely in a 'street' or public context. Excluding one from the analysis would have narrowed the scope of the thesis and, in particular, the examination of stolen goods.

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[1] Offence codes 63 and 73 relate to 'Other Theft of Personal Property'. This refers to thefts of unattended property outside the home where no force is used (e.g. theft of items left in cloakrooms). These offence codes are not included in the analysis as they are not directly comparable with police recorded crime and one has to make an assumption of criminal intent. The thesis is also predominantly interested in offences which involve direct contact (i.e. *from the person*).

One further issue arises in that analysis of robbery may be viewed as straying into the realms of 'violent crime'. However, after a comprehensive review the Office for National Statistics (ONS) has, from 2012/13 onwards, classified robbery as a standalone offence type which no longer falls under the category of violent crime. This is because the ultimate end goal of robbery is viewed as the theft of an item usually for financial gain and not the act of force itself (actual force/violence is not necessarily required to constitute the offence).

1.3 The General Picture of Theft from the Person and Robbery over Time

There are two main measures of crime in England and Wales – police recorded crime and crime recorded by the BCS. Over time, the trend in theft from the person recorded by the BCS is generally quite flat when compared to the peak and steep declines seen for other crime types (see Figure 1.1). In 2010/11, theft from the person comprised the lowest statistically significant decrease (17 per cent) since 1995 of all crime types recorded (Chaplin *et al.*, 2011). In the 2010/11 BCS, there were 563,000 incidents of theft from the person, largely consisting of stealth thefts (491,000) (ibid). Police recorded theft from the person offences generally follow a similar pattern to that recorded by the BCS, although an increase of one per cent between 2009/10 and 2010/11 was reported. However, this follows a steady period of decline since 2002/03.

There were 248,000 incidents of robbery recorded by the BCS in 2010/11 (Chaplin *et al.*, 2011). Data concerning robbery are thus notoriously difficult to interpret as a result of its relatively rare occurrence. There are marked fluctuations in the level of robbery documented by the BCS; showing both rises and falls in the period 1995-2010/11. This is most likely due to the small number of victims of this crime and thus any potential trends are much more sensitive to small changes. However, the overarching picture is that of a 27 per cent decline since 1995. More detailed discussion regarding potential trends in risk, incidence and concentration are contained in Chapter 5.

Figure 1.1: Trends in Theft Other than a Vehicle, 1981 to 2010/11 BCS (Taken from Chaplin *et al.*, 2011: 76)
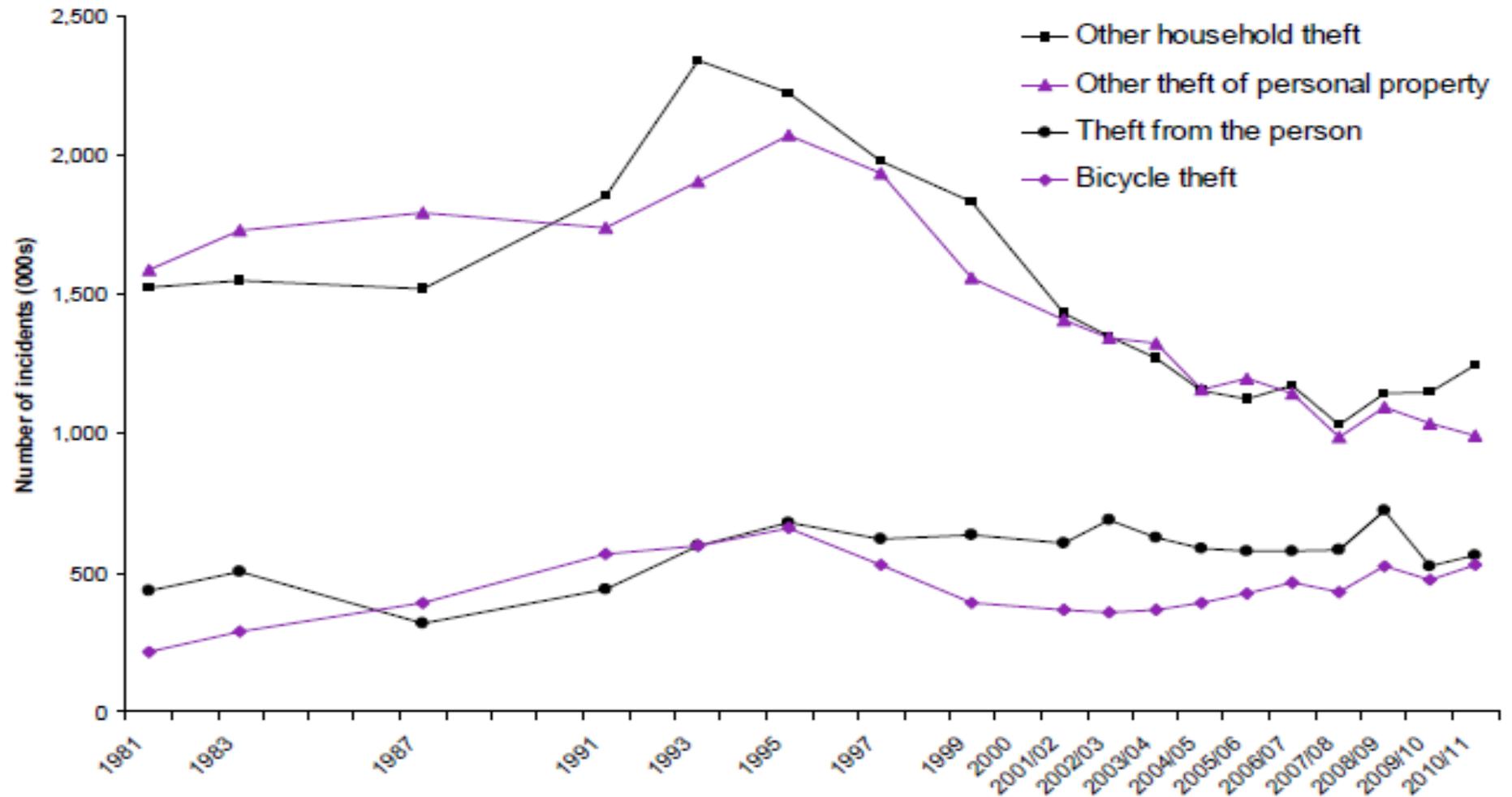
1.4 Aims and Objectives

The primary aim of the thesis is to explore the nature of theft from the person and robbery of personal property in England and Wales over the period of the 'crime drop'. Fourteen sweeps of the BCS are employed (1994 to 2010/11) to discern if there are particular vulnerable consumer goods and potential victimisation risk factors associated with these crime types and, if any changes in their nature and composition coincide with the falls in crime. Three areas in relation to theft from the person and robbery are explored: 1. the goods stolen; 2. the characteristics of the individuals from whom goods are stolen; and 3. the circumstances in which they are taken. In other words, what constitutes both a desirable item and 'suitable' victim of theft from the person and robbery, and why? In addition, what circumstances render encounters with 'motivated offenders' less likely to result in the theft of an item? It is hoped this work provides a platform for future explanations for the drop in crime. Four research questions that guide this investigation are therefore proposed:

1. Can 'hot products' be identified in relation to theft from the person and robbery between 1994 and 2010/11? In addition, have these stolen goods changed over time?
2. Do particular demographic, area and lifestyle characteristics affect theft from the person and robbery incidence and have these characteristics changed over time? In other words, are there particular high-risk population subgroups?
3. Are there certain characteristics of an incident that render encounters with offenders more likely to fail, i.e. result in an attempted victimisation, as opposed to completed theft from the person and robbery? If so, have these remained consistent over time?
4. Can these elements help explain changes in theft from the person and robbery victimisation between 1994 and 2010/11?

In order to answer these questions, five hypotheses are considered:

1. A reduction in 'repeat' victims of theft from the person and robbery is predominantly responsible for the overarching decline in these crimes;
2. The theft of new electronic goods, for example, mobile phones, MP3 players and cameras, has increased over the period of study whilst the theft of more 'traditional' items (e.g. cash) has seen a decline;

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3. Theft from the person and robbery victims largely comprise young (16-24 years old), single males with high incomes who more frequently engage in night-time activities away from the home;

4. The likelihood of an attempted theft from the person and robbery victimisation is decreased during the evening and at weekends. In general, these crimes also centre around commercial areas and places of entertainment in urban areas; and

5. Changes in target suitability hold the greatest explanatory power in relation to the nature and composition of theft from the person and robbery trends over time.

In testing these hypotheses and identifying determinants of these crime types over time, it is hoped this research can assist in further reducing crime and the number of victims. The Home Office estimates the average cost of a robbery is £7,282 (cited in Mailley *et al*., 2008; Cohen *et al*., 2004). In addition, there are a number of wider psychological harms that can result from such an invasion of personal space, particularly when they include threats made to your life (Gale and Coupe, 2005). Therefore the potential utility of developing a comprehensive picture of theft from the person and robbery victimisation to inform cost-effective crime prevention strategy should not be underestimated. This research fills a current gap in victimisation risk research, namely the application of established statistical techniques to explore theft from the person and robbery victimisation in England and Wales over a 17-year-period. In addition, it is hoped the thesis makes a contribution to the development of theory, particularly in its application to the crime drop.

1.5 Overview of the Argument
It is suggested, with regard to theft from the person and robbery, that the overarching trend is likely to be composed of two underlying trends: one which mirrors the more general decreases in crime, and one which reflects increased theft due to the greater availability of new, valuable and portable electronic goods that are attractive to thieves, including mobile phones, laptops and MP3 players. This has been referred to by some as 'an iCrime wave' (Roman and Chalfin, 2007). The BCS recorded a 190 per cent increase in the number of mobile phones stolen in 2000 when compared with 1995 (although an element of this may be a reflection of the increase in mobile phone ownership, it is still a significant increase) (Harrington and Mayhew, 2001; Curran *et*

al., 2005). This may also account for why there has been a much shallower decline in theft from the person and robbery relative to other crime types.

In addition to the increased availability of technology and its potential impact on subsequent crime rates, the author hypothesises that victims of theft from the person and robbery are likely to be predominantly young (16-24), single, professional males with high incomes who more frequently engage in night-time activities away from the home. It is contended that these are also the individuals who are most likely to own said new technology (Ofcom, 2013). It is proposed that these victim characteristics have remained relatively consistent over time and, in agreement with the patterns witnessed for other crime types, the overall drop in theft victimisation comprises a reduction in repeat victims rather than 'one-off' victims. It is argued that a large proportion of theft from the person and robbery victimisations occur during the evening and weekends in commercial urban areas, particularly near places of entertainment. These hypotheses are formulated after drawing upon victimisation risk and stolen goods literature in relation to these crime types (see Chapters 2 and 3).

With regard to the crime drop, the security hypothesis suggests that "...change in the quantity and quality of security was a key driver of the crime drop" (Farrell *et al.*, 2010: 1). It is suggested that security is a much easier concept to apply, and indeed measure, in relation to vehicles and households. The proliferation of vehicle security devices over the last 15 years clearly coincides with the drop in vehicle-related crime (Farrell *et al.*, 2009; van Dijk *et al.*, 2007). With regards to theft from the person and robbery, it is hypothesised that security has played less of a fundamental role, with target suitability, repeat victimisation, 'debut' and 'keystone crime' hypotheses exhibiting greater explanatory power for the falls in these crime types. The availability of suitable targets, in the form of lightweight electronic goods, is proposed to form a key component of changes in the overarching trend of theft from the person and robbery (van Dijk *et al.*, 2007).

It is hoped the thesis provides a platform for crime drop theorists. Such theories should be sufficiently advanced to account for and explain key dynamics identified throughout the course of this work. This is not an easy task, with crime rates described as "...expressions of the aggregate outcome of a multitude of individual

transactions between populations of offenders and victims" (Hope, 2007a: 113; van Dijk, 1994). Breaking down theft from the person and robbery victimisation into three constituent parts (stolen goods, victim characteristics and incident characteristics) would make this task more manageable and ultimately better informed.

1.6 Original Contribution to Knowledge

This research provides a number of recognisable contributions to the field of victimisation risk and crime drop research. As a whole, this work constitutes (to the author's knowledge) the most in-depth analysis of theft from the person and robbery over time in England and Wales than any previously available. The main contributions can be summarised as follows:

1. Fourteen sweeps of the BCS have been employed which presents a thorough and comprehensive 17-year period of analysis covering the 'crime drop';
2. Long-term analysis (1993-2010/11) of the goods stolen through these crime types has been conducted. In addition, findings are presented by six-month periods so as to be directly comparable with market data;
3. Theft and robbery *incidence* is modelled across sweeps as opposed to more traditional methods which model victimisation *risk*. Statistical modelling, in the form of negative binomial regression, has been utilised to this end;
4. Both victimisation risk factors and incident characteristics associated with theft from the person and robbery have been explored over a 17-year-period; and
5. The distinction between 'completed' and 'attempted' crimes has been retained which constitutes a development of much previous research.

Taken collectively, these contributions to knowledge offer a comprehensive picture of theft from the person and robbery victimisation in England and Wales over time. Ultimately, this work can be used both to inform future cost-effective allocation of crime prevention resources and provide a platform for further work by crime drop theorists. It builds upon previous groundbreaking empirical research which has generally examined theft or robbery as part of a larger group of offences, utilised data over a shorter time period or where it is confined to a specific locality.

In identifying lessons from the past, future strategy can be shaped. Specifically, in relation to stolen goods, trigger points in the data could be ascertained and potential 'hot products' identified. This may assist practitioners in establishing effective crime prevention strategies to stem potential or actual crime harvests of a new or existing product. It may also provide a fresh impetus in the promotion of corporate social responsibility in 'designing-out' crime from new products. For these reasons, it is felt the thesis has substantial scope and far-reaching implications for practitioners, industry and the wider public.

"The risk of becoming a victim of BCS crime has…fallen from 39.7 per cent in 1995 to 21.5 per cent in 2009/10, representing 6.5 million fewer victims" (Flatley *et al.*, 2010: 21). This rather poignant statistic provides a strong argument regarding the need for such research. Not only is it important to continue to reduce the number of victims of crime, but it is equally imperative to establish exactly what works in order to implement the most cost-effective crime reduction policy and practice. In search of this aim, the research utilises previous empirical findings and evidence from the BCS to evaluate past research and hypotheses and drive the development of new theory.

1.7 Structure of the Thesis

The thesis is comprised of ten chapters. The next two chapters provide a review of the literature divided into two parts – the first addresses victimisation risk where the second examines literature relating to the stolen goods market. Both discuss the relevant theoretical arguments and present existing empirical evidence focusing predominantly on studies relating to theft and robbery. Chapter 4 provides an overview of the data used and methodology employed. The advantages and disadvantages of using survey data are discussed.

The thesis then moves to a discussion of the analysis that makes this study original. Chapter 5 presents a detailed overview of the distribution of theft from the person and robbery offences from 1994 to 2010/11. This is followed by findings relating to goods stolen through theft from the person and robbery over time. Chapter 7 reports the results from victim characteristics analysis, followed by Chapter 8 which focuses upon characteristics of the incident. The remainder of the thesis considers potential crime prevention policy implications, theoretical contributions and recommendations for future research. A concluding chapter summarises the main findings.

Chapter 2: Literature Review 1 – Victimisation Risk

2.1 Objective and Outline

In order to build a more comprehensive picture of theft from the person and robbery over time it is necessary to draw upon an influential body of previous victimisation research. The main objective of this chapter is to explore the key theories around which victimisation risk factors and explanations for fluctuations in crime are most often based. Discussion will focus upon elements relating directly to crime drop research or theft from the person and robbery. Readers are directed to the original sources (Shaw and McKay, 1942; Cohen and Felson, 1979; Hindelang *et al.*, 1978; Cornish and Clarke, 1986; Brantingham and Brantingham, 1993) if they wish to gain a more thorough understanding of particular theoretical intricacies.

The chapter begins with discussion of the theoretical foundation of the research followed by a review of the dominant perspectives and hypotheses relating to the crime drop. From this, previous empirical findings regarding the risk of theft and robbery victimisation will be discussed and their limitations acknowledged. Finally, this research is situated within the context of previous work and a gap in criminological knowledge proposed.

2.2 Opportunity Theory

This section begins by outlining a set of well-established, oft-cited theories of victimisation. Opportunity-related theory generally begins on the premise of a dispersion of activities away from family and household settings that, in turn, leads to the increased convergence of offenders and targets, resulting in an apparently higher risk of victimisation (Cohen and Felson, 1979). Such theoretical insights have proven popular as a result of their apparent success in explaining the rise in burglary in both the United States and Western Europe in the 1960s. It is proposed that opportunity is a key component in the commission of crime; in fact, "opportunity makes the thief" (Felson and Clarke, 1998). A number of recent studies have utilised opportunity theory, particularly routine activity theory (Cohen & Felson, 1979; Felson, 2002), rational choice theory (Cornish and Clarke, 1986) and/or environmental criminology (Brantingham and Brantingham, 1993) as a sound theoretical foundation to explore the crime drop (van Dijk *et al.*, 2007; Farrell *et al.*, 2011a; van Dijk *et al*, 2012). Although this group of theories differ in their emphasis and employed terminology

they share certain assumptions regarding victimisation risk factors (Miethe and Meier, 1990).

Routine activity theory (Cohen and Felson, 1979; Felson, 2002) offers an overarching theory of the occurrence of crime. It situates a motivated offender within the context of an environment in which capable guardians are absent and a suitable target is present. The convergence of these three elements in time and space results in crime. The availability of suitable targets may therefore be a key driver of crime trends (van Dijk *et al.*, 2007) particularly in relation to lightweight electronic goods. Target suitability is comprised of two parts: the *accessibility* of an item or person and its material or symbolic *desirability* to an offender (Cohen *et al.*, 1981). Both elements are discussed in more detail in Chapter 3 in relation to stolen goods markets. These theoretical constructs will apply differently depending upon the crime type studied; what constitutes a 'desirable' target will differ across crime types, as will the motivations to commit them (Miethe *et al.*, 1987; Bennett, 1991). Theft and robbery are acquisitive crimes committed, on the whole, for financial gain (Jacobs and Wright, 1999; Gill, 2000; Brookman *et al.*, 2007; Miller, 1998) hence target suitability should be an important factor for predicting victimisation risk. This is in contrast to crimes such as domestic assault which are likely to be motivated by entirely different factors. With theft and robbery, it is assumed offenders adopt a 'rational choice' approach to their target selection whereby they seek situations in which returns are maximised and risks kept to a minimum (Cornish and Clarke, 1986).

The convergence of these three elements are said to be influenced by daily vocational and leisure activities, or more broadly one's 'lifestyle' (Cohen *et al.*, 1981). Hindelang *et al.*'s (1978) 'lifestyle/exposure' model made an early attempt to explain differential risks of personal victimisation. Differences in lifestyles result from a combination of role expectations (cultural norms), structural constraints and sub-cultural adaptations (ibid). These combine to produce varying exposure to risk of personal theft victimisation. A shift away from home-centred activities in the late 1960s is proposed to have increased the frequency of convergence of the three elements of crime. Such theories are not without their criticisms, particularly when practically applied to the empirical study of victimisation risk. These issues are explored in more detail in Section 2.6.

The criminological theories outlined thus far focus predominantly upon the characteristics and actions of particular individuals, often more readily referred to as micro-level factors. In contrast, macro-sociological theories of criminality largely focus upon the context within which such individual actions occur. Social disorganisation theory suggests a combination of three structural factors, namely residential mobility, ethnic heterogeneity and low economic status results in high levels of crime and delinquency within an area (Shaw and McKay, 1942). Changes in the composition of the community, limited interaction and communication difficulties combined with a lack of emotional investment, mean that residents of a community are unable to establish common values, defend local interests and maintain control of the area in which they live (Kornhauser, 1978; Meier and Miethe, 1993).

A perspective which combines both micro- and macro-level theories of crime is environmental criminology. This approach argues that criminal events must be understood as an amalgamation of elements – victim, offender and the immediate circumstances in which the incident occurs (Brantingham and Brantingham, 1991; Wortley and Mazerolle, 2008). This is driven by the belief that criminal behaviour is heavily influenced by environmental factors. Incidents are said to be concentrated around crime opportunities and other environmental features that facilitate criminal activity. Thus generating an understanding of crime patterns and the criminogenic attributes of these environments is vital. Previous empirical research has underlined the importance of both micro- and macro-level factors in relation to theft and robbery victimisation (Sampson and Wooldredge, 1987; Miethe and McDowall, 1993; Groff, 2007) and there have been various calls for a more integrated perspective (Reiss, 1986; Meier and Miethe, 1993; Rice and Smith, 2002).

The key theoretical perspectives that underpin this research are opportunity-related theory, social disorganisation theory and the environmental perspective. The primary justification for their utilisation lies in the strength of their explanatory power in relation to rises in crime in the 1960s. They also provide a foundation upon which to directly test and compare previous empirical findings.

2.3 Perspectives on the Crime Drop
So far, this chapter has explored theories of victimisation which have dominated the criminological literature. The overarching aim of the thesis is to explore trends in

theft from the person and robbery between 1994 and 2010/11. In order to build a more comprehensive picture, it is important we situate specific offence trends within the wider context of falling crime in this period. A growing number of comprehensive analyses of cross-national crime trends serve to substantiate the existence of large falls in crime across many industrialised countries (Tonry and Farrington, 2005; van Dijk *et al.*, 2005; Tseloni *et al.*, 2010; van Dijk and Tseloni, 2012). Many existing theories as to why this might have occurred fail to account for the fact that country-specific issues, government policies or legislative changes are not directly comparable (in either timing or extent) across countries experiencing very similar trends in crime (albeit with some exceptions) (van Dijk *et al.*, 2005; Zimring, 2007). Although such changes may have had an impact on levels of crime, they are unlikely to be key drivers. So whilst some theories fail to adequately account for this strikingly similar *universal* drop, namely increasing prison populations (Langan and Farrington, 1998); methods of policing (Levitt, 2004); the legalisation of abortion (Levitt and Dubner, 2005); and gun control policies (Duggan, 2001), others fail what Farrell *et al.* (2010: 34) term the 'phone test'. This asks "whether a hypothesis can account for increased theft of phone handsets…and other expensive electronic goods…which occurred within the context of overall falling crime rates". Although each of these existing theories deserve some merit in their own right and present interesting perspectives, few of these 'single-factor explanations' can be relied upon with certainty and utilised for policy purposes. The formulation of a 'general theory' of crime may be too ambitious an aim but as Tittle (1995, cited in Wikström, 2010: 213) states:

> No simple theory in the crime/deviance area…has proven to be more than minimally satisfactory in overall explanatory ability, in applicability to a wide range of deviance, or in empirical support for its tenets. All are plausible, yet they fail as general theories.

There remains a need to evaluate the legitimacy of previous research in the pursuit of externally valid and reliable hypotheses in relation to the crime drop. Such questioning is healthy for Criminology and ensures fresh ideas and knowledge are continuously fostered. In such a pursuit, Farrell (2013) outlines a number of existing hypotheses and evaluates them using five tests for a theory of the crime drop. Nearly all of the hypotheses presented fail at least one of the five tests, and are generally

judged as lacking external validity and a clear evidence base. Many focus heavily upon changes in the number of motivated offenders and do not account for varying offence trajectories across countries and crime types. It is not the intention to scrutinise all previous hypotheses here, as it is felt this would only provide a much less competent repetition of this previous work. However, those elements deemed particularly relevant to trends in theft and robbery of personal property and target suitability will be discussed. Focus will be upon hypotheses viewed as holding the most promise in terms of their explanatory power, namely economic explanations, the security hypothesis, debut criminality and emerging crime forms.

2.3.1 Economic Explanations

Economic explanations have gained relatively strong momentum with regard to theories of the crime drop (Field, 1990; 1999; Hale, 1998; Arvanites and Defina, 2006; Rosenfeld, 2009; Rosenfeld and Messner, 2009). In relation to theft and robbery, this is perhaps not surprising due to the predominantly financial motive behind much acquisitive crime (Jacobs and Wright, 1999). These explanations differ from many others in that similar fluctuations in the economy happened across Western countries at roughly the same time – thus passing the cross-transferability test.

Much economic theory rests on the principle that adversity drives crime by increasing the motivation to offend. By the same token, strong economies lead to less crime by reducing levels of criminal motivation (Arvanites and Defina, 2006). Historically, acquisitive crime is said to increase in periods of recession (Field, 1990; Sutton, 2004; Rosenfeld, 2009); although this contention has not been entirely borne out in the past (and, as far as we can tell, during the recent recession). After the Second World War households in most Western countries experienced huge increases in their disposable income. This was coupled with upturns in the economy and, contrary to expectation, a steep rise in crime between 1950 and 1980 (Lagrange, 2003). This does not lend support to the theory that economic adversity leads to increases in crime but instead suggests that increased opportunities to commit crime may have played a more pivotal role. Cohen and Felson (1979) attribute this rise in crime to a transformation of routine activities and lifestyles, both in terms of frequency and type of activities conducted away from the home. The number of suitable targets for theft was said to have increased (Clarke and Newman, 2006) and crime opportunities followed. Rosenfeld and Fornago's (2007) research finds strong

associations between measures of 'consumer sentiment' and robbery and property crime in the USA. Changes in personal consumption and the availability of targets are thus suggested as key to explaining fluctuations in levels of property crime (Hale, 1998), influenced by demand on the stolen goods market.

Western economies have, on the whole, grown as steadily between 1995 and 2010 as they did between 1950 and 1995. If economic growth drove levels of crime up after World War II, it is difficult to ascertain how the same principle can apply to falls in crime post-1990. Here lies one issue with economy-based theories of the crime drop: "Economic growth cannot credibly be construed as the tidal force of crime, driving it up in one period and pulling it down in another" (van Dijk *et al*., 2012: 310; van Dijk, 1994). The diminishing number of opportunities for crime in periods of recession combined with an apparently increased motivation to commit offences therefore appears to be at odds with each other (Cantor and Land, 1985).

The impact of the economy on crime levels is therefore rather unclear and, as yet, unexplained. Relationships between a number of economic indicators and crime have been found to be relatively inconsistent (van Dijk and Mayhew, 1992; Levitt, 2004). Figures 2.1 and 2.2 show two economic measures plotted against the risk of theft from the person and robbery between 1994 and 2010/11. Inflation is the rate of increase in prices for goods and services (expressed as a percentage). From first glance, inflation levels in the UK do not appear to have had an influence on the risk of theft and robbery victimisation. By contrast, the level of unemployment in the UK seems, until recently, to have declined at a similar rate to victimisation risk, although unemployment levels have not proved particularly reliable indicators in previous empirical research (Rosenfeld, 2009). The debate regarding the economy and crime is therefore likely to continue but won't be directly examined further in this work.

Figure 2.1: UK Rate of Inflation and Theft from the Person and Robbery Risk (1994-2010/11) (Source of Inflation Data: www.measuringworth.com)
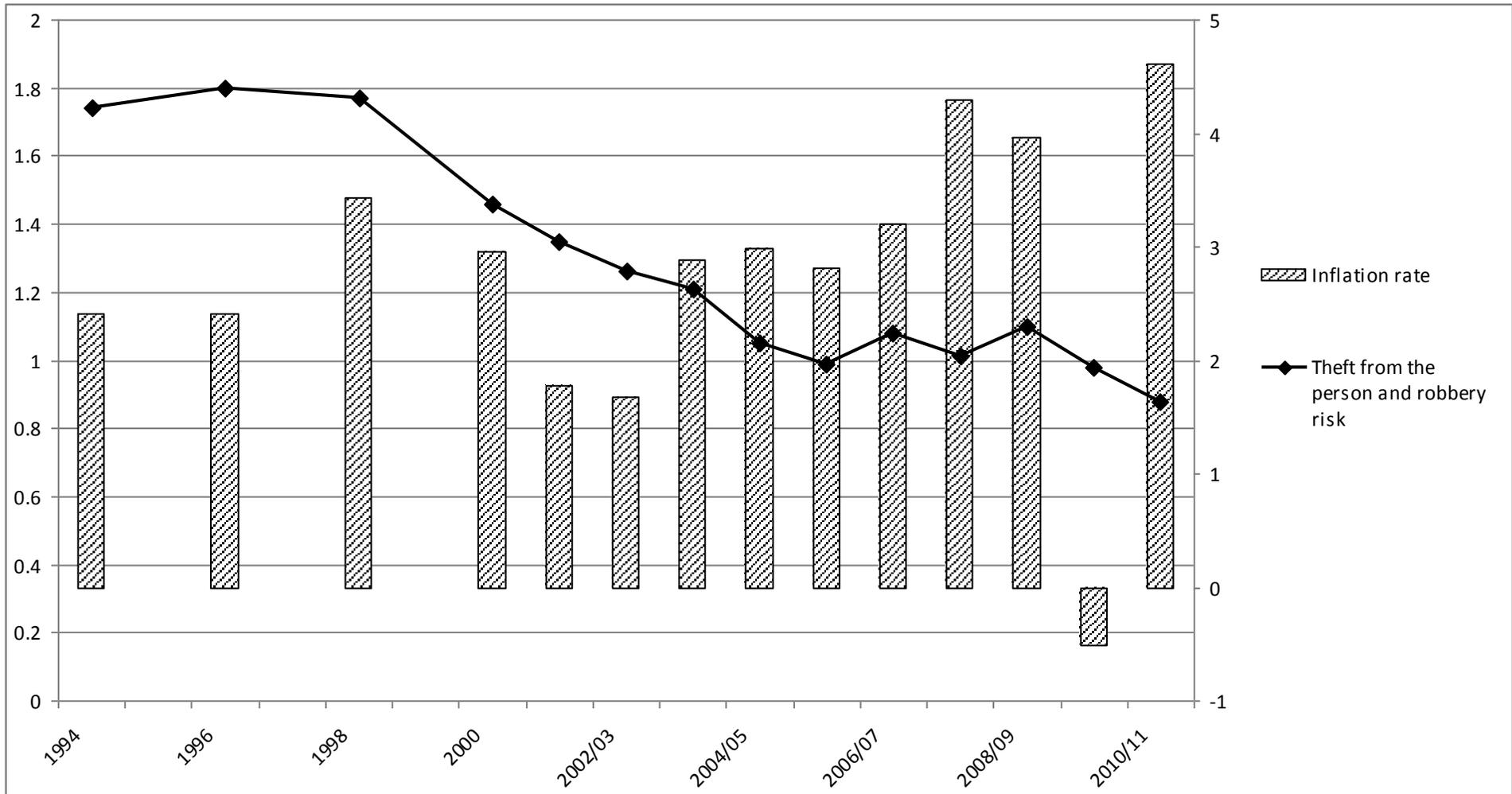
Figure 2.2: UK Rate of Unemployment and Theft from the Person and Robbery Risk (1994-2010/11) (Source of Unemployment Data: Office for National Statistics, 2013a)
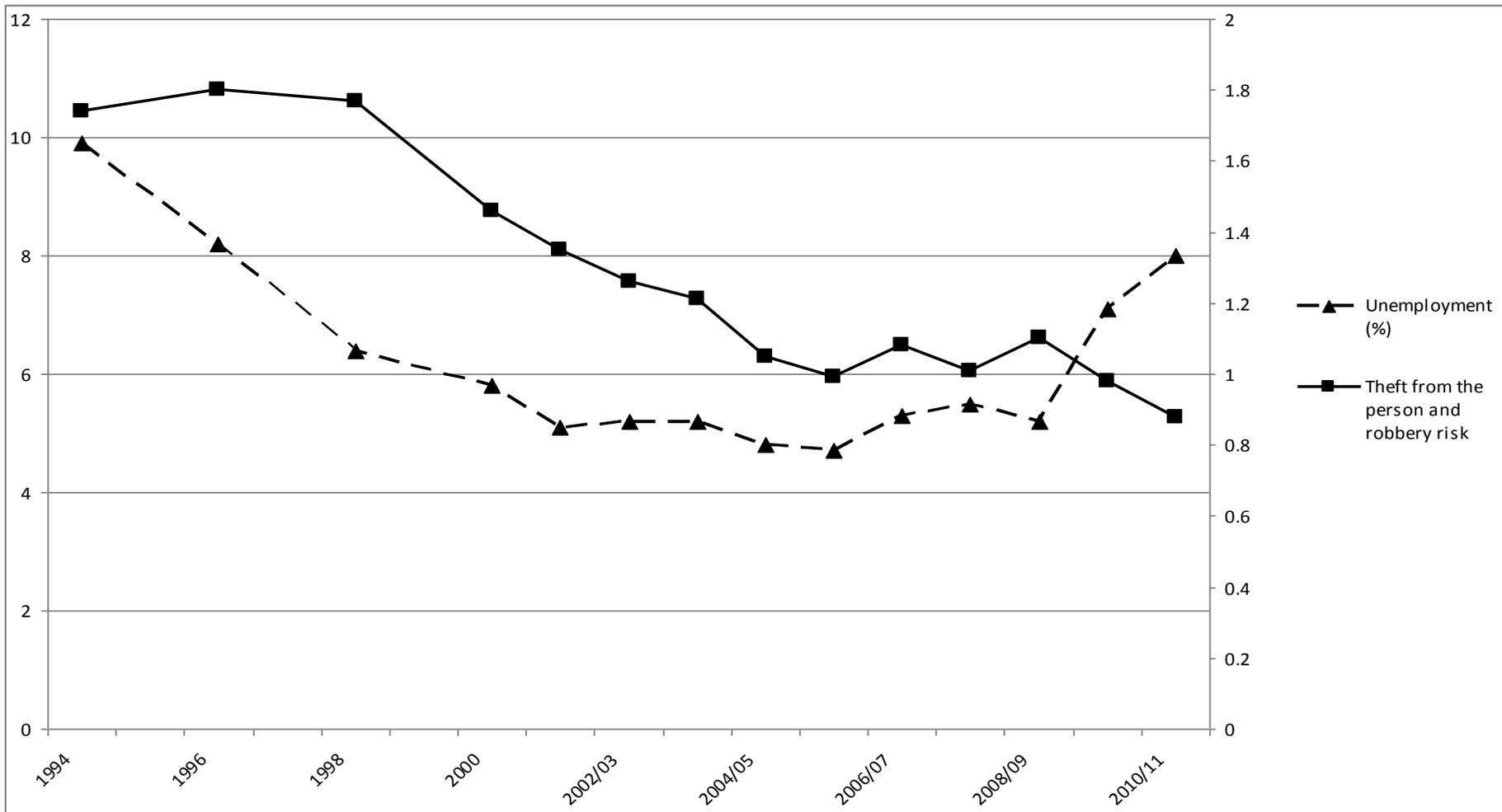
2.3.2 Security Hypothesis

If it is possible to apply the notion that an increase in activity away from the home leads to an increase in the risk of victimisation, the question must be posed as to how this can apply to a drop in crime. Farrell and colleagues suggest that the response to the threat of victimisation may have altered. In order to explore this assumption, the role of security in vehicle crime and residential burglary has been tested relatively comprehensively and its impact appears to be sizeable (Farrell *et al*. 2008; 2010; 2011a; 2011b; Tseloni et al. 2010). The availability of both vehicle and household security (particularly electronic immobilisers and central locking in relation to vehicles and window locks and double locks for households) has increased substantially over the period of the crime drop (Farrell *et al.*, 2010; Fujita and Maxfield, 2012; Britton *et al.*, 2012; Tseloni *et al.*, *under review*). In addition, analysis of the BCS shows households with 'enhanced security' measures have a much lower likelihood of burglary victimisation than those with only 'basic security' (Flatley *et al.*, 2010). This has resulted in the formulation of the 'security hypothesis' which states that "...change in the quantity and quality of security was a key driver of the crime drop" (Farrell *et al.*, 2008: 1).

The application of the security hypothesis to theft from the person and robbery may not be quite so straightforward. One would hypothesise the availability and use of personal security measures (in terms of physical devices) is not as commonplace and, in general, these devices are less routinely employed. Personal security often focuses upon making changes to routine or behaviour, such as avoiding a particular area or not walking alone when it is dark. This lack of attention to personal security is reinforced by the fact that the availability of both vehicle and household security devices has been measured consistently by the BCS since the early 1990s. Analysis of the availability and effectiveness of such devices has also been the focus of a number of BCS reports and journal articles. By contrast, personal security device use only appears to be asked on an ad-hoc basis and their effectiveness is largely untested empirically. This unfortunately means analysis of the role of personal security devices in theft from the person and robbery victimisation cannot be comprehensively studied over time.

If we look at the wider societal context, there has been an unprecedented increase in the use of private security (van Steden and Sarre, 2007; van Dijk et al., 2012).

Advancing technology has led to the widespread introduction of security in 'everyday' environments (Clarke and Newman, 2006) such as entertainment venues and shopping centres. Hence:

> Although the contribution of security to the crime drops is still unproven, its universality and pervasiveness across Western countries, and thereby its potential impact, cannot be in doubt (van Dijk et al., 2012: 312).

Theft and robbery happen predominantly 'on the street'. We may therefore assume that such widespread changes in the pervasiveness of security 'on the street' would have an impact on victimisation, although again this cannot be directly tested here.

The increased securitisation of particular consumer goods may have also played some role in falls in the rate of theft and robbery victimisation. This will be explored to some extent when analysing which items have been stolen over the period of the crime drop (see Chapter 6). In sum, the role of an increasingly securitised environment and application of security measures to consumer goods are deemed as important *contributors* to overall levels of theft from the person and robbery over time, but not key drivers. The question of just how rigorously the security hypothesis can be applied to explain declines in crimes where the application of security is less clear cut is therefore raised. To address this criticism, Farrell and colleagues suggest household and vehicle security may have exerted their influence on other crime types predominantly by reducing the number of opportunities to offend and stifling the length of criminal careers. This contention is formalised in the 'debut' and 'keystone' crime hypotheses (Farrell *et al.*, 2011a).

2.3.3 'Debut' and 'Keystone' Crimes

The security hypothesis is intended as a general hypothesis situated within a routine activity framework. This theory is composed of a number of other interlocking hypotheses – namely 'debut' and 'keystone' crime – as a means of applying these theories to crimes where the impact of changes in the quantity and quality of security over the period of the crime drop is less clear cut. The debut crime hypothesis suggests that vehicle crime and burglary offences may be predictive of a future career in offending. Svensson (2002) refers to these as 'strategic offences' and believes they provide the potential to identify individuals 'at risk' of further offending. His research suggests vehicle theft, non-vehicle theft and robbery are "predictive of a long and

serious subsequent career in delinquency" (ibid: 395). The debut crime hypothesis states that increases in household and vehicle security reduce the ease with which criminals can commit these particular crimes which leads to a diversion from the criminal career path (Farrell *et al.*, 2011b).

Vehicle theft is identified as a 'keystone crime' in that it may facilitate further crime, for example the transportation of stolen goods, enabling an offender to escape from a crime scene quickly and facilitating meetings with other criminals. A reduction in vehicle theft and hence the opportunity and ease with which they can commit other crimes is hypothesised as being one of the mechanisms for the drop in crime.

By the same token, increases in vehicle security, and thus reduced opportunities to commit this crime, may have led to a higher concentration of offenders concentrating upon non-vehicle theft and robbery offences. As continued 'strategic offences', combined with a seeming increase in the number of suitable targets (as a result of the proliferation of lightweight electronic goods) this may explain the shallower drop in theft and robbery over time when compared to other crime types. In other words, falls in vehicle-related crime and household burglary may have influenced an offender's offence of choice and ultimately the path and duration of their criminal career (Svensson, 2002; Sutton, 2008; 2010). Such a hypothesis is difficult to test, although interviews with convicted offenders have proved a fruitful line of enquiry in establishing motives and offence decisions (Miller, 1998; Wright *et al.*, 2006; Brookman *et al.*, 2007).

2.3.4 Emerging Crime Forms

There is a distinct possibility that overarching crime trends may be slightly misleading in that they mask underlying changes in the type of crime being committed. The fall in crime (as documented in statistics) may not be an accurate reflection of actual events. The focus of most readily available crime statistics remains upon crimes such as theft, burglary and violence to name but a few. Thus an increase in the number of offenders committing for example, cybercrime offences, may not be readily encapsulated by official statistics. As a relatively 'new' crime, and one that has not been robustly documented, it is also nigh on impossible to establish trends. Victims may also be insufficiently aware of what constitutes a cybercrime and thus not report it. However, cybercrime poses a real and evident threat, demonstrated by its identification in the UK as a national security priority. The estimated cost to the UK

economy from cybercrime is approximately £27billion per year (Detica, 2011) (although this estimate has been heavily criticised). In July 2013, the UK government invested an extra £650 million into tackling cybercrimes.

It may be that variations *within* particular crime types are taking place. Roman and Chalfin (2007) propose the existence of an American 'iCrime wave' due to a rise in violent offending to obtain iPods and other similar desirable electronic devices. Although the report they produce is largely speculative, their musings may hold some weight and warrant further exploration. With UK consumers identified as "early adopters of new technologies" (Ofcom, 2010) and with an inexorable growth in technology, the impact of particular products on theft and robbery trends should not be underestimated. The manufacture of new, inexpensive, increasingly lightweight products has transformed the consumer goods market (Felson, 2012). To take mobile phones as an example: in the UK, the proportion of adults who now own/use a mobile phone stands at 92 per cent, with over half of all adults (51 per cent) owning a Smartphone (Ofcom, 2013). Ownership of a Smartphone device has doubled over the past two years (with 27 per cent of adults owning one in 2011). With such a large population of mobile phone owners in the UK, and with this figure showing no signs of abating, the impact of theft and the threat of harm are spread rather widely. Farrell (2013) emphasises that a theory of the crime drop must be sufficiently nuanced to take account of increases in certain crime types or products alongside decreases in others. A lack of analysis of long-term trends in the type of product stolen may be masking changes in target selection.

With regard to the crime drop, it is felt that the basic premises of opportunity-related theory apply to theft from the person and robbery in that the number and frequency of criminal opportunities have altered, driven by changes in the availability and demand for particular consumer goods. In this sense, target suitability (in terms of accessibility and desirability) and 'debut' and 'keystone' crime hypotheses are proposed to have had a more direct impact upon a crime type where the application of security (to the target – in this instance a person) is somewhat 'less obvious' than that found for vehicles and households.

2.4 What Next for Crime Prevention Practice and Theory?
Over the past 17 years, there appear to have been major changes in the composition of targets of theft from the person and robbery; largely a result of new technology,

particularly mobile phones. Felson (2012) suggests we are in the midst of a transformation of organisational and electronic change where security has become inbuilt and crime and resources are managed much more effectively using evidence and mapping technology. This transformation is apparently "...marked by inconsistency in crime increases, decreases and composition" (ibid: 283). Ultimately, and importantly for this research:

> To understand these historic shifts, we must pay close attention to technology and the organised human means for using it, as well as how human populations zig and zag in their quest for prosperity and security alike (ibid: 284).

The ability of Criminology as a discipline to adapt and seek to understand these shifts means the subject must embrace other disciplines and harness technological advances in the prevention of crime. Advances should be made toward a more practical and applied stance (Clarke, 2004). Indeed, although it may be difficult in practice, efforts should be fixed upon changing "...the default to be secure, unobtrusive and liberating" (Farrell, 2010: 45).

Following this practical approach, it is argued by some that the most effective method of intervention in crime is "...at the point of crime itself, not at the point of hypothesized causal (and usually dispositional) factors such as family background and social class" (Newman, 1997: 5). The offender is seen to make a judgment about the potential costs and benefits of committing the particular crime. Thus, situational crime prevention is seen to play an active part in the "near causes" (Tilley, 2009: 109) decision-making process, attempting to reduce "...the propensity of the physical environment to support criminal behaviour" (Crowe 1991: 29). This particular approach to preventing crime has been well suited for use in reducing theft from the person in a public transport context (Barker *et al.*, 1993) where large numbers of strangers come into close contact with each other across a wide variety of settings (Clarke and Mayhew, 1980; Webb and Laycock, 1992; Smith and Cornish, 2006). With this in mind, Cornish and Clarke (2003) provide a list of 25 techniques of situational crime prevention which endeavour to alter the "person-situation interaction" (Cornish, 1993) in such a way that renders the criminal activity less likely. In increasing the effort and risk, reducing rewards and provocations, and removing

excuses a motivated offender may think twice about committing a crime. These measures have been shown to offer an effective, user-friendly framework in the tangible management of specific crime-types (Clarke, 1997). Therefore, it is proposed that these methods should remain a key tool in future crime prevention policy.

2.5 Previous Empirical Research

This period of organisational and technological change highlights the importance of studying the characteristics of victims over time. Variables relating to individual- and community-level characteristics and opportunity theory have been explored in relation to theft from the person and robbery and a number of recurrent themes emerge. Age, sex, marital status, employment, community-level variables and frequency of activity outside the home have been found to significantly predict victimisation across a number of studies and datasets and it is the intention to discuss the general findings here.

In terms of individual-level predictors, Gottfredson's (1984) findings that sex, age and marital status are strong predictors of personal theft/robbery victimisation can be seen as relatively indicative of a number of studies that followed (Miethe *et al.*, 1987; Kennedy and Forde, 1990; Wittebrood and Nieuwbeerta, 2000; Tseloni, 2000; Messner *et al.*, 2007). Cohen and Cantor (1980) found persons aged 16-29 face an increased risk of personal theft. Kennedy and Forde (1990) and Sampson and Wooldredge (1987) both document heightened vulnerability for young, unmarried males. Sampson and Wooldredge (1987) utilised logistic regression in modelling personal (theft with and without contact) and household (burglary and household theft) victimisation in the 1982 BCS. Marital status, sex and age were the strongest predictors of personal theft with contact. In addition, they found personal theft to be positively related to community family disruption and 'street activity' (defined as the rate at which residents go out at night on foot). Their results support a multilevel opportunity model of theft/robbery victimisation, in that "...an individual *or* community model in isolation is insufficient to explain patterns of victimization" (Sampson and Wooldredge, 1987: 391).

With an integrated approach in mind a number of studies have highlighted, in addition to individual-level predictors, the importance of routine activities in relation to crime**.** "Personal crime is contingent on the exposure that comes from following certain life-styles" (Kennedy and Forde, 1990: 137). For example, the characteristics

of your employment can influence the type of lifestyle you have and activities you engage in (Lynch, 1987), as well as the location and time of day you frequent particular places. Such defining properties constrain and shape the activities individuals perform on a day-to-day basis. Arnold *et al.*'s (2005) research suggests an individual's routine activities are the strongest predictors of victimisation, after age and sex, with 29 per cent of thefts of personal property attributed to evening leisure activities. This reflects findings from previous research conducted by Miethe *et al.* (1987) who found those engaging in more night-time activities possess a greater likelihood of becoming a victim of this crime type. A number of studies have specified particular night-time activities as holding stronger predictive capabilities, namely visiting a bar, going out for a meal, and going for a walk or drive (Kennedy and Forde, 1990; Mustaine and Tewksbury, 1998; Messner *et al.*, 2007). Incidents of theft and robbery are often concentrated in busy central commercial areas – where there is a high concentration of entertainment premises, for example bars and restaurants (Harrington and Mayhew, 2001; Linnell, 1988; Jochelson, 1997). Jochelson (1997) found in 25 per cent of robbery incidents victims had consumed alcohol prior to victimisation.

The influence of economic and employment status on the likelihood of becoming a victim of crime has been well-documented (Block *et al.*, 1984; Lynch, 1987). Cohen *et al.* (1981) and Maxfield (1987), when analysing personal theft victimisation, found the unemployed and those in full-time education were at increased risk of victimisation. In a more recent study of 27 countries, van Wilsem (2004) found theft victimisation rates to be higher among countries with high levels of income inequality. This cross-national approach is particularly useful in that it allows useful comparisons to be made across countries and reinforces the strength of particular findings.

Community-level variables have also been found to influence the risk of victimisation. Sampson (1985) documented the prediction capability of neighbourhood factors on robbery and theft victimisation. He concluded that structural density, residential mobility, and female-headed families have a strong positive influence on rates of victimisation. This research employs a number of structural constructs framed within the theory of social disorganisation. In a similar vein, Rountree *et al.* (1994) reported

that the presence of neighbourhood incivilities, population density, and ethnic heterogeneity in a neighbourhood dramatically impacts upon subsequent risk.

The importance of area context is emphasised by Lauritsen (2001) who reported the predictive capability of individual-level factors were influenced by a number of macro-level conditions. The risk associated with sex was found to be conditional upon whether the event occurred within a city, where men experienced higher levels of victimisation, or within the individual's neighbourhood, where women were just as likely to be victimised. Similar findings were documented by Sacco *et al.* (1993) who found differences in individual-level predictors between urban and rural settings. In rural areas, being male, single or separated and spending longer outside the home were associated with higher levels of victimisation. Miethe and McDowall (1993) also report individuals living in poorer areas have greater risks of both violent and property victimisation than their more affluent counterparts.

These studies serve to emphasise the relative importance of an integrated micro- and macro-level approach to the explanation of crime. These findings have implications for crime trends research in that they largely confirm that individual attributes, increased activity away from the home, and certain community-level characteristics are significant predictors of the theft or robbery of personal property. The challenge arises in ascertaining whether such a model can be applied to explain long-term trends for this particular crime type.

2.6 Limitations of Previous Studies

There are three main criticisms often levelled at previous victimisation research of this kind. Firstly, that much of this work is focused upon an aggregate measure of 'crime' or groupings of offences which are not comparable across studies. Issues can therefore arise in terms of the differing operationalisation of crime categories leading to inaccuracies in comparisons across studies (see Section 1.2) (Lauritsen, 2001; Stein, 2010). Secondly, that there is inconsistent or incomplete operationalisation of the main theoretical concepts of opportunity-related theory and an over-reliance on indirect measures, such as demographic characteristics. This can lead to individual differences being retrospectively attributed as support for theory (Garofalo, 1987; Miethe *et al.*, 1987). Finally, that much previous research has focused upon modelling risk rather than the full distribution of crime.

With regard to the operationalisation of opportunity-related concepts, specifically the exact nature of leisure-time activities, it is important to exercise caution when relying upon secondary data sets and their lifestyle and contextual measures which may lack sufficient detail (Lynch, 1987; Mustaine and Tewksbury, 1998). This lack of detail means measures of actual routines or target suitability are often substituted with variables measuring demographic characteristics supposedly representative of lifestyles (Stein, 2010). Demographic variables are seen to be "...associated with differences in expectations, constraints, opportunities, and preferences which influence the types of activities in which people engage" (Cohen and Cantor, 1980: 146). Miethe *et al.* (1987: 193) are critical of this over-reliance upon 'inadequate' measures of key concepts and posit opportunity-related approaches are largely "...unfalsifiable since the social distribution of victimization can easily be construed as consistent with at least one component of the theories". As Bursik and Grasmick note: "it has been notoriously difficult to collect reliable and valid indicators of its central components" (1993: 77). It is clear there is a need for greater specificity in victimisation research in that more detailed measures of routine activities could lead to a fuller understanding of the link between lifestyle and victimisation risk.

With regard to this thesis, the data required to adequately and thoroughly test routine activities is simply not consistently available over time in the BCS. Having said this, there are three direct measures of routine activities which are utilised – hours spent outside the home on an average weekday, number of visits to a pub and visits to a nightclub or disco per month. It is hoped these measures provide some indication of lifestyle from which valuable theoretical insights can be drawn. In addition, previous research has found demographic variables generally retain their significance and importance despite the inclusion of more detailed routine activity measures (Sampson and Wooldredge, 1987). As Cohen et al. (1981: 507) argue, perhaps the original lifestyle theory "...overemphasizes the role of lifestyles and individual activity patterns in mediating the effects of social inequality on victimization risk". It is also argued that in identifying potential demographic variables which predict victimisation risk, this may facilitate more straightforward targeting of crime prevention provision. Specifically, the availability of demographic profiling software to identify the profile of a particular neighbourhood means resources can be targeted toward higher-risk groups. If researchers know the age, sex and income profile of high-risk population groups then they may be easier to target than those who go out

for an evening meal twice a week for example. However, future research would benefit from more refined measurements of routine activities and community activity patterns so that an understanding of what it is about *particular* lifestyles or environments that increase victimisation risk, and indeed if lifestyle measures hold greater explanatory power than demographic characteristics such as age and sex.

Much existing empirical research has focused on victimisation risk – whereby a binary dependent variable is utilised to distinguish between victims and non-victims. Although incredibly useful, this kind of analysis does not take into account the often complicated mechanisms of criminal victimisation, in particular repeat victimisation. It is desirable to model the entire distribution of victimisation as, theoretically speaking, "the discrete outcome approach reifies the *status* of 'victim' as a stable quality at the expense of conceptualising the *process* of victimisation" (Hope, 2007b: 72).

2.7 Event Dependency vs. Unobserved Heterogeneity

The process of victimisation is highlighted by studies which have found a strong role for prior victimisation on current victimisation risk both within and across crime types (Ellingworth *et al.*, 1997; Wittebrood and Nieuwbeerta, 2000; Hope *et al.*, 2001; Tseloni and Pease, 2003). It is clear that individuals do not exhibit the same likelihood of suffering a particular crime. Victimisation is thus not a chance outcome following a succession of independent events and should be viewed as a series of 'hurdles'. This can be explained by one of two phenomena: either incidents in the reference period are not independent of each other (event dependency), i.e. individuals exhibit the same initial risk but this changes after each victimisation, or individuals exhibit intrinsic differential risks of victimisation (heterogeneity) (Pease, 1998; Tseloni *et al.*, 2002). It is thus vital to remain aware not only of the current risk, but also the 'life-course' of victimisation (Hope *et al.*, 2001: 613).

2.8 Summary

This chapter forms a platform for the analysis of theft from the person and robbery victimisation in England and Wales between 1994 and 2010/11. Both literature relating to the crime drop and empirical research regarding victimisation risk factors have been explored to this end. Theory relating to criminal opportunity in the context of the crime drop heavily informs the interpretation of the analysis presented herein.

The next chapter will explore the literature relating to the stolen goods market and target suitability.

Chapter 3: Literature Review 2 – the Stolen Goods Market

In order to make inferences about *why* there has been a fall in the level of theft from the person and robbery in England and Wales it is necessary to first develop an in-depth understanding of its nature and key drivers. The previous chapter reviewed literature relating to victimisation risk factors and general theories of the crime drop. The main objective of this chapter is to build upon this body of work and review literature relating to the stolen goods market and target suitability in order to provide a platform for further analysis. It is clear "...mankind cannot adequately understand the prevalence and incidence of theft...without understanding how different types of stolen goods markets operate to influence demand and supply..." (Sutton, 2014: 1627).

This review will inform interpretation of the stolen goods analysis presented in Chapter 6 where BCS data is utilised to determine if the proportion of incidents where particular goods are stolen has changed over the period of the crime drop. As discussed in Chapter 2, target suitability forms a component part of direct contact predatory crimes, both in terms of victims and the items stolen from them (Cohen and Felson, 1979). The availability of suitable targets and their methods of disposal may therefore be a key driver of crime trends (van Dijk *et al*., 2007) particularly in relation to lightweight electronic goods. Attention is also warranted as a result of the wider social, cultural and financial harms associated with handling and dealing in stolen goods. Firstly, the review will outline the context and main historical developments in the stolen goods market, followed by a discussion of legislation. A number of existing market typologies will then be presented. Finally, the theoretical foundation and review of previous empirical research is provided.

3.1 Context

The conventional focus on the thief is often too narrow in that "...theft is only the beginning of an intricate process by which stolen property is acquired, converted, redistributed and reintegrated into a legitimate property stream" (Henry, 1978: 72; Chappell and Walsh, 1974). Theft is all too often viewed as comprising two *separate* objectives – first, theft of the item(s) and secondly, selling the item(s) on. From an offender's perspective the completion of *both* objectives is essential. Thus, the thesis will explore theft from the person and robbery both in terms of the theft itself and subsequent disposal.

The level of trading in the stolen goods market is difficult to measure, thus estimates are relatively hard to come by. In the 12 months to March 2013, 106,186 individuals were sentenced for theft and handling stolen goods, a reduction from the previous year (Ministry of Justice, 2013: 16). Government figures from 1995 suggest thieves selling stolen goods in Britain cleared between £900 million and £1680 million (net) (UK National Accounts, 1997 cited in Sutton, 2014). The 2003 Offending, Crime and Justice Survey (OCJS) (Sutton *et al.*, 2008) reported seven per cent of adults in England and Wales had bought stolen goods, while 2.7 per cent admitted selling them. By contrast, the Home Office 'Handling Study' (Sutton, 1998) revealed 70 per cent of respondents believed their neighbours owned stolen goods such as televisions and VCRs. Such figures serve to highlight the lucrative and widespread nature of stolen goods within society.

The rapid growth of technology and widespread ownership of lightweight consumer durables (Ofcom, 2010; Felson, 2012) appears to sustain trading in illicit markets what with the combination of a ready supply of goods and a willing market (Sutton, 1995). New products and upgrades combined with clever, tailored advertising generates a desire to obtain the latest 'must-have' models. Such consumption patterns facilitate a ready market for second-hand goods with the generation of a demand that drives much property theft (Sutton, 2010). The continual introduction of new products into the marketplace means product saturation (where items are widely available and owned) is often quickly reached (Gould, 1969; Felson, 2002). Crucially, consumer demand and retail prices on the legitimate market influence which products are 'hot', or in particular demand, in stolen goods markets (Tremblay *et al.*, 1994; Sutton and Schneider, 1999). In relation to theft from the person and robbery, many individuals will own and carry desirable, expensive items on their person (in particular, CRAVED items (Clarke, 1999) – see Section 6.2.1) and thus be an attractive target to a potential offender. Research shows the majority of thieves steal to convert said property to cash (Cohen and Cantor, 1981; Bennett, 1986; Clarke, 1999). Therefore, if a particular product is carrying a high price on the legitimate market it is not unreasonable for the thief to believe they will gain a reasonable price for the item when sold through the stolen goods market.

Illicit markets impact not only upon the wider public in that "those who buy in stolen goods markets create a demand for their own victimization and also fuel the victimization of others…" (Sutton, 2010: 3) but they are also believed to exert a much wider influence. The impact upon legitimate traders is substantial: "the direct cost of the stolen goods trade to the fast-moving consumer goods industry is estimated to exceed \$56 billion" (Gill *et al.*, 2004: 2). Previous empirical research has also frequently highlighted the link between stolen goods markets and the drugs trade (see Section 3.6). The successful operation of stolen goods markets is also likely to impact upon wider crime trends, in particular certain items may drive up levels of theft (this notion is explored in more detail in Chapter 6).

3.2 Stolen Goods Legislation

It is the intention to briefly outline the relevant legislation in order to establish the illegality of dealing in the stolen goods market. In England and Wales, the offence of handling stolen goods is contained within the Theft Act 1968. Section 22(1) states:

> A person handles stolen goods if (otherwise than in the course of the stealing) knowing or believing them to be stolen goods he dishonestly receives the goods, or dishonestly undertakes or assists in their retention, removal, disposal or realisation by or for the benefit of another person, or if he arranges to do so.

The offence carries a maximum sentence of 14 years. The law requires the 'knowledge' or 'belief' that goods were stolen. This burden of proof can often be a stumbling block in the achievement of a successful conviction (Sutton, 2004; Sutton *et al.*, 2008). The enactment of local legislation, such as the Nottingham City Council Act 2003, has been used in an attempt to overcome this issue. Under this Act, second-hand goods dealers based within the city of Nottingham are required to register with Trading Standards and keep clear records, the aim being to foster transparency and discourage trading in stolen goods. In a similar vein, the Scrap Metal Dealers Act 2013 places a number of requirements on licensed dealers, including obtaining the name and address of individuals who wish to deposit scrap metal and only offering the option of a cheque or electronic transfer for its payment. These measures were introduced and reinforced after a surge in the theft of metal. By making it harder for criminals to dispose of stolen items, this may lead to a reduction in their theft (see Section 3.5).

3.3 Early Works on the Stolen Goods Market

The stolen goods market is a relatively under-researched area; somewhat surprising considering there are records of its discussion from as early as the 16th century (Greene, 1592). A detailed history of this 'informal economy' is provided by Henry (1978: 62) who documents its history and formal illegality. Colquhoun's (1796) typology represents one of the earliest in this area in which he outlines the role of three main actors: criminal receiver; careless receiver; and innocent purchaser. Such theorising was particularly powerful in that it directed attention toward the receiver of goods as crucial in driving levels of theft (Schneider, 2005). It was not until 1822 that an Act made provision for the independent trial of the receiver of stolen goods regardless of the arrest of the thief (Henry, 1978). Hall's (1952) classic study also proposed a similar three-part typology consisting of: the professional receiver; the occasional receiver; and the lay receiver. Distinctions were drawn between those engaged in receiving stolen goods on a 'professional' basis and those not, with emphasis placed upon the 'professional fence' – "...a dealer in stolen goods, controller of thieves, arch-criminal and a primary focus for attention" (Henry, 1978: 72). Criticisms are levelled toward this work for its underestimation of the influence of the 'amateur trade' (Klockars, 1974). Nonetheless, this growing body of work which focuses upon the receiver of stolen goods serves to demote the status of the thief to "...little more than an instrument of the fence – a highly visible but relatively minor cog in a gigantic distribution circuit" (Chappell and Walsh, 1974: 115).

3.4 Current Typologies – Market and Fence

The decision to focus both theoretical and practical efforts upon someone other than the thief signifies a continuation of earlier research outlined above. The thief is representative of one element of a much broader picture; "...in most cases, unless thieves believe that they can sell what they steal they will not steal it..." (Sutton, 2004: 143). In its adherence to basic principles of supply and demand (Roselius and Benton, 1973; Schneider, 2005) the stolen goods market can be seen to operate on a number of similar levels to the legitimate market; it is in their methods of operation where they predominantly differ. There are a number of actors beside the thief who play a crucial role in the successful functioning of the illicit marketplace (Eck, 1994). In this vein, the majority of work in this area distinguishes between three key actors: the thief (who steals to obtain cash); the fence (the 'middleman' who buys stolen goods from the thief); and the dealer (who sells the stolen goods on) (Stevenson and Forsythe, 1998). Thus, the importance of viewing theft trends as an amalgamation of

effects involving multiple players is emphasised.

> If we are to succeed in reducing motivation to steal it is essential to know what happens to stolen goods. This is because asking the questions *who* does *what* to *whom*, *when, where*, in *which way* and with *what* effects (in what might be termed the 8Ws) helps to identify risks from particular offenders in certain situations and identifies threats to potential targets of their offending (Sutton *et al.*, 2008: 6).

Despite growing agreement that details regarding stolen goods markets should be incorporated in the analysis of crime statistics, it is still a relatively under-researched field. Since his original work in 1998, Sutton remains the most-oft cited author in this area. The Home Office Handling Study (Sutton, 1998) was the first systematic analysis of its kind and established a number of the key theories at the heart of this thesis. The findings were based on 45 in-depth interviews with thieves and fences and a five-fold typology was produced; later updated (Sutton, 2010) to include a sixth eSelling element. It is this updated typology detailing the means by which thieves, fences and dealers operate that will be utilised. Despite the clear distinctions made below, research suggests dealing is often not restricted to single market types – more than one type is regularly used (Sutton 1998; Stevenson and Forsythe, 1998):

1. **Commercial fence supplies**. Goods are sold to commercial fences operating within shops, such as jewellers and second-hand dealers.
2. **Residential fence supplies**. Thieves sell goods to fences, usually at the fences' homes.
3. **Network sales**. Goods are passed from individual to individual, with each adding a small amount to the price until a consumer is found.
4. **Commercial sales**. Stolen goods sold secretly for a profit, either directly to the (innocent) consumer or another distributor. A legitimate business front is used to evade suspicion/detection.
5. **Hawking**. Thieves sell directly to consumers in places such as bars/pubs or door to door.
6. **"eSelling".** Goods are sold through private websites or online auction sites such as eBay.

(Taken from Sutton, 2010).

In addition, Lewis (2006) provides a useful typology of fences:

- **Level-1 fence**: often a storeowner who then sells the goods in their store or to another fence.
- **Level-2 (wholesale) fence**: buys from a level-1 fence to then often clean/repackage the goods to make them resemble legitimately manufactured items.
- **Level-3 fence**: takes repackaged goods from level-2 wholesale fences to sell to retailers.

The major increase in popularity of online auction sites (since around 1997) may have contributed to the ease with which the fence or dealer can dispose of their illegally-gained goods (Treadwell, 2012). Understanding the workings of such markets may aid the interpretation of crime trends.

3.5 Theoretical Foundation

The main mechanism by which intervention in the stolen goods market is proposed to reduce crime is through the Market Reduction Approach (MRA) (Sutton *et al.*, 2001). The MRA is based upon the premise that "reducing dealing in stolen goods will reduce motivation to steal" (ibid: vii). Such reductions are seen to derive from the achievement of two aims (ibid: 5):

- Instil the notion amongst thieves that transporting, storing, and selling stolen goods has become at least as risky as it is to steal goods in the first place; and
- Increase the risk involved in buying, dealing and consuming stolen goods for all involved.

The success of the MRA is reliant upon the routine and systematic gathering and analysis of information about stolen goods markets and multi-agency, partnership working. "If MRA tactics are successful, they should help to reduce motivation to steal or, at the very least, slow thieves down to reduce theft levels" (Sutton *et al*, 2001: 42).

The well-established body of work outlined in Chapter 2, namely opportunity-related theory, constitutes the core theoretical basis of the MRA. Routine activity theory (Cohen and Felson, 1979; Felson, 2002) situates a likely offender within the context of an environment in which capable guardians are absent and a suitable target is present. The convergence of these minimal elements results in crime. By

concentrating upon the stolen goods market the focus is upon motivated offenders and suitable targets. Traditionally, target suitability is seen largely in terms of a product's CRAVED attributes (see Section 6.2.1) whilst less attention is paid to its value on the illicit market. However, market demand and the ease with which goods can be disposed of may have a pivotal role in facilitating high-risk crime situations (Sutton, 1995).

The MRA utilises elements of both routine activity theory and situational crime prevention (Clarke, 1980; Clarke and Mayhew, 1980) in focusing upon specific individual and environmental factors found to be conducive to crime. The stolen goods market is viewed as "...a main motivational factor behind theft" (Sutton *et al.*, 2001: 2), thus intelligence gathering on various market types not only fosters awareness of operating dynamics but also generates greater understanding as to what constitutes a 'likely offender' and a 'suitable target'. From this it is proposed more effective strategies to disrupt criminality can be formulated.

More recently, Sutton (2012) has recommended that future theory should acknowledge, and account for, the fact that 'opportunity' remains relatively uncertain until after a crime is successfully completed. He suggests attention should be paid to the main drivers of offending and participation in the stolen goods market which lie outside the immediate crime event, such as the consumption of illegal drugs. It is felt a combination of the two approaches may provide the most viable and effective method of reducing crime.

3.6 Previous Empirical Research

Previous empirical findings are outlined in order that the dynamics of stolen goods markets can be explored. Preventive action may most fruitfully lie in challenging motivations that lie outside the immediate crime event (Sutton, 2012). These findings will also aid the selection of variables employed within later analysis. Four main areas will be discussed namely: motivations for theft; choice of target; methods of disposal; and the characteristics of actors within the stolen goods market.

3.6.1 Motivations for Theft

Two dominant perspectives emerge in the literature on motivations for theft, namely offending driven by economic need and that fuelled by emotions. Many offenders profess an immediate need for 'fast cash' to fund illicit drug use, a 'party lifestyle' and

to purchase status-conferring items (Jacobs and Wright, 1999; Gill, 2000; Brookman *et al.*, 2007; Miller, 1998). Tilley *et al.* (2004) found differences in motivation by age of the offender with older offenders more likely to cite obtaining money to support a drug habit, and younger individuals stealing to alleviate boredom, enhance their reputation and obtain fashionable clothing (Smith, 2003; Fitzgerald *et al.*, 2003).

Robbery is viewed as a quick and easy crime requiring little planning (Curran *et al.*, 2005) with offending frequency determined by the level of immediate need for money (Jacobs and Wright, 1999). Offenders were not particularly positive about their long-term prospects so were easily swayed by the promise of 'quick cash' in order to continue a cash-intensive, 'life as party' lifestyle (ibid: 155). These cost-benefit analyses may be relatively crude or bounded; influenced by desperation and a focus on immediate needs (Wright *et al.*, 2006; Gottfredson and Hirschi, 1990). Such needs may be intensified due to reliance upon drugs; Bennett *et al.* (2001) found 29 per cent of arrested thieves were heroin or cocaine users. Stevenson and Forsythe (1998) conducted 267 interviews with imprisoned burglars and found over four-fifths of the sample reported spending some or all of their burglary income on illicit drugs. Drugs are thus viewed as playing a significant role in the commission of theft. It could also be argued that the stolen goods market is a key contributing factor to this relationship; drugs, or the money to pay for them, are obtained through the theft and subsequent selling of items on the illicit market.

3.6.2 Choice of Target

Target suitability is comprised of two elements: the *accessibility* of an item or person and its material or symbolic *desirability* to an offender (Cohen *et al.*, 1981). Theft and robbery are acquisitive crimes committed, on the whole, for financial gain (see Section 3.6.1), hence target suitability should be an important factor for predicting victimisation risk. This discussion separates the 'target' into two principle components, the suitability of a victim and an item.

A number of qualitative research studies conducted with both active and imprisoned offenders have sought to identify the reasoning (if it exists) behind victim selection processes. Many offenders report seeking out individuals who they felt it would be easy to steal from (for example, if they appeared weak, not 'street-wise' or on their own) and unlikely to report the offence to the police (i.e. drunk people and drug dealers) (Tilley *et al.*, 2004). Stealing from a woman was often perceived as 'less risky'

in that they would be more likely to carry valuables and less likely to resist the theft (Miller, 1998). However, in general offenders would not target women or those deemed vulnerable, such as the elderly. Individuals were also targeted on the basis that they were likely to be in possession of desirable goods, either because the items were clearly on display or they looked well-dressed and affluent (ibid). Some victims were targeted after being seen withdrawing cash from an ATM or because they appeared to be going out (Brookman *et al*., 2007). Analysis conducted by Greater Manchester Police found one in four street crimes (robbery and snatch theft) were geographically connected to cash machines (cited in Tilley *et al*., 2004). It has been suggested that offenders may draw on past successful experiences and thus target particular robbery victims on a regular basis (Hochstetler, 2001; Jacobs, 2010). Drawing on this "…repository of crime targets" (Jacobs, 2010: 523) offenders can maximise potential gains by circulating within environments identified as 'target-rich'.

Apart from a few key studies, analysis of items stolen through theft from the person and robbery seems to have largely escaped the criminological research radar. Furthermore, the potential link between changes in thieves' product selection and crime trends in England and Wales has not been explored. Previous work of this kind either focuses predominantly upon aggregate 'crime' data or other crime types e.g. household burglary (Wellsmith and Burrell, 2005; Fitzgerald and Poynton, 2011), does not cover a time period sufficient for commenting upon the attractiveness of products to thieves before *and* after the crime drop (Clarke, 1999; Harrington and Mayhew, 2001) and/or utilises police recorded crime data for specific localities (Barker *et al.*, 1993; Smith, 2003). Work to address this gap in criminological knowledge is undertaken in Chapter 6.

An apparent rise in police recorded robbery of personal property and snatch theft in a number of British cities the late 1990s and early 2000s was seen to be driven by a surge in youth-on-youth offending and increased mobile phone ownership levels (Harrington and Mayhew, 2001; Smith, 2003; Curran *et al*., 2005). Described at one point as a 'national emergency', the 'Street Crime Initiative' (SCI) was launched in March 2002 in order to tackle these rising levels of drug-related street crime in England and Wales (Blunkett, 2002). A concern that new generations of mobile phones and MP3 players are 'fuelling robbery' have become relatively commonplace

headlines in the media (BBC News, 26th May 2005). Thus the influence of market demand for particular products on wider theft trends warrants further attention.

A growth in ownership of lightweight consumer durables coupled with the current sensitive economic climate further emphasise the importance of more detailed statistical analysis of the available data. Research by Schneider (2005) reports the ease with which property could be sold was the most common reported reason for its theft; stealing to order was relatively commonplace within the sample. Thus "...underlying market demands appear to truly drive theft patterns" (Schneider, 2005: 134; Sidebottom *et al.*, 2011). An offender has "...a hierarchy of money and goods that he prefers to take" (Johnson et al. 1993: 218), the most commonly cited including money and purses/wallets. Knowledge of this hierarchy may be utilised to shape effective crime prevention strategy. It would thus be naïve to neglect the role of the stolen goods market in relation to personal theft and robbery trends.

3.6.3 Methods of Disposal

We have identified that goods are predominantly stolen to fund an immediate cash need – either for drugs or status-conferring items. Schneider (2005) presents findings from 50 in-depth qualitative interviews with prolific offenders examining the disposal methods of goods stolen through shoplifting and burglary. This study found residential fences and network sales are the primary routes through which goods enter the stolen goods market. Stolen goods are also often traded directly for drugs (Stevenson and Forsythe, 1998). Important distinctions have been drawn between methods employed by inexperienced thieves and those used by prolific thieves (Sutton, 1998). The inexperienced were found to rely heavily upon existing markets, friends and relatives, where experienced thieves exhibit a more proactive approach in sourcing a range of buyers. The Internet may also be altering the criminal marketplace with potential new avenues for disposal through online auction websites such as eBay (Treadwell, 2012). In addition, stolen mobile phones are increasingly being shipped for resale overseas (where they are sold at a high price and are in great demand) to overcome the fact that blacklisted handsets no longer work in the UK (Mailley *et al.*, 2006).

3.6.4 Characteristics of Actors in the Stolen Goods Market

Documenting the prevalence and nature of the stolen goods market within society is an especially difficult task. The majority of research in this area utilises either large-

scale government surveys or offender interviews to infer stolen goods market characteristics. Sutton *et al.* (2008) suggest buying stolen goods is most often committed by young, single, poorly qualified males living in relatively deprived areas. More specifically, OCJS analysis revealed young males living in areas of relative deprivation in very low-income households were most likely to buy stolen mobile phones. These findings are documented alongside previous findings that thieves generally prefer to sell stolen goods locally (Langworthy and Lebeau, 1992; Sutton, 1998) and that illicit markets are concentrated in the least affluent areas (Sutton 1998, Felson 2002).

3.7 Limitations

By focusing on the stolen goods market and the MRA, the aim is to reduce motivation to steal. The terminology employed in much previous literature is rather general in that reference is made to 'theft' and 'stealing'; specific reference to particular crime types is, perhaps intentionally, not evident. It may therefore be advantageous to explore crime- and goods-specific marketplaces, on the basis that offenders may choose to steal and dispose of different items using different methods. It may also be that these crime signatures have changed over time. Put simply, do the goods stolen differ across crime types? In addition, do goods stolen through theft from the person and robbery differ from other crime types? Disaggregating the data by crime type and property stolen should provide a much clearer picture of trends and marketplace dynamics (Hale *et al.*, 2004).

3.8 Summary

Current literature on the stolen goods market still appears to be somewhat in its infancy. The dynamics of the illicit marketplace have been explored in a number of groundbreaking studies, yet it remains a topic which, despite its clear importance, is relatively neglected within criminological literature. This is perhaps due to the relative lack of data with regards to offenders. The development of knowledge in this area may place us in a better position to predict and offset potential crime harvests (Sutton, 2014).

Taking Chapters 2 and 3 collectively, literature and previous empirical research relating to victimisation risk, the crime drop and the stolen goods market have been reviewed. From this, it is clear that the offences of theft from the person and robbery remain relatively under-researched in relation to victimisation risk factors and stolen

goods in the context of the crime drop. Hopefully this review has helped to formulate a gap in existing criminological knowledge and provides a solid foundation upon which to conduct this research.

Chapter 4: Methodology

Having reviewed previous literature and identified a gap in existing knowledge, the purpose of this chapter is to outline the research design, data and methods employed in the thesis. This research has drawn heavily upon the work of leading statisticians and Criminologists in the field of victimisation research. Firstly, an introduction to, and overview of, the data – the BCS – is provided. Secondly, the validity of crime surveys is discussed followed by an overview and justification of the statistical methods employed.

4.1 The Data

As outlined in Chapter 1, this thesis forms part of a wider project to generate discussion and improve understanding of the major falls in crime since the mid-1990s. There are two main measures of crime in England and Wales – police recorded crime and the BCS. The project utilises BCS data to analyse crime specific changes in victimisation, goods stolen, routine activities, incident signatures and security. The decision to use the BCS rather than police recorded crime data was informed by the fact that: the reliability of police recorded crime has recently been called into question (ONS, 2014) (see Section 4.2); the BCS provides a consistent measure of crime over the period of the crime drop unaffected by changes in recording; data in the BCS covers the whole of England and Wales; and the information recorded is generally much more detailed.

4.2 The British Crime Survey[2]

The BCS is a face-to-face victimisation survey that is widely regarded as the most comprehensive long-term measure of crime trends in England and Wales. The survey was first conducted in 1982 and from then was run approximately every two years until 2001, when it became a continuous survey. Its reputation as a rich source of knowledge has grown considerably since its inception and, as such, it is routinely utilised by the UK government. "Rather than looking only at today's issues, the BCS

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[2] The BCS changed name to the Crime Survey for England and Wales (CSEW) in April 2012 after a move from the Home Office to the independent Office for National Statistics. All sweeps presented herein are filed under the name 'British Crime Survey' thus, for clarity and consistency, it was decided to retain this name within the thesis.

has been adept at looking forward at tomorrow's concerns, providing a bedrock of knowledge…" (Hough *et al.*, 2007: 16). In the author's opinion, it is the most appropriate, flexible and reliable data available for testing a range of criminological theories. In relation to theft from the person and robbery there has been a relative lack of empirical research over time (covering the period before, during and after the 'crime drop'). The BCS provides a consistent, reliable measure of crime and collects a wealth of information on the respondent, their household and area of residence, as well as (where appropriate) detailed information regarding experiences of crime. As such, it is a rich source of data, which, considering its scope and reliability, is currently massively underutilised in empirical victimisation research.

The importance of independent crime statistics (such as the BCS) was highlighted by the recent UK Commons Public Administration Select Committee (PASC) crime statistics inquiry (November 2013) where the integrity and reliability of police recorded crime data was called into question. Issues regarding public confidence in these statistics were also raised. As a result, the UK Statistics Authority (UKSA) announced that they no longer regard police recorded crime statistics as 'National Statistics', in light of "…accumulating evidence that suggests the underlying data on crimes recorded by the police may not be reliable" and is open to manipulation (ONS, 2014: 2). The BCS provides a relatively comprehensive, apolitical measure of crime that serves to enrich the victimisation and intelligence picture. The analysis presented herein utilises 14 BCS sweeps from 1994 to 2010/11.

4.2.1 Sampling Design

The BCS samples adults over the age of 16 residing in England and Wales. In recent years, the core sample size has been approximately 46,000 with the aim of conducting at least 1,000 interviews in each Police Force Area. The BCS has achieved the following sample sizes between 1994 and 2010/11:

Table 4.1: BCS Sample Size 1994 to 2010/11

Year	Core target sample size	Achieved sample size
1994	15,000	16,550
1996	15,000	16,348
1998	15,000	14,947

Table 4.1 (contd.) BCS Sample Size 1994 to 2010/11

Year	Core target sample size	Achieved sample size
2000	20,000	19,411
2001/2002	37,000	32,824
2002/2003	37,000	39,249
2003/2004	37,000	37,931
2004/2005	46,000	45,120
2005/2006	46,000	47,796
2006/2007	46,000	47,023
2007/2008	46,000	46,983
2008/2009	46,000	46,289
2009/2010	46,000	44,638
2010/2011	46,000	46,754

Adapted from Tipping *et al.* (2010).

It is clear that the achieved sample has increased considerably over time. This relatively large sample size reduces the error associated with using known sample statistics to estimate unknown population parameters. From January 2009, the survey was further extended to include 10-15 year olds, although this data is not analysed here.

4.2.2 Reference Periods

Prior to 2001, the full recall period was from 1 January of the year preceding interview until the date of interview – a period of about 14 months. For example, interviews for the 1996 BCS were conducted from January 1996 to June 1996, with incidents therefore reported from January 1995 to June 1996 (see Table 4.2). After 2001 and a move to continuous interviewing, the 'moving reference period' includes the current month plus the 12 months prior to the date of the interview.

Table 4.2: BCS Reference Periods 1994 to 2010/11

BCS Sweep	Interview Period	Incidents Reported
1994	January 1994 – June 1994	January 1993 – June 1994
1996	January 1996 – June 1996	January 1995 - June 1996

Table 4.2: (contd.) BCS Reference Periods 1994 to 2010/11

BCS Sweep	Interview Period	Incidents Reported
1998	January 1998 – June 1998	January 1997 – June 1998
2000	January 2000 – June 2000	January 1999 – June 2000
2001	January 2001 – June 2001	January 2000 – June 2001
2001/02	April 2001 – December 2001	April 2000 – December 2001
2002/03	April 2002 – March 2003	April 2001 – March 2003
2003/04	April 2003 – March 2004	April 2002 – March 2004
2004/05	April 2004 – March 2005	April 2003 – March 2005
2005/06	April 2005 – March 2006	April 2004 – March 2006
2006/07	April 2006 – March 2007	April 2005 – March 2007
2007/08	April 2007 – March 2008	April 2006 – March 2008
2008/09	April 2008 – March 2009	April 2007 – March 2009
2009/10	April 2009 – March 2010	April 2008 – March 2010
2010/11	April 2010 – March 2011	April 2009 – March 2011

The move from biennial to continuous annual sampling in 2001 has resulted in a number of issues with regard to the comparison of data pre- and post-2001. Prior to 2001, there are a number of gaps in the coverage of the data (i.e. July 1994 to December 1994). This is because the reference period began in January of the year preceding the BCS administration while fieldwork lasted for up to seven months, sometimes into July of the respective BCS year. In addition, since 2001, respondents are interviewed at various points throughout the year (moving reference period). As a result there are overlaps in the coverage of each sweep as shown in Table 4.2. The reference year for each respondent constitutes the 12 months prior to interview. Therefore one sweep of the BCS covers a 23-month time period. For example, interviews for the 2008/09 BCS were conducted from April 2008 to March 2009. Therefore, the reference period, when considering the sample collectively, spans April 2007 to March 2009. Such sampling changes have implications for time series analysis in that BCS sweeps (as they currently stand) are not directly comparable.

4.2.3 Questionnaire Design

The structure of the BCS is relatively complex. It generally consists of a set of core modules asked of the whole sample (e.g. socio-demographic details, routine activities etc.), a set of modules asked of different sub-samples (e.g. crime prevention, although

topics vary from year-to-year), self-completion modules (e.g. drug use, drinking and domestic violence) and, where relevant, a victimisation module (see Figure 4.1).

Figure 4.1: Modules of the 2010-11 BCS Questionnaire and Sub-set of Respondents Asked Each Module (Source: Fitzpatrick and Grant, 2011)

Questionnaire module	Core sample
Household box	All
Perceptions of crime	All
Screener questionnaire	All
Victimisation Modules	All victims
Mobile phone and bicycle theft	All
Performance of the Criminal Justice System	All
Module A	Random 25%
Module B	Random 25%
Module C	Random 25%
Module D	Random 25%
Anti social behaviour	Random 50%
Plastic card fraud	All
Road safety and traffic	All
Demographics and media consumption	All
Drugs and Drinking	All aged 16-59
Inter-Personal Violence	All aged 16-59

All respondents complete a screener questionnaire asking about their experience of crime, irrespective of whether they reported the incident to the police (specific terms such as 'theft' and 'burglary' are avoided as this requires knowledge of offence types). Although there have been some changes and additions, survey questions and wording have remained largely consistent over time to ensure comparability. The following questions are asked in order to identify incidents of theft from the person (or attempted theft from the person):

- Was anything you were carrying stolen out of your hands or from your pockets or from a bag or case? (Yes/No). If yes, how many times?
- Has anyone *tried* to steal something you were carrying out of your hands or from your pockets or from a bag or case? (Yes/No) If yes, how many times?

The victim is then asked if they were aware that something was being stolen from them which enables a coder to differentiate between a snatch theft from the person and other theft from the person. Additional questions further identify if the incident involved the use/threat of force or violence which, as a result, would constitute a robbery. Victimisation Modules are completed if an incident is identified within the screener questions. A maximum of six (five in 1994) Victim Modules can be

completed. The first three contain detailed questions relating to each incident with the remainder containing far fewer questions.

4.3 Validity of Crime Surveys

Victimisation surveys are useful in that they largely avoid the potential shortcomings associated with police recorded crime – political pressures, recording practices and court procedures (unconnected to genuine fluctuations in crime) can unduly influence official statistics. These issues were highlighted by the recent PASC inquiry (see Section 4.2; ONS, 2014). Such biases can lead to a subsequent underestimation of crime rates – the so-called 'dark figure' of crime (Jansson, 2007) – or misallocation of offence codes. Crime surveys are also less subject to biases which can occur through false reporting for insurance purposes.

With the wealth of demographic, social and area information collected for both victims and non-victims and, where relevant, incident and offender details, crime surveys can make a very valuable contribution to the evolution and development of policy and practice. Particular examples include the Criminal Justice System, crime prevention, victim support networks, Police practice, offender management, housing, education and environmental design (specific policy implications are discussed in more detail in Chapter 9).

As with most research tools, crime surveys have a number of limitations. The total survey error – that is, the difference between estimates and the true population value – is designed to be as small as is practicably possible. It is the intention to acknowledge and outline the main sources that may contribute to this error.

4.3.1 Response Bias

The BCS has two potential sources of response bias:

1. Where individuals do not report a victimisation in the reference period when they should have; and
2. Where individuals falsely report a victimisation when in fact it didn't occur.

The period of coverage of the survey – 12 months prior to interview (in sweeps post-2001) – is designed to increase levels of recall accuracy and reduce response bias. This is important as the accuracy of statistics is hugely influenced by the ability of

individuals to correctly recall past victimisations. However, it does limit the definition of victims to those who have been victimised within a particular 12-month period.

A related issue concerns the maximum number of Victimisation Modules that can be completed. This further restricts victims to fewer than six (five in 1994) victimisations within that particular 12-month period. Incidents occurring as part of a series (see Section 5.5 for definition) are also restricted to a maximum of five events. This ensures that estimates are not overly influenced by the few respondents who report a large number of incidents. This 'artificial upper limit' (Genn, 1988) may seriously underestimate the number of crimes (particularly repeat victimisations) in England and Wales (Farrell and Pease, 1993; Farrell and Pease, 2007; Nazaretian and Merolla, 2013). This has been referred to by Farrell and Pease (2007) as the 'sting in the tail' – namely the statistical tail of the frequency distribution of victimisation. In addition, detailed information is also only collected within the first three Victimisation Modules (to reduce respondent fatigue) so this again can limit the breadth of analysis able to be conducted.

4.3.2 Sampling Bias

Sampling bias can result when groups in the population have zero probability of selection. Potentially at-risk groups may be omitted as a result. These include the homeless and those living in institutions (such as halls of residence and prisons). Again, this may lead to a huge underestimation of crime levels and the sample is therefore not truly representative. In addition, the analysis conducted in this thesis does not include 10-15 year olds as this population has only been sampled since 2009. With regard to theft from the person and robbery offences, not including students in halls of residence or 10-15 year-olds may lead to an underestimation of the true level of crime.

4.3.3 Measurement Error

Measurement error can occur within the BCS in terms of the crime types covered and respondent, interviewer and coder bias.

With regard to offence coding, since its inception, the BCS has been coded so that offences match as closely as possible those classified by the police. Offences are recorded using the victim's version of events – the BCS does not require proof of criminal intent. Once Victimisation Modules have been completed, a specialist team of

trained coders review and classify offences. This is to reduce the likelihood of incorrect offence code allocation and foster greater consistency, although the possibility still exists for coder bias (Jacobs, 1984). With regard to theft and robbery, the allocation of offence codes may be relatively subjective – coders might need to differentiate between force 'just enough to snatch the property away', i.e. snatch theft from the person, and the level of force required to constitute a robbery.

Respondent bias can occur when answering survey questions, usually due to feelings of social desirability. Offences that occur within a family unit or work environment may be less frequently reported due to perceptions of the victim. They may not view the incident as a crime, be too embarrassed to report or hold particular cultural beliefs that perceive such behaviour as acceptable or permissible. If the crime is particularly sensitive, reluctance to report may be commonplace. Crimes motivated by hate or domestic violence might become such a routine part of an individual's lifestyle that they don't, or no longer, view what happens as a criminal offence or fail to accurately distinguish between events because they happen so frequently. A respondent may suspect a colleague or family member of having stolen from them but not want to admit this openly. An individual may take an enormous sense of pride in their physical ability/strength or have a particular reputation they wish to uphold in the community and thus feel embarrassed to admit to being the victim of a robbery or theft.

One saving grace in relation to measurement error in the BCS is that if this error has remained consistent over time (and is random) then *trends* in victimisation risk will be accurately reflected in the data (Sparks, 1981). Crime surveys are also more likely to avoid issues with regard to false reporting, particularly for the purposes of making insurance claims. This is particularly important in relation to this thesis with regards to the false reporting of mobile phone loss as theft. With the BCS, there appears little (financial or otherwise) incentive to be purposefully dishonest.

To conclude, aside from the aforementioned methodological constraints, the BCS is currently the most appropriate data source available to test criminological theorising. Users of continuous survey data must acknowledge and offset (where possible) the issues outlined above and remain particularly aware of any procedural and definitional changes between sweeps whilst conducting analysis (Jacobs, 1984). A

vast amount of information is collected on a wide range of topics. This allows researchers and policy makers to obtain an indication of potentially vulnerable areas and social groups in relation to crime risk. It can also broaden knowledge and understanding of specific types of victimisation and inform the development of crime prevention policy and practice.

4.4 Variable Harmonisation

Although question content and wording has remained relatively consistent in the BCS there have been a number of changes and additions over the course of time. In order to conduct analysis over time, it was necessary to ensure variables, as far as was possible, had the same categories in each sweep (see A4.1-A4.2 for more detail). This fosters direct comparability of variables over time. It is acknowledged that in harmonising variables over time some of the richness of the information is lost (particularly in more recent sweeps). However, it was felt the ability to make over time comparisons was important and detail loss was kept to a minimum where possible. The individual and incident level explanatory variables and their respective categories from the final models are shown in Tables 4.3 and 4.4. Discussion regarding their selection and theoretical grounding is contained within Chapters 7 and 8.

Table 4.3: Individual Level Explanatory Variables

Variable	Categories
Sex of Respondent	Male, Female
Age of Respondent	Count (16-99)
Number of Children	0, 1, 2+
Social Class of the Head of Household (see A4.3)	Professional, Intermediate Occupation, Routine Occupation, Never Worked/Not Classified
Highest Qualification Obtained	Higher/Further Education, Secondary (upper), Secondary (lower), Trade Apprenticeship, Other Qualifications, No Qualifications
Ethnic Group	White, Black, Asian/Mixed/Other

Table 4.3 (contd.): Individual Level Explanatory Variables

Variable	Categories
Household Income (see A4.3)	£4,999 and Under, £5,000-9,999, £10,000-19,999, £20,000-29,999, £30,000-49,999, £50,000 or More, Refused, Don't Know
Illness or Disability	No Disability, Disability/Long-standing Illness
Marital Status	Single, Married/Cohabiting, Separated/Divorced, Widowed
Employment Status	Paid Work, Waiting/Looking to Take New Job, Temporarily Sick/Long-term Sick or Disabled, Student (Full-Time), Retired, Looking After Home/Family, Other
Housing Tenure	Owner, Social Rented Sector, Private Rented Sector
General Health	Very Good, Good, Fair, Bad, Very Bad
Average Number of Hours Away from the Home on a Weekday	Under 1 Hour, 1-3 Hours, 3-5 Hours, 5-7 Hours, 7+ Hours
Number of Visits to a Pub in the Last Month	0, 1-3, 4-8, 9+
Number of Visits to a Club in the Last Month	0, 1-3, 4-8, 9+
Number of Cars Owned/Used in the Last Year	0, 1, 2, 3+
Anyone in Household Owned a Bicycle in the Last Year	Yes, No
Area Type	Inner City, Urban, Rural
Region	North East, Yorkshire and Humberside, North West, East Midlands, West Midlands, East, London, South West, South East, Wales

Table 4.4: Incident Level Explanatory Variables

Variable	Categories
Type of Incident	Single, Part of a Series
Quarter in Which Incident Happened	January-March, April-June, July-September, October-December
Force, Violence or Threats Used During Offence	None Used, Threatened, Force or Violence
Did the Incident Happen Within 15 Minutes of This Area	Yes, No
Time of Day	Daylight, Dawn/Dusk, Dark
Victim Aware of the Incident Happening	Yes, No
Location of Incident	At Home/Outside Home/At Place of Work, Travelling, At Place of Public Entertainment, Pub/Bar/Working Men's Club/Dancehall/Disco, Other Public or Commercial Location, Elsewhere
Contact with Offender	Yes, No
When Victimised	Weekend, Weekday
What Victim Doing at Time of Incident	At Work/Working/At School, Shopping, Leisure Activities, Travelling, Other
Weapon Used	Yes, No/No Information on Offender/Don't Know
Repeat Victim	Single Victim, Repeat

4.5 Weighting

All results presented within the thesis are unweighted. Generally, BCS users are advised to apply weights when conducting analysis to produce unbiased population estimates. For this research the data was, in some instances, combined across sweeps to increase the accuracy of the results (Chapter 6). The intention was to combine the data and present weighted analysis. However, the 'weighti' variable was found to be non-comparable across sweeps. This was brought to the attention of the data depositors and the ONS who acknowledged the issue. This response took some time so, to avoid further delay, it was decided to proceed with unweighted data analysis. Thus, all findings should be interpreted as estimates relating to the achieved sample

and not the wider population. More details regarding weighting can be found within Section A4.4.

4.6 Statistical Methodology

There are a number of statistical methods employed throughout the thesis. Chapter 6 utilises contingency tables and summary measures in exploring goods stolen through theft from the person and robbery over time. More sophisticated methods are employed in Chapter 7 where the predicted mean number of victimisations per victim, i.e. theft and robbery incidence, is analysed using negative binomial regression models (Cameron and Trivedi, 1986). Finally, Chapter 8 explores the likelihood of a failed victimisation using binomial logit modelling (Long, 1997). These methods assist in identifying changes in goods stolen over time as well as potentially high-risk population groups and situational characteristics. The software packages used were IBM SPSS Statistics, MLwiN and LIMDEP (IBM Corp., 2012; Rasbash *et al.*, 2009; Greene, 2002a).

4.6.1 Bivariate Statistics

The first step of any analysis involves the careful investigation of bivariate relationships, in this case contingency tables and summary statistics (Bachman and Paternoster, 2009). Where appropriate, the frequency of each value for the variable, its relative proportion of the total number of cases, and percentages of the total are given (broken down by sweep). Summary measures are also used, in particular the sample mean:

$$\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$$

(Bachman and Paternoster, 2009: 127) (4.1)

where y_i = the *i*th raw score in a distribution of scores and n = the total number of scores in the sample.

One of the first steps was to look at each sweep in turn to ascertain the level of dispersion (i.e. shape and distribution) of theft from the person and robbery victim data. The variance of a sample is calculated by subtracting the sum of the squared deviations of each score from the sample mean ($\bar{y}$) and dividing by the number of scores in the sample (n) minus 1:

$$s^2 = \frac{\sum_{i=1}^{n}(y_i - \bar{y})^2}{n-1}$$ (Bachman and Paternoster, 2009: 165) (4.2)

where y_i = the *i*th raw score in a distribution of scores, $\bar{y}$ = the sample mean and n = the total number of scores in the sample.

Values that don't deviate far from the mean are less dispersed, or more homogeneous, than values further from the mean.

4.6.2 Negative Binomial Regression Model

Victim characteristics analysis (Chapter 7) utilises a count variable to model (and predict) the entire distribution of theft from the person or robbery victimisation (crime incidence). The dependent variable is the number of victimisations experienced, i.e. 0 (non-victim), 1, 2, 3, 4, or 5 or more. Modelling incidence is a departure from much previous empirical research which models victimisation risk, i.e. the dependent variable distinguishes between victim and non-victim (Flatley *et al.*, 2010; Stein, 2010; Arnold *et al.*, 2005; Kennedy and Forde, 1990). Individual, lifestyle and area characteristics are used in an attempt to predict the average number of crimes experienced by an individual with given characteristics (see Table 4.3).

If crimes were random they would approximate the Poisson theoretical distribution (Nelson, 1980), where there is an assumption of equal mean and variance. The Poisson model also assumes crimes are independent. Previous empirical research suggests that crime is highly clustered, both in terms of the places where it occurs and the individuals who are targeted. The role of repeat victimisation has been found to play a key role in the crime drop and the composition of the overarching crime trend. The highly skewed distribution of crime therefore violates these basic theoretical assumptions, manifesting as overdispersion, and thus a Poisson specification does not fit the data particularly well (standard errors are often underestimated). The negative binomial theoretical distribution is a much better way to predict the observed distribution of crime as it allows the probability of any number of victimisations to be estimated. It can also be used to estimate victimisation risk and the risk of repeat victimisation (Cameron and Trivedi, 1986; Goldstein, 1995; Osborn and Tseloni, 1998):

$$\Pr(Y_i = y_i) = \frac{\Gamma(y_i + v)}{y_i! \Gamma(v)} \frac{v^v \mu_i^{y_i}}{(v + \mu_i)^{v + y_i}} \qquad\qquad y_i = 0,1,... \qquad\qquad (4.3)$$

where $v = 1/\alpha$ is the precision parameter and Γ is the gamma function.

In this instance, the response variable y_i is a count variable which gives the number of theft from the person and robbery incidents a particular individual has experienced within the reference period. In particular, y_i takes on values of 0, 1, 2...5, where i denotes the individual. The expected theft from the person and robbery incidence is calculated as $\mu_i = \exp(bx_i) + e_i$, where $e_i \sim \Gamma(v)$. In addition, variance is specified as:

$$\text{Var}(Y_i) = \mu_i + \alpha\mu_i^2 \qquad\qquad (4.4)$$

where μ and α are positive in order that the variance exceeds the mean and thus the model allows for overdispersion by capturing heterogeneity and/or event dependence across individuals (Tseloni, 1995).

In the interests of selecting the appropriate modelling strategy, a zero-inflated model was also tested. This decision came as a result of the heavily skewed nature of the data (i.e. a large number of non-victims or, in the model, 'zero' counts) (see A7.3). This can be a product of either unobserved heterogeneity (Long, 1997; Cameron and Trivedi, 1998) or a process that has separate mechanisms for generating zero and nonzero counts. For example, with regard to crime victimisation, one group may never experience crime regardless of the characteristics that appear in the model – the 'certain-zero' group. The other group contain individuals who are not victims within the reference period but retain some probability of experiencing a crime – the 'excess zero' group (Greene, 2002b: E20-79). Zero-inflated models handle overdispersion by explicitly modelling the production of zero counts (Long 1997). Two models are generated – a logit model for 'certain-zero' cases and a negative binomial model for the 'excess zero' group. The two models are then combined. LIMDEP software (Greene, 2002a) was utilised to estimate three models for the purposes of comparison: Poisson, negative binomial and zero-inflated negative binomial (ZINB). This was to test whether, as a result of overdispersion and 'excess zeros', a zero-inflated model was more appropriate. The Vuong and goodness of fit statistics (Tables A7.4 to A7.8) informed the decision to adopt the negative binomial model over the ZINB.

4.6.3 Interpreting Coefficients

All explanatory variables entering the models in the thesis are categorical, except for age, which is continuous. Each categorical variable is represented by a set of dummy variables. Each dummy represents a category within a particular variable, taking the value one when the variable falls into the category and zero otherwise. If a variable has n categories, there are n-1 dummy variables. This is because one value is designated as the reference category. For example, the explanatory variable marital status has four possible categories – single, married/cohabiting, separated/divorced or widowed. One category is selected as the base (in this case, married/cohabiting) and three (n-1) dummy variables are created to represent the remaining categories. The effect of the base category is incorporated in the constant term (Johnston, 1984). Theft from the person and robbery rates for the three remaining categories are expressed as a ratio to the base category. For instance, a coefficient for the category single gives the estimated change in the log odds when we hypothetically move from considering a married individual with given characteristics to another individual with identical characteristics except that he/she is single. A positive coefficient for an explanatory variable in a model implies an increase in probability or incidence for an individual in that category compared with an individual in the base category.

Rather than present the coefficients, which are difficult to interpret, the exponential of each coefficient is given. In addition, the predicted percentage change in the mean number of victimisations (Chapter 7) or the change in the odds of an attempted victimisation (Chapter 8) when compared to the reference individual (holding all other variables constant, except for the variable in question) is calculated (see A7.2 for more details).

4.6.4 Assessing Model Fit

The Wald statistic was utilised in order to assess model fit (Greene, 2002c). This is then compared to a chi-square distribution to assess its statistical significance. Statistics were calculated for each model and compared to ascertain their individual explanatory power. In particular, this tests whether coefficients are (jointly) significantly different from zero. This was calculated by:

$$W = Wald$$
$$= \chi^2[J] = [R(c_1) - r]' \{Est.Asy.Var[R(c_1) - r]\}^{-1} [R(c_1) - r]$$

<div align="right">(Greene, 2002c: 532) (4.5)</div>

where J = the number of coefficients, R(c1) = the coefficient matrix and r = the vector restrictions.

4.6.5 Calculating Statistical Significance

The level of statistical significance was derived in order to establish the degree of confidence one can have in the estimates made. P-values are reported (where relevant) in intervals of: $0.05 < \text{p-value} \leq 0.10$; $0.01 < \text{p-value} \leq 0.05$; and $\text{p-value} \leq 0.01$.

In order to test the statistical significance between two population proportions, i.e. the percentage difference between the proportion of incidents involving the theft of a particular item in 1996 and in 2010 (see Table 6.2), the following formula was used (where population P is equal but unknown):

$$Z = \frac{p_1 - p_2}{\sqrt{\frac{p_1 n_1 + p_2 n_2}{n_1 + n_2} * \frac{q_1 n_1 + q_2 n_2}{n_1 + n_2}} \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$
(McClave *et al.*, 1997: 392) (4.6)

where p_1 = the sample proportion for the first sample, p_2 = the sample proportion for the second sample, q_1 = the complement probability of sample 1 (1-p_1), q_2 = the complement probability of sample 2 (1-p_2) and n = the respective total number in each sample.

4.6.6 Binomial Logit Model

Analysis contained within Chapter 8 utilises binomial regression to model a binary dependent variable, i.e. victim of an attempt (1) against a victim of a completed event (0). As with negative binomial regression, dummy variables are created to represent categories of each explanatory variable. Logit models estimate coefficients to measure the effect of a particular independent variable (in this instance, an incident characteristic (see Table 4.4)) on a given dependent variable (the likelihood of a crime being an attempt (as opposed to completed)).

A linear model is not appropriate when using a binary dependent variable as the error term is not normally distributed – it is heteroscedastic which violates the Ordinary Least Squares (OLS) assumption of homoscedasticity (Johnston, 1984). The logit model does not assume constant variance and is nonlinear. With this model, a coefficient gives the estimated change in the log odds ratio – the logarithm of the ratio

of the probability that the event occurs over the probability that it doesn't occur (its complement) – per unit change in the explanatory variable:

$$\log\left(\frac{\pi_i}{1-\pi_i}\right) = z = \beta_0 + \beta_1 x_i$$

(Bachman and Paternoster, 2009: 625) (4.7)

where $\pi / (1 - \pi)$ refers to the odds that y = 1 and $\log[\pi / (1 - \pi)]$ is the log-odds.

Another assumption of the binomial model is that no two independent variables are closely related. Two sets of variables utilised in incident characteristics analysis were viewed as potentially violating this criterion. Thus, contingency tables followed by chi-square tests of independence were estimated in order to test the independence of each pair of variables.

$$x^2 = \sum_{i=1}^{k}\left(\frac{O_i - E_i}{E_i}\right)^2$$

(Bachman and Paternoster, 2009: 360) (4.8)

where O_i = the observed frequency from the sample data for each cell i and E_i = the expected frequency under the null hypothesis for each cell i and k = the number of cells.

The observed chi-square values were then compared to their respective critical values in the chi-square table (see Bachman and Paternoster, 2009: 677).

4.7 Summary

This chapter has covered the methodological advantages and disadvantages of using the BCS for the purposes of analysing theft from the person and robbery victimisation over time. The main statistical methods used to analyse the data have also been presented. Each is employed in an effort to answer the research questions that guide this investigation. Descriptive statistics (calculating the proportion (%) of incidents) are utilised in Chapter 6 in order to identify potential 'hot products' in relation to theft from the person and robbery over time. Chapter 7 presents results from negative binomial regression models to ascertain if particular demographic, area and lifestyle characteristics affect theft from the person and robbery incidence. The likelihood of a victimisation being unsuccessful based on particular incident characteristics forms the basis of Chapter 8 having utilised binomial regression techniques. Taken collectively, it is hoped these methods may assist our

understanding and help explain changes in theft from the person and robbery victimisation between 1994 and 2010/11. The following chapter will explore the distribution of theft and robbery victimisation over this period.

Appendix Chapter 4

A4. Methodology

A4.1 Variable Harmonisation across Sweeps

In order to, as far as is practicably possible, foster comparability when conducting analysis across all selected sweeps of the BCS, variable harmonisation was carried out. Variables were chosen on the basis of previous literature regarding theft from the person and robbery. The variables originally identified for analysis are listed in Tables A4.1 and A4.2.

Table A4.1: Variable Names of Interest by BCS Sweep 2004/05 to 2010/11 (Non-victim Form)

Variable	10/11	09/10	08/09	07/08	06/07	05/06	04/05
Sex	sex	sex	sex	sex	sex	sex	sex
Age	age	age	age	age	age	age	age
Marital Status	marst	marst	marst	marst	marst	marst	marst
Religion**	relig2	relig2	relig2	relig2	relig2	relig2	religion
Any Qualifications**	educint	educint	educint	educint	educint	educint	educint
Highest Qualifications	educat2	educat2	educat2	educat2	educat2	educat2	educat2
General Health	genhealt	genhealt	genhealt	genhealt	genhealt	genhealt	genhealt
Illness or disability	lillharm	lillharm	lillharm/illness	lillharm/illness	lillharm/illness	lillharm/illness	lillharm/illness
Life Satisfaction**	wellbe2	wellbe	+	+	+	+	+
Region	gor	gor	gor	gor	gor	gor	gor
Area Type	inner/rural2	inner/rural2	inner/rural2	inner/rural	inner/rural	inner/rural	areatyp
Social Class	hrpsec2	hrpsec2	hrpsec2	hrpsec2	hrpsec2	hrpsec2	hrpsec2
No. Cars Owned	cartot	cartot	cartot	cartot	cartot	cartot	cartot
Bike Owner	bikwh	bikwh	ownbike	ownbike	ownbike	ownbike	ownbike
Employment Status	(see A4.2.6)	-	-	-	-	-	-
Student	infstudy	infstudy	infstudy	infstudy	infstudy	infstudy	infstudy
Ethnic Group	reseth	reseth	ethnic	ethnic	ethnic	ethnic	ethnic

Table A4.1 (contd.): Variable Names of Interest by BCS Sweep 2004/05 to 2010/11 (Non-victim Form)

Variable	10/11	09/10	08/09	07/08	06/07	05/06	04/05
Tenure	tenure1	tenure1	tenure1	tenure1	tenure1	tenure1	tenure1
Hours TV**	+	tvwat1	tvwat1	+	+	+	+
Income (Personal)**	persinc	persinc	indinc	indinc	indinc	indinc	indinc
Income (Household)	tothhin2	tothhin2	tothhin1	tothhin1	tothhin1	tothhin1	tothhin1
Hours Weekday	weekday	weekday	weekday	weekday	weekday	weekday	weekday
Pub/bar	pubeve	pubeve	pubeve	pubeve	pubeve	pubeve	pubeve
Club/Disco	club	club	club	club	club	club	club

** Information was not available in all sweeps and was thus excluded from further analysis.

+ Information not available.

Table A4.2: Variable Names of Interest by BCS Sweep 1994-2003/04 (Non-victim Form)

Variable	03/04	02/03	01/02	2000	1998	1996	1994
Sex	sex	sex	sex	sex	sex01	sex01	sex
Age	age	age	age	age	age01	age01	age
Marital Status	marst	marst	marst	marst	marst01	marst01	marital
Religion+	religion	+	+	+	+	+	+
Any Qualifications**	educint	educint	educint	educint	+	+	+
Highest Qualification	educat2	educat2	educat2	educat2	educat2	educat2	educat2
General Health	genhealt	genhealt	genhealt	genhealt	genhealt	genhealt	genhealt
Illness or disability	lillharm/illness	lillharm/illness	lillharm/illness	lillharm/illness	lillharm/illness	illness	illness
Life Satisfaction**	+	+	+	+	+	+	+
Region	gor	gor	gor	gor	gor	gor	region
Area Type	areatyp	areatyp	areatyp	areatyp	acorn/incity	acorn/incity	acorn/incity
Social Class (HRP)	hrpsec2	hrpsec2	hrpsec2	sc2	hohclass	hohclass	hohsclas
No. Cars Owned	cartot	cartot	cartot	cartot	cartot	cartot	cartot
Bike Owner	ownbike	ownbike	ownbike	ownbike	ownbike	ownbike	ownbike
Employment Status	(see A4.2.6)	-	-	-	-	-	-
Student	infstudy	infstudy	infstudy	infstudy	lastwk	lastwk	lastwk
Ethnic Group	ethnic	ethnic	ethnic	ethnic	ethnicid	ethnicid	ethnicid

Table A4.2 (contd.): Variable Names of Interest by BCS Sweep 1994-2003/04 (Non-victim Form)

Variable	03/04	02/03	01/02	2000	1998	1996	1994
Tenure	tenure1	tenure1	tenure1	tenure	tenure	tenure	tenure
Hours TV**	+	+	+	+	+	+	+
Income (Personal)**	+	+	indinc	+	+	+	+
Income (Household)	tothhin1	tothhin1	tothhin1	tothhinc	tothhinc	tothhinc	tothhinc
Hours Weekday	weekday	weekday	weekday	weekday	weekday	weekday	weekday
Pub/bar	pubeve	pubeve	pubeve	pubeve	pubeve	pubclub	pubclub
Club/Disco	club	club	club	club	club		

** Information was not available in all sweeps and was thus excluded from further analysis.

+Information not available.

A4.2 Recoding

In order to foster comparison across sweeps, a number of variables were harmonised. It is now the intention to discuss (in turn) those variables which required recoding. Unless stated otherwise, don't know or refused responses were recoded as missing and thus excluded from further analysis.

A4.2.1 Marital Status

A new variable was computed in order to ensure consistency across sweeps. The new variable contains the following categories:

1. Single, never married;
2. Married/cohabiting;
3. Separated/married but separated/divorced; and
4. Widowed.

A4.2.2 Highest Qualification Obtained

It was necessary to compute two new variables for educational qualifications; one for the 1994 and 1996 sweeps ('educgrp') and another for 1998 onwards ('educgrp1'), the only difference being trade apprenticeships are included from 1998. The main change from the original BCS variable was the inclusion of a category for those respondents with no qualifications. The categories for 'educgrp1' are as follows:

1. Higher/further education;
2. (Upper) Secondary/A-Levels/SCE Higher;
3. Trade Apprenticeships;
4. (Lower) Secondary/GCSEs/O Levels/CSE/SCE;
5. Other qualifications; and
6. No qualifications.

A4.2.3 Illness or Disability

Two new variables were computed in order to ensure consistency across sweeps. The first contains just two categories – a long-standing illness, disability or infirmity or not. The second variable distinguishes between the existence of an illness, disability or infirmity or not and, further, whether it is limiting or non-limiting. Only the first was used in subsequent analysis.

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A4.2.4 Area Type

There is no specific variable which distinguishes between inner city, urban and rural areas contained in the survey pre-2001. Therefore, where the information was not readily available, a new variable was derived using the 'acorn', 'incity' and 'inner' variables using the following syntax:

recode acorn (1 thru 9, 27=3) into areatype / incity (1=1) into areatype /areatype (1,3=copy) (else=2).

format areatype (f8.0).

execute.

value labels areatype 1 'inner' 2 'urban' 3 'rural'

execute.

A4.2.5 Social Class of HOH

Social class is possibly one of the most difficult variables to record over time. There have been a number of changes in relation to this measure which impact upon the way social class has been recorded in the BCS. Initially, four new variables for social class were created: one for 1994, another for 1996 and 1998, another for 2000 and finally one for 2001/02 onwards. Using the ONS guide to the National Statistics Socio-economic Classification (NS-SEC) it was possible to combine data and generate three comparable classes across sweeps. These being:

1. Professional Occupations (NS-SEC codes 1.1, 1.2 and 2.0);
2. Intermediate Occupations (NS-SEC codes 3 and 4); and
3. Routine Occupations (NS-SEC codes 5, 6 and 7).

An additional category was created for those respondents who worked in the Armed Forces, had never worked, gave an inadequate description or could not be classified.

A4.2.6 Employment Status of Respondent

Respondent employment status is derived from a large number of variables. A new variable was computed in order to reduce the number of categories from a large number across sweeps (in some cases 19). The new variable contains seven categories which are consistent across sweeps. The categories are as follows:

1. Paid work/self-employed/government scheme/unpaid work for own or relative's business;
2. Waiting to take new job or business/Looking for work;
3. Temporarily sick or injured/Long-term sick or disabled;
4. Student (full-time);
5. Retired from paid work;
6. Looking after home/family; and
7. Other (must complete education, not looking, no jobs available, cannot leave present job, waiting results of job application).

An issue arose concerning those students who work, are on a government scheme or who carry out unpaid work for their own or a relative's business. Within the series of questions relating to employment status, respondents who state they work, are on a scheme or have their own business are not asked whether they are also a student in full-time education. From 2000 onwards, this question is asked separately (infstudy/hohstudy) and is a more accurate reflection of students within the sampled population. In the 1998, 1996 and 1994 sweeps it is not possible to distinguish between those categories. Therefore the newly created variable does not distinguish between those students solely in full-time education and those who work alongside their education. It includes separate categories for those who are exclusively full-time students and those who also carry out paid work, are on a government scheme or conduct unpaid work for their own or a relative's business. The latter are coded according to their employment. Although not ideal, this group of respondents constitutes a small proportion of the entire sample (for example, in 2010/11, 1.38 per cent fell into this category). It may also be that those who undertake employment alongside their studies are more likely to follow routine activities and lifestyles that are more closely aligned to their working counterparts.

A4.2.7 Ethnic Group

It was first necessary to compute two different variables relating to ethnic group; one for the 1994, 1996 and 1998 sweeps and another for 2000 onwards, the only difference being mixed race was included from 2000. These were eventually combined and the final categories are as follows:

1. White;

2. Black; and

3. Asian/Mixed/Other (including Chinese).

In sweeps from 1994-1998 Chinese respondents were coded as 'other'. Thus, to achieve consistency and due to the relatively small number of Chinese respondents, the other category includes Chinese.

A4.2.8 Tenure

A new variable was computed in order to ensure consistency across sweeps. The new variable contains the following categories:

1. Owners;

2. Private rented sector; and

3. Social rented sector.

A4.2.9 Income

As with social class, income is also fairly difficult to compare accurately over time. Due to a lack of consistent information across sweeps regarding personal income, it was decided that household income would be used (see A4.3). In order to increase consistency, grouped categories were created. It was necessary to compute two new variables for household income; one for the 1994 and 1996 sweeps ('incohous5') and another for 1998 onwards ('incohous6'). The difference lies in the upper limit for each variable. 'Incohous5' includes the following categories:

1. Less than £4,999;

2. £5,000-£9,999;

3. £10,000-£19,999;

4. £20,000-£29,999;

5. £30,000 or more;

98. Refused; and

99. Don't Know.

'Incohous6' has a higher upper limit:

1. Less than £4,999;

2. £5,000-£9,999;

3. £10,000-£19,999;

4. £20,000-£29,999;

5. £30,000-£49,999;

6. £50,000 or more;

98. Refused; and

99. Don't Know.

A4.3 Household Income and Head of Household (HOH) Social Class

In an ideal world, the personal income and social class of the *respondent* would have been utilised. It was decided on the basis of the following three reasons to use measures recorded for the Head of Household (HOH):

1. UK social mobility in terms of earnings, wages and education is low compared with other countries (OECD, 2010);

2. For this reason, the respondent would potentially identify most with the socioeconomic class and income of the household and spend accordingly; and

3. Data for the HOH contained the least missing cases when compared to those for the respondent.

A4.4 Weighting

Due to the nature of combining data across sweeps in Chapter 6, weighting the data proved more difficult. A change in the calculation of the incident weight in 2006/07 means the scales are not directly comparable before and after this time period. The user guides and technical reports only contained information concerning the calculation of household and individual weights, not incident. After bringing this to the attention of the ONS the latest User Guides were updated. Some weights are calculated per 10,000 of the population, others by 100,000. It is possible to make the weights for 2001/02-2005/06 comparable to those for 2006/07 onwards by dividing by 10,000.

Calibration weighting was introduced in 2001 and has been applied back to the 1996 BCS. The 'weighti2' variable within the 1996 dataset is comparable to weighti on datasets from 2006/07 onwards. Weighti2 is not available in the 1998 and 2000 datasets, but it can be calculated. It is not possible to apply weighting to sweeps prior to 1996 due to the regional component of the calibration weight being based on Government Office Region whereas pre-1996 the geographical identifier was standard region and these are not comparable.

Chapter 5: Theft from the Person and Robbery Trends

One of the first steps with most quantitative data analysis is to explore the distribution of the data. This enables the researcher to select appropriate modelling strategies and gain a clearer understanding of the data being analysed. Much has been made of the drop in crime in a number of industrialised countries since the mid-1990s. Aebi and Linde (2010; 2012) contend that it is rather inaccurate to speak of a *general* drop in crime because different crime types are not necessarily following the same trend. Therefore, it is crucial any debate first establishes the "...*actual* evolution of crime trends and, only after that, on providing explanations for that evolution" (Aebi and Linde, 2012: 37). The objective of this chapter is therefore to foster understanding of how theft from the person and robbery are distributed, both across the sample and over time.

BCS reports show a 17 and 27 per cent reduction in theft from the person and robbery offences respectively since 1995 (Chaplin *et al.*, 2011). The fall in theft from the person constitutes the lowest statistically significant decrease of all crime types recorded by the BCS. These falls may reflect a reduction in the total number of individuals victimised or a reduction in the number of events each victim suffers (in other words, repeat victimisation) (Farrell and Pease, 1993; Britton et al., 2012; Thorpe, 2007). In this chapter, theft from the person and robbery[3] incidence (the number of victimisations per respondent), risk/prevalence (the likelihood of becoming a victim of crime) and concentration (the estimated mean number of crimes per victim) (Trickett *et al.*, 1992; Tseloni, 2014) over the period of study are explored (see A5.1 for details of calculations).

Generally speaking, crime is a rare event. Within the general population the distribution of crime is highly positively skewed, with the majority of individuals not suffering any form of victimisation (Tseloni, 2014). Crime is therefore very much concentrated on particular individuals and households. This emphasises the

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[3] For the purposes of this chapter, the category of theft from the person is taken to be only 'completed' crimes i.e. snatch theft and other theft from the person. In BCS reports the category of 'theft from the person' includes 'attempted other theft from the person'.

importance of victimisation research in understanding potential risk and protective factors.

This chapter begins by presenting the observed frequencies of the number of incidents reported per respondent in the following crime categories – robbery, snatch theft from the person and other theft from the person – for each sweep of the BCS from 1994 to 2010/11 (Tables 5.1-5.3). This is followed by Table 5.4 showing the observed distribution of the three crime types combined. Repeat victimisation in relation to theft from the person and robbery is then considered.

5.1 Trend and Distribution of Robbery over Time

Previous BCS publications have highlighted the relatively small incidence of robbery of personal property in England and Wales, which is confirmed by Table 5.1. Across all 14 sweeps the majority of respondents were not victims of this crime type. A small proportion of the sample has been victimised once, and an even smaller proportion more than once. Therefore, each frequency distribution is highly positively skewed. This high positive skew means the data are notoriously difficult to interpret (Jansson, 2007), thus caution should be exercised in drawing too many conclusions from this data alone. It can be seen that there are clear fluctuations from year to year due to the small number of victims. Figure 5.1 shows these changes over time.

The mean number of robbery incidents was at its highest in 1994 and 1998 (both 0.53), with individuals in the sample expected to experience approximately 0.005 incidents in the aforementioned sweeps. Each victimised individual however experienced on average 1.17 incidents (calculated as 0.0053/0.0045) in 1994 and 1.04 incidents (calculated as 0.0053/0.0051) in 1998. The risk (per 100 individuals) of becoming a victim of robbery also peaked in 1998 (0.51 per cent); shaped largely by victims of one incident. Since 1998 there has been a fall in the likelihood of becoming a victim. The peak in robbery offences therefore appeared to happen much later than that found for other offences such as burglary. This is in line with previous findings regarding the timings of the international crime falls (van Dijk and Tseloni, 2012).

The concentration of robbery, i.e. the number of crimes per victim, is relatively stable with fluctuations from year to year. Concentration was at its highest in the 2000

sweep – where each victimised individual experienced an average of 1.54 incidents. This is in direct contrast to the previous sweep (1998) which had the lowest overall level of concentration of all sweeps studied. This may be a result of the increasing popularity and emergence of mobile phones into the mainstream market from 1999 onwards. The relevance of robbery concentration should not be overlooked and its importance in relation to both crime recording and victim support has been emphasised in a number of Home Office and academic publications (Jansson et al. 2007; Farrell and Pease, 2007). Crime concentration also has practical implications, in particular the targeted and informed prevention of repeat victimisation. Furthermore, such findings also influence academic research in establishing if there are differences between victims and non-victims and, further single victims and repeat victims. In sum, the likelihood of becoming a victim of robbery peaked in 1998 and has experienced a relatively shallow decline since, with fluctuations from year to year.

Table 5.1: Observed Frequency Distribution for Robbery Victimisation by BCS Sweep (1994-2010/11)

No. of Incidents	1994	1996	1998	2000	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
0	99.55 (16475)	99.57 (16278)	99.49 (14871)	99.69 (19350)	99.66 (32711)	99.7 (36369)	99.76 (37839)	99.78 (45020)	99.74 (47671)	99.77 (47095)	99.8 (46890)	99.78 (46184)	99.77 (44536)	99.81 (46667)
1	0.4 (66)	0.39 (63)	0.49 (73)	0.25 (48)	0.28 (93)	0.28 (103)	0.23 (88)	0.21 (93)	0.24 (113)	0.2 (96)	0.17 (79)	0.2 (93)	0.21 (92)	0.17 (80)
2	0.04 (7)	0.04 (6)	0.02 (3)	0.03 (5)	0.03 (11)	0.00 (3)	0.00 (3)	0.00 (4)	0.01 (7)	0.01 (6)	0.02 (9)	0.01 (5)	0.00 (4)	0.00 (3)
3	-	-	-	0.01 (2)	0.00 (3)	-	-	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (3)	0.00 (3)
4	0.01 (2)	-	-	-	0.00 (1)	0.00 (1)	-	0.00 (1)	-	-	0.00 (1)	0.00 (1)	-	-
5+	-	0.00 (1)	-	0.03 (6)	0.02 (5)	0.00 (3)	0.00 (1)	0.00 (1)	0.00 (4)	0.01 (5)	0.00 (3)	0.00 (2)	0.00 (3)	0.00 (1)
Total (raw no.)	(16,550)	(16,348)	(14,947)	(19,411)	(32,824)	(36,479)	(37,931)	(45,120)	(47,796)	(47,203)	(46,983)	(46,286)	(44,638)	(46,754)
Mean no. per 100 indiv.	0.53	0.49	0.53	0.48	0.47	0.35	0.26	0.25	0.31	0.29	0.25	0.26	0.28	0.21
Variance	0.31	0.30	0.04	1.52	0.87	0.52	0.20	0.32	0.57	0.77	0.68	0.46	0.59	0.34
Risk per 100 indiv.	0.45	0.43	0.51	0.31	0.34	0.30	0.24	0.22	0.26	0.23	0.20	0.22	0.23	0.19
Concentr.	1.17	1.14	1.04	1.54	1.35	1.16	1.08	1.13	1.2	1.26	1.28	1.18	1.22	1.15

Figure 5.1 – Mean, Risk and Concentration of Robberies, BCS 1994-2010/11
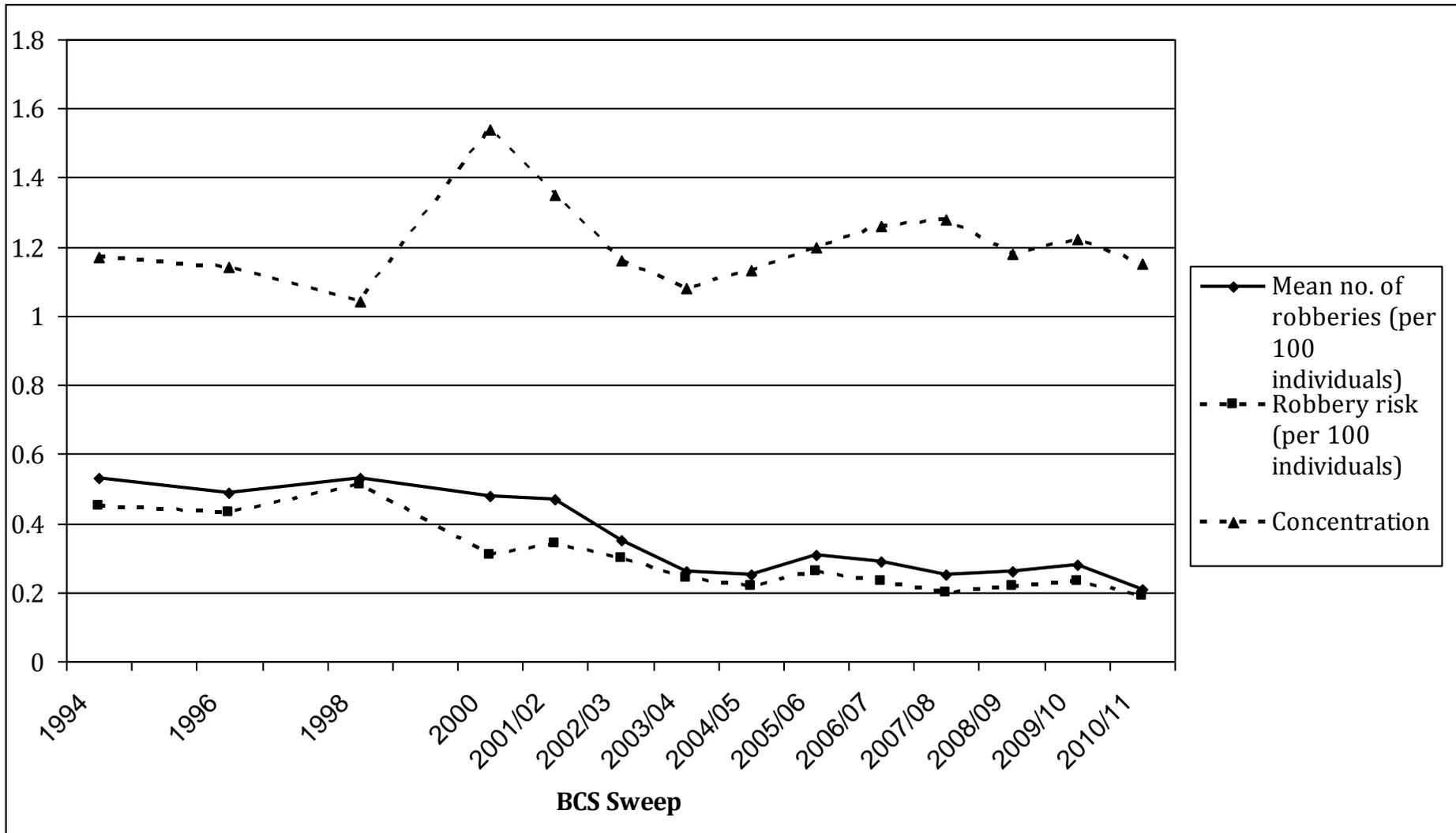
5.2 Trend and Distribution of Snatch Theft from the Person over Time

Moving to snatch theft from the person, it is clear that there are some similarities in the general composition and trend with robbery. Table 5.2 shows the very small incidence of snatch theft from the person in England and Wales. Across all 14 sweeps the vast majority of respondents were not victims of this crime type. Interestingly, snatch theft risk (per 100 individuals) was highest in 1994 (0.27 per cent), four years earlier than robbery, although generally the risk of being a victim of this crime type is very low.

In addition, the mean number of snatch thefts was highest in 1994 (0.31), with individuals in the population expected to experience approximately 0.003 incidents within that particular sweep. Generally the mean number of victimisations for this crime type is higher prior to the year 2000 which is somewhat expected. In 1994, each victimised individual experienced on average 1.15 incidents (calculated as 0.0031/0.0027). It is clear, compared to robbery, snatch theft from the person is not disproportionately concentrated on the same victims (shown by concentration values very close to one). It seems this is a crime which largely affects victims on isolated occasions. Although snatch theft from the person incidence and concentration has fallen since 1994 (see Figure 5.2), the trend over time is much shallower than that found for robbery. This is most likely a result of its relatively low incidence.

Table 5.2: Observed Frequency Distribution for Snatch Theft from the Person Victimisation by BCS Sweep (1994-2010/11)

No. of Incidents	1994	1996	1998	2000	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
0	99.73 (16506)	99.79 (16314)	99.74 (14908)	99.89 (19389)	99.81 (32763)	99.81 (36409)	99.78 (37849)	99.81 (45034)	99.88 (47738)	99.86 (47135)	99.87 (46920)	99.85 (46215)	99.88 (44583)	99.9 (46705)
1	0.24 (39)	0.21 (34)	0.25 (37)	0.11 (22)	0.18 (59)	0.18 (67)	0.21 (80)	0.19 (85)	0.12 (55)	0.14 (66)	0.13 (63)	0.15 (70)	0.12 (53)	0.1 (48)
2	0.01 (2)	-	0.01 (2)	-	0.00 (2)	0.00 (3)	0.00 (1)	0.00 (1)	0.00 (3)	0.00 (1)	-	0.00 (1)	0.00 (1)	0.00 (1)
3	0.02 (3)	-	-	-	-	-	-	-	-	0.00 (1)	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	0.00 (1)	-
5+	-	-	-	-	-	-	0.00 (1)	-	-	-	-	-	-	-
Total (raw no.)	(16,550)	(16,348)	(14,947)	(19,411)	(32,824)	(36,479)	(37,931)	(45,120)	(47,796)	(47,203)	(46,983)	(46,286)	(44,638)	(46,754)
Mean no. per 100 indiv.	0.31	0.21	0.27	0.11	0.19	0.2	0.23	0.19	0.13	0.15	0.13	0.16	0.13	0.11
Variance	0.10	0.00	0.05	0.00	0.03	0.04	0.21	0.01	0.05	0.07	0.00	0.01	0.18	0.02
Risk per 100 indiv.	0.27	0.21	0.26	0.11	0.19	0.19	0.22	0.19	0.12	0.14	0.13	0.15	0.12	0.1
Concentr.	1.18	1.0	1.05	1.0	1.03	1.04	1.06	1.01	1.05	1.04	1.0	1.01	1.07	1.02

Figure 5.2: Mean, Risk and Concentration of Snatch Theft from the Person, BCS 1994-2010/11
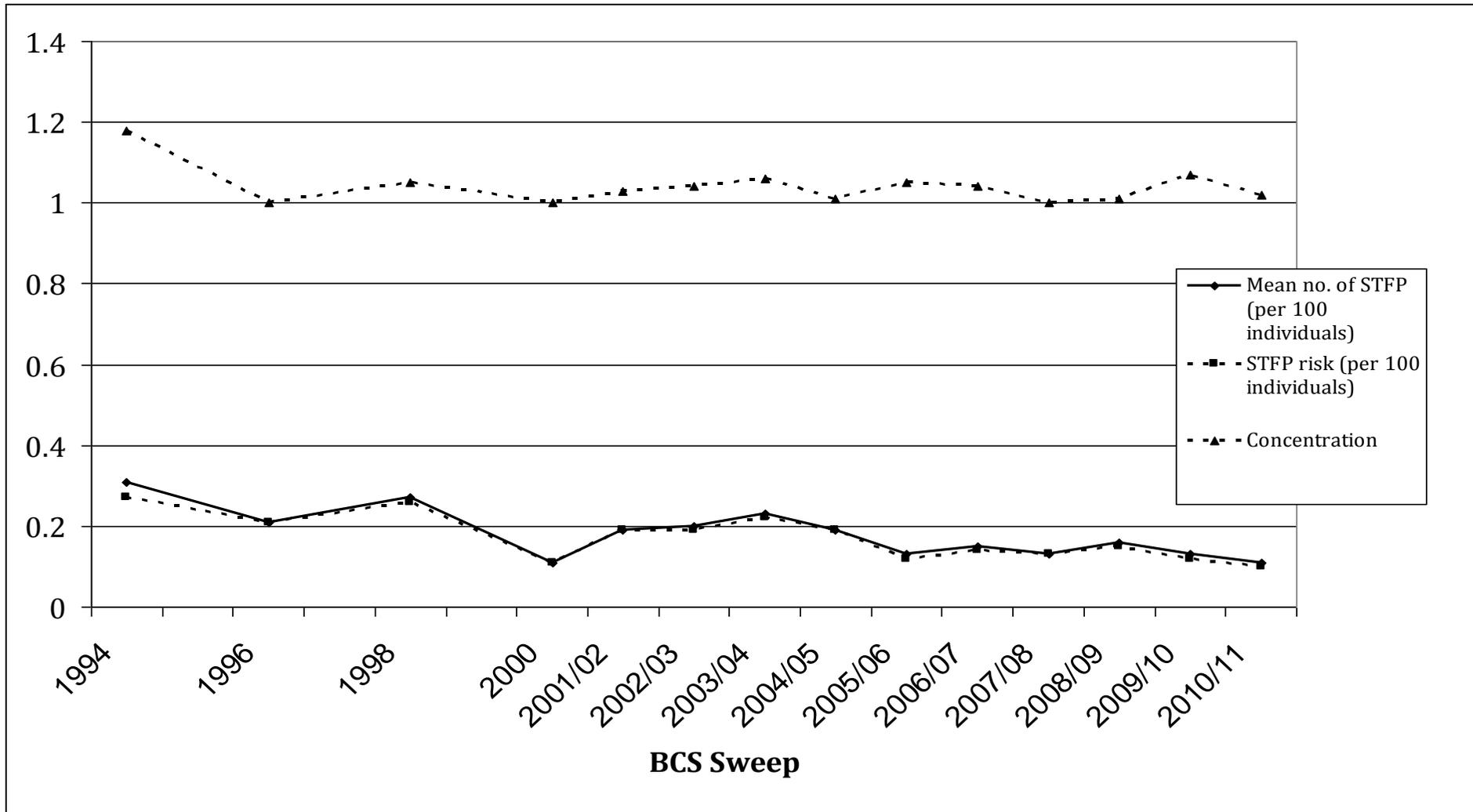
5.3 Trend and Distribution of Other Theft from the Person over Time

Of all three crime types, other theft from the person constitutes the largest proportion of offences when all are combined. In line with the pattern found for snatch theft and robbery, across all sweeps the majority of respondents were not victims of this crime type. Table 5.3 shows the observed frequency distribution of other theft from the person in England and Wales. Other theft risk was highest in 1996 (1.17 per cent). The risk of becoming a victim of this crime has decreased with fluctuations from 2005/06 onwards, but concentration has remained relatively stable (see Figure 5.3). Again, concentration values close to one suggests this crime is suffered predominantly by victims of isolated incidents. The mean number of other thefts from the person peaked in 1996 (1.21), with individuals in the population expected to experience approximately 0.01 incidents within that sweep. Each victimised individual however experienced on average 1.03 incidents (calculated as 0.0121/0.0117).

After looking at each crime type individually we can ascertain that falls first occurred for snatch theft from the person in 1994, followed by other theft from the person in 1996 and lastly for robbery in 1998. This may be suggestive of a change in offender tactics and signature; perhaps it is a reflection of the increased desperation of offenders in resorting to the use of force to obtain property. It also highlights that not only have there been differences in the international timing of falls in crime between offences but that differences are also found *within* crime types. This reinforces Aebi and Linde's (2012) contention that an understanding of the actual evolution of crime trends is a good place to start.

Table 5.3: Observed Frequency Distribution for Other Theft from the Person Victimisation by BCS Sweep (1994-2010/11)

No. of Incidents	1994	1996	1998	2000	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
0	98.97 (16379)	98.83 (16156)	99.0 (14797)	98.96 (19210)	99.17 (32553)	99.21 (36190)	99.24 (37644)	99.35 (44827)	99.38 (47500)	99.29 (46866)	99.31 (46660)	99.26 (45944)	99.35 (44348)	99.4 (46473)
1	1.0 (165)	1.14 (186)	0.98 (147)	1.02 (198)	0.8 (264)	0.76 (276)	0.73 (278)	0.63 (282)	0.59 (283)	0.7 (331)	0.68 (318)	0.71 (330)	0.63 (280)	0.58 (270)
2	0.03 (5)	0.04 (6)	0.01 (2)	0.02 (3)	0.02 (7)	0.03 (10)	0.02 (9)	0.02 (10)	0.02 (11)	0.01 (6)	0.00 (4)	0.02 (10)	0.02 (7)	0.02 (11)
3	0.00 (1)	-	0.00 (1)	-	-	0.00 (3)	-	-	-	-	0.00 (1)	0.00 (1)	0.00 (1)	-
4	-	-	-	-	-	-	-	0.00 (1)	0.00 (1)	-	-	-	0.00 (1)	-
5+	-	-	-	-	-	-	-	-	0.00 (1)	-	-	0.00 (1)	0.00 (1)	-
Total (raw no.)	(16,550)	(16,348)	(14,947)	(19,411)	(32,824)	(36,479)	(37,931)	(45,120)	(47,796)	(47,203)	(46,983)	(46,286)	(44,638)	(46,754)
Mean no. per 100 individuals	1.08	1.21	1.03	1.05	0.85	0.84	0.78	0.68	0.66	0.73	0.7	0.77	0.69	0.62
Variance	0.05	0.03	0.04	0.02	0.03	0.07	0.03	0.06	0.12	0.02	0.02	0.09	0.12	0.04
Risk per 100 indiv.	1.03	1.17	1.00	1.04	0.83	0.79	0.76	0.65	0.62	0.71	0.69	0.74	0.65	0.6
Concentr.	1.04	1.03	1.03	1.01	1.03	1.06	1.03	1.04	1.06	1.02	1.02	1.05	1.06	1.04

Figure 5.3: Mean, Risk and Concentration of Other Theft from the Person, BCS 1994-2010/11
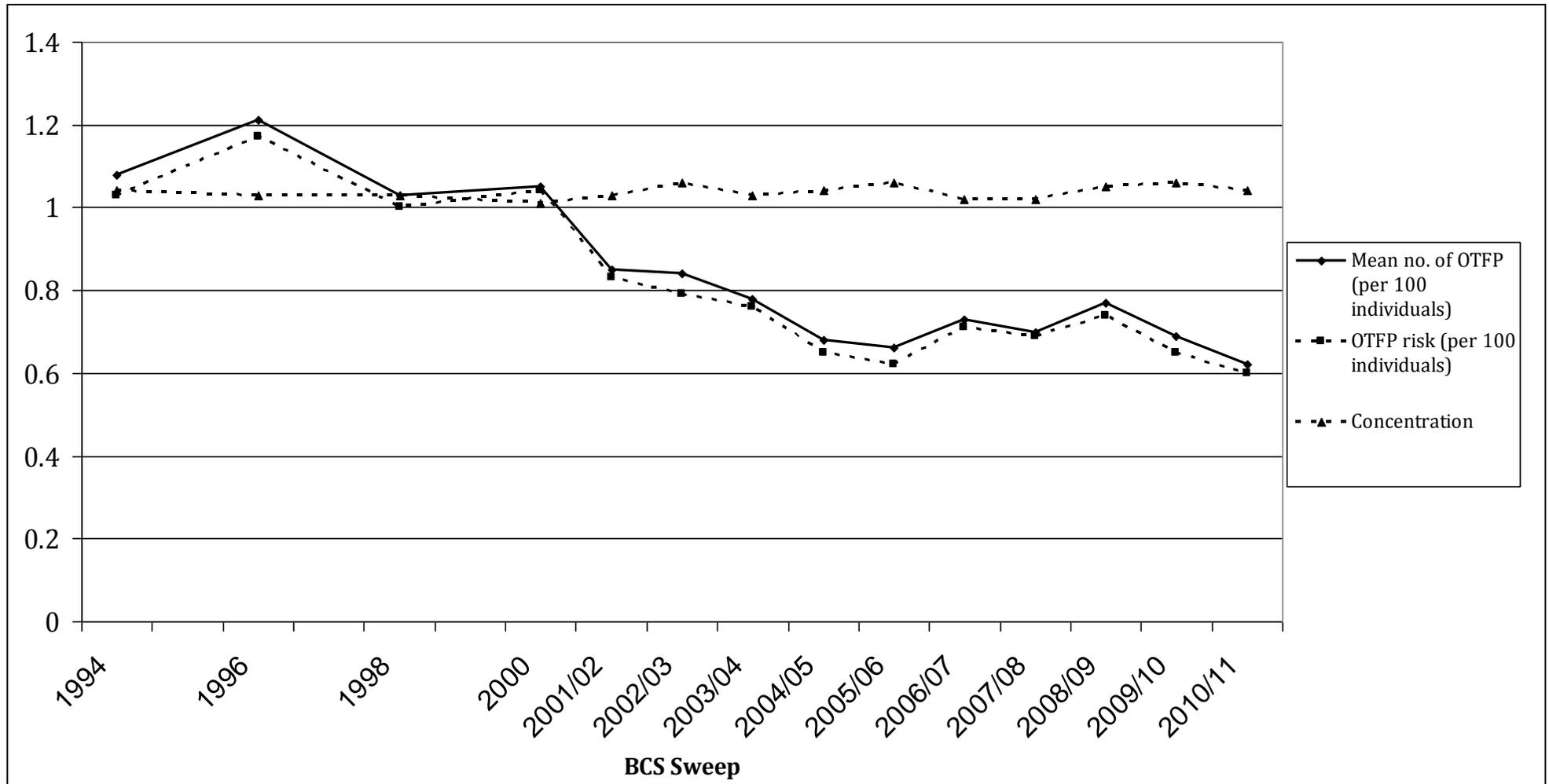
5.4 Trend and Distribution of Theft from the Person and Robbery over Time

Having explored each crime subset individually, this section will look at the aggregate of all three combined. The peak in theft from the person and robbery occurred in 1996 – slightly later than that found for other crime types, for example BCS reports suggest burglary was at its highest level in England and Wales in 1995 (Flatley *et al.*, 2010). Table 5.4 shows the distribution of theft from the person and robbery in England and Wales. Across all 14 sweeps the majority of respondents were not victims of these crimes. The average risk (per 100 individuals) across sweeps is 1.27 per cent, with the highest value found in 1996 (1.81 per cent). The risk of becoming a victim of this crime has decreased with fluctuations from 2005/06 onwards, mostly influenced by trends in other theft from the person, but concentration has remained relatively stable (see Figure 5.4). Looking at individual crime types, in general the highest risk is found for other theft from the person followed by robbery.

Compared to robbery, the concentration of snatch and other theft from the person victimisation is generally much lower. This means robbery is the most recurring crime type of those studied with victims of robbery experiencing a higher number of crimes per victim than for the other crime types. In other words, the figures suggest robbery is suffered disproportionately by the same targets. Risk relating to robbery victimisation may be closely related to intrinsic personal or social characteristics. Snatch and other theft from the person victimisation may be more opportunistic and thus an individual may be less prone to suffering a repeat. However, as stated previously, it is important to remain cautious when generalising from this small sample of robbery data.

The rare and varied nature of theft from the person and robbery victimisation manifests itself in the data via 'overdispersion' of the observed distribution of crime. Essentially, the variance of the sample exceeds the mean. If crimes were random they would approximate the Poisson theoretical distribution (Nelson, 1980), where there is an assumption of equal mean and variance. The Poisson model also assumes crimes are independent. An overdispersed distribution therefore violates these assumptions and thus a Poisson specification does not fit the data particularly well. The negative binomial theoretical distribution is therefore a much better way to predict the observed distribution of crime (Osborn and Tseloni, 1998) (see Chapter 4).

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Taken collectively, it is clear that theft from the person and robbery are not crimes which are disproportionately experienced by the same victim. It is also apparent that these offences have not experienced the same dramatic peak in the mid-1990s and steep declines found for other crime types.

Table 5.4: Observed Frequency Distribution for Theft from the Person and Robbery Victimisation by BCS Sweep (1994-2010/11)

No. of Incidents	1994	1996	1998	2000	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
0	98.25 (16260)	98.19 (16052)	98.23 (14682)	98.54 (19127)	98.64 (32379)	98.71 (36010)	98.78 (37470)	98.94 (44641)	99.0 (47317)	98.91 (46690)	98.98 (46504)	98.89 (45771)	99.0 (44191)	99.11 (46337)
1	1.63 (270)	1.73 (283)	1.72 (257)	1.38 (268)	1.27 (416)	1.22 (446)	1.18 (446)	1.02 (460)	0.94 (451)	1.04 (493)	0.98 (460)	1.07 (493)	0.95 (425)	0.85 (398)
2	0.08 (14)	0.07 (12)	0.05 (7)	0.04 (8)	0.06 (20)	0.04 (16)	0.03 (13)	0.03 (15)	0.04 (21)	0.03 (13)	0.03 (13)	0.03 (16)	0.03 (12)	0.03 (15)
3	0.02 (4)	-	0.00 (1)	0.01 (2)	0.00 (3)	0.00 (3)	-	0.00 (1)	0.00 (1)	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (4)	0.00 (3)
4	0.01 (2)	-	-	-	0.00 (1)	0.00 (1)	-	0.00 (2)	0.00 (1)	-	0.00 (1)	0.00 (1)	0.00 (2)	-
5+	-	0.00 (1)	-	0.03 (6)	0.02 (5)	0.00 (3)	0.00 (2)	0.00 (1)	0.01 (5)	0.01 (5)	0.00 (3)	0.00 (3)	0.00 (4)	0.00 (1)
Total (raw no.)	(16,550)	(16,348)	(14,947)	(19,411)	(32,824)	(36,479)	(37,931)	(45,120)	(47,796)	(47,203)	(46,983)	(46,286)	(44,638)	(46,754)
Mean no. per 100 indivs.	1.92	1.91	1.83	1.65	1.5	1.39	1.27	1.12	1.1	1.17	1.09	1.19	1.1	0.95
Variance	0.13	0.09	0.04	0.38	0.26	0.18	0.10	0.11	0.23	0.19	0.16	0.15	0.24	0.10
Risk per 100 indiv.	1.75	1.81	1.77	1.46	1.36	1.29	1.22	1.06	1.00	1.09	1.02	1.11	1.00	0.89
Concent.	1.1	1.05	1.03	1.13	1.11	1.08	1.05	1.06	1.1	1.07	1.07	1.07	1.09	1.06

Figure 5.4: Mean, Risk and Concentration of Theft from the Person and Robbery, BCS 1994-2010/11
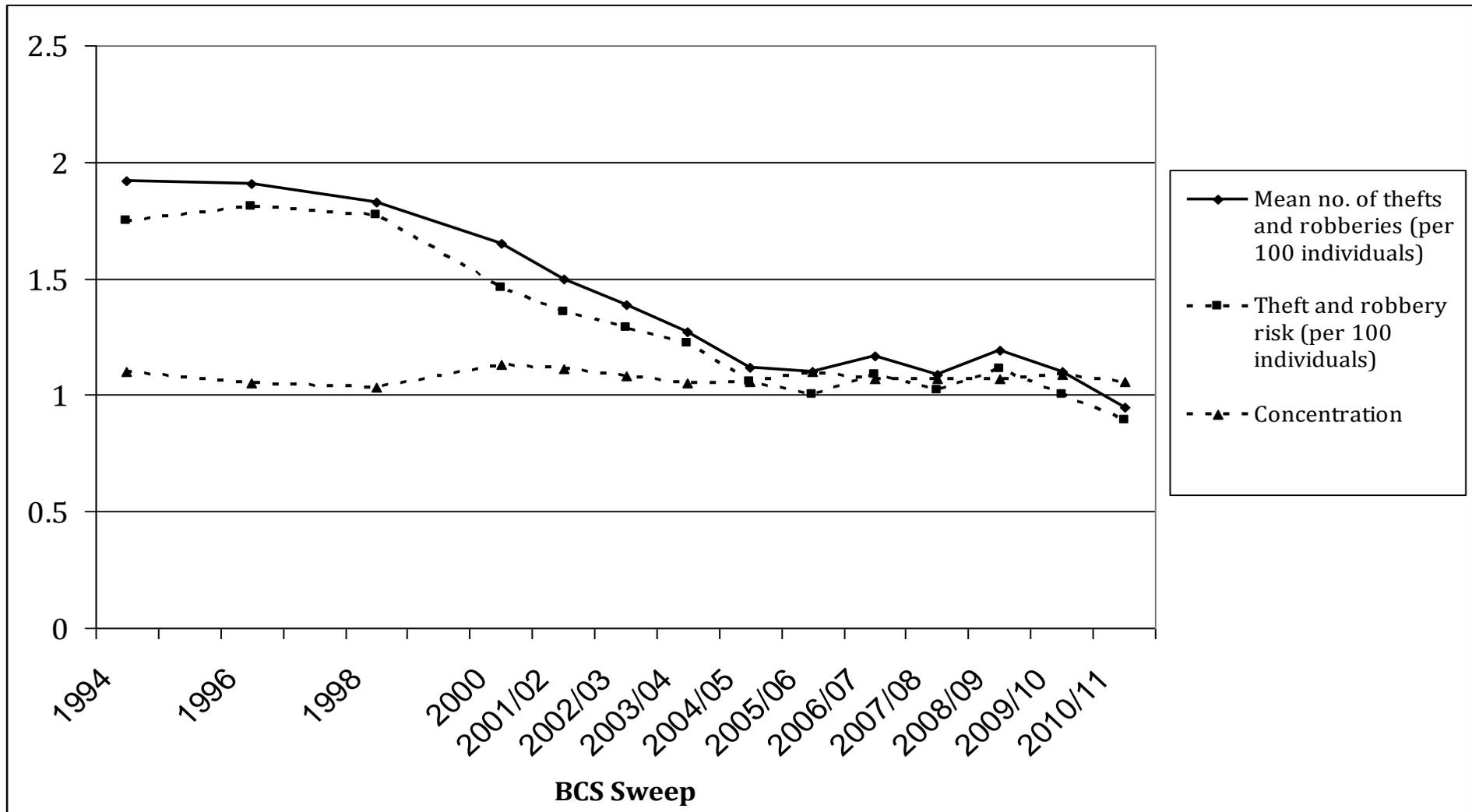
5.5 Repeat Victimisation by Theft from the Person and Robbery over Time

Becoming a victim of crime can have serious psychological and physical consequences. This harm can be further increased if an individual suffers more than one event. Crime is very unevenly distributed among the general population – in terms of hot spots, hot products, repeat victims and prolific offenders (Farrell, 2005). The BCS has undoubtedly made a major contribution to advancements in knowledge regarding repeat victimisation, largely stimulated by the work of Ken Pease and colleagues in the early 1990s (Forrester *et al.*, 1990; Pease, 1991; Farrell and Pease, 1993; Pease, 1998). Not only is this knowledge important from a victim support perspective, it is also valuable in most efficiently directing resources and police deployment to decrease crime further still (Farrell and Pease, 1993; Farrell, 1995; Pease, 1998; Tseloni *et al.*, 2002). Thus, the extent of repeat victimisation with regard to theft from the person and robbery is an important avenue to explore.

Becoming a victim of crime more than once can be measured in a number of ways. The term repeat victimisation is used to define a victim who has experienced the *same* crime type more than once. Multiple victimisation refers to victims who have experienced two or more *different* crime types within the same period. Series victimisation is defined as a number of recurrent incidents of a very similar nature and circumstance possibly carried out by the same perpetrator(s) (Tseloni, 2014). This particular analysis looks at victims of one or more incidents of theft from the person *or* robbery in the reference period therefore capturing a mixture of both repeat and multiple victims – the term repeat is utilised for ease.

A relatively large proportion of all incidents reported in the BCS are repeat or multiple victimisations. In 2006/07, 8.6 per cent of all adults experienced multiple victimisation in the previous 12 months, compared to 15.9 per cent experiencing a single incident (Thorpe, 2007). The level of repeat victimisation will further skew the overarching level of crime in that a large proportion is composed of offences committed against the same victims (Ellingworth *et* al., 1995; Chenery *et al.*, 1996). As Thorpe (2007: 81) documents:

> The number of single incidents of crime has fallen by 16 per cent since the
> peak of crime in 1995 but there has been a much larger drop (51%) in the

number of multiple incidents. This relatively large decline in multiple victimisation is a major factor in the overall decline in BCS crime since 1995.

Importantly, differences have been found by crime type – with victims of vandalism the most likely to suffer a repeat incident. By contrast, repeat incidents of burglary and theft from the person comprise a much smaller proportion of the total number of crimes than single incidents (ibid). Farrell and Bouloukos (2001) also found theft from the person exhibited one of the lowest mean international rates of repeat victimisation; a point which is reinforced by findings from this Chapter. Research by Nicholas *et al.* (2007) shows theft from the person has the lowest repeat victimisation rates, with only seven per cent of victims repeatedly victimised in a 12-month period.

Much previous empirical research has focused on victimisation risk rather than the number of crimes experienced per individual. Repeat victimisation is therefore overlooked despite its seemingly important contribution to overall crime trends (Farrell and Pease, 1993). One limitation of the BCS is that repeat victimisation is restricted to incidents which happened within a particular reference period. However, there are a number of statistical models for counts which can be employed to model the entire distribution of crimes and thus capture this phenomenon as it is currently measured.

The observed distribution of crimes, alongside the proportion of repeat crimes (the percentage of total crimes that affected the same victims) and repeat victims (the proportion of victims who suffered at least two incidents), are presented in Table 5.5 (see also Figures 5.5 and 5.6). This table suggests theft from the person and robbery incidents are not suffered disproportionately by the same targets. This is in stark contrast to many other crime types and is in agreement with findings from Nicholas *et al.* (2007). These findings have implications for crime reduction policy and are discussed in more detail below.

Table 5.5: Proportion of Repeat Crimes and Victims of Theft from the Person and Robbery (1994-2010/11)

No. of Incidents	1994	1996	1998	2000	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
0	98.25 (16260)	98.19 (16052)	98.23 (14682)	98.54 (19127)	98.64 (32379)	98.71 (36010)	98.78 (37470)	98.94 (44641)	99.0 (47317)	98.91 (46690)	98.98 (46504)	98.89 (45771)	99.0 (44191)	99.11 (46337)
1	1.63 (270)	1.73 (283)	1.72 (257)	1.38 (268)	1.27 (416)	1.22 (446)	1.18 (446)	1.02 (460)	0.94 (451)	1.04 (493)	0.98 (460)	1.07 (493)	0.95 (425)	0.85 (398)
2+	0.12 (20)	0.08 (13)	0.05 (8)	0.08 (16)	0.09 (29)	0.06 (23)	0.04 (15)	0.04 (19)	0.06 (28)	0.04 (20)	0.04 (19)	0.05 (22)	0.05 (22)	0.04 (19)
Repeat Crimes (%)	15.09	9.29	6.2	16.25	15.79	11.86	7.47	9.09	14.1	10.36	9.98	10.36	13.09	9.95
Repeat Victims (%)	6.9	4.39	3.02	5.63	6.52	4.9	3.25	3.97	5.85	3.9	3.97	4.27	4.92	4.56
Total (raw no.)	(16,550)	(16,348)	(14,947)	(19,411)	(32,824)	(36,479)	(37,931)	(45,120)	(47,796)	(47,203)	(46,983)	(46,286)	(44,638)	(46,754)

Figure 5.5: Proportion (% of the Population at Risk) of Single Victims and Victims of Two or More Incidents of Theft from the Person and Robbery over Time (1994-2010/11)
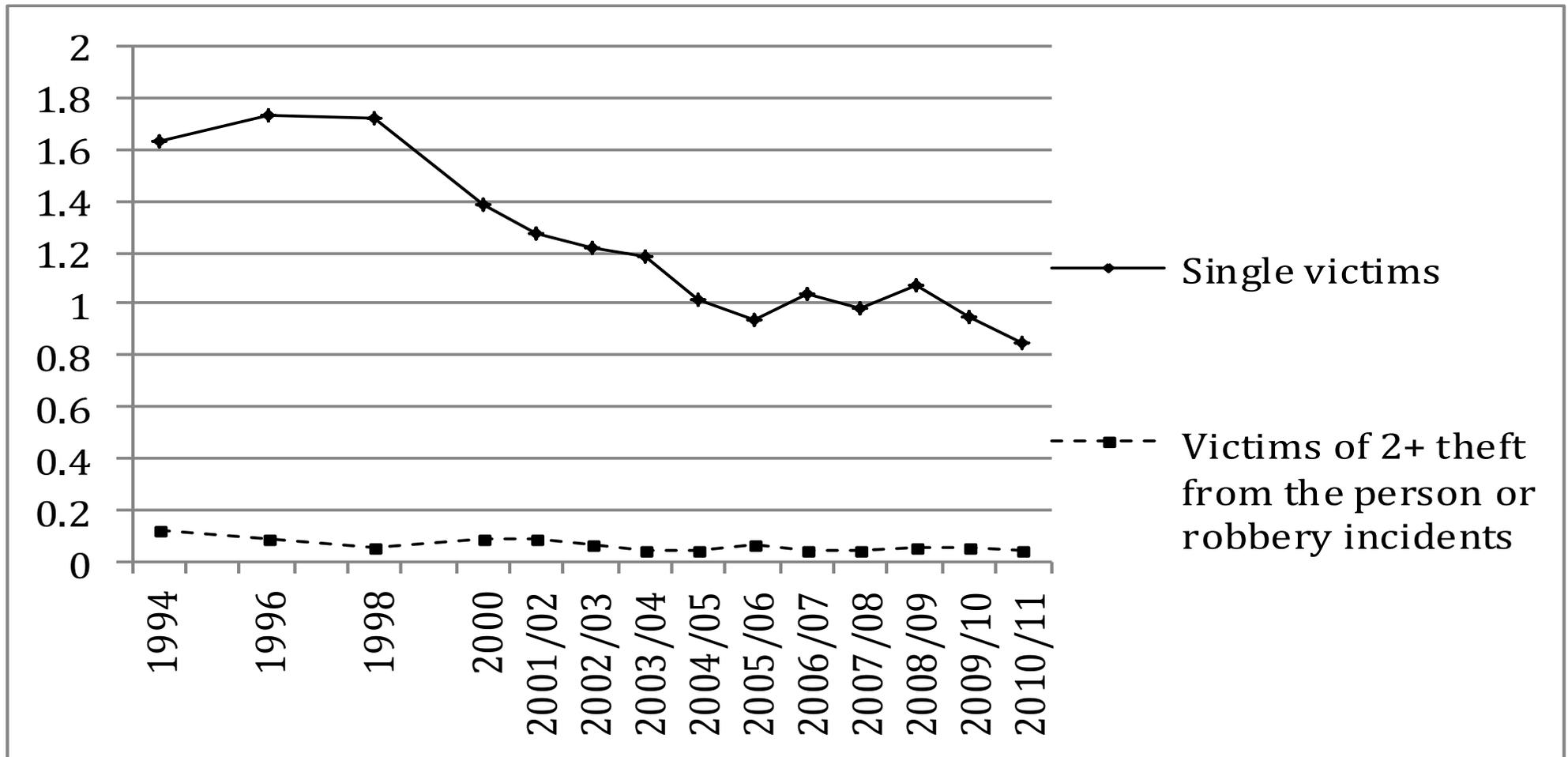
Figure 5.6: Proportion of Repeat Crimes and Repeat Victims of Theft from the Person or Robbery over Time (1994-2010/11)
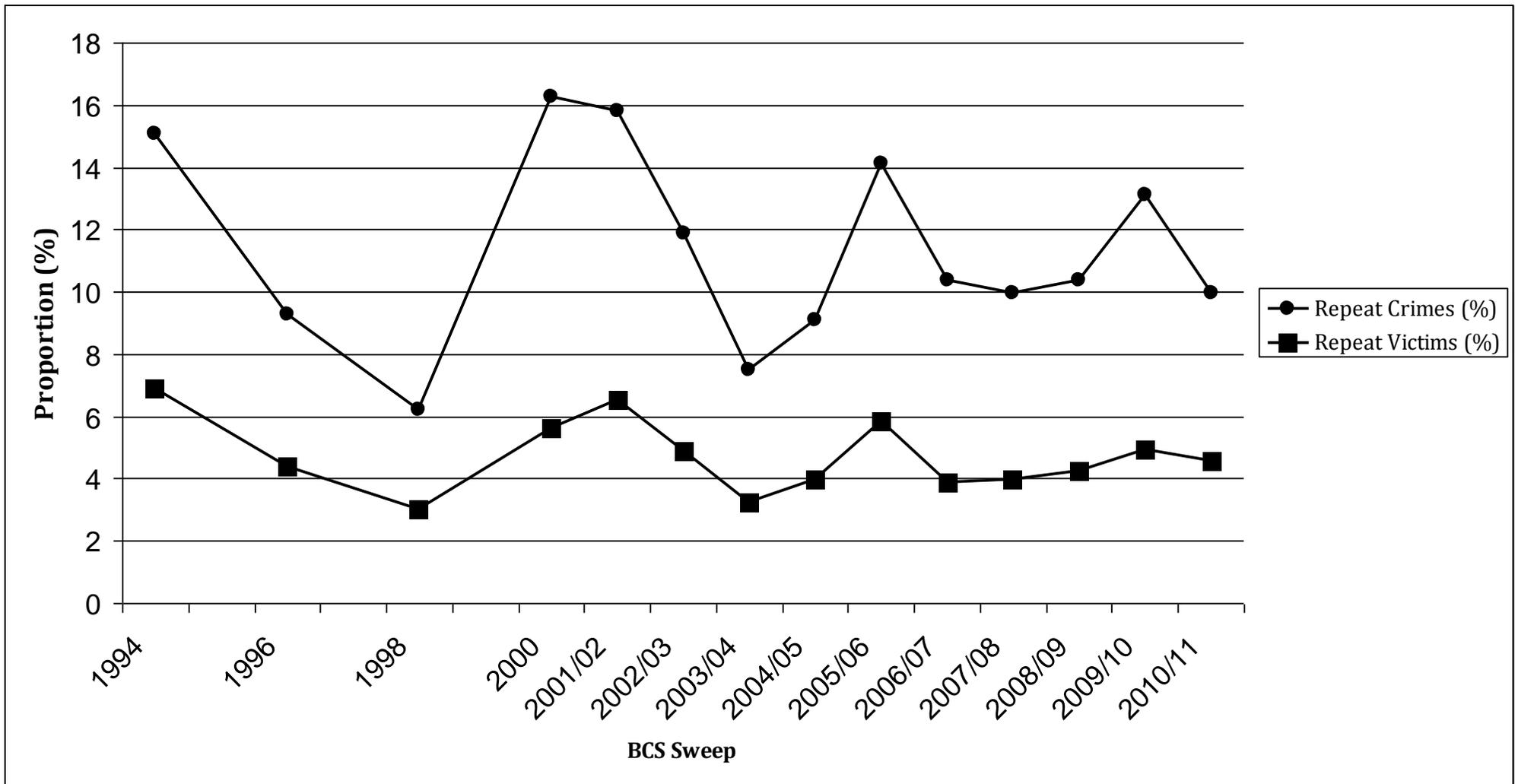
Figure 5.5 shows the fall in theft from the person and robbery victimisation is largely driven by a reduction in single, 'one-off' victimisations. The proportion of repeat victims has remained relatively consistent and flat over time. Figure 5.6 shows the proportion of repeat crimes and repeat victims over the period of study. There are large fluctuations in the proportion of repeat crimes from year to year so it is difficult to comment on any particular trend. On average (across sweeps) around five per cent of victims of theft from the person and robbery have experienced at least two incidents and approximately 11 per cent of the total number of thefts from the person and robbery affected the same victims. This is largely driven by higher numbers of repeat victims for robbery of personal property.

These are fascinating findings and enable us to reject our first hypothesis that a reduction in repeat victims of theft and robbery was largely responsible for its overall decline. This may explain why the drop in theft from the person and robbery is much shallower than that found for other crime types as changes in the level of aggregate 'crime' have been heavily influenced by a reduction in repeat victims (Thorpe, 2007). It appears theft from the person and robbery have bucked this general trend in that they are driven far more by changes in the prevalence of single incidents than by a change in the number of repeat victims (Hope, 2007a). As a result, measures designed to reduce the likelihood of a repeat victimisation will have had much less of an impact on the overarching theft trend by virtue of the fact that the level of repeat victimisation for theft from the person has been consistently low over time. This may help explain why the drop has been much shallower and why robberies recorded by the BCS have experienced a steeper decline than theft. In addition, the application of crime prevention and security to crimes against the person, such as theft and robbery, is somewhat less 'obvious' than for vehicles and households where locks and alarms are routinely employed. Personal security often focuses upon altering your routine or behaviour, such as avoiding particular areas or not walking alone when it is dark. The relevance and importance of repeat victimisation to the drop in theft from the person and robbery is clearly important and is explored in more detail throughout the thesis.

The findings presented herein reinforce the importance of crime specific analysis. Crimes such as theft from the person are comprised of a higher number of victims

with lower crimes per victim. Other crimes, such as vandalism and assault, generally have a lower number of victims with a larger number of crimes per victim (Thorpe, 2007; Nicholas *et al.*, 2007). This ultimately influences the form of prevention intervention selected. High levels of concentration point to identifying repeat victims and focusing resources on these individuals. In the case of theft from the person and robbery, where the concentration of crime is lower, the focus may be better spread more widely. Analysis of victim characteristics will assist in establishing if there are particular high-risk population subgroups toward which efforts should be concentrated.

5.6 Summary

This chapter has taken an in-depth look at the distribution of theft from the person and robbery in England and Wales between 1994 and 2010/11 in an attempt to build a comprehensive picture of these crime types and address hypothesis one:

> *A reduction in 'repeat' victims of theft from the person and robbery is predominantly responsible for the overarching decline in these crimes.*

In sum, the risk of becoming a victim of theft from the person and robbery in England and Wales peaked in 1996 and has decreased since with fluctuations from 2005/06. The hypothesis is rejected after ascertaining that the decline is largely comprised of a reduction in single victims. This rather unique structure (compared to other crime types) has implications for theory regarding the crime drop and is discussed in more detail in Chapter 9. The next chapter will look in further detail at the composition of this declining trend by examining the goods stolen through theft and robbery.

Appendix Chapter 5

A5. Theft from the Person and Robbery Trends

A5.1 Calculation of Risk, Incidence, Concentration, Repeat Victimisation and Repeat Crimes

The process for calculating victimisation risk, incidence and concentration is outlined below. Calculations for repeat victimisation and repeat crimes are also shown. A working example taken for theft from the person and robbery from the 2003/04 BCS dataset is utilised below. For more information please see Tseloni (2014).

Theft from the Person and Robbery (2003-04)

Theft and robbery victimisation risk in 2003/04 is calculated by dividing the number of victims by the total number of potential victims, in this case 461/37931 = 0.01215. Victimisation risk per 100 individuals is therefore 1.22 (see Table 5.4). The data shows 15 respondents were repeat victims therefore the percentage of repeat victimisation is 100 x (15/461), that is 3.25 per cent. This is a measure of victims who suffered at least two robbery incidents. The total number of crimes is 482 which gives a crime incidence (mean number of crimes in the entire population) of 1.27 per cent (100 x (482/37931)) or 0.013 crimes per respondent. Crime concentration (crimes per victim) is calculated by dividing the total number of crimes by the number of victims (482/461 = 1.05 crimes per victim). 36 crimes were the result of repeat victimisation therefore the percentage of repeat crimes is 100 x (36/482) which gives 7.47 per cent. This figure refers to the percentage of total crimes that affected the same victims.

Chapter 6: Goods Stolen Through Theft from the Person and Robbery

In order to add depth to our understanding of the declines in theft from the person and robbery over time, it is necessary to explore the composition of these trends. A growing, but still relatively limited, number of studies have explored the items stolen through particular crime types to ascertain whether some products are more prone to theft than others. The analysis presented herein is used to build a comprehensive picture of the goods stolen through theft from the person and robbery[4]. This work builds on the influential work of Clarke (1999) and is an attempt to establish if the items targeted through theft share specific criminogenic properties. In particular, the following research questions will be addressed:

1. Are there 'hot products' in relation to theft from the person and robbery and, if so, what are they?
2. Have there been changes in the products targeted through these crimes since 1994?
3. Are differences evident between the three crime types examined, i.e. robbery of personal property, snatch theft from the person and other theft from the person?
4. Where data is available, do trends in products stolen adhere to the 'life cycle hypothesis'? and
5. What are the implications for crime prevention policy?

To answer the aforementioned research questions, exploratory bivariate analysis will be conducted.

In what follows the author discusses previous empirical research followed by theory relating to product vulnerability to theft. BCS data relating to stolen goods is then discussed and thereafter the results of the analysis presented. The chapter closes with a discussion of findings and horizon scanning.

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[4] Offence codes 41, 43 and 44 are used in this analysis. Attempted crimes were not included due to the fact that no items were successfully stolen.

6.1 Empirical Foundation

To the author's knowledge, this is the first study to look at the items stolen through theft from the person and robbery over this time period. With few exceptions, research in this area generally falls into one of four categories, where they focus predominantly upon: aggregate crime data; other crime types e.g. household burglary (Budd, 1999; Wellsmith and Burrell, 2005; Fitzgerald and Poynton, 2011); a time period insufficient for commenting upon the attractiveness of products to thieves before *and* after the crime drop (e.g. Clarke, 1999); or police recorded crime data for specific localities (Barker *et al.*, 1993; Kock *et al.*, 1996; Smith, 2003).

Of the research that has been conducted, a number of similar conclusions can be drawn. Cash is heralded as "the mother's milk of crime" (Felson, 1998: 191), the ultimate hot product (Clarke, 1999: 21). In addition, the concentration of efforts upon a relatively small range of products is consistently reported. The most commonly cited include credit cards, bags, electronic items, jewellery and purses and wallets. However, there are distinct differences across crime types and settings (Clarke, 1999) thus the importance of crime specific analysis is emphasised.

There are a number of key studies that this research draws upon. In particular, Barker *et al.* (1993) and Smith (2003) contribute heavily to the understanding and prevention of 'personal robbery'. Both include discussion of goods stolen through this crime yet are limited in their use of police recorded crime data for specific localities. Covering a six-month period in London in 1987, Barker et al. (1993) found the most commonly stolen items were briefcases/bags, jewellery, wallets and credit cards. Smith (2003) examines crime reports and witness statements relating to personal robbery from seven police force areas. Cash is found to be the most frequent item of property stolen (one quarter of incidents) followed by mobile phones (18%), debit/credit cards (9%) and purses/wallets (8%) (ibid: 51). Interestingly, sex differences were found, with males more likely to have cash and mobile phones taken where females reported thefts of handbags, personal accessories, cash and debit/credit cards. Both studies utilise police data in their examination of personal robbery over relatively short time periods, and report some important parallel findings across the ten-year period they collectively cover, namely, the prominence of cash, wallets and credit cards.

Wellsmith and Burrell (2005) analyse goods stolen in incidents of residential burglary. Although this study looks at a different crime type, there are important lessons with regard to accounting for purchase prices and ownership levels. The study utilises police recorded crime data for a very deprived area of the West Midlands from June 1997 to September 2003 as well as General Household Survey (GHS) data. A preference toward portable and easily disposed of items was noted. Interestingly, theft of mobile phones showed the greatest increase over the period studied, from a negligible proportion of burglaries in 1997 to a peak of one in five burglaries at the beginning of 2003. This is consistent with increases in their ownership and apparent desirability. Wellsmith and Burrell (2005) question the inevitable 'saturation' of mobile phones due to their seemingly insatiable popularity and evolving technology. This research highlights the benefits of utilising (where possible) legitimate market data in order to better inform findings in relation to its illegitimate equivalent.

Budd (1999) used data from the 1998 BCS to analyse burglary of domestic dwellings. Longer-term trends are of interest here with an increase in the theft of credit cards and purses/wallets and peaks in the theft of cash in 1992 and 1998. More recently, Fitzgerald and Poynton (2011) examine police recorded crime data for household burglary in New South Wales in 2001 and 2010. The authors provide an interesting commentary regarding the trajectory of goods stolen. They find the market for stolen goods "...has changed considerably over the last ten years with a shift toward cash and other easily disposed of items" (ibid: 1). This research is important in that it highlights shifts in the preferences of offenders and analyses goods stolen over time.

The above research demonstrates the importance of the current project in bridging a gap. Existing research highlights the importance of utilising both crime and (where available) market data over time in conducting crime specific analysis. Cash, handbags/briefcases and electrical items are consistently presented as 'hot products', with the most common justifications for choosing particular items lying in their ease of disposal and, in many cases, their ready conversion to cash or drugs (see 3.6.1) (Clarke, 1999; Nelson *et al.*, 2002; Palmer *et al.*, 2002; Schneider, 2005). Cross-national trends in acquisitive crime are highly correlated (Tseloni *et al.*, 2010). These industrialised Western countries will have experienced similar improvements in

technology and levels of demand for particular manufactured goods. Cohen and Felson (1979) partly attributed the increase in residential burglary during the 1970s to the proliferation of lightweight electronic goods. With many of these items now carried on an individual's person, the central role of theft from the person and robbery is emphasised. The possibility that product selection and availability has influenced overarching crime trends in England and Wales is thus a major application of the current research.

6.2 Product Vulnerability Theory

   6.2.1 VIVA and CRAVED

It is repeatedly argued that crime prevention efforts should be concentrated on the most frequently targeted victims (Farrell and Pease, 1993). The notion that certain *goods* may be more vulnerable to theft, and thus form a worthwhile focus of attention, has slowly gained momentum. The most cited works are Cohen and Felson (1979) and Clarke (1999) and their respective VIVA and CRAVED acronyms. Both argue that particular elements make a product more attractive or 'hot' to thieves. VIVA refers to value, inertia, visibility and accessibility (Cohen and Felson, 1979). Recognising a number of limitations with their model, Clarke (1999: vi) built upon this existing theory of target suitability and claimed hot products must in fact "...be concealable, removable, available, valuable, enjoyable and disposable". An item is concealable when it is not identifiable after the theft. Removable products are those that are easily moved and disposable items are easy to sell on afterwards. Hot products should be enjoyable things to own or consume and available both in the legitimate market and at the point of theft. Existing research places particular importance upon those goods that are portable and disposable (Kock *et al.*, 1996).

If there are particular attributes that make a product vulnerable to theft it must also then be possible to anticipate these issues in new items, make appropriate modifications and stem potential crime harvests. Two vital methods of preventing theft lie in establishing ownership and denying the benefits of theft (Clarke, 1999). It is hoped that in future rather than take the usual route of innovation – crime consequence – response (Pease, 1997) we may more fully embrace innovative design, technology and manufacture to adapt such product vulnerabilities to theft and stem future potential crime 'epidemics'.

6.2.2 Life Cycle Hypothesis

It is fairly well established that demand for a product on the legitimate market will influence its positioning on the stolen goods market and subsequent theft (see Chapter 3). This is reflected in Gould (1969) and Felson's (1997; 1998) work suggesting that vulnerability to theft is dependent upon a product's novelty and availability. Felson claims new products go through a life cycle consisting of four stages, namely innovation, growth, mass market and saturation. In the innovation stage, products are relatively unknown and thus feature much less on both the legitimate and illegitimate markets. Theft levels are said to be highest during periods of growth and mass-market appeal. By saturation point, products are widely available, widely owned and usually relatively inexpensive, thus reducing their attractiveness to thieves.

The notion that consumers may avoid purchasing said items on the basis of their criminogenic properties has been voiced (Clarke, 1999). This is demonstrated by the UK Car Theft Index both in its placing pressure on industry to design out crime from vehicles and highlighting the importance of security to the wider public (Laycock, 2010). The current author doubts just how much of a role the 'criminogenic' potential of an item such as a mobile phone plays in consumer decision-making. This is where problems may lie in the implementation, effectiveness and promotion of crime prevention measures.

6.3 Data

Each sweep of the BCS has a number of associated data files (see Figure 4.1). Analysis of goods stolen through theft from the person and robbery is conducted solely within the Victimisation Module for each sweep. All analysis herein is conducted via the data and statistical software package IBM SPSS Statistics (IBM Corp., 2012).

For the purposes of this chapter, it was felt that to attribute findings to, for example, the 2008/09 BCS (where this could refer to an event in 2007, 2008 or 2009) (see Table 4.2) is not ideal, especially when the data is available to establish the year of victimisation. Consequently, a new 'semester of victimisation' variable was created which pinpoints the six-month period in which the victimisation occurred (see A6.1). The creation of this variable also allows for more accurate comparisons to be made with consumer data (where available).

6.4 Analysis Clarification

This analysis focuses on completed incidents of robbery and theft from the person. Robbery, snatch theft from the person and other theft from the person are analysed both individually and collectively. Only incidents with a valid offence code (41, 43 or 44) that occurred in England and Wales within the reference period for each sweep are included (see A6.2-A6.3).

6.5 Stolen Goods Variables

With regard to goods stolen, the BCS asks: "Was any property stolen, or taken without permission, even if the victim later got it back?" Questions relating to which items were stolen are then only asked of those who complete the long Victim Module (see A6.3), where respondents are asked: "Could you tell me what was actually stolen, even if you later got it back?" This is a multiple response categorical variable, thus respondents can report the theft of any number of items for each incident. Results are presented by six-month period of victimisation.

6.6 Analysis

6.6.1 Strategy

As discussed, the variable of interest is a multiple response categorical variable. The data thus captures all goods stolen in each incident. In preliminary analysis findings were presented as the risk of an item being stolen as a proportion of *all items* stolen (see A6.4). After consideration, it was felt calculating the proportion of *incidents* where a particular item was reported stolen was more appropriate. This allows for more consistent patterns to be drawn across sweeps and renders the findings comparable with previous research.

6.6.2 Are There 'Hot Products' in Relation to Theft and Robbery?

In adopting Wellsmith and Burrell's (2005) definition of a 'hot product' as those that are stolen in over 25 per cent of incidents (in this instance, in any one six-month period) four 'hot products' in relation to theft from the person and robbery can be identified (see Table 6.1 and Figure 6.1). These are cash, purses/wallets, credit/debit cards and mobile phones. Cash and purses/wallets are consistently the hottest products for these crime types. They alternate the top two positions over time. There is a clear concentration on a small range of items (approximately eight), leading the author to two potential conclusions:

1. These are items routinely carried on our person – emphasising the importance of Clarke's (1999) concepts of 'removability' and 'portability' and reinforcing the role of opportunism; and/or

2. Thieves specifically target these items (not opportunistic) and thus are a reflection of the tastes and needs of thieves and the wider population.

It is likely that stolen goods trends are made up of elements of both of the above. The items most commonly stolen are routinely carried together. It may be that the identified 'hot' products are not the most desired but act as motivators in terms of their potential contents, for example cash within a wallet. It was therefore of interest to test the co-occurrence of theft of particular products. For example, credit/debit cards are generally stolen alongside purses/wallets. Over one-third (approximately 37 per cent on average across sweeps) of incidents involve the theft of a purse/wallet *and* cash. Due to a lack of information concerning offenders, we cannot be completely certain of their exact motivations and such findings raise questions as to exactly which items (if any) are being targeted by thieves. Is the purse or wallet the focus of attention for its intrinsic value or its assumed contents (i.e. cash, credit/debit cards)? Without data to the contrary, and with the support of previous empirical evidence, one can assume the offender steals under the belief there is likely to be something contained within the purse or wallet. Cash is relatively anonymous, whereas purses/wallets, cards and mobile phones are less conspicuous, easier to identify and thus more difficult to dispose of.

Table 6.1: Proportion (%) of Theft from the Person and Robbery Incidents Where Selected Goods (Stolen in More Than 10% of Incidents in At Least One Semester) Stolen by Six-month Period (January 1993-June 2010)

	Jan-Jun 93	Jul-Dec 93	Jan-Jun 94	Jul-Dec 94	Jan-Jun 95	Jul-Dec 95	Jan-Jun 96	Jul-Dec 96	Jan-Jun 97	Jul-Dec 97	Jan-Jun 98	Jul-Dec 98	Jan-Jun 99	Jul-Dec 99	Jan-Jun 00	Jul-Dec 00	Jan-Jun 01	Jul-Dec 01
Cash	34.83	36.17	40.54		71.56	70.63	61.54		73.27	73.45	68.75		69.47	65.52	57.14	51.74	53.30	51.64
Purse/wallet	58.43	56.03	59.46		63.30	54.76	43.59		65.35	53.98	53.13		56.84	56.03	52.94	52.91	48.11	51.64
Credit/debit card	11.24	7.09	18.92		16.51	19.05	25.64		26.73	22.12	21.88		23.16	19.83	24.37	22.67	26.42	28.28
Mobile phone	1.12	1.42	0		0	0	2.56		5.94	7.08	3.13		4.21	11.21	15.97	22.09	20.75	26.23
Briefcase/handbag	6.74	12.77	13.51		2.75	14.29	5.13		13.86	6.19	6.25		6.32	8.62	5.04	7.56	8.96	7.38
Documents	12.36	12.06	13.51		17.43	15.08	15.38		6.93	6.19	6.25		14.74	10.34	10.08	4.65	6.13	6.15
Chequebooks	2.25	4.96	8.11		11.93	6.35	12.82		4.95	10.62	3.13		2.11	2.59	1.68	1.16	4.25	2.05
Jewellery/watches	12.36	3.55	13.51		4.59	3.97	0		1.98	6.19	6.25		5.26	7.76	7.56	8.14	3.30	6.15

Table 6.1 (contd.): Proportion (%) of Theft from the Person and Robbery Incidents Where Selected Goods (Stolen in More Than 10% of Incidents in At Least One Semester) Stolen by Six-month Period (January 1993-June 2010)

	Jan-Jun 02	Jul-Dec 02	Jan-Jun 03	Jul-Dec 03	Jan-Jun 04	Jul-Dec 04	Jan-Jun 05	Jul-Dec 05	Jan-Jun 06	Jul-Dec 06	Jan-Jun 07	July-Dec 07	Jan-Jun 08	July-Dec 08	Jan-Jun 09	July-Dec 09	Jan-Jun 10
Cash	52.88	52.85	53.81	54.29	53.13	55.46	49.31	58.3	49.59	47.84	49.55	50.42	51.82	53.23	50.49	45.66	42.59
Purse/wallet	48.17	52.85	49.05	48.16	44.79	45.8	43.78	51.82	45.49	44.71	48.18	49.58	48.58	52.02	52.45	49.32	40.12
Credit/debit card	26.7	33.74	30.95	33.06	26.56	28.57	29.03	35.63	27.87	29.8	33.18	30.51	30.77	29.44	31.37	25.11	23.46
Mobile phone	24.08	28.86	29.05	26.12	34.9	26.47	32.26	24.29	25.82	30.2	32.73	26.69	27.53	27.82	25.49	24.66	27.16
Briefcase/handbag	10.99	7.72	9.52	14.29	11.98	10.5	8.76	9.72	6.97	8.63	9.09	7.63	8.91	8.06	6.86	6.85	6.17
Documents	6.81	10.16	10.0	10.61	9.9	7.98	8.29	6.88	6.15	5.88	7.73	5.51	7.69	10.48	8.82	8.68	7.41
Chequebooks	4.19	3.25	2.86	3.67	2.08	1.26	3.23	1.21	2.46	1.96	2.73	0.85	3.24	2.82	2.45	0.91	1.23
Jewellery/watches	3.14	2.44	7.62	2.86	3.13	3.36	3.23	4.86	5.74	3.92	7.27	1.27	2.83	3.23	1.47	1.83	5.56

Figure 6.1: Proportion of Theft from the Person and Robbery Incidents Where Selected Goods Stolen by Six-month Period (January 1993 – June 2010)[+]
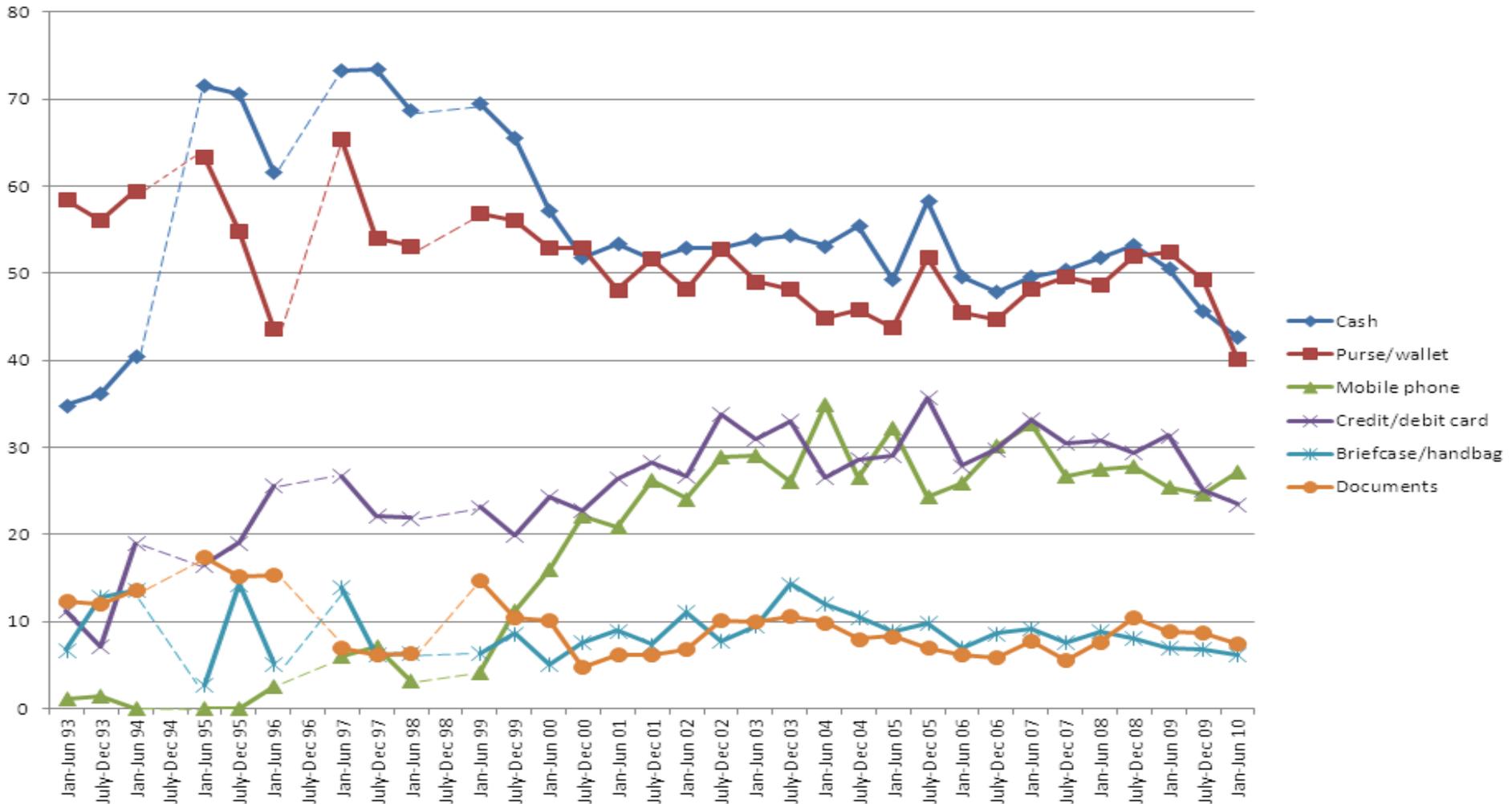
[+] Dotted lines refer to missing data when the BCS was not a continuous survey (see Section 4.2.2).

The potential role of opportunism should not be underestimated. As Harris *et al.* (2003: 157) state: "such data do not necessarily reflect exactly what thieves most crave but what they are able to steal". There appears to be a higher 'gamble' to be taken with products most regularly stolen in these crimes in that the offender will not always know the true value to be gained. The purse/wallet may be of no value itself and contain nothing of useable value. Mobile phones – with their increased capabilities – may have a wealth of data and high value attached. On the other hand, a handset may be installed with the latest security software which tracks its location and can remotely render it useless or catch an offender red-handed.

6.6.3 Have There Been Changes in Products Targeted Through Theft and Robbery Since 1994?

There have been a number of changes in the products stolen through theft from the person and robbery as recorded by the BCS since 1993 (see Figure 6.1 and Table 6.2). Table 6.2 shows the percentage change in the proportion of incidents where particular items were stolen between two six-month periods in 1996 and 2010 (January – June) (see Section 4.6.5 for calculation of statistical significance). These time periods were chosen as they constitute the highest and lowest years of risk of theft from the person and robbery victimisation (see Table 5.4). The theft trajectories of the four identified 'hot products' will now be discussed in turn.

Table 6.2: Percentage Change in Particular Items Stolen Comparing Six-month Periods in 1996 and 2010 (January – June)

Item	% change 1996 to 2010
Cash	-18.95~
Purse/wallet	-3.47~
Credit/debit card	-2.18*
Mobile phone	24.6~
Briefcase/handbag	1.04
Documents	-7.97~
Chequebooks	-11.59~
Jewellery/watches	5.56~

* $0.01 < \text{p-value} \leq 0.05$

~ $\text{p-value} \leq 0.01$

6.6.3.1 Cash

Arguably the most talked about of all items, the 'ultimate' hot product is said to be cash. In this instance cash and purses/wallets were always the top two items stolen in

theft from the person and robbery although, contrary to popular theory, the 'hottest' product alternates between periods. The theft of cash over time has decreased from its peak in July – December 1997 where it was stolen in 73.45 per cent of incidents. When comparing figures from January - June 1996 with its equivalent six-month period in 2010 we see a statistically significant reduction in the theft of cash by 18.95 per cent (see Table 6.2). There was a particularly marked decrease of 10.64 per cent from July 2008 to June 2010. The theft of cash in 2010 has reduced to levels seen prior to 1995.

6.6.3.2 Purse/Wallet

Interestingly, but perhaps not surprisingly, the theft of purses/wallets follows a very similar trend to cash, peaking in the six-month period of January – June 1997 (stolen in 65.35 per cent of incidents). A direct comparison of figures from January - June 1996 with January – June 2010 shows a reduction in the theft of purses/wallets by 3.47 per cent, although this is part of a much larger decline since 1995. The lowest risk of theft of this product is seen in January – June 2010 (40.12 per cent of incidents). The gap between the proportion of incidents where cash and purses/wallets are stolen has decreased over time (see Figure 6.1).

6.6.3.3 Credit/Debit Cards

The theft of credit/debit cards peaked in July – December 2005 where they were stolen in 35.63 per cent of theft from person and robbery incidents. The lowest value can be seen in July – December 1993 (7.09 per cent of incidents) and has increased since. When comparing figures from 1996 to 2010 there has been a decrease of 2.18 per cent, although this is probably a reflection of the steady increase in the theft of credit/debit cards from 1993 and the increased security measures now in place to prevent fraudulent card use (i.e. Chip and PIN).

6.6.3.4 Mobile Phones

Mobile phones constitute perhaps the most interesting trend – having shown the biggest increase of all products over time. The theft of mobile phones through theft from the person and robbery peaked in the period of January – June 2004, being stolen in 34.9 per cent of incidents. A direct comparison of figures from the first half of 1996 with the equivalent period in 2010 shows an increase in their theft by 24.6 per cent.

6.6.3.5 Other Products

When comparing figures from the first half of 1996 with those from 2010, it is possible to identify a decline in the theft of more 'traditional' products, for example chequebooks (11.59 per cent reduction) and documents (7.97 per cent). This forms part of a wider trend of decline over the full period for these items. The theft of chequebooks peaked in 1996 (stolen in 12.82 per cent of incidents), with negligible numbers in recent years. This is perhaps not particularly surprising in the context of the declining acceptance of cheques. There has been a decline in the theft of documents with fluctuations from year to year, peaking at 17.43 per cent in the first half of 1995. It is clear there has been somewhat of an evolution of 'hot products' over time and this has implications for future crime prevention policy.

There were a number of items that, somewhat surprisingly, were stolen in less than ten per cent of incidents in every six-month period. These include MP3 players, computer equipment and cameras. Thefts of lightweight, electronic items have been viewed as important drivers of stolen goods markets. This certainly appears to be the case with mobile phones. It may be that these other electronic items have a low resale value on the illegitimate market, are not routinely carried on the person or are not as accurately or consistently recorded in the BCS. This point is returned to within the discussion.

Figure 6.2: Comparing the Proportion (%) of Theft from the Person and Robbery Incidents Where Selected Items Were Stolen over a Six-month Period in 1996 with 2010
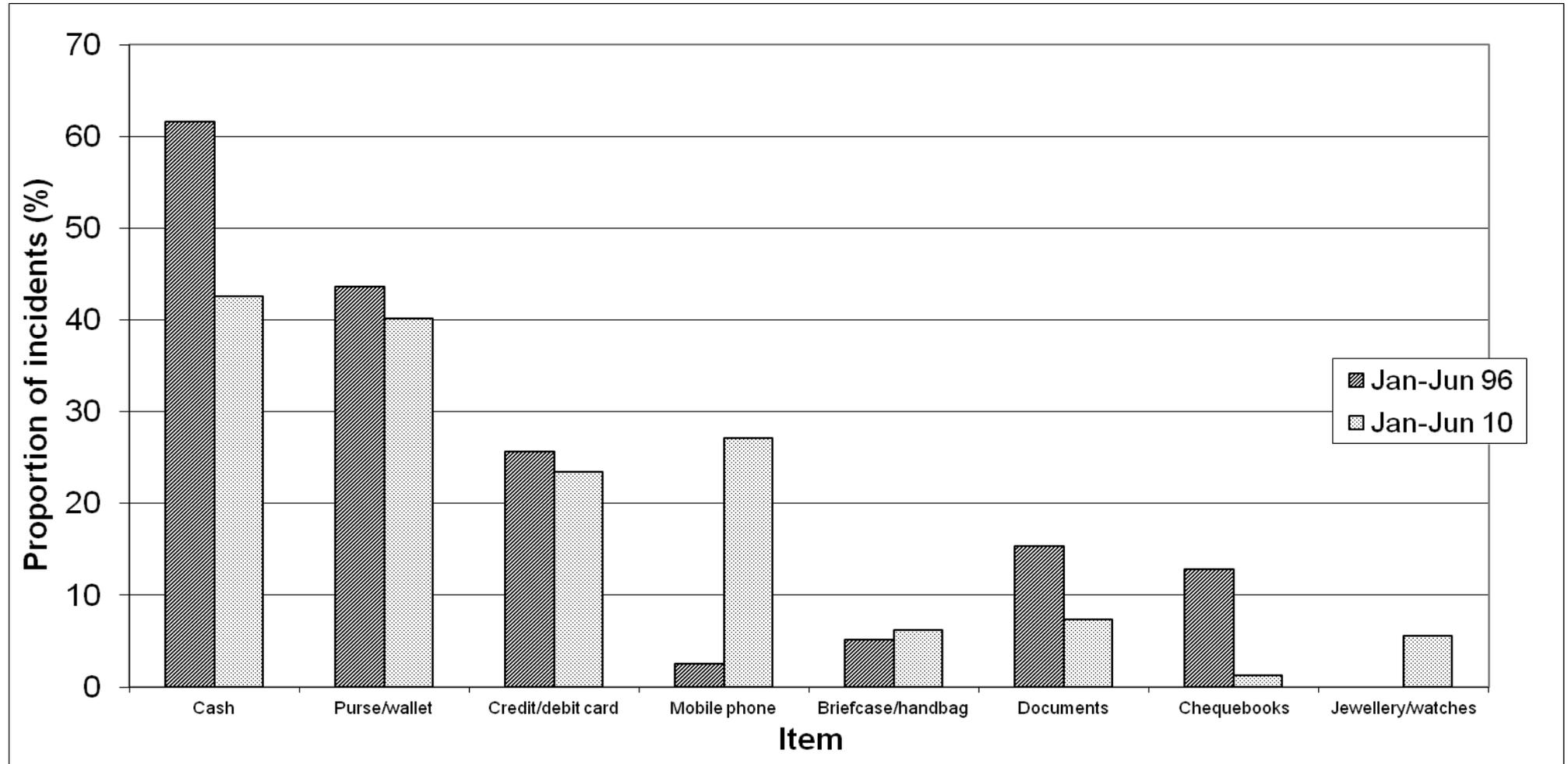
6.7 Do Trends in Products Stolen Through Theft and Robbery Adhere to the 'Life Cycle
Hypothesis'?

Wellsmith and Burrell (2005) highlight the significance of ownership levels and market data when analysing offender product selection. They state stolen items: "...should reflect what is desirable to the buying public in illegitimate second hand markets, which we may assume will be a reflection of what is popular on the legitimate market" (ibid: 743). Field (1990; 1999) also discusses the link between consumer expenditure and opportunities for crime in that it influences the stock of potential goods vulnerable to theft. Trends in the theft of cash, credit/debit cards, mobile phones and chequebooks appear to adhere to such theorising and are discussed in detail below.

6.7.1 Trends in Payments in the United Kingdom

Having established theft of cash and chequebooks has declined and theft of credit/debit cards has, on the whole, increased, this begs the question as to whether this is a reflection of payment habits in England and Wales. Felson and Clarke (1998: 23) identified a "...major shift in the direction of a cashless society". A study by the Payments Council (2010) has highlighted changes in the way UK consumers are both receiving and dispensing of their money. The increase in popularity of online shopping and the advent of new technology in the form of 'contactless payments', for example the Barclaycard PayTag[5] and PulseWallet[6], are transforming the way in which goods are paid for. Cash is now used in 59 per cent of all transactions, a decline from almost three quarters (73 per cent) ten years ago (ibid: 13). Those who rely most on cash tend to be the very old, young and poorest members of society, which has implications for crime prevention policy.

With the vast majority now receiving their wages directly into a bank account (Payments Council, 2010), the decline in 'cash in hand' payments may well have contributed to less cash circulating within society or, more specifically, carried on the person. Vulnerability to theft and robbery victimisation may be reduced, and exposure limited, due to withdrawing only cash intended to be spent in the

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[5] This device allows you to simply touch an enabled device or debit card to a contactless reader to make a payment (currently a maximum value of around £20). A signature or PIN number is not required. Barclaycard have developed a sticker – the PayTag – that can be placed on the back of a mobile phone handset so it can be used in the same way.
[6] Biometric technology allows payments to be made by simply scanning your palm against a reader.

immediate future. In support of this, cash machine withdrawals have doubled over the past decade and debit card usage has increased fourfold. "Each adult now uses a debit card 158 times per year, almost every other day, up from a little more than once a week in 1999" (Payments Council, 2010: 17). By contrast, by 2018 less than one per cent of payments will be made by cheque. It seems convenience appears to rule – "faster payments drives even more transactions out of the wallet and onto the internet" (ibid: 3). These shifts in payment preferences may have contributed to the decline in the theft of cash and purses and wallets.

The introduction of Chip and PIN in the UK in 2004 and its mandatory status from February 2006 had the intention of reducing card theft and fraud. The theft of credit/debit cards peaked in July – December 2005 where they were stolen in 35.63 per cent of theft from the person and robbery incidents. This may have been in anticipation of the widespread rolling out of the system. Since then, the proportion of incidents where cards were stolen has decreased with fluctuations year to year. It therefore appears Chip and PIN may have had its desired effect. Financial Fraud Action UK (2012) reports that total fraud losses on UK cards in 2011 were at their lowest annual figure since 2000, but lost and stolen card fraud increased by 13 per cent between 2010 and 2011. After the introduction of more sophisticated measures (such as Chip and PIN) to combat fraud, this may be a reflection of offenders reverting to distraction-type offences, for example obtaining cards and pin codes through deception.

6.7.2 Mobile Phone Ownership

With a 34.9 per cent increase in the theft of mobile phones over the period studied, this product is perhaps the most interesting of all the 'hot' products. Such findings are not particularly surprising when you consider their seemingly insatiable demand and popularity over the past two decades. Figure 6.3 shows ownership levels (as measured by the General Household Survey) against the risk of having a mobile phone stolen (as measured by the BCS). The growth in ownership and increased vulnerability to theft appear to be consistent with Felson and Clarke's (1998) life cycle hypothesis. However, as Wellsmith and Burrell (2005: 748) note "…the limited availability of data restricts the certainty with which conclusions may be drawn".

Figure 6.3: Mobile Phone Ownership against the Proportion of Theft from the Person and Robbery Incidents Where a Mobile Phone was Stolen (1993-2009)
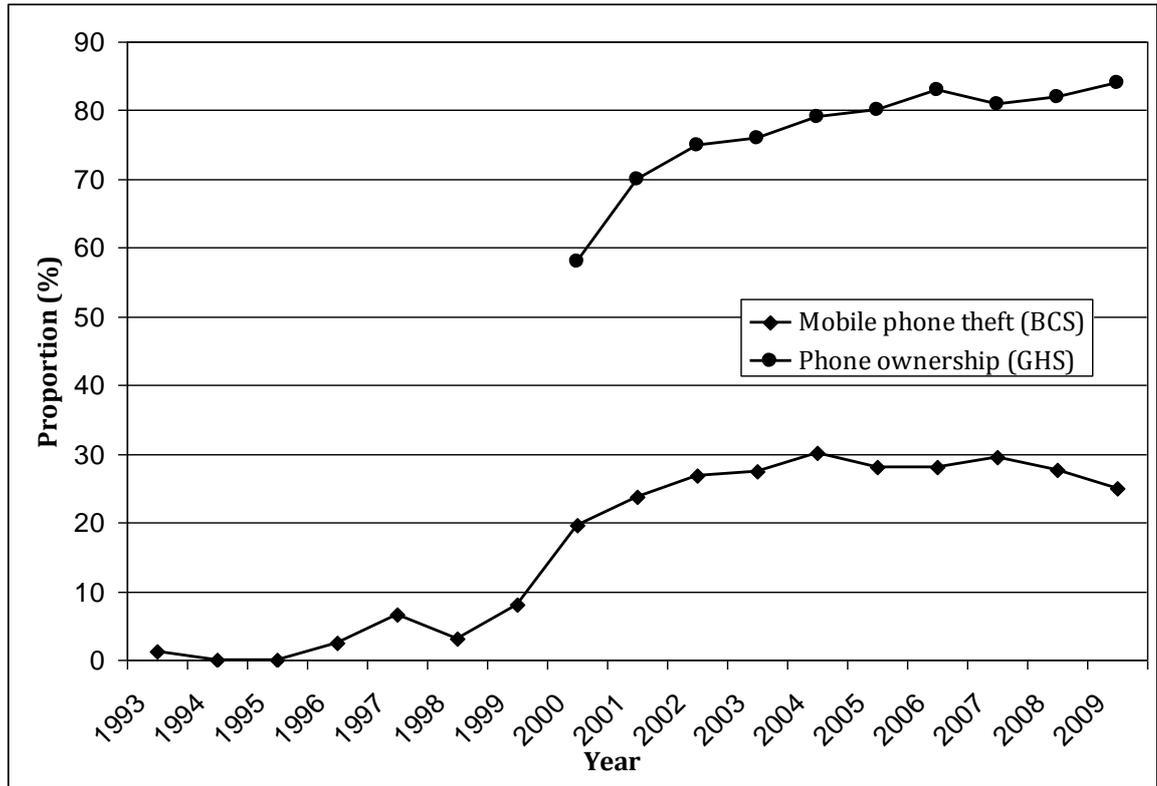
We witness a rather marked increase in the theft of handsets from 1996 until its peak in 2004. Mobile phones first appeared in the 'top five' of stolen items for theft from the person and robbery in July - December 1999. This coincides with what some term the 1999 'tipping point' (Computer Networking and Telecommunications Research (CNTR), 2013). This was a key year in the popularity of mobile phones with more than four million sold in last three months of the year – the majority in the last few weeks before Christmas (BBC News, 5th January 2000). It also constituted the top Christmas present in the annual listings and was the year that saw handsets being sold in supermarkets. 2004 was the first year when there were more mobile phones in the UK than people. It was also a year of new, innovative designs where many individuals may have been either purchasing phones for the first time or replacing older handsets. In an analysis of the type of mobile phone handset stolen in 2004/05, Mailley *et al.* (2008) showed that Nokia (in particular the 7250, 6230 and 3310 models) accounted for 36 per cent of handset sales in 2004 and 55 per cent of thefts. There was also a dramatic rise in the theft of the Motorola Razr handset in 2005. These figures highlight the disproportionate number of thefts of particular desirable handsets and show that theft may, in part, be driven by such factors.

In terms of portability, one of the first commercially available, mass-produced handsets, the Nokia 1011, was released on 10th November 1992 weighing 470g and with the following dimensions: 175 x 60 x 35mm (CNTR, 2013). By contrast the latest Apple iPhone 5 weighs 112g and has dimensions of 123.8 x 58.6 x 7.6mm (Apple Inc., 2013). This is quite a dramatic reduction in overall size with the iPhone over four times lighter in weight and thinner in depth and thus, more portable.

The Apple iPhone has been a particularly iconic handset and was first made available in the UK in November 2007. It may be anticipated that this would cause a rise in mobile phone theft from late 2007 onwards. This does not appear to be the case but this conclusion is largely speculative as specific data on the type of handset stolen is not available. It would be interesting to replicate the Mailley *et al.* (2008) study using police recorded crime data to ascertain if there are a disproportionate number of iPhone thefts relative to their sales figures. Data from the 2011/12 BCS (not analysed here) does indicate a marked increase in the theft of mobile phones which may be a reflection of the increased ownership of Smartphone devices. In 2011/12 the proportion of theft from the person and robbery incidents involving the theft of a mobile phone increased to 46 per cent from 31 per cent in 2010/11 (ONS, 2013b). For the first time, mobile phones were the most stolen item having overtaken cash and purses/wallets.

With 92 per cent of adults owning or using at least one mobile phone in 2013 (Ofcom, 2013) the market for handsets can be seen as particularly buoyant. With such widespread ownership, it would not be naïve to suggest the majority of legitimate handset purchases are most likely on an upgrade or replacement basis. The reduction in theft of mobile phones seen since 2004 may have been a reflection of entering the saturation phase of the consumer life cycle of mobile phones. Mobile phone users may have become more attuned to the risks of ownership. They may no longer have occupied their position as a symbol of status and affluence. However, it seems this was relatively short-lived as, since 2010 changes in the market, most notably the rise in popularity of Smartphones, may have renewed interest in the stolen goods market for mobile phones. Ofcom (2013) figures suggest, of those using a mobile phone in 2013, 51 per cent had a Smartphone, an increase from 26 per cent in 2010. The introduction of the Samsung Galaxy handset as well as the Apple iPhone 4 and, more

recently, 5 may have stimulated the theft market; increasing their demand and resale value. The capability to store a wealth of personal data may also drive their popularity as a target for thieves. In fact, this has led to "an epidemic of Smartphone thefts" (The New York Times, 9th April 2012) in America and calls for the creation of a central database to combat this emerging trend. With new handsets and upgrades regularly introduced to the market there may be increases in theft which coincide with these legitimate market introductions which emphasises the importance of working in partnership with the technology industry.

Such increases in theft highlight the importance of crime prevention, particularly methods which seek to establish ownership and deny the benefits of theft. These include websites such as immobilise.com and applications such as 'Find my iPhone'[7]. The ability to block stolen mobile phones was introduced in the UK in 2003. One may think this would have an influence on subsequent theft trends. However, handsets could still be unblocked relatively easily and cheaply (until the enactment of legislation which banned this) thus the impact may have been much smaller than anticipated. The latest iPhone software includes a number of updates intended to protect the handset against theft. These include an activation lock (ID and password required to unlock the phone if lost), Touch ID (fingerprint scanner) and remote erase capabilities (allow you to remotely delete all data from the handset). These are important steps forward for phone manufacturers which should be praised and encouraged.

One suggestion as to why mobile phones may be stolen in an increasing proportion of incidents, despite their security advances, is the lack of personal financial value attached to the device. The majority of mobile phones are now likely to be obtained on a monthly contract basis, in fact at the end of 2012, over half (53 per cent) of mobile subscriptions were on a contract (Ofcom, 2013). Thus the actual high monetary value of the item (a Smartphone costs approximately £500) may become slightly obscured. As such, the level of protection conferred to these items may not be appropriate. This point is rather poignantly addressed in Figure 6.4.

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[7] An application which allows you to track the location of your device.

Figure 6.4 Crime Prevention Advice (Source: @brumtheftteam Twitter Account)

6.7.3 Price of Gold

Research by Sidebottom *et al.* (2011) found a significant correlation between lagged increases in the price of copper and subsequent copper theft. In this vein, and out of interest, the price of gold since 1990 was obtained and compared to the proportion of incidents involving the theft of jewellery (Figure 6.5). One would expect there to be a slight lag in the market price and subsequent theft levels. The price of gold has followed a general pattern of increasing since 1992. The proportion of incidents of theft from the person and robbery where jewellery is stolen is relatively small and fluctuates from year to year. In addition, it is not possible to ascertain the type of jewellery stolen in the BCS. Theft of jewellery from the person may prove more difficult as they are items which are likely to be being worn in close proximity to the body. This comparison would be much more suited to the analysis of residential burglary or police recorded crime data in localities where jewellery theft is a particular issue.

Figure 6.5: Price of Gold in the UK (in USD) Compared to the Proportion of Incidents Involving the Theft of Jewellery as Measured by the BCS
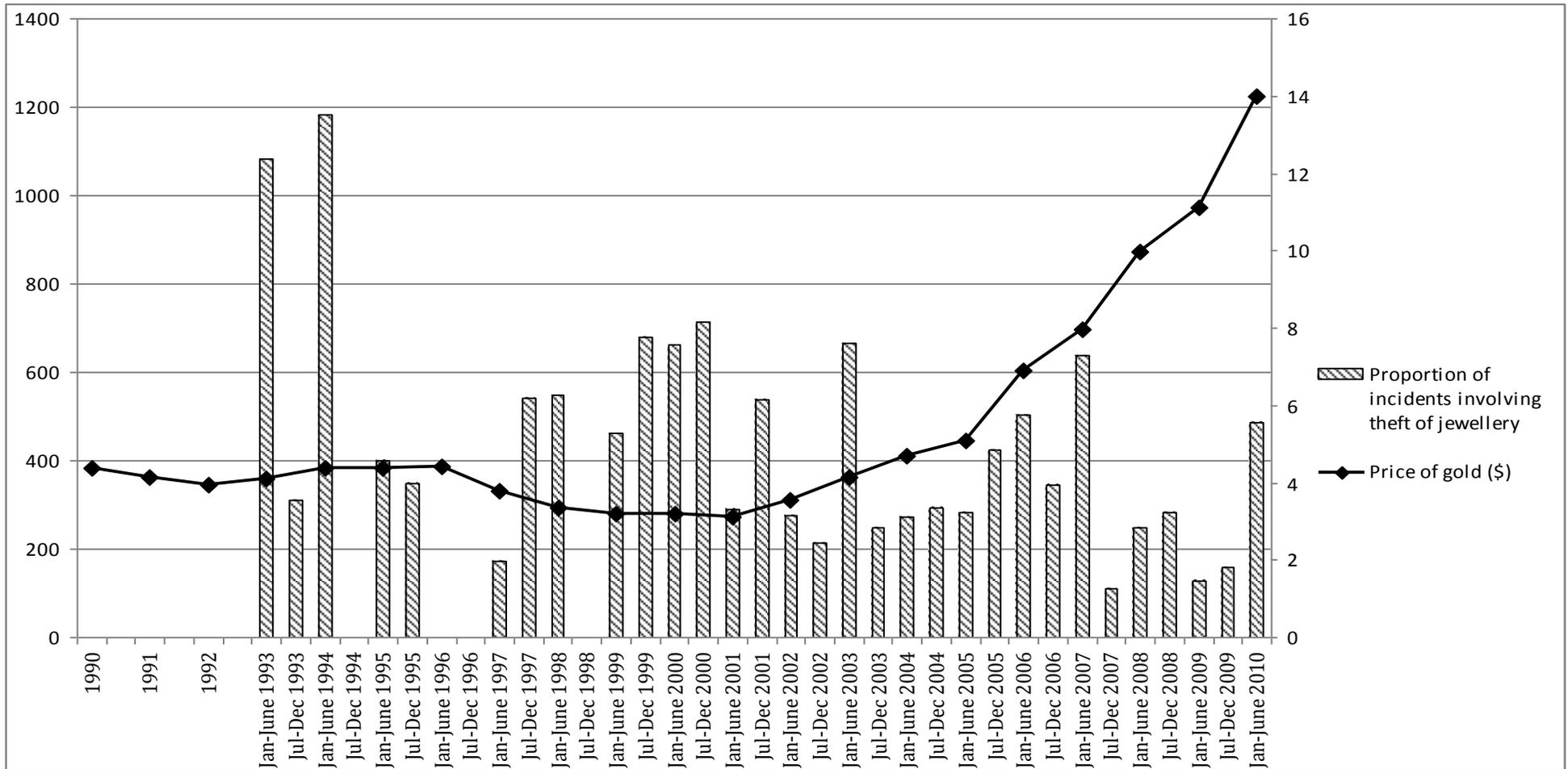
6.8 Are Differences Evident Between the Three Crime Types Examined?

Having emphasised the importance of crime specific analysis, the above work was replicated by individual theft type. This was in order to ascertain whether there were differences in the items targeted over time between theft types. For example, are the same products targeted for robbery as for snatch theft? Parsing goods stolen by crime type is interesting in that differences found may be indicative of offender modus operandi and the ease of theft. By virtue of the fact that a large proportion of males will carry items directly on their person and females may be more likely to carry a bag, it leads one to the hypothesis that a wider range of items may be stolen in snatch theft victimisation (Burney, 1990; Smith, 2003). Discussion of this particular analysis is kept to a minimum due to the small numbers of incidents involved and caution should be exercised in generalising too much from these findings.

6.8.1 Products Stolen in 'Robbery of Personal Property'

Although the numbers are relatively small for this crime type, interestingly cash is always the hottest product by quite some margin. This may be indicative of the true motivation of the offender to obtain cash over anything else. With the threat or use of force they may be more likely to demand particular items. This may also be a result of cash being carried in places that are less easily reached, such as pockets. Consistent with the overall trend, there has also been an increase in the theft of mobile phones.

6.8.2 Products Stolen in 'Snatch Theft from the Person'

The risk of becoming a victim of snatch theft is relatively small thus the data is difficult to interpret as it is very sensitive to small changes. Not surprisingly, briefcases and handbags are stolen in a higher proportion of incidents. Risk is also spread more evenly across products, likely to be the result of the theft of bags containing several items. Cash, purses/wallets and mobile phones remain the hottest products across most periods. Unlike the other crime types mobile phones appear as the hottest product in 2004 and 2007. This may be a reflection of phones being stolen whilst in overt use. A number of popular, iconic handsets were introduced to the market in these years, namely the Motorola Razr and Apple iPhone.

6.8.3 Products Stolen in 'Other Theft from the Person'

Cash, purses/wallets and credit/debit cards are at highest risk of theft for this crime type. Mobile phones appear to be stolen less frequently. One can speculate this is due

to the higher frequency of contact with a phone handset and/or the higher level of protection afforded to these items. Their increased function and capability may mean the likelihood they will be left unattended or out of easy reach is reduced.

6.8.4 Products Stolen in All Other Crime

Analysis was also conducted for all other crimes recorded by the BCS (excluding theft from person and robbery) (see A6.5). Risk was spread over a *much* wider range of products. This finding emphasises the importance of portability and accessibility with regard to products that are vulnerable to theft from the person and robbery. The most commonly stolen products in all other crimes were vehicle parts/accessories, garden furniture, cash and credit/debit cards.

With regard to the items stolen over time through all other crimes, the same general pattern found for theft and robbery is apparent. Theft of cash peaked in 1997 and has declined since, reducing to levels seen prior to 1995. In addition, the proportion of incidents in which mobile phones, computers (including equipment) and bicycles were stolen has increased. There has been a relatively large decline in the theft of stereo equipment. Having said this, stolen goods data relating to 'all crime' should be interpreted with caution as code frame changes render comparisons across sweeps difficult (see A6.6).

6.9 Discussion and Horizon Scanning

The findings presented in this chapter show a concentration on a much smaller range of products than has been found in other research. This is likely due to the fact that we generally carry a small range of items on our person. As a result, when compared with previous research and other crime types, these select few items were stolen in a much larger proportion of incidents – cash was stolen in around 60 per cent of incidents and purses/wallets in approximately 50 per cent, compared to 28 and eight per cent respectively in Smith's (2003) robbery research. Cash undeniably occupies a dominant (albeit diminishing) position in the stolen goods landscape. This is at odds Fitzgerald and Poynton's (2011) findings in relation to burglary in New South Wales which noted a shift *toward* the theft of cash. This may indicate both crime type and international differences in stolen goods trends which would constitute an interesting area for further research. As documented in Wellsmith and Burrell's (2005) work, the greatest increase over the period studied was found for mobile phones. The continual

introduction of new, desirable handsets creates renewed interest in both the legitimate and stolen goods mobile phone market. It appears despite their age, mobile phones are still in the phase of mass market and growth (Felson, 1998). It is suggested that this may be one reason why mobile phones continue to occupy a dominant position in the stolen goods marketplace.

The theft of MP3 players and cameras are an interesting case for discussion. It was hypothesised that the theft of new electronic goods has increased over the period of study. Both items share a number of the CRAVED attributes found for mobile phones. With regard to MP3 players, iPods are particularly visible due to white headphone leads. However, somewhat surprisingly, cameras and MP3 players were stolen in less than ten per cent of incidents in all sweeps analysed. On average, cameras were stolen in around two per cent of incidents, with a slight increase occurring since 1993. The BCS began recording 'MP3 player/personal organiser' theft as a separate category in 2005. This coincides with an increase in the popularity and sale of iPods (Roman and Chalfin, 2007). MP3 players and personal organisers were stolen in around four per cent of thefts on average, peaking in 2008 where they were stolen in approximately six per cent of incidents. Their apparent low rate of theft may be due to a low resale value on the stolen goods market or because they are not routinely carried on the person. The increased capability of mobile phones means that MP3 players are now often built into handsets. There may also be issues with regard to accurate recording of MP3 players by the BCS. It is likely that low theft levels are the result of a combination of these factors. Analysis of the theft of MP3 players through all other crimes recorded by the BCS suggests there hasn't been a marked increase in their theft since 2005 (see Table A6.3). It seems this particular electronic product bucks the trend found for mobile phones.

Unfortunately, it is not possible using BCS data to identify where stolen goods are subsequently sold. Previous research suggests that residential fences and network sales are popular methods of disposal (see Chapter 3). The increase in popularity of online auction sites since the late 1990s may have contributed to a shift in offender decision-making towards selecting goods that are difficult to identify and easy to dispose of through 'eSelling' (Sutton, 2010; Treadwell, 2012). Although

unsurprisingly goods stolen through theft and robbery, unlike other crime types, appear to be largely driven by which items are carried on our person.

Shifts in payment preferences may explain trends in the theft of particular hot products and ultimately have implications for future product selections, particularly the theft of cash. Questions remain as to whether it will continue to occupy such a dominant position due to more people living on credit and an increase in the popularity of online shopping. However, it is hypothesised that cash, purses/wallets, credit/debit cards and mobile phones will continue to occupy dominant positions (although perhaps alternating in their positioning) as the items most frequently stolen in theft and robbery. The findings are a clear reflection of the items we carry on our person. With a tendency to carry cash and credit/debit cards in a purse or wallet, the gap between cash and purse/wallet theft is likely to remain relatively small.

One particular implication of recent technological advances lies in the criminogenic properties of 'cashless payments', particularly mobile phone payment methods such as 'PayTag'. Although the value of any such transaction is currently lower than £20 it is vital to anticipate the potential impact upon the theft of, for example, mobile phones as a result. Cashless payments may also increase the likelihood of identity theft or other financial crime (Whitehead and Farrell, 2008). An increase in the popularity of mobile banking and shopping over the Internet may also increase vulnerability to other forms of crime.

Emphasis must be placed on designing-out crime from potentially criminogenic items at the design and innovation stage where possible. It is vital to foster good relationships between Criminologists and key industry sectors to alleviate any potential tension between commercial interests and crime reduction (see Chapter 9). Target hardening of new products must be achieved through healthy and open dialogue with business (Kettlewell, 2007). In doing so, potentially 'troublesome tradeoffs' (Ekblom, 2005) between security and user-friendliness or aesthetics, are far easier to resolve. It is important that security remains commensurate to risk (Ekblom and Sidebottom, 2008). The findings presented here can help ascertain the level of risk and appropriate response.

Another method of achieving a reduction in crime would be to mandate the implementation of built-in security in mobile phones and other electronic devices (van Dijk and Vollaard, 2012). Although market-based incentives, such as theft indices (e.g. Car Theft Index), are usually a preferred method of intervention (Mailley *et al*., 2008; van Dijk, 2006). Theft indices (highlighting particular items which are at higher risk of theft) would require regular evaluation and timely publications highlighting *specific* stolen products. This may assist in making security a more marketable aspect of portable electronic goods and encourage corporate social responsibility. By building in security at the design stage, the benefits of theft would be reduced. In line with the principles of the Market Reduction Approach (Sutton *et al*., 2001), by reducing the level of dealing in the stolen goods market the motivation to steal would hopefully follow suit.

6.10 Security Hypothesis

The overriding message from the security hypothesis is that security improvements have driven overall falls in crime (Farrell *et al*., 2008). There may be some case to suggest that security has impacted on the type of items stolen, although this may not be particularly easy to test empirically due to a lack of data. One hypothesis is that the theft of cash has declined, not through security intervention, but largely as a result of the decline in its circulation within society. The recent increase in the theft of mobile phone handsets (ONS, 2013b) even after the introduction of a number of security improvements would suggest these measures are not as effective as originally hoped. The increasing security measures employed for credit and debit cards, for example Chip and PIN, may have led to a reduction in their theft and could be tested empirically.

Theft from the person and robbery are largely 'street crimes'. It is thus important to be aware of the changes that have happened 'on the street' since 1994. It could be argued that there has been an increase in the 'securitisation' of the street. Most poignantly through a marked, and much publicised, increase in the employment of Closed-Circuit Television (CCTV), although previous research has found mixed results regarding the deterrent effect of CCTV (Curran *et al*., 2005). The resurgence of community policing may have contributed to fewer opportunities for theft and robbery. High visibility policing has been identified as one of the biggest deterrents of street theft and robbery in the existing literature (ibid).

In general, trends in goods stolen currently seem less driven by security and more by availability, desirability and ultimately their ease of disposal. The increased 'securitisation' of the street may have had some impact on theft trends but this is difficult to robustly test. The application of security to crimes against the person is much less straightforward than for household burglary or vehicle-related crimes. This is emphasised by the lack of attention from academia and practitioners (particularly when compared to vehicle and household security) given to the use and effectiveness of 'personal' precautions against victimisation. Ultimately, this may have contributed to the relative lack of security adopted against these crime types. Whilst market-driven incentives to introduce security measures into new electronic products are few and far between, the subsequent pressure on industry to invest in these measures is likely to remain low. This may be one reason why the fall in crime has been least felt for offences of theft from the person.

6.11 Limitations

There are some largely unavoidable limitations associated with the analysis presented herein, namely broad coding categories and sampling restrictions to the over 16s. These issues are explored in more detail within the Appendix (Sections A6.7-A6.8). Levels of mobile phone theft are likely to be hugely underestimated due to the lack of analysis of data for those under 16. Various studies have highlighted the heightened risk of mobile phone theft for teenagers (Harrington and Mayhew, 2001; ONS, 2013b). The vast majority of mobile phones are also stolen through 'other theft' (where property is left unattended), an offence type which is not examined here. Therefore increased mobile phone ownership is likely to have had an even larger impact on crime trends than that presented here.

6.12 Summary

This analysis has yielded a number of important findings which fill a gap within existing criminological literature. The aim has been to facilitate a shift toward anticipating targets for theft. In agreement with much previous empirical research, four hot products have been identified in relation to theft from the person and robbery victimisation, namely cash, credit/debit cards, purses/wallets and mobile phones. These hot products have remained relatively consistent over time although their positioning in the proportion of incidents where they are stolen has changed.

This chapter has addressed hypothesis two:

The theft of new electronic goods, for example, mobile phones, MP3 players and cameras, has increased over the period of study whilst the theft of more 'traditional' items (e.g. cash) has seen a decline.

It is concluded that despite overall reductions in the level of theft and robbery in England and Wales, theft of particular electronic goods, in this instance, mobile phones, has increased whilst the theft of more 'traditional' items such as cash have seen a decline. Thefts of MP3 players and cameras comprise a much smaller proportion of incidents than previously anticipated. Taken collectively, the findings lend support to the hypothesis that the overarching trend in theft from the person and robbery is made up of two underlying trends, with mobile phones occupying a dominant position. The picture may have been rather different without the introduction and subsequent popularity of this item (Harrington and Mayhew, 2001; Aebi and Linde, 2012). It may also explain why the falls in theft from the person and robbery were much less prominent than that found for other crime types. Therefore, in future "...we must pay close attention to technology and the organised human means for using it..." (Felson, 2012: 284).

There is a case to be made for increasing public awareness, particularly amongst young people, regarding the safe and responsible way to operate technology (e.g. www.outofyourhands.com). Unfortunately, at present "the criminal opportunities offered by potential victims are an undesired side-effect of their possession of certain goods" (van Dijk, 1994: 107). Education and risk awareness may help reduce the likelihood of victimisation. The thesis now moves to consider whether there are particular victim attributes which further increase the level of victimisation risk. In other words, are there certain individuals from whom these goods are more likely to be stolen from?

Appendix Chapter 6

A6. Goods Stolen Through Theft from the Person and Robbery

A6.1 Selection of Time Periods

It was felt that presenting findings by sweep, for example, 2002/03 was too broad when the information is readily available to identify the specific month and year of victimisation. Thus, the analysis was conducted by six-month period by combining data across sweeps. This makes BCS data much more comparable with market data and social trends. However, due to the non-continuous nature of the survey prior to 2000, data is not available for three six-month periods: June through December 1994, 1996 and 1998.

A6.2 Single and Series Incidents

It is possible to distinguish between a single, isolated incident and those deemed as a series of similar events. For those classed as a series, only one Victimisation Module is completed which obtains details regarding the most recent incident. Thus stolen goods analysis is restricted to single incidents or those classed as the most recent in a series.

A6.3 Short vs. Long Victim Forms

If a respondent experiences more than one incident within the reference period, a computer programme is used to allocate the order of the Victimisation Modules. This priority ordering works as follows (taken from Fitzpatrick and Grant, 2011: 18):

- According to the type of crime. Victimisation Models were asked in reverse order to the screener questions. Broadly speaking this means that all personal incidents were asked before property-related incidents, which were asked before vehicle-related incidents; and
- Chronologically within each type of crime (see A6.2).

Practically, this means that the survey only collects limited details (through the short Victim Module) for those incidents deemed as more common (e.g. criminal damage to vehicles) (ibid). Data concerning stolen goods is not collected within the short Victim Module. The analysis presented here is therefore restricted to respondents

completing the long Victim Module on whom information was available regarding both month and year of victimisation and items reported stolen.

A6.4 Goods Stolen as a Proportion of Incidents or Items?

Originally, analysis of goods stolen through theft from the person and robbery was presented as the proportion of *items* involving the theft of a particular item (see Table A6.1). For example, in 2009/10 12.29 per cent of all goods stolen were mobile phones. This showed how much a particular item accounted for the entire range of items and potentially highlights the ranked desirability of items. Analysis was then presented as the proportion of *incidents* involving the theft of a particular item (see Table A6.2). For example, mobile phones were stolen in 25.23 per cent of incidents in 2009/10. Although the data (when ranked) produces the same results, it was decided to present the findings as a proportion of incidents consistent with Clarke's (1999) pioneering work and a number of studies that followed. The incident is ultimately the focus of analysis and the items stolen within that incident, not the total number of items stolen. This makes the work more comparable and controls for incidents in which a large number of items are stolen.

Table A6.1: Goods Stolen as a Proportion (%) of *Items* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
Cash	24.24	25.21	24.24	25.43	26.45	25.85	24.05	26.67	27.41
Purse/wallet	25.25	23.52	24.24	23.59	21.85	22.45	22.4	25.1	25.27
Mobile phone	12.29	12.6	15.1	13.42	13.85	14.42	13.0	12.6	9.77
Credit/debit card	14.89	14.44	14.97	15.15	15.20	13.4	15.48	13.85	11.69
Briefcase/handbag	3.72	4.05	4.23	4.55	4.95	5.15	5.26	4.31	4.29
Documents	4.74	4.05	2.74	3.03	3.60	4.53	5.37	2.95	4.77
House keys	1.92	2.44	2.51	2.49	2.82	3.81	3.82	3.06	3.81
Jewellery/watches	0.68	1.69	1.83	2.81	1.91	1.54	2.06	2.61	2.38
Car keys	0.45	0.75	1.14	0.32	0.45	0.93	0.93	0.79	0.72
Clothes	0.79	0.84	0.91	0.43	1.46	1.34	1.44	0.57	1.07
Glasses/sunglasses	0.90	0.75	0.91	0.76	0.11	-	-	-	-
Cheque book	1.01	1.41	0.8	0.97	1.13	1.24	1.44	1.48	1.07
Cigarettes/tobacco	0.68	0.28	0.69	0.54	0.45		-	-	-
Computer (inc. equipment)	0.45	0.28	0.69	0.22	0	0.51	0.1	0.68	0.36
MP3 player/personal organiser	1.01	0.94	0.69	0.43	-	-	-	-	-
Toiletries/make up	0.45	0.28	0.69	0.32	0.34	-	-	-	-
Camera	0.90	0.75	0.57	0.54	0.45	0.51	0.52	0.11	0.48

Table A6.1 (contd.): Goods Stolen as a Proportion (%) of *Items* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
Car/van	0.56	0.28	0.46	0.11	0.45	0.21	0.1	0.11	0.48
Food/drink	0.68	1.03	0.46	0.76	0.34	-	-	-	-
CDs/tapes/DVDs	0.34	0.19	0.23	0.22	0.11	0.21	0.52	0.57	0.36
Garden furniture	0	0	0.23	0	0	0	0.1	0	0
Household items	0.34	0.37	0.23	0.54	0	0	0.41	1.14	1.31
Sports equipment	0.23	0	0.23	0	0.11	0	0	0	0
Baby/child items	0	0	0.11	0	0	-	-	-	-
Stereo equipment	0.11	0	0.11	0.43	0.34	0	0.31	0.79	0.12
Television	0.11	0	0.11	0.11	0.11	0	0	0.45	0.36
Video equipment/camcorder	0.11	0	0.11	0.11	0	0	0.1	0.11	0.12
Animals	0	0	0	0	0	-	-	-	-
Bicycle	0.45	0.19	0	0.32	0.56	0.41	0.1	0.11	0.48
Bicycle parts	0	0	0	0	0	-		-	-
Bin	0	0	0	0	0	0.1	0	0	0
Books	0.23	0.28	0	0	0.11	-	-	-	-
Children's toys	0.23	0.09	0	0	0	0	0.1	0.45	0
Doors/windows	0	0	0	0	0	-	-	-	-

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Table A6.1 (contd.): Goods Stolen as a Proportion (%) of *Items* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
DVD player	0	0.09	0	0	0	0	0	0	-
Foreign currency	0.11	0	0	0	-	-	-	-	-
Furniture/white goods	0.11	0	0	0	0.11	-	-	-	-
Ladders	0	0	0	0	-	-	-	-	-
Motorcycle/scooter	0.23	0	0	0.22	0	0	0.1	0	0
Tools	0.23	0	0	0.22	0.23	0.1	0.1	0	0.24
Vehicle parts/accessories	0.23	0.28	0	0	0	0	0	0	0.12
Other	1.24	1.87	0.8	1.95	2.48	3.3	2.27	1.48	3.34
Don't know	0	0	0	0	0	0	0	0	0
Refused	0	0	0	0	0	0	0.1	0	0

Table A6.2: Goods Stolen as a Proportion (%) of *Incidents* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
Cash	49.31	54.34	48.51	50.98	53.81	53.33	53.47	52.57	54.5
Purse/wallet	51.62	50.71	48.51	46.85	44.34	46.67	50	49.44	50.24
Mobile phone	25.23	27.47	30.11	26.9	28.41	29.89	28.94	24.83	19.43
Credit/debit card	30.32	31.72	29.89	30.37	30.72	27.96	34.26	27.29	23.22
Briefcase/handbag	7.41	8.89	8.28	9.11	9.93	10.54	11.57	8.5	8.53
Documents	9.49	8.89	5.52	6.07	7.39	9.46	12.04	5.82	9.48
House keys	3.94	5.25	4.83	4.99	5.77	7.74	8.33	6.04	7.58
Jewellery/watches	1.39	3.64	3.68	5.64	3.7	3.23	4.63	5.15	4.74
Car keys	0.93	1.62	2.07	0.65	0.92	1.94	2.08	1.57	1.42
Clothes	1.62	1.82	1.84	0.87	3.0	2.8	3.24	1.12	2.13
Glasses/sunglasses	1.85	1.62	1.84	1.52	0.23	-	-	-	-
Cheque book	2.08	3.03	1.61	1.95	2.31	2.58	3.24	2.91	2.13
Cigarettes/tobacco	1.39	0.61	1.38	1.08	0.92	-	-	-	-
Computer (inc. equipment)	0.93	0.61	1.38	0.43	0	1.08	0.23	1.12	0.71
MP3 player/personal organiser	2.08	2.02	1.38	0.87	-	-	-	-	-
Toiletries/make up	0.93	0.61	1.38	0.65	0.69	-	-	-	-
Camera	1.85	1.62	1.15	1.08	0.92	1.08	1.16	0.22	0.95

Table A6.2 (contd.): Goods Stolen as a Proportion (%) of *Incidents* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
Car/van	1.16	0.61	0.92	0.22	0.92	0.43	0.23	0.22	0.95
Food/drink	1.39	2.02	0.92	1.52	0.69	-	-	-	-
CDs/tapes/DVDs	0.69	0.4	0.46	0.43	0.23	0.43	0.93	1.12	0.71
Garden furniture	0	0	0.46	0	0	0	0.23	0	0
Various household items	0.69	0.61	0.46	1.08	0	0	0.93	2.24	2.61
Sports equipment	0.46	0	0.46	0	0.23	0	0	0	0
Baby/child items	0	0	0.23	0	0	-	-	-	-
Stereo equipment	0.23	0	0.23	0.87	0.69	0	0.69	1.34	0.24
Television	0.23	0	0.23	0.22	0.23	0	0	0.89	0.71
Video equipment/camcorder	0.23	0	0.23	0.22	0	0	0.23	0.22	0.24
Animals	0	0	0	0	0	-	-	-	-
Bicycle	0.93	0.4	0	0.65	1.15	0.87	0.23	0.22	0.95
Bicycle parts	0	0	0	0	0	-	-	-	-
Bins	0	0	0	0	0	0.22	0	0	0
Books	0.46	0.61	0	0	0.23	-	-	-	-
Children's toys	0.46	0.2	0	0	0	0	0.23	0.89	0
Doors/windows	0	0	0	0	0	-	-	-	-

Table A6.2 (contd.): Goods Stolen as a Proportion (%) of *Incidents* by BCS Sweep 2001/02 to 2009/10

Item	09/10	08/09	07/08	06/07	05/06	04/05	03/04	02/03	01/02
DVD player	0	0.2	0	0	0	0	0	0	-
Foreign currency	0.23	0	0	-	-	-	-	-	-
Furniture/white goods	0.23	0	0	0	0.23	-	-	-	-
Ladders	0	0	0	-	-	-	-	-	-
Motorcycle/scooter	0.46	0	0	0.43	0	0	0.23	0	0
Tools	0.46	0	0	0.43	0.46	0.22	0.23	0	0.24
Vehicle parts/accessories	0.46	0.6	0	0	0	0	0	0	0
Other	2.55	4.04	1.61	3.9	5.08	6.71	4.86	2.91	6.64
Scrap metal	0	-	-	-	-	-	-	-	-
Fuel	0	-	-	-	-	-	-	-	-
Games consoles	0.23	0.81	0	-	-	-	-	-	-
Caravan	-	-	-	0	0	-	-	-	-
Work materials	-	-	-	0	0	-	-	-	-
Meter money	-	-	-	-	-	-	-	-	-
Unweighted N	**432**	**495**	**435**	**461**	**433**	**462**	**432**	**447**	**422**

Notes:

1. Excludes don't knows.

A6.5 Goods Stolen Through 'All Other Crimes'

Analysis was also conducted for all other crimes recorded by the BCS (excluding theft from the person and robbery). Risk was spread over a much wider range of products (see Table A6.3). This data should be interpreted with caution as code frame changes (predominantly after 2001) render comparisons across sweeps difficult, particularly with regard to the classification of 'other'.

Table A6.3: Proportion (%) of Incidents of All Crimes (Minus Theft from the Person and Robbery) Where Selected Goods Were Stolen by Calendar Year (1993-2009)

Item	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cash	9.94	8.80	12.27	11.63	13.58	13.38	12.34	12.18	12.94	13.01	12.48	12.53	11.64	11.17	9.93	10.99	9.99
Purse/wallet	4.41	3.76	5.88	5.12	6.72	7.22	5.85	6.72	6.77	7.44	7.11	6.59	6.58	5.96	4.95	5.58	4.97
Mobile phone	1.05	1.18	1.18	1.09	1.45	2.29	2.99	5.20	6.16	6.66	7.72	7.22	6.55	5.58	5.77	5.82	4.84
Credit/debit card	2.41	1.61	4.53	3.41	4.84	5.63	3.93	4.64	5.34	5.79	6.21	5.83	5.07	4.90	3.96	4.33	3.73
Briefcase/handbag	4.30	2.79	3.82	4.50	3.36	3.17	3.58	3.87	4.56	4.75	4.81	4.84	3.66	3.59	3.10	3.62	3.10
Documents	3.76	3.86	2.68	2.02	2.53	3.70	2.11	3.01	2.74	2.69	3.15	2.25	2.12	2.24	1.85	1.53	1.39
House keys	-	-	-	-	-	-	-	-	2.17	1.98	2.31	2.11	2.10	1.85	1.40	1.46	1.82
Jewellery/watches	5.96	5.58	5.50	4.50	4.76	3.35	3.79	4.48	4.07	3.89	3.72	3.28	3.50	3.08	2.91	2.83	2.50
Car keys	-	-	-	-	-	-	-	-	0.91	1.13	1.31	1.35	1.23	1.14	1.06	1.22	1.19
Clothes	10.28	8.80	8.41	10.54	9.91	8.27	8.76	8.00	7.77	6.61	6.68	5.61	5.58	4.82	4.37	4.08	4.49
Cheque book	1.55	0.75	2.00	1.24	2.11	1.58	1.71	1.17	1.89	1.94	1.65	1.66	1.05	0.95	0.96	0.70	1.01
Computer (inc. equipment)	1.63	2.25	1.69	1.24	1.77	1.76	2.22	2.09	2.22	2.88	3.08	2.76	2.85	3.08	2.76	3.15	3.13
MP3 player/personal organiser	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.21	1.18	1.61	2.16	2.14
Camera	2.75	1.72	2.22	1.40	2.11	1.06	1.50	1.63	1.82	1.89	1.89	2.09	1.89	2.21	1.92	2.10	2.02
Car/van	7.10	6.44	6.23	7.29	5.27	4.93	5.66	6.06	6.13	5.33	5.70	5.29	3.96	4.32	3.82	3.75	2.88
Food/drink/alc/groc/shop.	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.39	1.48	1.62	2.35	2.43	1.74
CDs/tapes/DVDs	-	-	-	-	-	-	-	-	5.99	6.50	6.28	6.20	4.95	4.00	3.55	3.56	2.70
Garden furniture	-	-	-	-	-	-	-	-	12.82	13.93	13.10	13.80	13.50	13.15	14.06	12.74	13.95
Various household items	-	-	-	-	-	-	-	-	5.80	3.80	2.38	1.17	0.72	0.87	2.11	3.16	3.20
Sports equipment	-	-	-	-	-	-	-	-	1.50	1.41	1.28	1.06	1.29	1.18	1.78	1.58	1.79
Stereo equipment	10.17	10.09	7.08	5.89	6.24	7.22	4.92	5.30	5.31	5.07	4.93	4.26	3.52	2.52	1.49	0.92	0.73
Television	3.01	3.86	2.68	2.79	1.79	1.23	1.23	1.27	1.26	1.11	0.97	0.50	0.73	0.68	0.91	1.11	1.19

Table A6.3 (contd.): Proportion (%) of Incidents of All Crimes (Minus Theft from the Person and Robbery) Where Selected Goods Were Stolen by Calendar Year (1993-2009)

Item	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Video equipment/camcorder	5.20	5.04	4.19	3.88	3.82	2.29	2.75	2.29	1.97	1.54	1.38	0.72	0.73	0.64	0.50	0.54	0.38
Bicycle	9.01	6.01	10.54	5.89	10.05	7.92	9.27	9.98	9.87	10.20	11.17	12.60	13.31	14.56	15.64	14.84	15.47
Children's toys	-	-	-	-	-	-	-	-	1.01	1.54	1.17	0.84	1.14	1.49	1.56	1.60	1.61
Doors/windows	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.14	0.49	0.30	0.50	0.50	0.48
DVD player*	-	-	-	-	-	-	-	-	0.00	0.28	0.71	1.12	0.56	0.87	0.79	0.89	0.53
Motorcycle/scooter	0.92	0.54	0.95	0.62	0.94	0.70	0.69	1.27	1.05	1.18	1.43	1.51	1.31	1.34	1.47	1.46	1.39
Tools	9.96	7.94	9.45	12.25	10.91	7.57	10.77	8.71	7.89	7.61	7.19	6.33	6.28	5.23	5.46	5.21	5.83
Vehicle parts/accessories	17.01	23.07	19.77	25.12	22.55	27.29	19.56	15.69	17.79	17.99	17.81	17.37	17.32	18.82	20.02	19.82	19.33
Other	34.71	35.41	33.99	33.80	31.55	31.51	37.30	21.24	7.46	8.36	10.10	10.83	8.26	8.12	5.67	6.99	6.76
Scrap metal	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.40	1.03
Games consoles	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.19	0.96	1.48	1.14

- information not collected.

A6.6 Code Frame Changes

Occasionally, the wording of a question or its potential answers are changed and hence the coding frame changes. This is largely to include more categories of stolen goods and improve the accuracy of recording. Where changes to the 'what was stolen' variable fell within a sweep, two sets of stolen goods variables are recorded within one data set, often with a large number of missing cases on each. The reason for this overlap lies in survey procedure where, in some cases, the coding frame was altered midway through the survey period. In order to combat this, although not ideal, data was combined across data sets to create an overarching set of comparable categories which accounted for most cases and most stolen goods. All four 'hot products' listed in Chapter 6 have been coded within the dataset throughout the period of analysis and the author feels it is unlikely these items would have been mistaken for anything else or incorrectly labelled.

A6.7 Category Selection and Consistency

The 'what was stolen' variable is a multiple response categorical variable with a large number of categories. As a rule, goods which were stolen in fewer than two per cent of incidents were not explored in further detail. The items deemed to be of greatest interest, in terms of either value or impact, to the Police, industry and the wider public received particular attention, for example mobile phones and credit/debit cards. Those items which were stolen in more than ten per cent of incidents in at least one sweep are given the most attention.

A6.8 Screeners vs. Victimisation Module Frequencies

There are two measures of victimisation within the BCS. Screener questions are asked in the first instance to identify if a respondent has been a victim of crime. Answers to screener questions are self-perceived and not subject to any capping or limit. If a victimisation is identified in the screener questions, up to six (five in 1994) Victimisation Modules are then asked of the respondent. Within the Victimisation Module the coding of the incident is carried out by an experienced Home Office coding team. Justification for using the frequencies from the Victimisation Module lies in the operation of a consistent coding frame which ensures greater comparability over time. One drawback of using Victimisation Module frequencies is the imposed limit on the number of incidents.

Chapter 7: Victim Characteristics

It has been established that the stolen goods marketplace has undergone fairly radical changes over the period of the crime drop. This chapter aims to build on an existing body of influential victimisation research (outlined in Chapter 2) to establish if victims of theft from the person and robbery share particular characteristics and whether these have also changed. Advanced statistical modelling, in the form of negative binomial regression, is utilised to address the following research questions:

1. Are particular demographic, lifestyle and area characteristics associated with the incidence of theft from the person and robbery?

2. Have there been changes in the characteristics associated with theft from person and robbery over time?

3. Have there been changes in the relative importance and magnitude of the characteristics associated with these crime types over time? and

4. Are differences evident between characteristics associated with attempted victims and 'completed'?

In what follows, justification for the selection of explanatory variables is provided followed by an exploration of existing criminological theory relating to victim vulnerability to theft. Thereafter the results of the statistical modelling are presented. The chapter closes with a discussion of findings.

7.1 Explanatory Variable Selection

The explanatory variables of theft from the person and robbery victimisation were selected on the basis of previous literature and their predictive power in existing empirical research. This subsection overviews their theoretical basis and operationalisation via the BCS for the purposes of analysis.

A solid body of research has, in the exploration of victimisation and BCS data, established that there are particular characteristics associated with an increased vulnerability to becoming a victim of crime. It is possible these 'flags' (Tseloni and Pease, 2003) of potential future victimisation could be used to inform and target future preventive effort. With regard to theft from the person and robbery, both

individual (micro-) and community (macro-) level predictors have been identified as important. In particular, age, sex, marital status and employment significantly predict theft from the person and robbery victimisation across a number of studies and datasets (Gottfredson, 1984; Miethe *et al.*, 1987; Maxfield, 1987; Wittebrood and Nieuwbeerta, 2000; Tseloni, 2000; Messner *et al.*, 2007). Region, area type, 'street activity' (rate at which residents go out at night on foot), frequency of activity outside the home and routine activities are also strong predictors (Sampson and Wooldredge, 1987; Kennedy and Forde, 1990; Arnold *et al.*, 2005; Messner *et al.*, 2007). Previous victimisation has also been shown to predict later subsequent crime experiences (Ellingworth *et al.*, 1997; Wittebrood and Nieuwbeerta, 2000; Hope *et al.*, 2001; Tseloni and Pease, 2003). However, due to a lack of data, prior victimisation is not studied here.

As discussed in Section 2.6, a lack of direct measures of routine activities has ultimately led to the use of some proxy measures, namely demographic indicators. Although not ideal, the research is constrained to those indicators that are available consistently over time in the BCS. Alongside the lifestyle indicators which are consistently available, it is suggested demographic variables may be "…associated with differences in expectations, constraints, opportunities, and preferences which influence the types of activities in which people engage" (Cohen and Cantor, 1980: 146).

Informed by previous research, a number of demographic, lifestyle and area variables were identified within the BCS datasets. These variables were cross-checked and recoded (where necessary) across every sweep of the BCS to ensure consistency (see A4.1-A4.2). Variable harmonisation was carried out in order to, as far as is practicably possible, foster comparability over the entire time period of study. The following discussion regarding the selection and operationalisation of variables is structured by the three categories of demographic, lifestyle and area characteristics. Where relevant, reference is also made to the theoretical concepts of routine activity theory: suitability of the target; proximity to motivated offenders; and the absence of guardianship.

7.1.1 Demographic

Twelve demographic characteristics entered the models. These were:

- Age;
- Sex[8];
- Number of children;
- Social class of the Head of Household[9] (see A4.3);
- Highest qualification achieved;
- Ethnic group;
- Household income (see A4.3);
- Whether the respondent has an illness or disability;
- Marital status;
- Employment status;
- Tenure; and
- General health.

In addition to their relevance according to theory and previous empirical research, these variables were selected due to being recorded in every BCS sweep between 1994 and 2010/11.

As mentioned, as well as being important in their own right, these demographic characteristics may also act as proxy measures of an individual's accessibility and attractiveness to a potential thief. Measures of potential affluence such as employment status and household income are important in that economic resources may shape individual lifestyles and choices (Aaltonen *et al*., 2012). Individuals with higher incomes may be more likely to own valuable, desirable items. By the same token, they may also be able to afford the means to better protect their belongings. Cohen and Cantor (1980) argue that individuals not in full-time employment or looking for work have more leisure time compared to those in full-time work and are thus at increased risk.

One of the major components of opportunity-related theory is the frequency of activity outside the home. Age is hypothesised to influence victimisation through younger individuals spending more time outside of the home than their older

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[8] The term 'sex' as opposed to 'gender' is used throughout the thesis. This ensures consistency with BCS publications. In addition, sex refers to those biological and physiological characteristics that define men and women whereas gender is a reference to socially constructed concepts.
[9] Head of Household is sometimes referred to as the Household Reference Person.

counterparts. The places a younger person is likely to visit and the types of activities they engage in may also place them at an increased risk. Marital status is said to proxy levels of guardianship in the sense that a partner acts as a guardian of both the potential victim and their property. In addition, the activities of married individuals may be more likely to be home-centred. By contrast, those who are single, separated or divorced may seek to pursue more activities outside the home without this level of guardianship.

Disability, general health, and ethnicity are also included as proxies for target suitability in that they could indicate the perceived vulnerability or attractiveness of the individual to a potential thief. Due to the limited nature of the information either from, or about, offenders within such self-report victimisation surveys, target attractiveness can be a difficult concept to measure. However, it is felt the variables outlined above offer a reasonable indication of the wealth and perceived attractiveness of an individual from an offender's perspective.

7.1.1.1 Demographic Profile over Time

There have been a number of changes to the demographic profile of the achieved BCS sample over time (see Table 7.1). The mean age of the sample has slightly increased from around 46 in 1994 to 51 in 2010/11. With regards to sex, the split has remained relatively consistent with a slightly higher proportion of females in the sample (approximately 55 per cent). The general health of the sample has remained relatively consistent – with the majority (around 70 per cent) reporting good or very good health. The sample profile with regard to age and sex appears to be a reflection of trends in wider society in terms of an ageing population profile and a higher proportion of females.

The proportion of respondents with qualifications at the higher or further education level has increased (from 20 per cent in 1994 to over 32 per cent in 2010/11). By the same token the number of respondents with no qualifications has declined. Individuals who class themselves as 'looking after the home or family' are much less prominent (from 14.2 per cent in 1994 to 5.2 per cent in 2010/11). There is roughly a 50/50 split in the sample of those married to unmarried. Prior to 2005/06 there was a slightly higher proportion of married participants. This is again a reflection of wider changes in England and Wales, namely the long-term decline in the number of

marriages since 1972 (ONS, 2012a) and an increase in the number of couples choosing to cohabit rather than get married (Beaujouan and Bhrolcháin, 2011). The number of respondents with a household income of less than £4,999 has also dramatically decreased (from 20.8 per cent in 1994 to 3.3 per cent in 2010/11). This is in line with a general increase in earnings and disposable income in England and Wales over this time period (Carrera and Beaumont, 2010). In general, households appear to be earning more. However, this should be viewed in line with a rise in the cost of living. The proportion of social renters has declined slightly (from 25.6 per cent in 1994 to 16.7 per cent in 2010/11) although the number of individuals privately renting has more than doubled since 1994.

Demographic changes in the achieved sample could have influenced overarching trends in theft from the person and robbery. The majority appear to be a reflection of changes in wider society, such as, an ageing population, higher incomes (consistent with rises in the cost of living) and declining marriage rates. Previous empirical research suggests risk of theft and robbery declines as one gets older. An ageing population may therefore contribute to an overall decline. Higher household incomes and a decline in the popularity of marriage may have contributed to increases in that there may be more disposable income thus increasing purchasing power for expensive, desirable items and different lifestyle choices (with fewer capable guardians in the form of a partner, although this may be a slightly old-fashioned view). This changing demographic picture may have had an influence on the overarching trends in theft from the person and robbery but it is unlikely to have been a key driver of the drop in crime (Levitt, 2004).

7.1.2 Lifestyle

Five lifestyle indicators entered the models. These were:

- Hours spent away from the home on an average weekday;
- Number of visits to a pub in the last month;
- Number of visits to a club in the last month;
- Number of cars owned/used in the last year; and
- Whether anyone in the household owned a bicycle.

Lifestyle variables may provide an indication of proximity to potential offenders, time spent in public or, more specifically, 'on the street' (important because theft from the

person and robbery are largely 'street crimes') and levels of guardianship. Time spent outside the home may proxy frequency of contact with others and potential crime opportunities. Car and bike ownership provide measures of an individual's mobility and transportation methods. Licensed premises, such as nightclubs and pubs, have been highlighted as particularly 'risky facilities' (Johnson *et al.*, 2010) thus exposure to these environments may increase the incidence of victimisation.

7.1.2.1 Lifestyle Characteristics over Time

The importance of lifestyle, particularly levels of 'street activity', in relation to victimisation has been highlighted by a number of previous studies (Sampson and Wooldredge, 1987; Miethe *et al.*, 1987; Arnold *et al.*, 2005). Therefore any changes in routine activities may hold some explanatory power for the overall decline in theft. The number of hours spent away from the home on an average weekday has remained relatively consistent over time with the majority spending more than seven hours outside the home (around 40 per cent of the sample). There has been a slight reduction in the number spending less than one hour away. This suggests that levels of street activity (as measured by the BCS) and potential crime opportunities have not changed dramatically over time.

Approximately 50 per cent of the sample visited a pub in the last month, compared to around ten per cent who visited a club or disco. This has been largely consistent over time but with slight declines in the frequency of visits, particularly the proportion of respondents visiting a pub more than nine times and a club/disco four to eight times per month. These environments are consistently identified as 'risky' with regard to theft and robbery victimisation (Clarke and Eck, 2005; Kennedy and Forde, 1990; Messner *et al.*, 2007; Smith *et al.*, 2006), particularly for the theft of mobile phones. A slight reduction in the frequency of visits may have contributed to overall declines in victimisation but it is unlikely to be a key driver.

In line with trends in the general population, there has been an increase in the number of cars owned or used (ONS, 2012b). Ownership of two or more cars is increasingly common. Car ownership or use will potentially reduce the amount of time spent 'on the street' and therefore may play a role in falls in theft. Vehicle security standards have improved relative to increases in their ownership which may have stemmed a potential vehicle crime harvest. The proportion of respondents with

someone in their household who owns a bike has remained static at roughly 40 per cent.

7.1.3 Area

Area characteristics are consistently employed to indicate proximity to motivated offenders. In this instance this is measured using two variables:

- Government Office Region (or, within earlier sweeps, Standard Statistical Region); and
- Area type (rural, inner city or urban).

The premise behind the selection of these variables is that there may be a higher concentration of offenders within urban, highly populated areas, thus increasing the likelihood of contact between a motivated offender and a potential target (Wiles and Costello, 2000). These areas may also be characterised by limited social interactions and a lack of common values leading to higher levels of crime. This is framed by social disorganisation theory (Shaw and McKay, 1942).

7.1.3.1 Area Characteristics over Time

Over half of respondents live in an urban area; this proportion having increased over the period of study. The number of respondents living in an inner city area was over 20 per cent in sweeps prior to 2001/02. This has reduced dramatically in more recent sweeps to around eight per cent. With regard to the Government Office Region, the proportion of respondents sampled from each area has remained largely consistent over time. The largest proportion of respondents reside in the North West.

All demographic, lifestyle and area characteristics that entered the models are given in Table 7.1 and are broken down by sweep. The proportion (per cent) of the total sample (victims and non-victims) is provided. 'Don't know' and 'refused' responses (< 0.5%) were dropped from the analysis apart from those relating to household income. These responses were retained as additional categories in the statistical modelling as they constitute a rather large proportion of the sample (over 20 per cent in some cases) and may offer extra insight concerning the respondent. The total number of cases included in each sweep, after dropping those missing, is given in the last row. All variables (apart from age) are binary or categorical and, within the

discussion, their effect on theft from the person and robbery victimisation is interpreted relative to a reference or base category (see 4.6.3, A7.1 and A7.2). The respective reference category is given in brackets next to each variable in the table.

Table 7.1: Descriptive Statistics across BCS Sweeps (% of Final Sample) 1994-2010/11

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Sex (Female)													
Male	44.6	45.0	44.0	44.3	44.6	44.8	44.7	44.8	45.2	45.5	45.1	45.1	45.1
Number of children (No children)													
One Child	13.9	12.6	12.9	12.3	12.5	12.3	12.2	12.2	12.2	12.7	12.8	12.7	12.3
Two or More Children	19.8	16.8	17.4	16.2	16.1	15.8	15.9	15.5	15.6	15.1	14.7	14.2	14.2
Social Class of HOH/HRP (Routine occupations)													
Professional	6.6	32.3	33.1	34.4	34.7	35.8	35.6	36.1	37.1	37.4	37.2	37.1	37.1
Intermediate Occupations	65.9	44.9	44.6	18.1	18.3	18.1	18.9	19.2	19.5	19.5	20.3	19.4	19.7
Never worked/Not classified	4.8	1.1	0.6	6.5	6.4	6.7	5.9	6.1	4.7	4.5	4.9	5.5	5.5
Highest Qualification (Secondary (upper))													
Higher/further educ. (inc. degree and teaching qual.)	20.0	21.5	23.2	24.4	25.6	26.5	26.7	28.7	29.7	30.4	32.1	32.3	32.9
Secondary (lower) – GCSE/O Level/ CSE/SCE	28.2	27.2	21.1	18.6	18.5	18.6	18.7	19.0	19.4	19.9	19.9	19.2	19.5
Trade Apprenticeship	NA	NA	5.1	6.5	6.4	6.0	6.1	5.8	5.6	5.7	5.2	5.2	5.2
Other Qualifications	4.9	4.3	3.0	5.0	5.2	4.7	4.7	4.7	4.4	4.3	4.1	4.3	4.5
No Qualifications	38.6	39.3	36.5	36.3	35.0	34.3	33.5	31.0	29.6	28.3	27.5	27.4	26.0

Table 7.1 (contd.): Descriptive Statistics across BCS Sweeps (% of Final Sample) 1994-2010/11

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Ethnic Group (White)													
Black	7.0	2.1	2.3	1.5	1.6	1.8	1.7	1.6	1.7	1.8	2.1	1.9	2.1
Asian/Mixed/Other	9.8	3.4	3.7	3.9	3.6	4.0	4.3	4.3	4.7	4.8	5.0	5.3	5.7
Household Income (£10,000-£19,999)													
£4,999 and under	20.8	19.6	15.2	8.2	9.0	7.5	6.4	6.2	6.4	5.6	5.6	3.4	3.3
£5,000-£9,999	22.0	17.4	17.9	13.6	13.0	13.1	13.0	12.2	11.8	11.5	10.9	11.2	11.5
£20,000-£29,999	13.7	15.1	16.3	14.6	14.5	14.2	14.3	13.1	14.0	13.9	13.7	13.9	13.8
£30,000-£49,999	11.0	13.8	12.3	15.0	15.5	16.3	17.3	18.4	18.0	18.3	18.6	17.1	17.2
£50,000 or more			5.1	6.7	7.7	9.1	9.2	10.1	10.9	12.1	12.8	13.8	13.7
Refused	1.3	2.8	2.5	10.7	9.2	10.4	10.9	11.6	10.8	10.7	10.3	10.5	10.3
Don't know	2.4	3.9	4.5	11.9	11.7	10.8	10.0	10.0	9.4	10.2	10.1	10.1	10.2
Illness or Disability (No disability)													
Disability/long-standing illness	31.6	32.1	29.9	27.8	27.1	27.7	28.0	27.7	28.5	28.5	27.5	28.6	29.6
Marital Status (Married/cohabiting)													
Single	19.1	19.7	24.0	23.4	24.2	24.8	24.4	25.3	26.1	26.8	27.0	26.8	27.6
Separated/Divorced	10.3	10.5	13.5	12.9	13.6	13.6	13.8	13.9	14.0	13.9	14.1	14.4	14.4
Widowed	12.7	13.0	12.7	12.9	12.3	12.3	12.7	12.3	11.8	11.7	11.9	11.6	11.3

Table 7.1 (contd.): Descriptive Statistics across BCS Sweeps (% of Final Sample) 1994-2010/11

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Employment status (Paid work)													
Waiting or looking to take new job	6.1	4.0	2.5	1.7	1.7	1.5	1.5	1.6	1.7	1.8	2.2	2.8	2.6
Temp. sick or injured/long-term sick or disabled	4.1	4.4	4.9	5.2	5.0	5.0	5.0	4.5	4.8	4.5	4.6	4.4	4.5
Student (full-time)	3.0	2.3	1.9	1.8	2.0	2.0	2.0	2.0	2.2	2.3	2.4	2.4	2.3
Retired from paid work	22.3	24.3	23.5	27.3	26.8	27.2	28.3	27.9	27.9	28.0	28.1	29.1	28.9
Looking after home/family	14.2	11.7	12.6	7.9	7.7	7.3	7.2	6.5	6.3	5.9	5.5	5.4	5.2
Other/Something else	1.0	0.8	1.3	1.6	1.8	1.6	1.5	1.4	1.2	1.2	1.5	1.7	1.7
Tenure (Owners)													
Social rented sector	25.6	24.1	23.3	19.0	18.8	18.7	17.7	17.1	16.8	16.7	16.4	16.7	16.7
Private rented sector	7.6	7.5	10.5	9.1	9.6	9.3	10.1	10.8	11.7	12.6	13.6	14.2	15.8
General Health (Good)													
Very Good	34.7	35.5	39.1	36.8	37.9	38.5	39.0	38.2	36.3	36.5	37.2	35.9	36.1
Fair	22.8	21.5	18.5	19.5	19.1	18.3	18.3	17.9	18.4	18.1	17.8	18.9	18.9
Bad	4.2	3.7	4.9	5.4	5.3	5.3	5.1	5.2	5.1	5.2	5.3	5.1	5.1
Very Bad	1.1	1.0	1.5	1.2	1.0	1.1	1.0	0.9	1.0	0.9	1.0	1.0	1.2
Hours Away from Home (Weekday) (3-5 hours)													
Under 1 hour	8.3	8.2	7.4	8.7	8.2	7.7	8.0	7.3	6.9	7.0	7.0	7.1	6.4
1-3 hours	22.7	21.6	22.4	22.8	22.9	23.0	23.2	22.6	22.5	22.5	22.2	23.3	23.3

Table 7.1 (contd.): Descriptive Statistics across BCS Sweeps (% of Final Sample) 1994-2010/11

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
5-7 hours	10.3	10.1	10.2	9.4	9.8	9.9	10.1	10.1	10.5	10.1	9.9	10.2	10.3
7+ hours	41.7	43.0	43.4	42.6	43.2	42.7	42.0	43.4	43.2	44.0	44.0	42.4	42.7
Visits to Pub in Last Month (No visits)													
1-3 times	40.00	40.4	28.0	28.8	29.3	29.0	29.0	27.1	27.6	27.1	27.5	27.9	28.4
4-8 times			15.4	15.9	15.7	16.0	15.3	16.7	16.6	17.0	16.1	15.2	15.1
More than 9 times			7.0	8.0	7.7	7.5	7.0	7.2	6.9	6.4	5.7	5.2	5.0
Visits to Club in Last Month (No visits)	NA	NA											
1-3 times			8.9	9.3	9.3	9.1	8.3	7.8	7.9	7.8	7.4	7.2	7.0
4-8 times			2.6	2.2	2.1	2.1	1.8	1.9	1.8	1.8	1.7	1.4	1.2
More than 9 times				0.5	0.7	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3
No. of Cars Owned/Used Last Year? (No car)													
1 car	45.3	45.0	45.6	44.6	43.8	43.0	42.8	42.9	42.4	42.4	42.1	42.2	42.6
2 cars	20.3	22.2	23.2	25.2	26.5	27.0	27.8	28.5	28.8	28.9	28.7	28.5	28.1
3+ cars	4.1	4.8	4.8	5.8	6.1	7.0	7.3	7.7	7.9	8.1	8.2	8.5	8.3
Anyone in Household Owned a Bicycle? (No bicycle)													
Own a bike	41.3	42.7	43.3	41.2	42.8	42.5	43.0	43.8	44.8	44.5	44.7	45.3	44.5
Area Type (Rural)													
Inner City	27.6	23.0	22.9	8.3	8.8	8.9	8.1	7.8	7.7	7.8	8.2	7.9	8.2
Urban	52.6	56.2	55.5	67.0	66.8	65.8	65.1	67.6	67.7	66.8	66.1	66.2	66.8

Table 7.1 (contd.): Descriptive Statistics across BCS Sweeps (% of Final Sample) 1994-2010/11

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Region (South East)													
North East (North in 1994)	6.5	6.0	6.3	5.9	6.5	6.4	6.4	6.2	6.7	6.6	6.7	6.7	6.8
Yorkshire & Humberside	10.2	9.9	10.2	9.3	9.1	9.0	9.1	9.0	9.1	9.2	9.1	9.1	8.9
North West	12.4	13.1	12.3	12.6	12.5	12.8	12.1	12.2	11.9	11.7	11.3	11.7	11.9
East Midlands	7.5	7.8	8.0	9.2	9.8	9.7	10.5	11.0	11.0	11.1	11.4	11.0	11.0
West Midlands	10.8	10.5	10.5	10.4	9.6	10.0	9.9	10.0	9.7	10.0	9.4	9.6	9.5
East (East Anglia in 1994)	3.6	8.8	9.8	11.3	11.6	12.4	13.5	13.4	13.2	13.0	12.7	12.9	12.8
London (Greater London in 1994)	17.7	14.6	14.5	8.8	9.0	9.0	7.4	7.0	7.4	7.7	8.4	8.7	8.8
South West	7.9	8.7	8.7	10.8	10.7	10.6	11.2	10.9	10.8	10.6	10.7	10.9	10.8
Wales	5.0	5.2	5.4	7.9	8.3	8.0	8.1	8.8	8.7	9.1	9.0	8.6	8.4
Age (Continuous)													
Mean	46.89	48.37	48.6	49.93	49.83	50.06	50.57	50.52	50.5	50.45	50.68	51.21	51.2
Standard Deviation	18.85	18.65	18.41	18.53	18.45	18.4	18.59	18.43	18.47	18.58	18.57	18.59	18.65
Final sample size (raw number)	16,464	15,775	14,315	32,313	36,160	37,493	44,770	47,358	46,720	46,466	45,823	44,011	46,154

7.2 Modelling Strategy

Data was first cleaned in IBM SPSS Statistics (IBM Corp., 2012) and dummy variables created for each categorical explanatory variable (see A7.1). Statistical modelling was then conducted using MLwiN version 2.26 (Rasbash *et al.*, 2009).

Negative binomial modelling (Cameron and Trivedi, 1986) was used to model the full distribution of crime counts for each sweep of the BCS from 1994 to 2010/11. Sampling weights were not used (see A4.4). Three models were estimated for both completed and attempted crimes, making a total number of six models. Initially, a baseline model was run. This was followed by saturated models that included all explanatory variables. Where at least one dummy variable within the variable group was statistically significant at the ten per cent level, all dummies for that variable were retained. For clarity, models are referred to as baseline, saturated and reduced respectively. Different models have been utilised dependent upon the research question. For questions one, two and four, where interest lies in establishing patterns *within* sweeps the reduced models are reported. For question three where we are specifically interested in the magnitude of change over time, results from the saturated models are reported. This is because the saturated models (after 2001/02) are directly comparable as the same variables entered each saturated model[10].

7.3 Results

This chapter involved the rather painstaking analysis of a very large amount of data and, as a result, there are a wealth of findings. In the interests of clarity, this section will begin by outlining the characteristics of the reference person, address issues regarding overdispersion and discuss the explanatory power of each phase of the models. All findings should be interpreted relative to this reference individual (see Sections 4.6.3 and A7.2). Results from the reduced models are then presented under the headings of demographics, lifestyle and area. In addition because two reduced models were estimated – one relating to 'completed' theft from the person and

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[10] Variables which entered the models from 2001/02 onwards are not directly comparable with prior sweeps due to *very* slight variations in the dummy variables entering these models. These variations are noted in Table 7.1.

robbery, the other to attempted – two further subheadings are used (completed victimisation and attempted victimisation) to ease interpretation. The remainder of the chapter is dedicated to answering the research questions.

7.3.1 Reference Individual

Findings should be interpreted relative to the reference individual holding all other variables constant. The reference individual is a white female living in a rural area in the South East of England. She is married or cohabiting and has no children under the age of 16 in the household. She is buying her house with the help of a mortgage or shared ownership scheme. She spends between three and five hours outside the home on an average weekday and is currently in paid employment. The Head of Household's social class is a routine occupation and the household income is between £10,000 and £19,999. She completed A-Levels and is in good health with no long-standing illnesses or disabilities. In an average month she will not visit a pub or club and does not own or use a car or bicycle. The predicted mean number of crimes experienced by the reference individual was calculated for each sweep and is discussed in Section 7.4.3.

7.3.2 Overdispersion

As shown in Table 5.4 the distribution of theft from the person and robbery is overdispersed. This is most likely a reflection of the highly skewed nature of the data (an excessive number of zeros, i.e. non-victims). This was the main reasoning behind employing negative binomial regression models. The dispersion parameters (shown as α in Tables 7.6 and 7.7) confirm the data are highly significantly dispersed, particularly for attempts and thus selecting a model which accounts for overdispersion was appropriate (see also A7.3).

The overdispersion parameter in relation to completed theft from the person and robbery has remained relatively consistent over time, with the highest value found in 2005/06 and the lowest in 1996. There are considerably larger values for attempted victimisations. In addition, they show a greater degree of variation across sweeps. The highest value is also found in 2005/06 and lowest in 2003/04. This suggests that the distribution of theft and robbery was more variable in 2005/06 when compared to other sweeps.

7.3.3 Explanatory Power of Models

In order to ascertain the explanatory power of each phase of the model, the joint chi-square values and their respective degrees of freedom were compared (Trickett *et al.*, 1995). The model joint chi-square values were recorded for each stage (Tables 7.2 and 7.3), i.e. chi-square values were obtained for the base model (base), followed by a model containing only demographic characteristics (demographic), then demographic and lifestyle (DL) and so on until a value for the saturated model (demographic, lifestyle and area) was obtained. The differences in values were then compared to ascertain the explanatory power for each phase of the model (Tables 7.4 and 7.5). The results suggest more explanatory power is obtained using the demographic variables alone compared to lifestyle and area variables. For example, in 2010/11 the joint chi-square value for the completed model containing only demographic variables is 68.9 per cent that of the saturated model, compared to 15.4 and 15.7 per cent for lifestyle and area factors respectively. Even when you account for the degrees of freedom, demographic variables retain their position of power. This is in agreement with previous research which highlights the importance of sex, age and marital status (Flatley *et al.*, 2010) as robust predictors of personal theft victimisation. It may be that changes in the demographic profile outlined in Section 7.1.1.1 have exerted an influence on overarching theft and robbery trends due to their higher explanatory power.

Table 7.2: Model Joint Chi-square Values from Negative Binomial Models of the Number of Completed Theft from the Person and Robbery Incidents across BCS Sweeps (1994-2010/11)

Model	df	1994 (df)	1996 (df)	1998 (df)	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Base	1	34.361	2.790	13.968	32.879	46.934	64.209	90.686	91.381	68.164	43.980	55.682	68.886	60.025
Demographic	37	169.05 (35)	145.63 (35)	120.75 (37)	231.41	226.40	279.90	281.31	234.25	321.23	246.79	265.98	254.65	266.71
Demographic + lifestyle (DL)	51	186.14 (44)	175.58 (44)	165.02 (50)	285.36	280.07	341.24	362.53	278.07	401.91	303.32	342.04	312.85	326.19
Saturated	62	235.85 (55)	220.17 (55)	209.72 (61)	379.12	351.21	395.67	408.01	333.47	446.89	364.10	427.01	374.12	386.99
Retain	NA	211.87	213.65	191.65	373.93	346.37	389.43	393.22	322.14	433.94	357.86	416.43	362.72	366.65

Table 7.3: Model Joint Chi-square Values from Negative Binomial Models of the Number of Attempted Theft from the Person and Robbery Incidents across BCS Sweeps (1994-2010/11)

Model	df	1994 (df)	1996 (df)	1998 (df)	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Base	1	19.90	24.510	17.31	35.74	47.79	50.80	53.46	55.93	55.35	59.02	117.06	43.99	71.21
Demographic	38	89.63 (35)	100.52 (35)	77.33 (37)	118.34	120.33	133.89	144.53	119.01	113.97	196.90	218.88	149.05	146.43
Demographic + lifestyle (DL)	52	109.19 (44)	111.40 (44)	95.37 (50)	139.98	134.65	168.20	165.32	135.59	145.51	234.24	247.98	183.17	171.93
Saturated	63	137.15 (55)	128.40 (55)	127.91 (61)	159.10	161.14	217.05	207.13	174.57	218.86	252.24	299.49	206.36	191.17
Retain	NA	123.71	109.76	112.74	130.29	141.36	195.28	187.10	150.94	207.51	233.26	276.83	181.53	159.26

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Table 7.4: Model Chi-square Differences from Negative Binomial Models of the Number of Completed Theft from the Person and Robbery Incidents across BCS sweeps (1994-2010/11)

Model	df+	1994 (df)	1996 (df)	1998 (df)	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Base→ Demographic	37	134.69 (34)	142.84 (34)	106.78 (36)	198.53	179.46	215.69	190.62	142.87	253.07	202.81	210.30	185.76	206.68
Demographic → DL	14	17.09 (9)	29.96 (9)	44.27 (13)	53.96	53.67	61.34	81.22	43.82	80.67	56.53	76.06	58.20	59.48
DL → Saturated	11	49.71 (11)	44.59 (11)	44.71 (11)	93.76	71.14	54.43	45.49	55.40	44.98	60.78	84.97	61.27	60.80

+ Degrees of freedom here refer to the number of variables added in each phase of the model.

Table 7.5: Model Chi-square Differences from Negative Binomial Models of the Number of Attempted Theft from the Person and Robbery Incidents across BCS Sweeps (1994-2010/11)

Model	df+	1994 (df)	1996 (df)	1998 (df)	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Base→ Demographic	37	69.73 (34)	76.01 (34)	60.02 (36)	82.61	72.54	83.09	91.06	63.08	58.62	137.89	101.82	105.07	75.21
Demographic → DL	14	19.56 (9)	10.89 (9)	18.04 (13)	21.63	14.32	34.31	20.79	16.58	31.54	37.34	29.10	34.12	25.51
DL → Saturated	11	27.96 (11)	17.00 (11)	32.54 (11)	19.12	26.49	48.85	41.81	38.98	73.35	18.00	51.52	23.19	19.23

+ Degrees of freedom here refer to the number of variables added in each phase of the model.

7.3.4 Demographic Characteristics

7.3.4.1 Completed Theft from the Person and Robbery

A number of demographic variables entered the model and, as demonstrated by the joint chi-square model statistics (Tables 7.2 and 7.4), the explanatory power of these variables alone is relatively substantial. Results from the reduced models of completed theft from the person and robbery are presented in Table 7.6. The most commonly associated variables for completed crimes are age, sex, marital status, employment status, general health and tenure.

Age has a consistently protective effect across sweeps. With each year of age, there is a decrease in the predicted mean number of victimisations (min. -1.00% in 2007/08; max. -2.76% in 2005/06, 2009/10 and 2010/11)[11]. In other words, as you get older the expected mean number of thefts from the person or robberies reduces. Being in fair, bad or very bad health increases the mean number of victimisations. By contrast, those in very good health see a decrease (min. –20.55% (2006/07); max. -26.36% (2009/10)). In general, males experience a much-reduced predicted mean number (in some cases up to 43.84 per cent less (2006/07); min -19.83% (2005/06)) when compared with an otherwise similar female. This is a consistent effect across sweeps. In agreement with previous research, marital status is an important predictor of theft from the person and robbery victimisation. Being unmarried increases your predicted mean number of victimisations rather markedly. For example, in 2004/05 being widowed increases the expected mean number by 234.68 per cent (min. 53.11% (1996)).

The employment and economic status of the respondent are important variables. Individuals who are waiting or looking for work experience an increased predicted mean number of victimisations in nearly a third of the sweeps analysed (min. 80.94% (2001/02); max. 150.93% (2009/10)). With regard to tenure, the effect of renting (either social or private) was only significantly different from the base category, homeowners, in three sweeps. Where significant, social and private renters experience an increased predicted number of victimisations.

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[11] These figures relate to the percentage effect of each dummy variable on the predicted mean number of victimisations. Figures are calculated using values from the reduced models.

7.3.4.2 Attempted Theft from the Person and Robbery

As with completed crimes, a number of personal characteristics significantly influence attempted theft from the person and robbery across sweeps. Results from the reduced models of attempted theft from the person and robbery are presented in Table 7.7. Age has a consistently protective effect (min. -2.37% (2006/07); max. -4.78% (1994 and 2010/11)). Being separated or divorced increases the predicted mean number of attempted victimisations (min. 49.18% (2005/06); max. 162.48% (2008/09)). Being in fair (min. 50.23% (2008/09); max. 123.45% (2007/08)) or very bad health (min. 230.69% (2006/07); max. 512.88% (2004/05)) rather dramatically increases the predicted incidence of an attempted victimisation. Respondents with a long-term illness or disability have an increased predicted mean number of attempted victimisations (min. 47.26% (2009/10); max. 127.28% (2003/04)).

Interestingly, males experience a much-increased predicted incidence of attempted theft and robbery (65.7 per cent in 2004/05) when compared with the reference female. Where significant, this is a consistent positive effect across sweeps. With regard to tenure, renting (either social or private) was significantly different from the base category, homeowners, in a limited number of sweeps. Where the effect was significant, social and private renters experienced an increase in the number of predicted victimisations.

7.3.5 Lifestyle Characteristics

7.3.5.1 Completed Theft from the Person and Robbery

A number of lifestyle variables are important with respect to their effect on completed theft from person and robbery victimisation. In particular, nightclub or disco visits per month, car use/ownership and hours away from the home on an average weekday. The greater the number of visits to a club per month the higher the predicted mean number of victimisations. In 2008/09 visiting a club more than nine times a month increased the expected number by 341.5 per cent (min. 100.97% (2004/05)).

Car ownership or use in the last year decreases the predicted incidence of victimisation by around 50 per cent (e.g. one car: min. -24.04% (2007/08); max. -50.44% (1998)). In addition, spending less than one hour away from the home on an

average weekday unsurprisingly reduces the expected number of victimisations (min. -32.5% (2002/03); max. -63.69% (2004/05)).

7.3.5.2 Attempted Theft from the Person and Robbery

Fewer lifestyle indicators are statistically different from their respective base category when analysing attempted theft and robbery. However, methods of transport have a relatively consistent, significant effect across sweeps. Car use or ownership decreases the predicted mean number of attempted victimisations (e.g. one car: min. -30.51% (2003/04); max. -55.74% (2009/10)). Conversely, bike ownership increases the predicted incidence of attempted victimisation (min. 34.58% (2002/03); max. 128.19% (1994)).

7.3.6 Area Characteristics

7.3.6.1 Completed Theft from the Person and Robbery

A selected number of area characteristics significantly influence completed theft and robbery incidence. Living in London rather dramatically increases the predicted mean number of victimisations (min. 56.21% (2004/05); max. 193.0% (2002/03)), as does living in an inner city (min. 46.23% (2003/04); max. 110.64% (2001/02)) or urban area (min. 27.89% (2005/06); max. 85.34% (2008/09)). By contrast, living in the North East (min. -41.49% (2004/05); max. -66.95% (1998) or Wales (min. -16.22% (1998); max. -60.43% (2001/02) decreases victimisation incidence. Living in the North West previously increased the predicted mean number of victimisations (by up to 110.85 per cent in 1994). However, since 2004/05 this prediction has reversed and there is a decrease in the expected number of victimisations when compared to the South East base category (max. -33.77% (2007/08)).

7.3.6.2 Attempted Theft from the Person and Robbery

Living in London (min. 72.98% (2001/02); max. 317.87% (1998)) or an inner city area (min. 92.9% (2002/03); max. 163.79% (2005/06)) increases the predicted mean number of attempted victimisations. Those living in Wales experience a decreased incidence when compared to their counterparts in the South East (min. -50.34% (2007/08); max. -80.56% (2003/04)).

Table 7.6: Negative Binomial Regression (Reduced) Models of Completed Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Constant	-3.575	-5.001	-3.725	-3.496	-4.129	-3.992	-3.595	-3.341	-4.098	-4.841	-4.002	-3.253	-3.691
							Exp (b)						
Sex (Female)													
Male	0.65#	0.59#	-	0.98	0.61#	0.63#	0.67#	0.8~	0.56#	0.56#	0.57#	0.69#	0.58#
Number of children (No children)													
One Child	-	1.43*	-	-	-	-	1.25	-	-	-	-	-	-
Two or More Children	-	1.23	-	-	-	-	1.39~	-	-	-	-	-	-
HOH Social Class (Routine Occupations)													
Professional	-	1.53~	-	-	1.34~	1.4~	1.15	1.04	-	1.6#	-	-	-
Intermediate Occupations	-	1.4~	-	-	1.41~	1.38~	1.39~	0.93	-	1.22	-	-	-
Never worked/Not classified	-	1.24	-	-	0.95	1.11	0.86	0.66~	-	1.53~	-	-	-
Highest Qualification (Secondary (Upper))													
Higher/FE (inc. degree and teaching qualification)	-	-	-	0.9	-	-	-	-	0.99	-	-	-	-
Secondary (lower) – GCSE/O Level/CSE/SCE	-	-	-	0.85	-	-	-	-	0.67~	-	-	-	-
Trade Apprenticeship	-	-	-	0.38~	-	-	-	-	0.61	-	-	-	-

Table 7.6 (contd.): Negative Binomial Regression (Reduced) Models of Completed Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Other Qualifications	-	-	-	0.66	-	-	-	-	0.62	-	-	-	-
No Qualifications	-	-	-	0.69*	-	-	-	-	0.61#	-	-	-	-
Ethnic Group (White)													
Black	0.95	1.25	-	-	-	1.01	-	1.23	-	-	0.64*	-	-
Asian/Mixed/Other	1.53~	1.69~	-	-	-	1.44*	-	1.57~	-	-	1.13	-	-
Household Income (£10,000-£19,999)													
£4,999 and under	0.76	1.47*	-	1.56~	1.33	-	-	-	1.15	1.53~	-	-	1.09
£5,000-£9,999	0.82	1.16	-	1.25	1.06	-	-	-	0.95	1.39*	-	-	1.1
£20,000-£29,999	0.85	1.18	-	0.84	0.75	-	-	-	1.13	1.3	-	-	1.01
£30,000-£49,999	1.49*	0.86	-	1.18	1.01	-	-	-	1.25	1.17	-	-	0.89
£50,000 or more			-	1.08	1.9#	-	-	-	0.98	1.38	-	-	1.53~
Refused	3.04#	0.87	-	1.08	1.02	-	-	-	0.91	1.18	-	-	0.84
Don't know	0.62	2.11#	-	2.03#	1.02	-	-	-	1.48~	1.33	-	-	0.99
Illness or Disability (No disability)													
Disability/ illness	-	-	-	-	1.69#	1.5#	-	-	-	-	1.37~	-	-
Marital Status (Married/cohabiting)													
Single		1.96#	2.01#	1.31	1.44~	1.77#	1.87#	1.58#	1.66#	1.9#	1.6#	1.5#	1.73#	1.47~
Separated/Divorced		2.39#	1.53~	1.2	2.01#	1.85#	2.1#	2.26#	1.64#	1.81#	1.55#	1.44~	1.59#	1.29

Table 7.6 (contd.): Negative Binomial Regression (Reduced) Models of Completed Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Widowed	1.96~	1.53*	2.07#	1.56~	1.79#	2.23#	3.35#	1.92#	1.7~	1.82#	1.85#	1.98#	1.28
Employment status (Paid work)													
Waiting or looking to take new job	-	-	1.16	1.81~	1.31	0.99	1.52	0.53	2.35#	2.32#	1.45	2.51#	1.51
Temp. sick or injured/long-term sick/disabled	-	-	1.78*	1.03	0.98	2.36#	1.93#	0.89	1.62~	1.14	1.47	2.04#	1.32
Student (full-time)	-	-	1.25	1.3	1.41	1.22	1.99#	2.2#	1.75~	1.88#	1.2	1.44	1.12
Retired from paid work	-	-	1.7*	0.97	1.73~	1.21	1.24	1.24	1.55~	1.25	1.24	2.11#	1.72~
Looking after home/family	-	-	1.41	0.79	0.99	0.9	0.83	0.99	1.37	1.27	1.17	0.91	0.72
Other/Something else	-	-	0.61	0.78	1.18	1.09	1.33	1.1	1.28	1.47	1.61	1.27	1.66
Tenure (Owner)													
Private rented sector	-	-	1.83#	-	-	1.39~	-	-	0.97	1.2	1.32~	-	-
Social rented sector	-	-	1.79#	-	-	1.09	-	-	1.26	1.67#	1.22	-	-
General Health (Good)													
Very Good	0.93	1.04	0.9	0.74~	0.96	-	0.79~	0.84	0.79*	0.95	0.77~	0.74~	0.85
Fair	1.37*	1.25	1.38	1.43~	1.02	-	1.07	1.5#	1.32*	1.37~	0.96	1.15	1.66#
Bad	2.04~	1.42	2.31#	2.15#	1.15	-	1.48*	1.8~	2.02#	1.96#	1.02	1.8#	2.04#
Very Bad	3.14~	2.72~	1.25	1.29	2.76#	-	2.53~	2.35*	1.95*	2.78~	2.69#	1.52	4.45#

Table 7.6 (contd.): Negative Binomial Regression (Reduced) Models of Completed Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Hours Away from Home (Weekday) (3-5 hours)													
Under 1 hour	-	0.47~	0.46~	0.44#	0.68*	1.18	0.36#	0.57~	-	0.53~	0.55~	0.45#	-
1-3 hours	-	0.81	0.68*	0.96	0.69~	0.89	0.72~	0.71*	-	0.76*	0.96	0.86	-
5-7 hours	-	0.81	1.2	0.9	1.06	1.67#	0.91	1.07	-	0.98	1.05	0.8	-
7+ hours	-	1.03	1.15	0.96	0.83	1.07	0.88	0.75*	-	0.93	1.0	1.01	-
Visits to Pub in Last Month (No visits)													
1-3 times	-	-	-	0.75*	-	-	1.14	-	1.16	1.04	-	-	-
4-8 times			-	0.72*	-	-	1.47~	-	1.36~	1.25	-	-	-
More than 9 times			-	0.98	-	-	1.56~	-	2.21#	2.04#	-	-	-
Visits to Club in Last Month (No visits)													
1-3 times	-	-	1.72#	1.37*	1.39~	1.54#	1.64#	1.34*	1.58#	1.47~	1.38~	2.06#	1.6#
4-8 times			0.86	1.73*	2.17#	2.09#	2.07#	2.01#	1.33	1.88~	2.23#	3.03#	2.89#
More than 9 times				3.23#	3.02#	3.87#	2.01*	1.54	1.39	1.57	4.41#	2.1	4.06#
No. Cars Owned/Used Last Year? (No car)													
1 car	0.69~	0.55#	0.5#	0.57#	0.68#	0.6#	0.54#	0.59#	0.59#	0.76~	0.63#	0.52#	0.57#
2 cars	0.57~	0.52#	0.82	0.53#	0.59#	0.61#	0.55#	0.57#	0.43#	0.66~	0.48#	0.57#	0.48#
3+ cars	0.81	0.8	0.85	0.39#	0.47#	0.36#	0.61~	0.86	0.49#	0.8	0.77	0.72	0.56~

Table 7.6 (contd.): Negative Binomial Regression (Reduced) Models of Completed Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Anyone in Household Owned a Bike? (No bike)													
Own a bike	1.26	-	-	-	1.38#	-	-	-	-	1.25~	-	-	-
Area Type (Rural)													
Inner City	1.48	1.72~	-	2.11#	1.7#	1.46*	1.67#	1.68~	1.35	1.53~	1.82#	-	1.41
Urban	1.00	1.48*	-	1.25	1.26	1.11	1.25	1.28*	1.34~	1.15	1.85#	-	1.44~
Region (South East)													
North East (North in 1994)	0.29~	0.72	0.33~	0.48~	0.96	0.65	0.59~	0.51~	0.96	0.46#	0.66	0.37#	0.55~
Yorkshire & Humberside	1.09	1.05	1.21	1.16	1.47*	0.74	0.76	0.82	1.0	0.65*	0.92	0.5#	0.52~
North West	2.11#	1.79~	1.44	1.59~	1.21	0.76	0.69*	1.14	0.9	0.66~	0.86	0.82	0.89
East Midlands	1.1	1.11	0.66	0.97	0.8	0.76	0.74	1.01	1.23	0.57~	0.96	0.79	0.88
West Midlands	0.98	2.08#	0.92	1.23	1.37	1.0	0.55#	1.19	1.08	0.86	0.82	0.95	1.0
East (East Anglia in 1994)	0.14*	0.48*	0.7	0.72	1.32	0.78	1.02	1.0	1.05	0.74	0.87	0.86	1.19
London (Gtr. London in 1994)	2.18#	2.54#	2.27#	2.43#	2.93#	1.96#	1.56~	2.07#	2.59#	1.6~	2.48#	2.42#	2.39#
South West	1.06	0.91	0.31~	0.7	0.87	0.77	0.59~	0.69	0.82	0.59~	0.72	0.77	1.02
Wales	0.76	0.79	0.84	0.4#	0.54~	0.53~	0.56~	0.53~	0.76	0.53#	0.54#	0.62*	0.56*
Age	0.98#	1.00	0.98#	0.98#	0.98#	0.98#	0.98#	0.97#	0.98#	0.99*	0.98#	0.97#	0.97#
α	7.03#	4.01#	6.03#	12.51#	10.69#	8.07#	6.22#	16.93#	11.52#	11.23#	8.95#	15.38#	8.11#

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01; - Did not enter the model

Table 7.7: Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Constant	-3.716	-2.987	-5.234	-3.612	-3.763	-5.026	-3.94	-4.615	-4.65	-3.469	-5.396	-3.705	-3.922
	Exp (b)												
Sex (Female)													
Male	-	-	-	-	-	-	1.66#	-	1.32*	1.32*	1.39~	-	1.48~
Number of children (No children)													
One Child	0.78	0.44#	-	-	-	-	0.53~	-	-	0.72	0.85	-	0.61*
Two or More Children	0.59*	0.48#	-	-	-	-	0.81	-	-	0.54~	0.59~	-	1.06
HOH Social Class (Routine Occupations)													
Professional	-	1.57	1.85~	1.42	-	1.87#	-	-	-	-	1.38*	1.46*	2.0#
Intermediate Occupations	-	1.5	0.94	2.69#	-	1.16	-	-	-	-	1.09	0.83	1.39
Never worked/Not classified	-	1.94	8.68#	1.17	-	1.22	-	-	-	-	0.79	0.56	0.59
Highest Qualification (Secondary (Upper))													
Higher/FE (inc. degree/teach. qual)	1.9*	0.85	-	1.08	0.7	-	0.95	-	-	-	1.32	1.03	-

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Table 7.7 (contd.): Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Secondary (lower) – GCSE/O Level/CSE/SCE	1.05	0.6	-	0.75	0.7	-	0.55~	-	-	-	1.52*	0.9	-
Trade Apprenticeship	-	-	-	1.02	0.58	-	0.57	-	-	-	1.54	0.38*	-
Other Qualifications	2.37*	0.32*	-	1.00	0.8	-	0.21~	-	-	-	1.88*	1.03	-
No Qualifications	1.16	0.62	-	0.49~	0.48~	-	0.53~	-	-	-	0.71	0.43#	-
Ethnic Group (White)													
Black	0.35~	0.48	-	-	-	-	0.27~	-	-	-	-	-	-
Asian/Mixed/Other	1.76~	2.02*	-	-	-	-	0.78	-	-	-	-	-	-
Household Income (£10,000-£19,999)													
£4,999 and under	-	1.21	2.37~	1.88	-	1.09	-	1.24	0.98	1.78*	-	1.59	-
£5,000-£9,999	-	1.17	1.13	1.42	-	1.19	-	1.19	0.54~	0.99	-	1.07	-
£20,000-£29,999	-	1.12	0.7	1.05	-	1.06	-	1.02	1.04	0.94	-	1.6*	-
£30,000-£49,999	-	0.68	1.26	2.45#	-	0.83	-	0.73	0.64*	1.12	-	1.13	-
£50,000 or more			1.18	1.27	-	1.33	-	1.49	0.92	1.3	-	1.1	-
Refused	-	1.07	1.25	1.01	-	1.11	-	0.42~	0.66	0.78	-	0.61	-
Don't know	-	2.52~	2.11*	1.99~	-	1.64*	-	0.96	0.79	0.96	-	1.47	-

Table 7.7 (contd.): Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Illness or Disability (No disability)													
Disability/long-standing illness	1.76~	-	-	-	1.61~	2.27#	-	1.89#	1.97#	-	1.91#	1.47*	-
Marital Status (Married/cohabiting)													
Single	1.08	-	-	-	1.61~	1.26	1.18	1.7~	-	-	1.92#	0.89	0.99
Separated/Divorced	2.36#	-	-	-	1.74~	1.37	1.57*	1.49*	-	-	2.62#	1.29	1.65~
Widowed	0.75	-	-	-	1.8*	1.93~	2.16~	0.98	-	-	1.06	2.41#	1.16
Employment status (Paid work)													
Waiting or looking to take new job	1.32	-	2.73~	-	-	-	-	-	1.69	1.87*	-	-	1.46
Temp. sick or injured/long-term sick/disabled	0.57	-	2.25	-	-	-	-	-	0.99	0.8	-	-	1.93
Student (full-time)	1.34	-	0.73	-	-	-	-	-	2.5#	3.15#	-	-	1.73
Retired from paid work	3.44#	-	3.19~	-	-	-	-	-	0.66	0.67	-	-	1.75
Looking after home/family	0.81	-	1.36	-	-	-	-	-	0.73	0.49*	-	-	0.81

Table 7.7 (contd.): Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Other/Something else	1.89	-	1.19	-	-	-	-	-	0.44	0.4	-	-	0.76
Tenure (Owner)													
Private rented sector	-	-	2.69#	1.19	2.07#	-	1.31	-	-	1.14	-	1.23	-
Social rented sector	-	-	1.47	1.65	1.07	-	2.43#	-	-	1.53*	-	1.94#	-
General Health (Good)													
Very Good	0.71	0.62~	-	0.7	0.71*	-	1.08	-	0.91	0.7~	0.82	0.82	0.94
Fair	1.04	1.83#	-	1.22	1.22	-	1.68~	-	1.41	2.23#	1.5*	1.26	1.77~
Bad	2.15*	1.98	-	3.79#	1.7	-	1.63	-	1.29	2.75#	1.74*	1.42	1.35
Very Bad	4.21~	2.56	-	0.53	1.13	-	6.13#	-	3.31~	3.89~	1.23	3.48~	0.94
Hours Away from Home (Weekday) (3-5 hours)													
Under 1 hour	0.53	0.26~	0.15~	-	0.42~	1.47	-	-	0.39*	-	-	-	0.95
1-3 hours	0.43#	0.9	0.36#	-	0.78	1.44	-	-	1.29	-	-	-	0.97
5-7 hours	0.29#	1.15	0.94	-	0.8	2.28#	-	-	1.47	-	-	-	1.72*
7+ hours	0.52~	0.74	1.4	-	0.62~	1.56*	-	-	0.95	-	-	-	1.2

Table 7.7 (contd.): Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Visits to Pub in Last Month (No visits)													
1-3 times			-	-	-	-	-	0.64~	-	-	-	1.47~	-
4-8 times	-	-	-	-	-	-	-	0.97	-	-	-	1.57~	-
More than 9 times			-	-	-	-	-	0.91	-	-	-	2.09~	-
Visits to Club in Last Month (No visits)													
1-3 times	-	-	-	-	-	1.75#	1.17	1.45	0.91	1.07	1.59~	-	-
4-8 times			-	-	-	2.14~	0.69	1.4	2.33~	1.36	2.93#	-	-
More than 9 times				-	-	2.9~	3.77~	5.09~	4.14~	3.44*	1.83	-	-
No. Cars Owned/Used Last Year? (No car)													
1 car	-	-	-	0.52~	-	0.69*	-	-	0.55#	0.48#	-	0.44#	0.5#
2 cars	-	-	-	0.43#	-	0.47#	-	-	0.79	0.42#	-	0.37#	0.51#
3+ cars	-	-	-	0.28~	-	0.53*	-	-	0.82	0.55~	-	0.41#	0.73
Anyone in Household Owned a Bicycle? (No bicycle)													
Own a bike	2.28#	-	-	1.35	1.35*	-	-	-	-	1.4~	1.39~	1.25	-
Area Type (Rural)													
Inner City	-	-	-	-	1.93~	1.28	2.19#	2.64#	2.23~	-	1.57	-	2.55#
Urban	-	-	-	-	1.4	1.56~	1.2	1.68~	2.32#	-	1.84#	-	1.43

Table 7.7 (contd.): Negative Binomial Regression (Reduced) Models of Attempted Theft from the Person and Robbery over Demographic, Routine Activity and Area Characteristics across BCS Sweeps

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Region (South East)													
North East (North in 1994)	1.37	0.91	+	0.12#	0.36~	0.28~	0.69	0.56	0.89	0.32#	0.82	0.49*	0.91
Yorkshire & Humberside	1.93*	0.77	1.85	0.81	0.64	0.95	0.82	1.3	0.96	0.44~	0.71	0.76	0.37~
North West	1.87*	1.49	1.9	0.69	1.05	0.71	0.87	0.57*	0.83	0.86	1.02	0.66	0.79
East Midlands	2.01*	1.21	1.28	0.33~	0.72	0.85	2.13#	0.87	0.62	0.65	1.17	1.22	1.21
West Midlands	1.45	1.38	1.78	0.82	1.02	0.68	0.77	1.2	1.03	0.57*	1.37	0.85	1.01
East (East Anglia in 1994)	0.29	1.04	0.91	0.67	0.86	1.01	0.92	1.08	0.97	0.81	1.16	0.69	1.14
London (Gtr. London in 1994)	3.73#	2.98#	4.18#	1.73*	1.47	2.00#	1.43	1.76*	2.85#	1.31	3.25#	2.33#	1.57
South West	1.01	0.91	1.15	0.76	0.35#	0.68	0.71	0.34#	0.71	0.31#	0.6	0.57	0.88
Wales	0.81	0.76	1.14	0.3~	0.21#	0.19#	0.27~	0.32~	0.41~	0.5~	1.06	0.97	0.48*
Age	0.95#	0.97#	0.97#	0.97#	0.97#	0.97#	0.96#	0.97#	0.98#	0.97#	0.96#	0.97#	0.95#
α	14.59#	23.60#	14.85#	50.93#	42.75#	9.50#	37.90#	60.49#	36.31#	29.26#	17.16#	37.19#	44.52#

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01; - Did not enter the model; + No cases so merged with base.

7.4 Discussion

Analysis of such comprehensive data over a 17-year period has produced a wealth of interesting results. As mentioned, the author is particularly interested in whether there are:

1. Particular demographic, lifestyle and area characteristics that affect the incidence of theft from the person and robbery;
2. Changes in the significance of indicators across sweeps;
3. Changes in the relative importance of indicators across sweeps; and
4. Differences between the victim characteristics of those experiencing completed crimes as opposed to attempted.

Answering these questions will ultimately inform the crime prevention and wider policy recommendations made from this thesis. The following discussion is structured around the aforementioned research questions.

7.4.1 Are There Particular Demographic, Lifestyle and Area Characteristics that Affect the Incidence of Theft and Robbery?

The analysis suggests that, across sweeps, there are a number of indicators that consistently affect theft from the person and robbery incidence. In line with previous research, the most common are age, sex, marital status and frequency of activity outside the home (in particular 'nightclub or disco' visits). In addition, an individual's general health, housing tenure status and car ownership/use significantly impact upon victimisation. With regard to area characteristics, living in London, an inner city or urban area increases the predicted mean number of victimisations when compared to someone living in a rural area in the South East. Conversely, living in Wales reduces the predicted incidence.

There are a number of inferences that can be drawn from the above findings. Those variables deemed to be a potential indicator of affluence play less of a role than would possibly be expected. Head of household's income and social class, perhaps unsurprisingly due to the fact they are not measures directly relating to the respondent, have less of a bearing upon subsequent victimisation frequency. Educational qualifications also appear to play a fairly minor role in that their effect was not statistically significant in the majority of the sweeps analysed. As stated by

Flatley *et al.* (2010: 570): "...sex, age and marital status remain the most robust predictors of victimization in the British data, and SES differences, measured by occupation, education or income, are relatively small". However, tenure, measures of mobility (i.e. use/ownership of cars or bicycles) and general health do appear to offer some additional indication regarding the perceived vulnerability and accessibility of an individual to a potential thief.

Where significant, the way in which an individual occupied their accommodation (i.e. tenure) had a positive effect on victimisation incidence, namely social and private renters experienced an increased risk. This could be suggestive of a younger, more transient population who own the latest gadgets. It may also be linked to the level of affinity felt to their area of residence, manifest in a lack of shared community values and emotional investment (Kornhauser, 1978). Tenure may also proxy the amount of disposable income available.

Owning or having access to one or more cars could act as a physical barrier or protection from victimisation. Theft from the person and robbery are largely 'street crimes'. Thus, car ownership would be expected to reduce the amount of time spent on the street and increase mobility. This will be explored further within the incident characteristics analysis (Chapter 8) exploring the location of the crime and what the victim was doing at the time of the incident.

Respondents are asked to rate their general health on a scale of very good to very bad. Those who report fair, bad or very bad health consistently experience an increase in their predicted mean number of victimisations compared to someone in good health. Those who state they are in very good health see a reduced incidence. These findings should be interpreted with caution due to the inability to differentiate between the health status of the respondent before and after victimisation. It is also a self-reported measure hence it is not necessarily comparable from individual to individual. They may be in bad health as a result of their crime experience. If an individual's bad health is visible, an increased predicted incidence may also be a reflection of perceived vulnerability by the offender and thus a supposedly enhanced likelihood of successful commission of a crime. This would form an interesting avenue for future research.

A reduction in predicted incidence as one gets older could be attributed to a number of factors. Age could be a proxy measure for lifestyle. It may be that older individuals are less exposed to particular activities or places that could render them more vulnerable, for example, nightclubs or discos. This is explored further in Chapter 8. It may also be that the offender perceives the individual as a less attractive target – perhaps they are seen, on the balance of probabilities, as less likely to own the latest desirable gadgets. In fact, recent Ofcom (2013) research highlighted that while 99 per cent of 15 to 34 year olds own mobile phones, this proportion reduces to 58 per cent for the over 75s. They may also be viewed as more capable of protecting themselves or likely to employ increased security measures. In addition, the level of home-centred activities may be increased for older individuals (Cohen *et al.*, 1981). Previous research (Sacco *et al.*, 1993; Miethe and McDowall, 1993; Lauritsen, 2001) has found a number of effects are conditional upon other factors. For example, risk associated with sex was dependent upon area type. A potential avenue for future research may be to model interaction effects for the aforementioned variables, particularly age.

Measurement of capable guardianship was achieved through a number of proxy measures. Being married consistently predicted the lowest victimisation incidence. This could be a result of the partner's ability to act as a capable guardian or may be a wider indicator of lifestyle choices. Spending less than one hour away from the home on a weekday is associated with reduced incidence. This is not particularly surprising as the time spent in public in contact with potential offenders is seemingly minimal.

In agreement with much literature in this field, theft and robbery victimisation incidence appears to be heightened by residing in inner city and urban areas. This may be a result of being in closer, more frequent proximity to motivated offenders or from spending more time in busy, crowded places. The number of visits to a nightclub or disco, whilst possibly increasing the frequency of contact, may also heighten vulnerability. Licensed premises offer environments where groups of individuals, who usually do not know each other, converge (Smith *et al.*, 2006). This, in some cases, is combined with individuals with a reduced sense of awareness and ability to protect themselves (and supervise their belongings) as a result of alcohol. Previous research suggests offenders prefer to operate in busy locations which offer easy

escape routes (Monk *et al.*, 2010). An offender may also find it easier to conceal their criminal activities in these kinds of socially active environments.

7.4.2 Has There Been a Change in the Significance of Indicators across Sweeps?

For the most part, indicator effects that are significantly different from their respective base category are consistent across sweeps (see Tables 7.6 and 7.7). This suggests that the effect of certain risk and protective factors for theft from the person and robbery have retained their significance over time. Seventeen years of data suggests individuals with particular demographic and lifestyle characteristics in specific areas experience a different predicted mean number of victimisations. This adds weight to the argument that these findings could be utilised in the cost effective allocation of crime prevention resources and is discussed in more detail within Chapter 9.

For completed crimes, the only effects to retain significance (at the ten per cent level) in all sweeps are living in London, owning one car and visiting a nightclub or disco one to three times in the last month. Sex, age, marital status, and the number of cars owned/used have a significant effect on theft from the person and robbery incidence in the vast majority of sweeps. Sex, with the exception of 1998 and 2001/02 sweeps, has a statistically significant effect (at the five per cent level) in all sweeps. Age retains statistical significance at the one per cent level in all except the 1996 and 2007/08 sweeps. Dummy variables for marital status have a significant effect ($0.01 <$ p-value ≤ 0.05) on theft from the person and robbery in all sweeps apart from separated or divorced in 1998 and 2010/11, single individuals in 1998 and widowers in 1996 and 2010/11. The effect of ownership or use of two cars in the last year significantly reduces theft from the person and robbery incidence in all sweeps apart from 1998. The aforementioned variables have largely retained their statistically significant effect across sweeps and can thus be considered important indicators with regard to the incidence of theft from the person and robbery.

There are a few variables which offer a much less clear picture. Visiting a nightclub more than nine times in the last month did not have a statistically significant effect in sweeps between 2004/05 and 2007/08 and in 2009/10. However, in the remaining sweeps the effect retains a high level of statistical significance. This may simply be the result of the small sample of respondents in this category. With regard to area,

residing in Wales (post 2001/02) and Yorkshire and Humberside (post-2007/08) in more recent years has a significant protective effect. The importance of employment status is also more pronounced in sweeps after 2001/02. In particular, being a full-time student between 2004/05 and 2007/08 consistently increases the predicted mean number of victimisations compared to individuals in paid work.

The pattern for attempted crimes is much less consistent, with a greater degree of variation across sweeps. Age is the only indicator which has a statistically significant effect at the one per cent level in all sweeps. From 2004/05 the effect associated with being male becomes significantly different from (the base category) female. Having a disability or long-term illness has a statistically significant effect (at the five per cent level) in six of the 13 sweeps, with the majority featuring in more recent sweeps. Likewise, owning or using a car is much more prominent as a significant protective effect in sweeps post-2006/07. The effect associated with living in London is significant at the five per cent level in seven sweeps.

In sum, these findings demonstrate that the statistical significance of certain effects has indeed altered over time. These are valuable findings in that they may provide an indication of a changing pattern of offending signatures and target selection. It demonstrates that the effect of particular dummy variables do not significantly differ from their respective reference category. Importantly, it further highlights the importance of analysing completed and attempted crimes separately as it appears attempted crimes are more prone to change. However, with some exceptions, changes in statistical significance appear to be rather ad-hoc, thus patterns are not clear cut enough to draw any particularly reliable conclusions. Where variables retain their significant effect over time, the assertion that they are reliable indicators over time is cemented.

7.4.3 Has There Been a Change in the Relative Importance of Indicators across Sweeps?

In order to establish if there has been a change in the relative importance of indicators across sweeps it is necessary to use the results from the saturated models (see Tables 7.8 and 7.9) as this ensures comparability over time (see Section 7.2). The predicted mean number of crimes for the reference individual has also been

calculated for each sweep (using values from the saturated models) and is presented at the end of the respective tables.

Figure 7.1 shows the change in the predicted incidence for the reference individual over time. This individual was selected on the basis that they were expected to experience the lowest mean number of crimes (which makes the interpretation of coefficients slightly easier). Tables 7.8 and 7.9 show the very low predicted mean number of crimes that the reference individual is likely to experience in each sweep. Due to such small numbers the interpretation of any trend is difficult as there are clear fluctuations from year to year and the data is sensitive to small changes. However, it is possible to see a decline in theft incidence for completed crimes from 2001/02 and for attempts from 1996. The predicted mean number of completed crimes is generally always higher than that for attempts (apart from in 1996). Interestingly, the lines coincide in 2002/03, a point which is explored in more detail in Chapter 8.

7.4.3.1 Completed Theft from the Person and Robbery

With a few exceptions (living in the North West and West Midlands), variables retain the same direction of influence across sweeps. This indicates that factors are holding their risk or protective status over time. For example, being male consistently reduces the predicted mean number of victimisations by around 40 per cent. In order to illustrate more clearly change over time, the top three risk and protective factors for completed theft from the person and robbery are presented in Tables 7.10 and 7.11 (calculated as the percentage change in the mean number of predicted completed victimisations compared to the respective base category).

Of the risk factor categories the majority relate to: health (28.21%)[12]; the area in which the respondent lives (25.64%); and nightclub or pub visits in the last month (20.5%). The risk associated with visiting a nightclub or disco more than four times a month is particularly prominent in more recent sweeps. This is confirmed by an emerging national trend of mobile phone theft from within music venues and nightclubs (National Mobile Phone Crime Unit (NMPCU), 2013).

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[12] Calculated as (100/39)*11; the proportion of all (39) factors (Table 7.10) which related to health (11).

Of the protective factor categories the vast majority relate to: the region in which the respondent lives (41.03%); car ownership or use (38.46%); and hours spent outside the home on a weekday (15.38%). This is particularly interesting in that area has the effect of both increasing and decreasing the predicted mean number of victimisations. The ability to identify and provide a national over time overview of consistent risk or protective factors is incredibly useful from a crime prevention standpoint (see Chapter 9).

7.4.3.2 Attempted Theft from the Person and Robbery

The top three risk and protective factors for attempted theft from the person and robbery are presented in Tables 7.12 and 7.13. As found previously, attempted victimisation presents a much less consistent picture. Of the risk factors for attempted theft from the person and robbery, the majority relate to: the area in which the respondent lives (25.64%), being in bad or very bad health (20.51%) and club or pub visits in the last month (15.38%). Of the protective factors for attempted theft and robbery, the majority relate to the area in which the respondent lives (38.46%), car ownership or use (15.38%) and hours spent outside the home on an average weekday (15.38%).

Figure 7.1: Mean Number of Thefts and Robberies for the Fictional Reference Individual
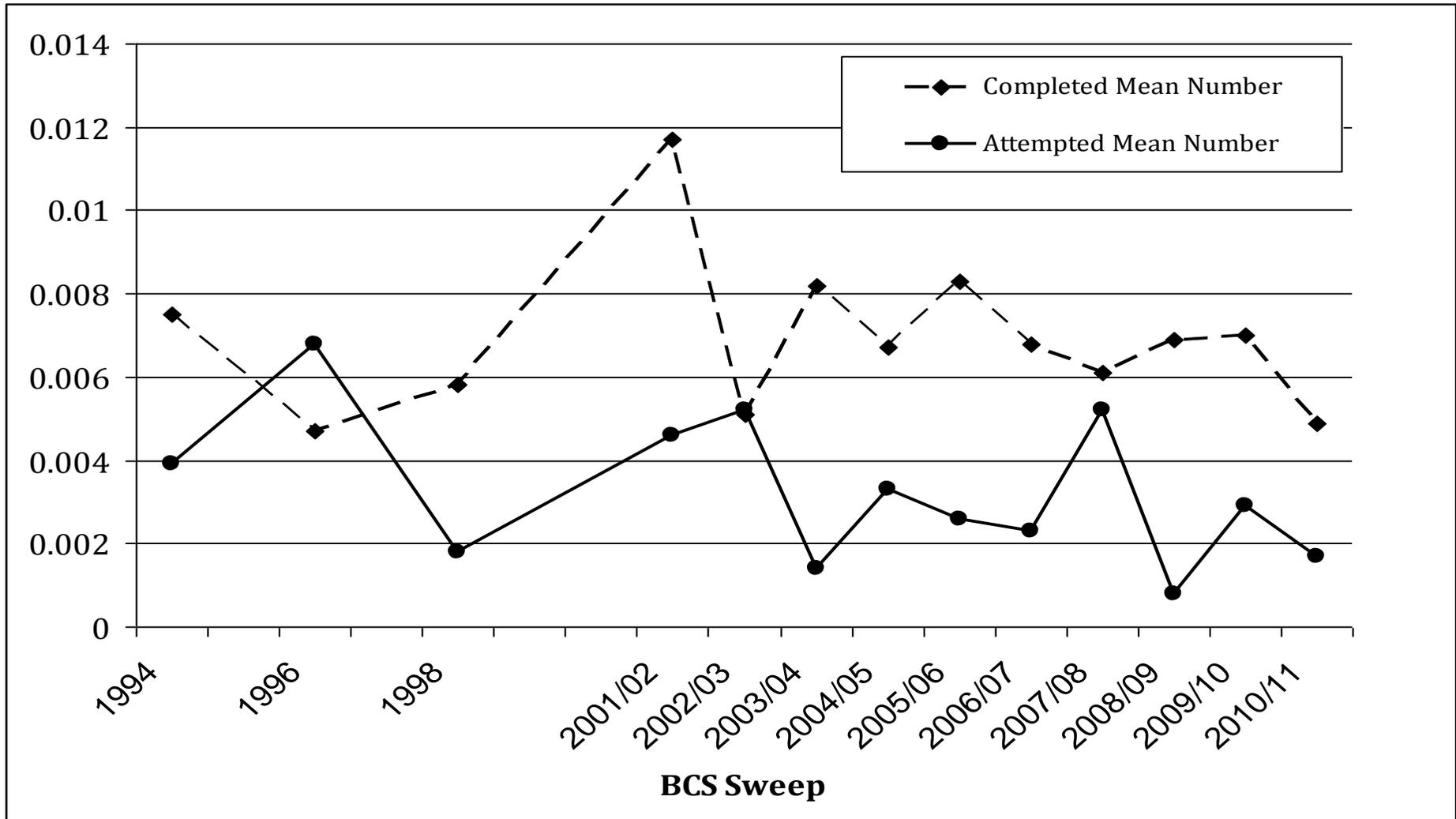
Table 7.8: Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
	100*(EXP(b)-1)												
Sex (Female)													
Male	-37.0#	-42.94#	-16.89	-18.37*	-38.37#	-36.87#	-33.04#	-20.71~	-43.95#	-42.94#	-42.31#	-33.3#	-42.71#
Number of children (No children)													
One Child	-14.7	42.19*	-5.73	-5.35	-1.19	-1.29	19.6	13.66	-20.39	22.51	1.61	-20.78	4.5
Two or More Children	-10.6	23.99	17.0	-16.22	-1.0	-10.6	29.95*	3.67	4.71	-4.88	12.52	-3.25	-10.51
HOH Social Class (Routine Occupations)													
Professional	13.43	56.05~	15.84	8.55	28.15*	41.06~	13.54	4.92	-5.64	53.27#	15.26	6.5	8.0
Intermediate Occupations	6.18	44.05~	-11.84	-5.54	39.1~	35.53~	41.91~	-5.82	19.96	19.84	2.22	17.0	9.64
Never worked/Not classified	21.65	22.88	-1.69	2.84	-5.82	12.41	-11.13	-33.57*	-6.48	52.5~	-0.4	20.92	-11.93
Highest Qualification (Secondary (Upper))													
Higher/FE (inc. degree and teaching qual)	42.62	30.6	20.2	-10.6	11.18	-14.87	7.68	-12.8	0.5	-12.8	3.77	-0.1	13.43

Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Secondary (lower) – GCSE/O Level/CSE/SCE	0.3	7.14	10.96	-12.72	15.6	-12.28	11.85	5.87	-33.1~	-24.35	-12.45	-13.32	-9.24
Trade Apprenticeship	NA	NA	35.26	-60.82~	-19.59	-26.29	7.57	-14.27	-39.29	-22.35	-24.12	-6.57	6.5
Other Qualifications	-11.66	25.86	-6.57	-34.16	12.19	-13.76	10.4	-21.1	-38.3	-30.79	-24.87	-19.59	-5.26
No Qualifications	8.11	24.36	38.96	-30.51*	-14.44	-22.51	13.88	-8.61	-38.61#	-24.19	-13.76	0.3	-0.6
Ethnic Group (White)													
Black	-2.76	19.36	-37.81	-11.57	-23.59	2.12	1.21	29.69	15.84	-7.6	-36.87*	27.25	25.61
Asian, Mixed or Other	57.3~	74.72~	-6.29	17.82	6.5	46.08*	-17.72	62.74~	8.65	-5.92	12.3	17.35	15.95
Household Income (£10,000-£19,999)													
£4,999 and under	-16.14	35.53	8.22	51.44*	33.11	-4.69	8.55	-8.06	17.47	52.81*	-5.73	7.14	6.61
£5,000-£9,999	-13.67	9.09	-17.39	24.86	6.08	4.5	-20.47	-10.77	-5.82	39.38*	-5.16	12.08	9.64
£20,000-£29,999	-21.34	20.56	24.11	-15.04	-24.72	-17.39	-8.79	-0.7	15.14	28.66	-14.62	-18.05	-0.2
£30,000-£49,999	30.21	-13.84	-12.54	17.94	2.33	3.05	-13.67	3.46	29.82	15.26	-3.05	-11.13	-11.57
£50,000 or more			49.18	5.76	89.46#	-21.1	31.92	6.82	3.67	33.64	-0.8	19.01	46.37*

Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Refused	197.43#	-14.36	-29.11	9.31	2.22	-11.93	18.41	-18.13	-6.39	18.41	-4.5	-14.96	-12.54
Don't know	-38.98	105.44~	-11.84	103.6#	4.5	5.87	-24.72	5.13	50.68~	34.85	22.38	17.82	1.41
Illness or Disability (No disability)													
Disability/long-standing illness	29.43	11.63	34.45	19.72	66.86#	37.16~	13.09	-1.0	0.5	5.44	35.8~	4.29	12.86
Marital Status (Married/cohabiting)													
Single	65.86#	95.62#	39.79	38.26*	74.89#	75.42#	58.88#	67.36#	95.42#	57.62#	51.74#	63.39#	44.63~
Separated or Divorced	129.33#	52.65*	20.68	94.64#	83.86#	100.37#	125.69#	64.21#	81.85#	54.19~	45.35~	49.78~	23.37
Widowed	66.53*	50.68*	93.29~	56.05~	77.71#	118.37#	246.95#	93.29#	74.02#	80.94#	88.7#	87.95#	31.52
Employment status (Paid work)													
Waiting or looking to take new job	-18.78	18.41	18.18	78.78~	27.76	-3.63	44.77	-45.66	121.0#	135.14#	49.78	139.65#	60.0*
Temp. sick or injured/long-term sick/disabled	-39.35	-27.17	64.87	-7.5	-3.15	132.8#	79.5~	-5.26	54.5*	15.84	54.81	77.0~	44.2

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Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11+

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Student (full-time)	32.71	1.11	26.87	23.0	42.76	21.17	104.21#	112.97#	72.12~	85.71~	19.84	32.18	18.89
Retired from paid work	25.11	7.9	75.42*	-6.01	74.19~	16.18	29.05	28.79	49.93*	27.51	28.4	101.38#	93.87#
Looking after home/family	-15.13	-11.84	31.39	-19.43	0.9	-4.78	-18.29	-1.19	29.95	32.31	20.92	-13.5	-14.79
Other/Something else	93.87	6.4	-42.65	-27.24	19.24	7.25	29.82	15.37	27.76	52.65	67.03	18.53	87.01*
Tenure (Owner)													
Private rented sector	6.82	13.88	79.68#	14.0	3.36	33.78*	-5.07	21.41	-2.47	19.48	35.8~	15.03	7.36
Social rented sector	-5.92	31.92	73.85#	20.44	13.09	7.57	13.2	2.74	27.89*	69.38#	31.0	28.79	18.77
General Health (Good)													
Very Good	-5.26	5.65	-9.24	-24.04~	-4.21	-12.19	-20.63~	-16.05	-20.07*	-4.11	-24.04~	-26.36~	-15.38
Fair	29.18	21.41	23.99	34.18*	2.94	15.14	2.02	49.48~	32.45*	32.84*	-1.88	11.96	63.23#
Bad	90.6~	42.76	100.17~	90.22#	15.26	10.08	36.21	80.58~	109.59#	89.65#	3.25	70.74~	103.4#

Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Very Bad	228.38~	158.05*	13.2	15.6	173.19~	-34.3	134.2~	131.64*	114.26*	168.05~	175.11#	36.89	349.52#
Hours Away from Home (Weekday) (3-5 hours)													
Under 1 hour	7.36	-53.65~	-55.51~	-56.18#	-32.56*	20.8	-63.83#	-43.39~	-27.53	-45.94~	-45.72~	-54.98#	-34.95
1-3 hours	-6.2	-19.02	-32.83*	-3.73	-30.93~	-9.97	-27.82~	-28.89*	-1.09	-23.66*	-4.59	-14.19	-20.71
5-7 hours	38.26	-20.23	21.05	-10.24	6.5	66.03#	-7.23	6.72	-1.39	-2.27	5.55	-21.1	25.48
7+ hours	-3.54	-0.6	21.65	-5.26	-15.97	6.72	-11.13	-25.25*	-13.06	-5.45	-0.6	0.1	-0.6
Visits to Pub in Last Month (No visits)													
1-3 times			17.59	-23.74*	-16.47	2.84	11.29	-11.66	16.53	2.74	-4.02	-8.79	-2.96
4-8 times	0.5	7.57	-30.93	-26.88*	-13.58	15.72	41.91~	6.93	36.75~	24.36	5.02	-0.3	11.74
More than 9 times			14.68	-2.66	-4.5	19.6	52.35~	12.3	121.67#	102.18#	3.87	28.4	-2.96
Visits to Club in Last Month (No visits)													
1-3 times	Inc. Pub	Inc. Pub	74.72#	37.71*	45.79~	46.23~	63.72#	31.92	58.57#	45.64~	36.34~	102.59#	56.99#
4-8 times			-9.79	71.94*	117.93#	82.39~	112.97#	84.23~	34.31	86.45~	115.33#	158.83#	182.36#
More than 9 times				225.11#	201.02#	226.42#	105.44*	40.78	35.93	53.27	334.05#	54.19	333.19#

**Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]**

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
No. Cars Owned/Used Last Year? (No car)													
1 car	-35.47#	-41.43#	-48.78#	-40.61#	-31.0#	-40.13#	-44.29#	-41.2#	-42.36#	-24.8~	-39.47#	-41.32#	-44.12#
2 cars	-46.37~	-43.62~	-19.67	-43.56#	-39.53#	-38.55#	-44.35#	-44.23#	-58.19#	-34.82~	-55.69#	-34.88~	-53.05#
3+ cars	-21.42	-12.45	-14.27	-58.65#	-50.84~	-64.9#	-40.01~	-19.83	-53.33#	-22.12	-28.32	-20.71	-45.01~
Anyone in Household Owned a Bicycle? (No bicycle)													
Own a bike	31.65*	-4.4	0.4	5.44	37.99#	-5.92	18.65	16.88	10.63	24.48*	6.93	9.31	20.8
Area Type (Rural)													
Inner City	55.27*	60.64*	36.89	106.47#	68.2~	46.23*	69.89#	73.33#	35.93	54.65~	84.97#	23.86	39.38
Urban	3.56	44.92	16.77	25.86	27.51	8.98	28.4*	29.18*	34.72~	14.68	87.39#	25.86	46.52~
Region (South East)													
North East (North in 1994)	-70.03~	-28.54	-68.96~	-51.28~	-5.07	-37.87*	-39.95~	-49.39~	-3.63	-53.65#	-32.16	-61.98#	-42.36*
Yorkshire & Humberside	7.14	5.65	19.24	17.35	48.14*	-27.89	-21.65	-15.97	0.4	-34.62*	-6.85	-49.24#	-45.99~
North West	115.33#	82.39~	37.58	61.45~	23.0	-24.87	-29.04*	16.88	-8.52	-33.57~	-12.37	-18.45	-8.79
East Midlands	10.41	11.52	-35.01	-2.27	-19.27	-24.12	-24.19	2.22	23.0	-42.31~	-3.34	-20.15	-9.79
West Midlands	-0.6	107.92#	-8.42	24.98	39.24	-2.76	-43.73~	19.12	9.2	-13.32	-15.13	-6.95	4.29

Table 7.8 (contd.): Estimated Percentage Difference in Mean Number of Completed Theft from the Person and Robbery Incidents Compared to the Respective Base Categories, BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
East (East Anglia in 1994)	-85.86*	-52.0*	-31.82	-27.75	30.6	-22.2	1.01	-0.1	5.23	-25.1	-13.06	-13.58	20.56
London (Gtr. London in 1994)	116.84#	152.19#	117.71#	144.98#	190.66#	96.4#	58.25~	112.12#	156.77#	64.71~	142.06#	117.06#	129.79#
South West	4.81	-8.06	-68.75~	-29.04	-13.84	-24.19	-40.84~	-32.7	-17.96	-40.79~	-28.25	-21.02	3.36
Wales	-22.97	-19.1	-18.86	-59.83#	-44.68*	-47.9~	-42.71~	-45.34~	-22.97	-47.11#	-44.18#	-33.64	-42.54*
Age	-2.76#	-0.4	-2.08~	-1.69#	-2.18#	-2.27#	-2.57#	-2.37#	-1.78#	-0.8	-1.69#	-2.66#	-2.57#
Mean no. of crimes – reference individual	0.0075	0.0047	0.0058	0.0117	0.0051	0.0082	0.0067	0.0083	0.0068	0.0061	0.0069	0.007	0.0049

[+] Estimates taken from saturated negative binomial regression models

*$0.05 < $ p-value ≤ 0.10

~$0.01 < $ p-value ≤ 0.05

#p-value ≤ 0.01

Table 7.9: Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
							Exp ((b)-1) x 100						
Sex (Female)													
Male	-1.69	-5.64	15.14	11.07	-15.89	-1.0	68.03#	12.19	34.04*	30.34*	31.26*	13.31	45.35~
Number of children (No children)													
One Child	-21.02	-52.38~	4.6	12.19	-25.47	6.5	-48.47~	12.98	13.66	-26.07	-11.49	5.65	-38.37*
Two or More Children	-41.55*	-50.24~	-36.62	-27.6	-26.29	-14.53	-24.35	-28.68	-13.32	-42.99~	-37.12*	-22.51	10.63
HOH Social Class (Routine Occupations)													
Professional	-7.69	65.86*	76.83*	37.16	33.11	90.98#	30.87	19.6	26.87	40.07*	37.71*	42.05*	92.32#
Intermediate Occupations	-25.1	58.72*	-6.01	144.73#	19.12	17.35	-11.13	-2.57	13.66	25.11	10.52	-15.8	37.3
Never worked/Not classified	-38.98	114.47	779.34#	12.08	-0.5	23.49	-27.24	-14.79	19.36	-21.89	-26.51	-51.91*	-50.64*
Highest Qualification (Secondary (Upper))													
Higher/FE (inc. deg & teach qual.)	88.89*	-15.46	5.65	3.46	-30.09	-8.97	-8.52	19.72	28.27	27.12	29.18	5.65	-7.69

Table 7.9 (contd.): Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Secondary (lower) – GCSE/O Level/CSE/SCE	5.44	-37.37	8.44	-24.87	-22.35	5.55	-45.66~	1.51	12.52	-19.83	50.68*	-4.69	-22.28
Trade Apprenticeship	NA	NA	-0.2	-7.04	-33.97	-6.2	-41.49	-9.06	33.51	46.96	61.61	-63.98*	-30.09
Other Qualifications	139.17*	-67.24*	92.32	10.74	-12.45	-47.01	-79.65~	8.33	-14.87	53.11	89.84*	12.86	-36.56
No Qualifications	-0.7	-35.85	-9.34	-45.39*	-45.94~	-27.31	-46.15~	0.9	-22.66	-17.72	-31.34	-54.11~	-11.13
Ethnic Group (White)													
Black	-68.71~	-57.43	-57.89	-17.06	-26.58	-49.84	-73.92~	-40.55	-45.99	40.21	-51.76	7.25	-53.56
Asian, Mixed or Other	76.3~	111.91~	-45.61	23.24	36.62	-22.12	-25.84	23.24	0.9	-34.88	26.62	21.65	53.27
Household Income (£10,000-£19,999)													
£4,999 and under	-20.31	1.51	113.61~	105.24*	-12.28	-2.66	-25.92	15.84	-2.57	73.15*	-30.16	52.35	-17.63
£5,000-£9,999	7.25	8.55	10.08	49.33	-7.69	9.53	-38.25	16.65	-44.79*	-3.54	-40.96	12.98	-9.15
£20,000-£29,999	-32.09	27.51	-29.18	4.08	2.12	8.98	-27.31	0.7	0.9	-5.54	-17.55	60.32*	-23.74
£30,000-£49,999	11.52	-11.93	29.82	143.76#	9.09	-13.84	-22.82	-28.61	-40.01*	13.88	-22.04	14.34	-38.06
£50,000 or more			17.0	33.38	2.53	36.48	-29.6	28.15	-19.43	35.53	24.98	12.75	30.87

Table 7.9 (contd.): Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Refused	11.18	7.57	27.38	17.23	-42.19	13.66	-29.18	-58.1~	-34.82	-20.31	-28.82	-37.94	-16.89
Don't know	-37.69	163.53~	96.6	111.91~	-37.06	68.54~	-7.5	-14.7	-18.05	2.12	-8.15	32.98	24.61
Illness or Disability (No disability)													
Disability/long-standing illness	78.43~	30.47	30.21	27.12	48.74*	72.12#	10.41	78.43#	91.94#	9.31	81.48#	52.81~	-2.18
Marital Status (Married/cohabiting)													
Single	-1.88	21.53	-3.92	8.98	40.35	18.89	18.53	51.13*	-7.32	22.51	86.24#	-24.72	4.19
Separated or Divorced	125.92#	10.41	36.07	41.91	69.22~	29.05	52.5*	44.77	13.88	31.0	156.25#	24.98	68.2~
Widowed	-29.53	29.95	37.71	-13.84	64.54	95.62~	140.61#	-12.63	-3.25	-1.69	-8.15	108.13~	14.57
Employment status (Paid work)													
Waiting or looking to take new job	22.26	-45.66	131.17*	104.42	19.6	87.39	31.65	-0.2	71.6	119.24~	11.29	52.5	45.35
Temp. sick or injured/long-term sick or disabled	-44.68	-11.66	70.74	-33.83	54.34	37.16	18.89	5.23	0.8	-6.67	25.11	-29.88	99.17*
Student (full-time)	31.65	26.24	-23.66	35.12	7.9	33.38	20.2	68.37	138.21~	215.82#	15.37	74.19	78.25
Retired	254.31#	-37.81	175.66~	-19.99	68.37	5.76	-20.86	38.96	-29.18	-11.75	54.81	25.86	78.96

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Table 7.9 (contd.): Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Looking after home/family	-21.81	22.88	33.91	-44.46	-5.16	57.46	11.85	-47.8	-18.78	-40.07	-33.37	-48.31	-20.63
Other or Something else	95.81	-68.56	6.4	31.52	-2.66	16.88	-41.84	34.72	-53.93	-53.09	-1.98	20.56	-27.6
Tenure (Owner)													
Private rented sector	13.31	41.91	145.96#	11.07	99.97#	30.47	36.48	23.99	20.44	11.96	10.85	22.51	23.74
Social rented sector	0.8	7.47	37.16	61.61*	13.54	17.59	160.39#	9.53	16.77	49.48*	7.57	110.01#	25.36
General Health (Good)													
Very Good	-30.93	-32.9*	8.98	-29.53	-30.79*	-12.89	14.68	12.19	-9.61	-29.39~	-19.18	-14.19	-7.69
Fair	0.5	72.12~	54.34	14.68	25.48	39.79	61.93~	14.23	44.05*	118.15#	50.68*	32.18	68.71~
Bad	96.4	72.46	-22.04	273.97#	55.73	57.78	43.19	-14.27	36.34	184.34#	69.55	71.09	30.6
Very Bad	306.74~	179.27	-28.61	-46.15	-1.59	20.8	417.58#	129.56	222.2~	200.12*	34.72	345.93#	-1.39
Hours Away from Home (Weekday) (3-5 hours)													
Under 1 hour	-49.03	-74.92~	-83.77~	-58.6	-57.98~	38.54	-33.77	-40.01	-58.23*	-37.69	-52.72	-35.08	-5.54
1-3 hours	-57.13#	-11.13	-64.26#	-17.88	-25.92	41.34	1.61	-14.27	31.92	-20.86	-1.88	4.6	0.3
5-7 hours	-70.97#	11.85	-16.81	-26.21	-15.89	143.27#	52.5	12.64	47.26	21.17	15.95	47.11	73.67*
7+ hours	-46.58~	-27.24	28.92	5.87	-39.59*	84.23~	-17.55	-23.74	-4.21	7.57	-1.49	28.15	21.17

Table 7.9 (contd.): Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Visits to Pub in Last Month (No visits)													
1-3 times			-6.48	19.6	10.52	-17.63	-18.86	-37.75~	-11.57	-12.89	-3.63	39.51*	8.0
4-8 times	8.11	15.26	-27.17	40.78	-1.29	-20.71	-1.69	-6.01	-12.63	-27.39	-17.72	33.11	1.92
More than 9 times			-32.77	42.9	56.21	2.94	10.52	-10.77	-5.54	-24.19	8.55	73.5*	12.98
Visits to Club in Last Month (No visits)													
1-3 times	Inc. Pub	Inc. Pub	54.96	25.99	-18.54	86.08#	15.95	38.4	-8.24	8.11	61.93~	25.61	22.88
4-8 times			20.2	22.51	8.22	121.0~	-34.3	19.6	141.57~	46.52	195.35#	99.77	-53.23
More than 9 times				179.83	1.21	140.37	295.11~	309.6*	305.93~	239.74*	70.57	7.36	136.08
No. Cars Owned/Used Last Year? (No car)													
1 car	-34.16	2.43	-14.44	-49.69#	-28.25	-27.09	15.26	-28.18	-46.1#	-50.59#	-16.72	-57.26#	-48.0#
2 cars	-9.88	-33.9	-19.18	-57.26#	-6.76	-49.74#	-3.25	-21.34	-21.42	-54.71#	-29.67	-63.03#	-48.16~
3+ cars	-3.15	-39.16	-49.49	-77.71#	6.5	-44.35*	14.11	-13.32	-20.47	-38.25	-33.44	-61.21#	-30.79
Anyone in Household Owned a Bicycle? (Not a bicycle owner)													
Own a bicycle	137.98#	1.01	27.25	47.11*	45.79~	13.77	6.5	30.73	3.36	39.38~	42.05~	34.72*	13.88
Area Type (Rural)													
Inner City	29.82	55.12	-16.22	31.65	119.68~	30.6	131.17#	169.66#	127.96~	23.86	54.34	7.9	160.91#
Urban	-23.97	20.68	-32.02	-25.7	50.23*	57.62~	23.99	71.77~	134.43#	14.91	80.4#	23.24	43.48

Region (South East)

Table 7.9 (contd.): Estimated Percentage Difference in Mean Number of Attempted Theft from the Person and Robbery Incidents Compared to the Respective Base Categories for BCS Sweeps 1994-2010/11[+]

CHARACTERISTICS	1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
North East (North in 1994)	15.6	-24.65	^	-86.72#	-64.08~	-73.18#	-33.24	-38.74	-7.69	-67.47#	-20.07	-49.49	-9.52
Yorkshire & Humberside	84.6	-30.09	82.39	-18.21	-31.75	-2.37	-21.65	28.27	-0.9	-55.74~	-28.32	-22.89	-62.62~
North West	69.22	37.99	92.32	-35.21	10.96	-28.04	-17.3	-43.22*	-12.37	-14.44	6.18	-29.25	-20.39
East Midlands	94.06	21.41	23.24	-62.58~	-28.68	-13.24	111.07#	-18.29	-34.42	-30.93	21.53	23.24	20.68
West Midlands	36.62	24.98	90.22	-18.21	14.11	-28.68	-23.81	21.65	6.82	-44.79*	44.63	-13.93	0.1
East (East Anglia in 1994)	-70.06	-4.88	-10.68	-31.13	-6.95	-0.6	-10.33	5.23	-2.37	-17.8	20.8	-28.25	13.43
London (Greater London in 1994)	227.4#	132.8#	377.79#	57.15	50.68	119.24#	43.48	74.54*	185.77#	22.51	208.95#	126.6#	58.25
South West	3.87	-15.89	17.12	-23.51	-60.66~	-31.48	-31.55	-67.14#	-29.11	-68.87#	-38.98	-39.89	-11.22
Wales	-14.53	-25.25	22.75	-67.21~	-74.72#	-80.27#	-73.79#	-66.88~	-57.17~	-49.94~	12.08	-2.27	-49.99
Age	-4.69#	-2.66#	-3.15~	-2.27~	-3.63#	-2.37#	-3.54#	-3.15#	-2.37#	-3.05#	-4.21#	-3.15#	-4.21#
Mean no. of crimes – reference individual	0.0039	0.0068	0.0018	0.0046	0.0052	0.0014	0.0033	0.0026	0.0023	0.0052	0.0008	0.0029	0.0017

[+]Estimates from saturated negative binomial regression models; ^ No cases so merged with base; *0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

Table 7.10: Estimated Percentage Increase in Completed Theft from the Person and Robbery Incidence Due to Assuming Given Characteristic Compared to Respective Base Category. Highest Ranking Three Characteristics by BCS Sweep[+]

1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
V. bad health (228.38) ~	V. bad health (158.05)*	London (117.71)#	Club 9+ x/month (225.11) ~	Club 9+ x/month (201.02)#	Club 9+ x/month (226.42) #	Widowed (246.95) #	V. bad health (131.64)*	London (156.77) #	V. bad health (168.05) ~	Club 9+ x/month (334.05) #	Club 4-8 x/month (158.83) #	V. bad health (349.52) #
Refused income (197.43)#	London (152.19) #	Bad health (100.17) ~	London (144.98)#	London (190.66)#	Temp. or long-term sick (132.8)#	V. bad health (134.2)~	Full-time student (112.97) #	Pub 9+ x/month (121.67) #	Waiting or looking for job (135.14)#	V. bad health (175.11) #	Waiting or looking for job (139.65) #	Club 9+ x/month (333.19) #
Sep. or divorced (129.33)#	West Midlands (107.92) #	Widowed (93.29)~	Inner city (106.47)#	V. bad health (173.19) ~	Widowed (118.37) #	Sep. or divorced (125.69) #	London (112.12) #	Waiting or looking for job (121.0)#	Bad health (89.65)#	London (142.06) #	London (117.06) #	Club 4-8 x/month (182.36) #

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

+ Estimates taken from saturated negative binomial regression models of completed theft from the person and robbery (for base categories see Table 7.1).

Table 7.11: Estimated Percentage Decrease in Completed Theft from the Person and Robbery Incidence Due to Assuming Given Characteristic Compared to Respective Base Category. Highest Ranking Three Characteristics by BCS Sweep+

1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
East (85.86)*	<1 hour outside home (53.65)~	North East (68.96)~	Trade apprent. (60.82)~	3+ cars (50.84)~	3+ cars (64.9)#	<1 hour outside home (63.83)#	North East (49.39)~	2 cars (58.19)#	North East (53.65)#	2 cars (55.69)#	North East (61.98)#	2 cars (53.05)#
North (70.03)~	East (52.0)*	South West (68.75)~	Wales (59.83)#	Wales (44.68)*	Wales (47.9)~	2 cars (44.35)#	Wales (45.34)~	3+ cars (53.33)#	Wales (47.11)~	<1 hour outside home (45.72)~	<1 hour outside home (54.98)#	Yorkshire & Humb. (45.99)~
2 cars (46.37)~	2 cars (43.62)~	<1 hour outside home (55.51)~	3+ cars (58.65)#	2 cars (39.53)#	1 car (40.13)#	1 car (44.29)#	2 cars (44.23)#	Male (43.95)#	<1 hour outside home (45.94)~	Wales (44.18)#	Yorkshire & Humb. (49.24)#	3+ cars (45.01)~

*0.05 < p-value ≤ 0.10

~0.01 < p-value ≤ 0.05

#p-value ≤ 0.01

+ Estimates taken from saturated negative binomial regression models of completed theft from the person and robbery (for base categories see Table 7.1).

Table 7.12: Estimated Percentage Increase in Attempted Theft from the Person and Robbery Incidence Due to Assuming Given Characteristic Compared to Respective Base Category. Highest Ranking Three Characteristics by BCS Sweep[+]

1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
V. bad health (306.74) ~	Don't know income (163.53) ~	Never worked/ not class. (779.34)#	Bad health (273.97) #	Inner city (119.68) ~	5-7 hours outside home (143.27) #	V. bad health (417.58)#	Club 9+ x/month (309.6)*	Club 9+ x/month (305.93) ~	Club 9+ x/month (239.74)*	London (208.95) #	V. bad health (345.93) #	Inner city (160.91) #
Retired (254.31)#	London (132.8)#	London (377.79)#	Income £30,000-£49,999 (143.76) #	Private renter (99.97)#	Club 4-8 x/month (121.0)~	Club 9+ x/month (295.11) ~	Inner city (169.66) #	V. bad health (222.2)~	Full-time student (215.82) #	Club 4-8 x/month (195.35) #	London (126.6)#	Temp. sick or disabled (99.17)*
London (227.4)#	Asian, mixed or other ethnicity (111.91) ~	Retired (175.66) ~	Interm. social class (144.73) #	Sep. or divorced (69.22)~	London (119.24) #	Social renter (160.39)#	Disability or illness (78.43)#	London (185.77)#	V. bad health (200.12)*	Sep. or divorced (156.25) #	Social renter (110.01) #	Prof. social class (92.32)#

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

+ Estimates taken from saturated negative binomial regression models of attempted theft from the person and robbery (for base categories see Table 7.1).

Table 7.13: Estimated Percentage Decrease in Attempted Theft from the Person and Robbery Incidence Due to Assuming Given Characteristic Compared to Respective Base Category. Highest Ranking Three Characteristics by BCS Sweep[+]

1994	1996	1998	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
5-7 hrs outside home (70.97)#	<1 hour outside home (74.92)~	<1 hour outside home (83.77)~	North East (86.72)#	Wales (74.72)#	Wales (80.27)#	Other qual. (79.65)~	South West (67.14)#	<1 hour outside home (58.23)*	South West (68.87)#	2+ children (37.12)*	Trade apprent. (63.98)*	Yorkshire & Humb. (62.62)~
Black (68.71)~	Other qualif. (67.24)*	1-3 hours outside home (64.26)#	3+ cars (77.71)#	North East (64.08)~	North East (73.18)#	Black (73.92)~	Wales (66.88)~	Wales (57.17)~	North East (67.47)#	Age (4.21)#	2 cars (63.03)#	Never worked/ not class. (50.64)*
1-3 hrs outside home (57.13)#	1 child (52.38)~	Age (3.15)#	Wales (67.21)~	South West (60.66)~	2 cars (49.74)#	Wales (73.79)#	Refused income (58.1)~	1 car (46.1)#	Yorkshire & Humb. (55.74)~	----	3+ cars (61.21)#	2 cars (48.16)~

*0.05 < p-value ≤ 0.10

~0.01 < p-value ≤ 0.05

#p-value ≤ 0.01

+ Estimates taken from saturated negative binomial regression models of attempted theft from the person and robbery (for base categories see Table 7.1).

7.4.4 Are There Differences in the Victim Characteristics of Completed Crimes vs. Attempted?

The importance of the distinction between completed and attempted crimes has been emphasised throughout the thesis. Findings from this particular analysis serve to further cement this assertion. There are broad similarities between the risk and protective factors identified in the previous section. However, there are also some clear and interesting differences in the effects which were significant between the statistical models. In particular, fewer variables had a consistent, significant effect over time when analysing attempted crimes – there was much more variation in the characteristics of these victims.

Perhaps the most interesting difference between completed and attempted victim characteristics relates to the effect of sex. Males were found to have a reduced predicted incidence of victimisation for completed theft from the person and robbery when compared to their respective female. This effect was reversed for attempts. This may explain why previous empirical research (which often combines the two offences) identifies males as being at an increased risk of theft and robbery. Another, albeit potentially old-fashioned, viewpoint may be that this is the result of males increased ability to protect themselves and thwart potential criminal activity. It may also be a reflection of the likelihood of a female to be carrying a bag and the relative ease with which this can be stolen compared to stealing directly from their person. Robberies may be much more likely to be interrupted or thwarted.

The perception of vulnerability is important. An offender may (rightly or wrongly) perceive vulnerability and act accordingly. Individuals classified as having a long-term illness or disability consistently experience an increase in the predicted mean number of attempted victimisations. This may be due to the offender's perception of vulnerability being misinformed or miscalculated and thus they are unsuccessful in their commission of a crime. Perhaps the wider public are more likely to come to an individual's aid if they have a visible disability or illness. However, this is largely speculative.

Owning a bicycle also increases the predicted mean number of attempted theft from the person and robbery victimisations. This is in direct contrast with car

ownership/use. Simply because an individual owns a bicycle or car does not mean that they were victimised whilst using this means of transport. However, it may be indicative of the average time an individual spends 'on the street' and accessible to potential offenders. Those who own a bicycle may be in more frequent contact with motivated offenders and are without the physical protection a car offers. Age, sex, general health and living in London, Wales or an inner city are significant factors across completed and attempted theft from the person and robbery. This finding emphasises their importance across victimisation types.

7.5 Theoretical Implications

It is important to establish if, or to what extent, the theory underpinning the thesis is applicable to the findings from this victim characteristics analysis. As previously mentioned, the key consistent variables in relation to theft from the person and robbery incidence are age, sex, marital status, general health, frequency of activity outside the home, area of residence and car ownership/use. There are also clear differences between the characteristics of completed and attempted victimisation. From this, we can draw a number of tentative conclusions.

Firstly, crime specific analysis is warranted, as shown by the results of the models in this chapter. With regard to theory, where possible, future work should differentiate between completed and attempted crimes and not group them as one aggregate crime type. Secondly, demographic characteristics retain their significant effect within the models despite the introduction of direct lifestyle measures. Finally, the level and frequency of guardianship as well as the area in which one resides are key factors in predicting victimisation incidence.

As mentioned, the reliance upon demographic variables as proxy measures for lifestyle is not ideal. Although the lifestyle measures utilised within the models are not as detailed as one may like they are clearly important with regard to theft and robbery victimisation. Importantly, demographic variables also consistently retain their significant effect alongside more direct measures of lifestyle such as number of visits to a pub per month. Characteristics such as age, sex and marital status may be indicative of particular lifestyles. It is clear both the intrinsic characteristics of an individual and the lifestyle they lead are important in predicting victimisation incidence. It may also be that the lifestyle measures employed here are not detailed

enough to capture subtle differences in victimisation risk. Therefore future victimisation surveys should seek to employ more detailed direct measures of lifestyle (for example, drinking habits, public transportation use, more detailed measures of visits to licensed premises and details of particular leisure activities).

In relation to routine activity theory, the level and frequency of guardianship appears to be important, shown by the significance of effects relating to how often individuals leave the house and marital status. The level of activity away from the home (as measured by the BCS) has remained relatively consistent over time. Within the context of the crime drop, this suggests that the same types of individuals are being targeted but less often. The area in which an individual resides is also important, although specific areas are not consistently highlighted as altering incidence over time. The analysis conducted in Chapter 8 may shed more light on the characteristics of environments which are conducive to victimisation. Proximity to potential offenders seems to offer reasonable justification for why living in London or inner city areas and frequent visits to nightclubs significantly increase the predicted incidence of theft and robbery. Car ownership may reduce this proximity to motivated offenders by providing a physical barrier and thus increased levels of car ownership (combined with the commensurate increase in their security) may have contributed to the drop in crime. The attractiveness and accessibility of a potential victim may additionally be gauged by the age of an individual. It is important to exercise caution in making too many inferences regarding lifestyle from a set of demographic indicators. However, these research findings provide a solid platform for future research to test and explore exactly what it is about individuals who share particular demographic characteristics which makes them more vulnerable to theft and robbery victimisation.

With regard to theoretical implications in relation to the crime drop, there are three main findings thus far. Chapter 5 demonstrated that, contrary to other crime types, the fall in theft from the person and robbery was largely comprised of a reduction in single incidents. In addition, Chapter 6 suggests the drop in these offences was dominated by two underlying, divergent trends – the theft of particular electronic goods such as mobile phones increased, whilst the theft of more 'traditional' items such as cash declined. With regard to the characteristics of victims, findings from this

chapter suggest that offenders have a "repository of crime targets" (Jacobs, 2010: 523) from whom they successfully steal – namely, young, single females who frequently visit bars or nightclubs. This finding is broadly consistent over the entire period of the crime drop.

Levels of street activity (as measured by the BCS) have remained relatively stable although there has been an increase in levels of car ownership which, as mentioned, may have resulted in fewer interactions 'on the street'. The demographic profile of the sample has changed somewhat, with fewer married individuals, a lower proportion falling in the lowest income band (less than £4,999) and more individuals with Higher or Further Educational qualifications. The findings outlined thus far therefore suggest the main changes over the period of the crime drop appear to have occurred both demographically and in the choice of goods stolen.

Perhaps the most important theoretical link to be made in relation to the crime drop lies in the suitability and availability of targets. A widespread increase in the use and ownership of lightweight, portable goods that are carried on our person has undoubtedly contributed to an increase in the stock of potential targets. As discussed, there are two divergent trends which have combined to produce an overall (albeit shallow) decline. It is clear from Chapter 6 that the stolen goods landscape has changed dramatically since the early 1990s. The variables most frequently identified as altering the incidence of theft from the person are also characteristics often associated with the likelihood of owning particular desirable items such as mobile phones. This emphasises the importance of proactive crime prevention in reducing the risk associated with owning such items. In addition, it reiterates Felson's (2012) contention that we must pay attention to technological advances and the human means of using it. If nothing is proactively done to reduce the likelihood of new 'crime harvests' it may be that theft and robbery levels will begin to increase. Target suitability is therefore hypothesised as playing a key role in relation to the crime drop. Although not directly tested here, it should be noted that the increased securitisation of 'everyday environments' (Clarke and Newman, 2006) or particular products may have led to changes in the offender decision-making process and reduced the number of viable opportunities. This may have stemmed the 'crime harvest' somewhat. Future research should seek to test the contribution of the

securitisation of particular products to see if this has influenced the level of theft of particular items and overarching trends.

7.6 Summary

It is concluded that hypothesis two can be partially accepted:

> *Theft from the person and robbery victims largely comprise young (16-24 years old), single males with high incomes who more frequently engage in night-time activities away from the home.*

Findings in this chapter suggest there are particular characteristics which consistently influence theft from the person and robbery incidence, namely age, sex, marital status and general health. Over time, victims of completed victimisations are predominantly young, single *females*. In addition, frequency of activity outside the home (in particular 'nightclub or disco' visits), housing tenure and car ownership/use also alter incidence across BCS sweeps. Proximity to potential offenders also seems to offer reasonable justification for why living in London or inner city areas and frequent visits to nightclubs significantly increase the predicted incidence of theft and robbery. These findings are very much in agreement with previous empirical research.

There have been slight changes both in the characteristics which have a significant influence on theft from the person and robbery incidence and their relative importance over time. There are clear and important differences between completed and attempted victimisation, with variables in the attempted models much more prone to variation and less consistent across sweeps. However, sex, age, marital status and number of cars owned/used have a statistically significant effect in the majority of sweeps analysed. With very few exceptions, variables retain the same direction of influence with general health, area of residence and car ownership in particular maintaining their importance across sweeps.

In order to build upon the picture being formed of theft from the person and robbery victimisation, the next chapter will explore the characteristics of these incidents. The analysis is informed by the findings outlined within this chapter, with particular interest in the location and timing of the incident.

Appendix Chapter 7

A7. Victim Characteristics Analysis

A7.1 Selection of Dummy Variables

The reference individual is a white female living in a rural area in the South East of England. She is married or cohabiting and has no children. She spends between three and five hours outside the home on an average weekday and is currently in paid employment. The Head of Household's social class is a routine occupation and the household income is between £10,000 and £19,999. She completed A-Levels and is in good health and has no long-term illnesses or disability. In an average month she will not visit a pub or club and does not own a car or bicycle. The above characteristics are entailed in the intercept of each model. However, as it is, it represents zero age. To address this problem we assume that the reference woman is the unweighted mean age for the total sample of respondents.

Dummy variables are shown in Table A7.1 along with the reference (base) category for each categorical explanatory variable. There are some very minor differences in dummy variables created for the 1994 and 1996 sweeps due to question coding changes. These are shown in Tables A7.2 to A7.3

Table A7.1: Dummy Variables for Sweeps 1998 to 2010/11

Explanatory variable	New variable (dummy)	Base
Sex	Male	Female
No. of children	1 child/2+ children	No children
Marital status	Single/Separated or divorced/Widowed	Married or cohabiting
Hours away from home	Under 1 hour/1-3/5-7/7+	3-5 hours
Pub visits/month	1-3 times/4-8/9+	No visits
Club visits/month	1-3 times/4-8/9+	No visits
No. of cars owned or used in last year	1 car/2 cars/3+ cars	No car

Table A7.1 (contd.): Dummy Variables for Sweeps 1998 to 2010/11

Explanatory variable	New variable (dummy)	Base
Bicycle owner	Bicycle owner	No bicycle
HOH social class	Professional/Intermediate/Never worked	Routine Occupation
Area type	Inner City/Urban	Rural
Highest educational qualification	Higher education/Trade Apprenticeship/Lower Secondary/Other qualification/No qualifications	Upper Secondary
Ethnic group	Black/Asian, Mixed or Other	White
Household income	£4,999 and under/£5,000-£9,999/£20,000-£29,999/£30,000-£49,999/£50,000 or more/Refused/Don't know	£10,000-£19,999
Employment status	Waiting or looking for work/Sick or disabled/Student/Retired/Looking after home or family/Other work	Paid work
Disability	Disability or long-standing illness	No disability
Government Office Region	North East/North West/Yorkshire and Humberside/East Midlands/West Midlands/East of England/London/South West/Wales	South East
Tenure	Private rented sector/Social rented sector	Owner, buying with help of mortgage or loan or shared ownership
General health	Very good/Fair/Bad/Very bad	Good

Table A7.2: Dummy Variables for 1996 Sweep

Explanatory variable	New variable (dummy)	Base
Sex	Male	Female
No. of children	1 child/2+ children	No children
Marital status	Single/Separated or divorced/Widowed	Married or cohabiting
Hours away from home	Under 1 hour/1-3/5-7/7+	3-5 hours
Pub visits/month Club visits/month	Visited a pub in the last month	No visits to a pub in the last month
No. of cars owned or used in last year	1 car/2 cars/3+ cars	No car
Bicycle owner	Bicycle owner	No bicycle
HOH social class	Professional/Intermediate/Never worked	Routine Occupation
Area type	Inner City/Urban	Rural
Highest educational qualification	Higher education/Trade Apprenticeship/Lower Secondary/Other qualification/No qualifications	Upper Secondary
Ethnic group	Black/Asian, Mixed or Other	White
Household income	£4,999 and under/£5,000-£9,999/£20,000-£29,999/£30,000 or more/Refused/Don't know	£10,000-£19,999
Employment status	Waiting or looking for work/Sick or disabled/Student/Retired/Looking after home or family/Other work	Paid work
Disability	Disability or long-standing illness	No disability

Table A7.2 (contd.): Dummy Variables for 1996 Sweep

Explanatory variable	New variable (dummy)	Base
Government Office Region	North East/North West/Yorkshire and Humberside/East Midlands/West Midlands/East of England/London/South West/Wales	South East
Tenure	Private rented sector/Social rented sector	Owner, buying with help of mortgage or loan or shared ownership
General health	Very good/Fair/Bad/Very bad	Good

Table A7.3: Dummy Variables for 1994 Sweep

Explanatory variable	New variable (dummy)	Base
Sex	Male	Female
No. of children	1 child/2+ children	No children
Marital status	Single/Separated or divorced/Widowed	Married or cohabiting
Hours away from home	Under 1 hour/1-3/5-7/7+	3-5 hours
Visited a pub in the last month	Visited a pub	No visits
No. of cars owned or used in last year	1 car/2 cars/3+ cars	No car
Bicycle owner	Bicycle owner	No bicycle
HOH social class	Professional/Intermediate/Never worked	Routine Occupation
Area type	Inner City/Urban	Rural
Highest educational qualification	Higher education/Trade Apprenticeship/Lower Secondary/Other qualification/No qualifications	Upper Secondary

Table A7.3 (contd.): Dummy Variables for 1994 Sweep

Explanatory variable	New variable (dummy)	Base
Ethnic group	Black/Asian, Mixed or Other	White
Household income	£4,999 and under/£5,000-£9,999/£20,000-£29,999/£30,000 or more/Refused/Don't know	£10,000-£19,999
Employment status	Waiting or looking for work/Sick or disabled/Student/Retired/Looking after home or family/Other work	Paid work
Disability	Disability or long-standing illness	No disability
Government Office Region	North/North West/Yorkshire and Humberside/East Midlands/West Midlands/East Anglia/ Greater London/South West/Wales	South East
Tenure	Private rented sector/Social rented sector	Owner, buying with help of mortgage or loan or shared ownership
General health	Very good/Fair/Bad/Very bad	Good

A7.2 Interpretation of Negative Binomial Coefficients

Negative binomial coefficients should be interpreted as the change in the expected log count of the number of victimisations for each 1-unit increase in that variable. With regard to findings presented in Chapter 7, for ease of interpretation, the results are presented as either the factor change in the predicted mean number (incidence) of victimisations or the percentage change in the incidence. Both the factor and percentage change in the expected count are calculated using the coefficients from the original models. A working example is given below:

Taking the saturated model for completed theft from the person and robbery in 2010/11, the coefficient for male is -0.557. This can be interpreted as: being a male decreases the expected number of victimisations by a factor of .57 (=exp[-.557]) holding all other variables constant. Alternatively, if interested in percentage change,

this would convert to: assuming the category male decreases the expected number of victimisations by 42.71% ((= 100 * [exp ($\beta_k * \delta$) – 1]) (=100 [exp (-.557) -1])) (where β_k = the coefficient for variable k and δ = the value of the variable k) when compared to the respective female reference person. If a result is not statistically significant this suggests the effect of that particular variable is not significantly different from the reference category.

A7.3 Selection of Appropriate Modelling Strategy

In order to ascertain the most appropriate modelling strategy a clear understanding of the characteristics and distribution of the data is required (see Tables 5.1 to 5.4). Before extending the analysis to other sweeps, the 2009/10 BCS was first selected to explore such characteristics and is taken to be a relatively reliable indicator of the *general* nature and distribution of victimisation within other sweeps.

The dependent variable in this case is a count variable with values from 0 to 5. This measure of crime incidence was preferred over the victim/non-victim dichotomy in order that the entire distribution of crimes was modelled (Osborn and Tseloni, 1998). It enables the analyst to more fully understand the mechanisms by which crime has decreased by taking account of repeat victimisation. However, counting conventions within the BCS cap the number of victimisations at five. This leads to potential underestimation of the concentration of victimisation (see Tseloni and Pease (2010) for further discussion).

When looking at the frequency distribution of theft from the person and robbery (see Table 5.4) the variance exceeds the mean. In statistical terms, this is referred to as overdispersion. This is thought to result from the apparent 'non-random' nature of victimisation whereby individuals vary greatly in their experience of it. If crimes were random events their distribution would approximate the Poisson theoretical distribution (Nelson, 1980) whereby the variance is constrained to be equal to the mean. As a result, the Poisson specification is often a poor fit to crime data of this kind.

The decision to test a zero-inflated model was recommended by particular attributes of the dependent variable. The data is overdispersed and highly positively skewed with a large percentage of non-victims ('zeros'). Zero-inflated models handle

overdispersion by changing the mean structure to explicitly model the production of zero counts (Long 1997). Two models are generated – a logit model for 'certain-zero' cases and a negative binomial model for the 'excess zero' group – and then combined. LIMDEP software (Greene, 2002a) was utilised to estimate three models for the purposes of comparison: Poisson, negative binomial and zero-inflated negative binomial (ZINB). Vuong and goodness of fit statistics are presented in Tables A7.4 to A7.8, which informed the decision to adopt the negative binomial model over the ZINB.

Table A7.4: Vuong Statistic for Negative Binomial vs. ZINB Saturated Models in LIMDEP for Completed and Attempted Theft from the Person and Robbery

Crime type	Vuong Statistic
Completed TFP and Robbery	.1254
Attempted TFP and Robbery	.4756

The Vuong statistic comparing the negative binomial to the ZINB is inconclusive in both cases. This statistic has a standard normal distribution with large positive values favouring the ZINB model and with large negative values favouring the non-zero-inflated version (Long, 1997).

Table A7.5: Difference in Model Chi-square Values for Poisson, Negative Binomial and ZINB Models in LIMDEP for Completed Theft from the Person and Robbery[+]

Model	LL FUNCTION baseline	LL FUNCTION saturated	Difference/chi-square
Poisson	-2610.187	-2411.615	198.572
Negative Binomial	-2491.149	-2324.950	166.199
ZINB	-2491.227	-2324.8998	166.327

+ Baseline and saturated model log likelihood functions are compared to obtain value.

Table A7.6: Difference in Model Chi-square Values for Poisson, Negative Binomial and ZINB Models in LIMDEP for Attempted Theft from the Person and Robbery[+]

Model	LL FUNCTION baseline	LL FUNCTION saturated	Difference/chi-square
Poisson	-1596.869^	-1448.738	149.337
Negative Binomial	-1459.901^	-1354.590	105.763
ZINB	1459.990^	-1353.372	106.618

+ Baseline and saturated model log likelihood functions are compared to obtain value.
^Baseline model includes age and sex because the model would not run when only including sex.

Table A7.7: Model Chi-square Values for Completed Theft from the Person and Robbery for Negative Binomial model in MLwiN and LIMDEP

Programme	Model chi-square
MLwiN	374.116
LIMDEP	166.199

Table A7.8: Model Chi-square Values for Attempted Theft from the Person and Robbery for Negative Binomial Model in MLwiN and LIMDEP

Programme	Model chi-square
MLwiN	206.361
LIMDEP	105.763

The MLwiN negative binomial model shows a better fit to the data (demonstrated by the higher model chi-square statistic). Thus, in the interests of parsimony, the simpler negative binomial model was selected.

Parameter estimates and standard errors from the negative binomial models from each software package were compared to ascertain if there were any significant differences across programmes (see Tables A7.9 and A7.10).

Table A7.9: Parameter Estimates and Standard Errors for Completed Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
cons	-3.607*	-3.649*	0.509	0.489
age	-0.027*	-0.027*	0.006	0.006
male	-0.405*	-0.389*	0.12	0.115
onechil	-0.233	-0.234	0.178	0.171
twochil	-0.033	-0.037	0.188	0.181
socprof	0.063	0.082	0.153	0.146
socinter	0.157	0.158	0.157	0.152
socnever	0.19	0.188	0.206	0.197
highed	-0.001	-0.003	0.18	0.172
trade	-0.068	-0.101	0.329	0.328
seclower	-0.143	-0.13	0.192	0.183
otherqual	-0.218	-0.215	0.33	0.32
noqual	0.003	0.007	0.203	0.194
black	0.241	0.253	0.278	0.262
ethother	0.16	0.142	0.209	0.203
inc1	0.069	0.062	0.257	0.248
inc2	0.114	0.128	0.189	0.182
inc4	-0.199	-0.188	0.214	0.207
inc5	-0.118	-0.107	0.21	0.202
inc6	0.174	0.18	0.227	0.218
incref	-0.162	-0.174	0.226	0.223
incdk	0.164	0.179	0.198	0.19
disab	0.042	0.055	0.158	0.151
sing	0.491*	0.495*	0.172	0.168
sepdiv	0.404*	0.418*	0.188	0.182
wid	0.631*	0.642*	0.223	0.217
waitlookwk	0.874*	0.869*	0.248	0.232

Table A7.9 (contd.): Parameter Estimates and Standard Errors for Completed Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
student	0.279	0.248	0.266	0.254
retired	0.7*	0.716*	0.251	0.243
homefam	-0.145	-0.118	0.28	0.269
otherwork	0.17	0.151	0.395	0.391
tesickdis	0.571*	0.592*	0.282	0.266
privrent	0.14	0.138	0.155	0.149
socrent	0.253	0.258	0.162	0.156
vgood	-0.306*	-0.301*	0.131	0.127
fair	0.113	0.126	0.164	0.155
bad	0.535*	0.522*	0.251	0.238
vbad	0.314	0.316	0.494	0.461
innercity	0.214	0.207	0.228	0.219
urban	0.23	0.225	0.155	0.149
neast	-0.967*	-0.938*	0.325	0.31
nwest	-0.204	-0.206	0.225	0.218
yorkhumb	-0.678*	-0.672*	0.274	0.266
eastmids	-0.225	-0.215	0.234	0.225
westmids	-0.072	-0.06	0.232	0.222
east	-0.146	-0.144	0.224	0.216
london	0.775*	0.759*	0.212	0.205
swest	-0.236	-0.217	0.241	0.229
wales	-0.41	-0.413	0.272	0.264
weeknone	-0.798*	-0.776*	0.288	0.277
weekone	-0.153	-0.151	0.171	0.167
weekfive	-0.237	-0.218	0.217	0.208
weekseven	0.001	0.025	0.182	0.175
pubone	-0.092	-0.091	0.145	0.14

Table A7.9 (contd.): Parameter Estimates and Standard Errors for Completed Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
pubfour	-0.003	-0.003	0.178	0.168
pubnine	0.25	0.26	0.239	0.225
clubone	0.706*	0.678*	0.172	0.164
clubfour	0.951*	0.937*	0.303	0.282
clubnine	0.433	0.367	0.633	0.627
carone	-0.533*	-0.514*	0.144	0.138
cartwo	-0.429*	-0.409*	0.189	0.181
carthree	-0.232	-0.224	0.24	0.231
bike	0.089	0.089	0.125	0.12

*Significant at 10% level

Table A7.10: Parameter Estimates and Standard Errors for Attempted Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
cons	-4.252*	-4.315*	0.716	0.699
age	-0.032*	-0.031*	0.009	0.009
male	0.125	0.133	0.161	0.156
onechil	0.055	0.065	0.224	0.213
twochil	-0.255	-0.254	0.257	0.251
socprof	0.351*	0.358*	0.203	0.196
socinter	-0.172	-0.173	0.243	0.239
socnever	-0.732*	-0.738*	0.387	0.378
highed	0.055	0.048	0.24	0.23
trade	-1.021*	-1.044*	0.567	0.568
seclower	-0.048	-0.064	0.254	0.247

Table A7.10 (contd.): Parameter Estimates and Standard Errors for Attempted Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
otherqual	0.121	0.123	0.4	0.385
noqual	-0.779*	-0.773*	0.307	0.295
black	0.07	0.07	0.417	0.395
ethother	0.196	0.205	0.289	0.274
inc1	0.421	0.415	0.375	0.355
inc2	0.122	0.129	0.298	0.288
inc4	0.472*	0.463*	0.27	0.262
inc5	0.134	0.133	0.287	0.279
inc6	0.12	0.105	0.32	0.314
incref	-0.477	-0.49	0.381	0.377
incdk	0.285	0.277	0.3	0.291
disab	0.424*	0.421*	0.215	0.206
sing	-0.284	-0.27	0.236	0.232
sepdiv	0.223	0.215	0.244	0.238
wid	0.733*	0.714*	0.334	0.329
waitlookwk	0.422	0.393	0.367	0.355
student	0.555	0.551	0.384	0.371
retired	0.23	0.205	0.361	0.348
homefam	-0.66	-0.673	0.466	0.462
otherwork	0.187	0.178	0.542	0.527
tesickdis	-0.355	-0.372	0.43	0.405
privrent	0.203	0.202	0.218	0.213
socrent	0.742	0.761*	0.229	0.217
vgood	-0.153	-0.154	0.181	0.177
fair	0.279	0.274	0.231	0.221
bad	0.537	0.552	0.376	0.358
vbad	1.495*	1.488*	0.563	0.531

Table A7.10 (contd.): Parameter Estimates and Standard Errors for Attempted Theft from the Person and Robbery in 2009/10 Using Negative Binomial Regression in MLwiN and LIMDEP (Saturated Model)

Variable name	Parameter Estimate: MLwiN	PE: LIMDEP	Standard Error: MLwiN	SE: LIMDEP
innercity	0.076	0.073	0.323	0.315
urban	0.209	0.211	0.211	0.208
neast	-0.683	-0.661	0.423	0.414
nwest	-0.346	-0.342	0.328	0.327
yorkhumb	-0.26	-0.238	0.349	0.343
eastmids	0.209	0.23	0.302	0.298
westmids	-0.15	-0.123	0.336	0.328
east	-0.332	-0.316	0.325	0.322
london	0.818*	0.828*	0.298	0.292
swest	-0.509	-0.474	0.36	0.352
wales	-0.023	0.01	0.354	0.344
weeknone	-0.432	-0.412	0.438	0.426
weekone	0.045	0.046	0.278	0.276
weekfive	0.386	0.394	0.302	0.295
weekseven	0.248	0.257	0.27	0.262
pubone	0.333*	0.328*	0.194	0.187
pubfour	0.286	0.284	0.241	0.232
pubnine	0.551*	0.54*	0.323	0.311
clubone	0.228	0.249	0.248	0.234
clubfour	0.692	0.719*	0.443	0.423
clubnine	-0.071	0.102	0.984	0.910
carone	-0.85*	-0.846*	0.205	0.198
cartwo	-0.995*	-0.995*	0.263	0.251
carthree	-0.947*	-0.971*	0.348	0.345
bike	0.298*	0.305*	0.173	0.167

*Significant at 10% level

The parameter estimates and standard errors achieved are, reassuringly, very similar across programmes.

Chapter 8: Incident Characteristics

So far, the thesis has explored over time changes in the goods stolen through theft from the person and robbery and the characteristics of the victims they are stolen from. In order to add another level of understanding, the main purpose of this chapter is to establish where, and in what circumstances, these incidents happen. The following three research questions will be addressed:

1. Are particular incident characteristics associated with an increased likelihood of an attempted theft from the person and robbery as opposed to completed?
2. If so, are these characteristics consistent over time? and
3. Do variables relating to victim characteristics hold more explanatory power than those relating to the incident when it comes to whether or not a crime will 'fail'?

In order to test the aforementioned questions, attempted crimes are modelled against those which were 'successful'. In other words, which incident characteristics, if any, increase the likelihood of an attempted or failed victimisation?

8.1. Previous Empirical Research

There has been remarkably little attention paid to BCS data which identifies the characteristics of theft from the person and robbery incidents. The majority of research in this area utilises police recorded crime for specific localities or offender interview data. There are a number of common themes which emerge from the existing research, namely the risk associated with licensed premises and alcohol, the importance of distraction in busy commercial areas and the use of weapons.

Previous research suggests the location in which offences occur is not random but clustered in particular areas (Block and Block, 1995). Licensed premises are consistently identified as 'risky facilities' (Johnson *et al.*, 2010). In addition, individuals under the influence of alcohol are often viewed by offenders as good targets as they are deemed less aware of their own personal safety and belongings and less capable of 'fighting back' (Smith *et al.*, 2006; Monk *et al.*, 2010). Jochelson (1997) found that victims had consumed alcohol prior to 25 per cent of robbery

incidents. In addition, loud music and the distraction of being around friends may increase the likelihood of bags and belongings being left unattended. Risk in these facilities is said to be at its highest in the early evening, typically 'after work' (ibid) or during the evening when there are a particularly high concentration of potential targets in a relatively confined area.

Busy commercial areas can provide a perfect location for offences to take place relatively unnoticed. Offenders express a preference for locations where there is high pedestrian volume and congestion in order that they can 'blend in' (Monk *et al.*, 2010; Poyner and Webb, 1992). Incidents which occur in shopping centres are generally more frequent during the afternoon (midday until 4pm) and are a reflection of shop opening hours or specific market days (Poyner and Webb, 1992). The National Crime Victimisation Survey (NCVS) (2005, cited in Monk *et al.*, 2010) found that street robbers targeted victims on the way to/from work, school, shopping or running errands. When carrying out these kinds of activities, an individual may be preoccupied and less aware of their surroundings and belongings.

A select number of studies have explored the motivations and tactics of robbery offenders (Miller, 1998; Wright *et al.*, 2006; Brookman *et al.*, 2007). One of the key themes to emerge from this research is the difference in weapon use between offenders in the USA and those in the UK. Use of a gun or weapon in the commission of an offence was much more common in the USA (Miller, 1998). Offenders in the UK were much less likely to carry or use a weapon. If carried, a knife was the most likely weapon of choice (Smith, 2003) and would only be used in worst case scenarios.

8.2 Theoretical Justification for Variable Selection

An environmental approach would advocate that analysis should consider the entire 'criminal event' and, in particular, the environment in which the incident occurs (Wortley and Mazerolle, 2008). These insights can then be used to inform broader policy initiatives and local issues. The analysis contained within this chapter and the exploration of theft from the person and robbery victimisation over time was conducted in this vein. In order to retrospectively study these criminal events, a guiding principle when conducting the analysis was that variables were consistently available across all BCS sweeps from 1994 until 2010/11. In addition, there lies theoretical reasoning behind the choice of incident variables that entered the models.

Much of the work here is framed by routine activity theory and the three elements of an apparently 'successful' victimisation – the convergence of a motivated offender and suitable target in the absence of a capable guardian. By identifying the characteristics of an incident which potentially increase the likelihood of a failed victimisation, this may give some indication of where the three elements are least likely to converge. Criminologists may then study particular locations in order that crime prevention may be more effectively targeted and the criminogenic properties (or lack of) in such environments studied in more depth. Taken collectively with the findings from Chapter 7, it should provide a much clearer indication of the types of lifestyles and locations which foster greater exposure to high-risk situations.

The BCS contains a number of direct measures which detail where and under what circumstances the incident occurred. Incident variables may also act as proxy measures of an individual's accessibility, vulnerability and attractiveness to a potential thief. These include the time of year the incident happened, whether the victim had any contact with the offender and what the victim was doing at the time. The time of the year allows us to evaluate the risk associated with particular seasonal holiday periods such as Easter and Christmas. More importantly, it provides an indication of the weather and number of daylight hours. Warmer weather and lighter nights may be conducive to higher levels of street activity. The activity being conducted at the time of the theft may also proxy the level of access the offender had to the victim. For example, marketplaces in the daytime may provide sufficient cover for a criminal to steal an item from a preoccupied victim.

Levels of offender motivation (and, to an extent, the perceived vulnerability of the target) may be reflected in variables relating to whether force, violence or threats were employed in the commission of the offence and whether or not a weapon was used. The likelihood of an attempted incident may be reduced if a victim is made to feel vulnerable or under immediate threat. If force or violence is used this may be more suggestive of a particularly motivated offender.

A number of variables could be viewed as proxies for the level of guardianship. These include whether the incident happened within 15 minutes of the victims residence, if the crime occurred in daylight or darkness, where the incident occurred and what the

individual was doing at the time of the offence. If a victim is closer to home this may increase the likelihood of being able to get to a place of relative safety if they are familiar with the area. There may also be more frequent contact with acquaintances or relatives which could increase the likelihood of an attempt. Attempts may also be more likely if the incident happens in daylight or in a public environment, as there may be a larger number of capable guardians and more chance of the offence being interrupted. Conversely, this may actually increase the frequency of contact with potential offenders and provide higher levels of cover or concealment for their activity.

8.3 Data Selection

8.3.1 Sweep Selection

Four sweeps were selected for the purpose of this analysis – 1996, 2001/02, 2002/03 and 2010/11. Selection was based on the mean number of crimes (both completed and attempted) experienced (see Figure 7.1 and Tables 7.8 and 7.9) by the fictional reference individual (see Section 7.3.1). Sweeps in which the highest predicted mean number of attempted and the highest number of completed crimes for the reference individual were chosen, as well as a sweep where the mean number of attempted crimes was the same as completed.

The highest mean number of predicted attempted victimisations for the reference individual is found in 1996, as well as the lowest mean number of completed crimes. 1996 also constitutes the only sweep in which the mean number of attempted victimisations exceeds (by a reasonable margin) those completed. This time period may therefore hold key information regarding potential incident characteristics that give more frequent rise to attempted victimisations. The highest mean number of predicted completed victimisations for the reference individual is found in 2001/02.

In a departure from results found for other sweeps, there are almost identical values for the mean number of completed and attempted victimisations in 2002/03 thus warranting further exploration. The 2010/11 sweep was selected on the basis that it is the most recent dataset analysed within the thesis. It is felt that these four sweeps cover a sufficient time period both practically and theoretically.

8.3.2 Explanatory Variable Selection

Explanatory variables relating to the circumstances of incidents of theft from the person and robbery victimisation were selected on the basis of previous literature and empirical research (see Sections 8.1 and 8.2). These variables were consistently available across sweeps and were hypothesised to hold some explanatory power with regard to explaining when a crime is more likely to fail, for example the offence is interrupted by a capable guardian or the victim overcomes the offender. Variable harmonisation was carried out over time to ensure consistency across sweeps and foster comparability (see A8.1). Thirteen incident variables were identified during the initial phase of the analysis. These were:

- whether it was a single incident or part of a series;
- which quarterly period the victimisation occurred;
- whether force, violence or threats were used;
- whether the incident happened within a 15-minute radius of the respondents household;
- whether the incident happened in daylight or dark;
- whether the respondent was aware of the incident happening;
- what time of day the victimisation happened;
- where the incident occurred;
- whether the respondent had any contact with the offender;
- whether the event happened during the week or at the weekend;
- what the respondent was doing at the time;
- whether or not a weapon was used in the commission of the offence; and
- whether the respondent was a repeat victim (of theft from the person or robbery but where the incident was not part of a series).

8.3.3 Tests of Association

Tests of association were carried out between two sets of variables:

1. Whether the incident happened in daylight or dark and what time of day the incident happened; and

2. Whether the respondent had contact with the offender and if they were aware the incident was happening.

It was felt that each pair may be too closely associated or one variable may be acting as a proxy for the other. Chi-square tests of association were therefore carried out (Bachman and Paternoster, 2009). The observed frequencies obtained were significantly different (at the one per cent level) from the frequency expected if there was no association between the two pairs of variables (chi-square value for pair one = 427.775 and pair two = 304.4).

Due to the strong association between both sets of variables, one variable from each pair was added in alternate models. If each variable of the strongly associated pair displayed similar magnitude and significance when alone in the model and with their associated factor then both were retained in the final model. This was the case for the second pair relating to awareness of the incident and contact with the offender. If either lost significance when entering the model together but were significant when entering alternate models, only one of the variables was retained or a new variable created which combined the two. A cross tabulation was run using 'daylight' and 'time of day'. However, too few cases existed in each category to warrant creating a new variable. Therefore, 'daylight' was retained as it was deemed more theoretically relevant in that daylight may be suggestive of higher levels of street activity which could provide cover for a potential offender (Poyner and Webb, 1992). This variable is also more often employed in existing research. As a result, 12 variables entered the final model.

8.4 Descriptive Statistics

All characteristics that entered the models are given in Table 8.1 and are broken down by sweep. Each case refers to a single incident; thus the same victim may appear in the sample twice if they suffered more than one theft from the person or robbery victimisation that was not deemed part of a series (min 0% in 1996; max. 8.4% in 2001/02). All variables are binary or categorical and, within the discussion, their effect on the likelihood of attempted theft from the person or robbery victimisation is interpreted relative to a reference or base category (see Section 4.6.3). The respective reference category is given in brackets next to each variable in the table. In addition, descriptive statistics relating to the demographic, lifestyle and area characteristics of the sample are provided in Table 8.2.

Table 8.1: Descriptive Statistics of Theft from the Person and Robbery across Selected BCS Sweeps – Incident Characteristics (% of Final Sample)

CHARACTERISTICS	1996	01/02	02/03	10/11
Type of incident (Single)				
Series	4.6	6.5	6.4	5.6
Quarter in which incident happened (October-December)				
January - March	31.6	19.7	20.9	19.2
April - June	18.9	23.4	23.7	23.1
July - September	22.4	28.8	26.4	27.2
Force, violence or threats used (Force or violence)				
Threat	4.1	7.9	5.3	5.9
No force, violence or threat	64.8	65.2	67.6	70.5
Happen within 15 minutes of this area? (No)				
In this area	37.2	42.5	39.3	35.7
Time of day (Dark)				
Daylight	68.4	67.3	67.8	64.7
Dawn/dusk	3.8	5.8	4.9	4.1
Aware of incident happening (Aware)				
Not aware	50.0	48.5	47.6	50.8
Location (Elsewhere – including other street)				
At home/outside home/place of work	11.7	11.1	10.5	9.5
Travelling	18.1	15.3	14.6	17.7
At place of public entertainment	2.0	5.1	6.0	5.4
Pub/bar/working men's club/dancehall/disco	-	7.4	6.9	8.3
Other public or commercial location	42.9	46.6	43.4	37.5
Contact with offender? (Yes, contact)				
No contact	35.7	42.2	43.7	43.8
When victimised? (Weekend)				
Weekday	69.6	69.4	65.3	66.0
What doing at time of offence? (Travelling)				
At work/working/at school	7.7	8.6	7.2	8.1
Shopping	47.2	38.1	43.1	33.6
Leisure activities	14.0	23.2	25.0	25.3
Other	4.8	4.2	1.6	3.1
Weapon used? (Weapon used)				
No weapon/no info re: offender/don't know	89.5	91.9	92.3	93.5
Repeat Victim? (Single victim)				
Repeat victim	0.0	8.4	4.1	3.7
Final sample size (raw number)	392	431	636	589

Table 8.2: Descriptive Statistics of Theft from the Person and Robbery across Selected BCS Sweeps – Victim Characteristics (% of Final Sample)

CHARACTERISTICS	1996	01/02	02/03	10/11
Sex (Female)				
Male	34.7	39.4	36.6	40.4
Number of children (No children)				
One Child	13.8	16.9	14.0	14.6
Two or More Children	14.8	12.8	16.7	15.6
Social Class of HOH/HRP (Routine Occupations)				
Professional	30.6	32.0	35.7	38.4
Intermediate Occupations	48.5	18.8	18.1	18.2
Never worked/Not classified	1.0	10.7	9.6	7.5
Highest Qualification (Secondary (Upper))				
Higher/further educ.(inc. degree and teaching qual.)	24.5	23.9	26.9	35.8
Secondary (lower) – GCSE/O Level/CSE/SCE	24.7	12.1	22.6	20.7
Trade Apprenticeship	NA	3.0	3.9	3.2
Other Qualifications	3.6	4.6	5.7	3.4
No Qualifications	38.5	33.2	28.3	21.2
Ethnic Group (White)				
Black	4.1	3.2	3.5	4.6
Asian/Mixed/Other	8.2	9.5	5.8	10.7
Household Income (£10,000-£19,999)				
£4,999 and under	27.0	13.7	14.9	5.9
£5,000-£9,999	14.8	14.4	14.8	14.8
£20,000-£29,999	15.3	8.8	10.2	11.5
£30,000-£49,999	9.4	15.5	14.2	12.7
£50,000 or more		5.8	11.0	16.6
Refused	2.0	8.8	6.1	7.0
Don't know	8.7	18.3	9.1	12.1
Illness or Disability (No disability)				
Disability/long-standing illness	35.2	32.5	32.7	32.8
Marital Status (Married/cohabiting)				
Single	33.4	42.0	42.9	49.4
Separated/Divorced	13.8	19.0	17.5	14.9
Widowed	14.8	11.1	11.6	8.5
Employment status (Paid work)				
Waiting or looking to take new job	4.3	4.9	3.1	6.5

Table 8.2 (contd.): Descriptive Statistics of Theft from the Person and Robbery across Selected BCS Sweeps – Victim Characteristics (% of Final Sample)

CHARACTERISTICS	1996	01/02	02/03	10/11
Temp. sick or injured/long-term sick or disabled	5.1	7.4	6.3	8.3
Student (full-time)	5.1	5.1	5.3	6.6
Retired from paid work	21.4	19.0	21.4	19.0
Looking after home/family	12.2	7.7	9.0	4.4
Other/Something else	1.0	2.1	1.6	2.7
Tenure (Owners)				
Social rented sector	10.7	29.9	27.4	25.1
Private rented sector	34.4	16.0	17.1	26.3
General Health (Good)				
Very Good	30.6	29.9	33.6	33.3
Fair	27.3	24.4	20.6	23.1
Bad	5.4	9.5	6.1	7.1
Very Bad	1.5	1.4	1.9	2.4
Hours Away from Home (Weekday) (3-5 hours)				
Under 1 hour	4.8	4.6	6.1	4.6
1-3 hours	20.7	20.2	18.6	18.7
5-7 hours	10.2	9.5	13.1	13.9
7+ hours	45.2	48.3	43.2	47.2
Visits to Pub in Last Month (No visits)				
1-3 times	40.6	24.6	27.7	28.5
4-8 times		17.2	16.8	18.5
More than 9 times		12.5	12.1	6.6
Visits to Club in Last Month (No visits)				
1-3 times	NA	15.3	14.6	14.9
4-8 times		6.3	5.3	4.1
More than 9 times		1.9	2.5	1.5
No. of Cars Owned/Used Last Year? (No car)				
1 car	38.8	36.0	37.1	33.1
2 cars	14.5	18.8	19.8	20.5
3+ cars	4.1	2.8	5.7	8.5
Anyone in Household Owned a Bicycle? (No bicycle)				
Own a bike	35.5	42.2	46.1	46.5
Area Type (Rural)				
Inner City	36.0	19.3	17.9	16.5
Urban	52.8	69.1	67.9	70.5

Table 8.2 (contd.): Descriptive Statistics of Theft from the Person and Robbery across Selected BCS Sweeps – Victim Characteristics (% of Final Sample)

CHARACTERISTICS	1996	01/02	02/03	10/11
Region (South East)				
North East (North in 1996)	3.3	3.0	4.9	4.4
Yorkshire & Humberside	11.5	10.9	9.7	4.6
North West	3.6	16.2	15.4	10.7
East Midlands	6.6	7.0	6.3	10.0
West Midlands	5.6	9.7	9.7	9.3
East (East Anglia in 1996)	14.3	8.1	10.4	12.9
London	11.5	26.0	23.1	24.6
South West	3.8	5.8	5.2	9.0
Wales	32.4	1.9	2.8	4.2
Age (Continuous)				
Mean	45.15	42.86	43.01	42.03
Standard Deviation	20.91	20.06	20.08	19.57
Final sample size (raw number)	392	431	636	589

8.4.1 Where and When Do Incidents of Theft from the Person and Robbery Happen?

Table 8.1 shows the circumstances in which incidents of theft from the person and robbery victimisation have occurred. These characteristics have remained relatively consistent over time, with the vast majority (roughly 95 per cent) being single, isolated incidents. A small proportion (min 0% in 1996; max. 8.4% in 2001/02) of the incidents were repeat victimisations (see Chapter 5), although interestingly there were no repeat incidents reported in 1996. This further demonstrates that the composition of theft from the person and robbery is dominated by one-off incidents. Events are fairly equally spread throughout the year with slightly more incidents happening in July to September months. The majority of incidents (around 65 per cent) happen in daylight hours on a weekday and where no force or violence is used. The overwhelming majority (approximately 90 per cent) do not involve the use of a weapon. This is perhaps unsurprising due to the majority of the victimisations being classified as 'other theft from the person' offences. On average, around 40 per cent of incidents happen within a 15-minute radius of the victim's household. There is a roughly equal split of incidents where the victim is aware the victimisation is

happening to those who are not; although most (around 60 per cent) have some form of contact with the offender.

With regard to the location of the incident and what the victim was doing at the time, the most common (around 40 per cent) place to be victimised is in an 'other public or commercial location', defined as a shop, street, market or hospital etc. The most likely activity to be conducting when victimised is, in fact, shopping (around 40 per cent, although this number has decreased) followed by incidents where the victim is travelling to or from a location, generally school/college, work or a night out.

8.5 Modelling Strategy

Data was first retrieved and cleaned in IBM SPSS Statistics 19 (IBM Corp., 2012). Dummy variables were then created for each categorical explanatory variable (see Table A8.1) and descriptive statistics obtained. Logit modelling was conducted using MLwiN version 2.26 (Rasbash *et al.*, 2009).

A single-level logit model (Long, 1997) was used to model a binary response variable (where 0 = completed theft from the person or robbery and 1 = attempted theft from the person or robbery) for each selected BCS sweep. Interest ultimately lies in how attempted/'failed' incidents differ from those which are completed. Sampling weights were not used (see A4.4) and a number of models were estimated. Initially, a baseline model was run. This was followed by a saturated model including all incident characteristics variables. Where at least one variable within a category was statistically significant at the ten per cent level, all categories of that variable were retained. For clarity, models are referred to as baseline, saturated and reduced respectively.

An additional model was estimated including victim characteristics – this is referred to as the victim and incident model. Different models have been utilised dependent upon the research question. For question one where the interest lies in establishing differences *within* sweeps the reduced incident models are reported. For question two where we are interested in the magnitude of over time change, results from the saturated incident models are reported. This is because the saturated models are comparable over time as the same variables entered the final model. With regard to question three, interest lies in establishing the relative influence of victim and

incident characteristics hence both reduced and saturated models are reported, although for clarity discussion regarding this is limited to Section 8.6.2 and data relating to these particular models can be found in the Appendix (A8.2).

8.6 Results

> *8.6.1 Are Particular Incident Characteristics Associated with a Change in Likelihood?*

In what follows, results of the reduced incident models are presented. Findings should be interpreted relative to the reference incident holding all other variables constant. The reference incident is a single incident which happened at the weekend whilst the victim was travelling in darkness at some point during the period of October to December. Force or violence and a weapon were used in the commission of the offence. It did not happen within 15 minutes of the victim's household. The victim was not a repeat victim of theft from the person or robbery. Categories were selected on the basis that the likelihood of an attempt as opposed to a 'completed' victimisation was relatively low, i.e. incident conditions were proposed to be more conducive to a 'successful' or completed event. This was to make interpretation of the coefficients slightly easier. For example, the change in likelihood as a result of a unit change in the dependent variable should (more often than not) in this case be positive, i.e. an increased likelihood compared to the respective base category. Results from the reduced incident models of theft from the person and robbery by sweep are presented in Table 8.3.

Table 8.3: Single-level Logistic Regression (Reduced) Models of Theft from the Person and Robbery over Incident Characteristics across Selected BCS Sweeps

CHARACTERISTICS	1996	01/02	02/03	10/11
Type of incident (Single)				
Series	-	-	-	2.33*
Quarter in which incident happened (October-December)				
January - March	-	2.06*	-	-
April - June	-	1.09	-	-
July - September	-	1.53	-	-
Force, violence or threats used (Force or violence)				
Threat	3.29*	1.68	3.84#	2.71~
No force, violence or threat	2.28#	1.84*	1.49	2.07~
Happen within 15 minutes of this area? (No)				
In this area	-	0.52~	0.7*	-
Time of day (Dark)				
Daylight	-	-	-	0.61*
Dawn/dusk	-	-	-	1.23
Aware of incident happening (Aware)				
Not aware	0.12#	0.05#	0.09#	0.04#
Location (Elsewhere – including other street)				
At home/outside home/place of work	-	1.12	-	0.44*
Travelling	-	1.55	-	0.93
At place of public entertainment	-	1.95	-	1.11
Pub/bar/working men's club/dancehall/disco	-	0.15*	-	0.46
Other public or commercial location	-	1.01	-	0.69
Contact with offender? (Yes, contact)				
No contact	0.46~	0.32#	0.37#	0.37#
When victimised? (Weekend)				
Weekday	-	-	-	-
What doing at time of offence? (Travelling)				
At work/working/at school	0.62	0.6	0.51*	0.54
Shopping	0.76	0.82	0.64*	1.75
Leisure activities	0.98	0.48*	0.56~	0.54*
Other	0.58	0.72	1.07	0.33*
Weapon used? (Weapon used)				
No weapon/no info re: offender/don't know	-	-	3.16#	2.17*
Repeat victim? (Not a repeat victim)				
Repeat victim	-	-	0.36*	3.69~

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

- did not enter the model

Table 8.3 shows there are a number of factors that consistently increase the likelihood of an attempted crime. Discussion is constrained to those variables which have a significant effect in more than one sweep in order to keep to the most salient and reliable points. These include if no threat, force or violence was employed in the commission of an offence as well as if there is no weapon.

Although the vast majority of incidents occur without the use of a weapon (see Table 8.1), the results in Table 8.3 suggest the likelihood of an event being unsuccessful is reduced when a weapon is involved, as opposed to an event where no violence is used or just threats are made. This is not particularly surprising, as often the intention behind their use is to instil fear of immediate harm and increase the chances of obtaining the desired property.

Other factors which decrease the likelihood of an attempted victimisation include those where the victim is not aware the incident is happening, when they have no contact with the offender and when they are carrying out leisure activities outside of the home. This may explain the higher prevalence of other theft from the person offences whereby the victim has an item stealthily and, at the time, unnoticeably removed from their person (i.e. pick pocketing). Being within 15 minutes radius of their household also reduces the likelihood of an attempt. Findings regarding repeat incidents are rather contradictory. This may be due to the small number of repeats included within the sample. Specific interpretation is provided in Section 8.6.3.

8.6.2 Do Victim Characteristics Hold More Explanatory Power than the Characteristics of the Incident?

A model was estimated to compare the explanatory power (in terms of which factors may best explain the likelihood of an attempt) of victim to incident characteristics. To ensure consistency, victim characteristics entered the model in the same format as that for the analysis conducted for the purposes of Chapter 7 (see Table 8.2). Models were estimated in stages, whereby baseline, followed by models including demographic, lifestyle, area and incident characteristics were run.

Interested readers are signposted to the Appendix (A8.2) for model results. Similar incident characteristics retained their significance and direction of influence when entered in the models both with and without victim characteristics. In general, very

few victim characteristic variable effects were significantly different from their respective base category. In agreement with results from Chapter 7, the most consistent indicators were age and marital status. Being single reduced the likelihood of an attempted victimisation. This adds weight to the suggestion that being married increases levels of guardianship and reduces the likelihood of victimisation. The model joint chi-square values were recorded for each stage (Table 8.4), i.e. chi-square values were obtained for the base model (base), followed by a model containing only demographic characteristics (demographic), then demographic and lifestyle (DL) and so on until a value for the saturated model (DLA and incident) was obtained. The differences in values were then compared to ascertain the explanatory power for each phase of the model (Table 8.5).

Table 8.4: Model Joint Chi-square Values of Binomial Logit Models

Model	df	1996 (df)	01/02	02/03	10/11
Base	1	10.557 (1)	7.168	5.880	7.439
Demographic	37	45.239 (35)	42.250	35.792	60.416
Demographic + lifestyle (DL)	51	51.066 (44)	52.267	48.235	72.891
Demographic + lifestyle + area (DLA)	62	56.929 (55)	56.776	58.923	83.741
DLA + incident	85	91.839 (76)	88.213	153.389	147.468

Table 8.5: Model Chi-square Differences of Binomial Logit Models

Model	df	1996	01/02	02/03	10/11
Demographic (i.e. demographic minus base)	36	34.682	35.082	29.912	52.977
DL	14	5.827	10.017	12.443	12.475
DLA	11	5.863	4.509	10.688	10.85
Incident	23	34.91	31.437	94.466	63.727

Across all sweeps, the model chi-square statistics demonstrate (relative to the number of variables included in each part of the model) incident characteristics hold greater explanatory power compared to victim characteristics when modelling the likelihood of attempted victimisation against completed victimisation. This highlights the importance of the incident and 'near causes' of crime (Tilley, 2009). The likelihood of an event being unsuccessful may therefore be more conditional upon incident factors than the characteristics of victims themselves. From a crime prevention standpoint, this suggests efforts should also be targeted toward adapting potentially criminogenic environments as well as focusing on certain intrinsic victim characteristics. This is reinforced by the value and success of a number of situational crime prevention initiatives, particularly crime prevention through environmental design (CPTED) (see Cozens *et al.*, 2005 for a comprehensive review).

8.6.3 Are Findings Consistent Over Time?

In order to establish if there have been changes in the odds of an attempt over time, results from the saturated models are presented in Table 8.6. Against expectations, only two variables – one indicating the victim had no contact with the offender and the second where no force or violence was used – had statistically significant effects (at the ten per cent level) in every sweep analysed. Two further variables – indicating threats were made during the offence and when the victim was unaware of the incident – had significant effects in three of the four sweeps analysed. This was somewhat disappointing but may be slightly rectified if a larger number of sweeps were included in any future analysis. However, it does instil a greater level of confidence in discussing the four variables which did have significant effects in the majority of sweeps. It is also interesting to establish which variables consistently didn't have a significant effect over time.

Awareness of the offence taking place and contact with the offender have a significant effect in at least three of the four sweeps analysed. If the victim is not aware the offence is taking place, the odds of the victimisation being an attempt rather than a completed crime are reduced by around 90 per cent. In other words, the victim is not aware and any potential they may have to disrupt the offence is therefore lost. In a similar vein, where the victim had no contact with the offender, there was (in all four sweeps) around a 60 per cent reduction in the odds of an attempt (min. -53.19% (1996); max. -67.76% (2001/02)).

The use of verbal threats, as opposed to an incident in which actual force or violence is used, greatly increases the odds of an attempted victimisation (min. 174.83% (2010/11); max. 311.24% (1996)). In all four sweeps, where no threats are made and where no violence is used the odds of an attempt increase by at least 65 per cent. Similarly, if no weapon is used in the commission of an offence, the likelihood of an attempt increases by up to 216.45 per cent (in 2002/03). Thus, use of force or violence consistently decreases the likelihood of an attempted victimisation in the majority of sweeps. It is therefore a finding we can have relative confidence in. The fact that violence or immediate threats of weapon use are more likely to result in an individual surrendering their property is not particularly surprising.

When incidents happen within a 15-minute radius of the victim's household, the odds of an attempted victimisation are reduced by around 40 per cent in two of the four sweeps (min. -37.25% (2002/03); max. -47.11% (2001/02)). This may be suggestive of the fact that individuals spend a lot of their time within a short distance of home. If the victim was carrying out leisure activities outside of the home the odds of an attempted victimisation, when compared to the base category, were reduced by around 50 per cent in two of the four sweeps analysed (min. -43.62% (2010/11); max. -58.73% (2001/02)). The locations of said leisure activities may provide a busy environment with lots of potential escape routes for an offender. In addition, the victim may be otherwise distracted with the activity at hand.

Where the event constituted a repeat incident, the likelihood of an attempted victimisation had a significant effect in two of the four sweeps analysed. However, where significant, the effect of this variable was contradictory – with a 65.97 per cent reduction in the odds of an attempt in 2002/03 and a 270.99 per cent increase in the odds of an attempt in 2010/11. This peculiarity is likely a reflection of the small number of repeat incidents.

8.6.4 Over-time Changes in Effects

As shown in Chapter 5, the risk of becoming a victim of theft from the person and robbery peaked in 1996. This was also the year in which there were the lowest mean number of predicted completed crimes for the reference individual and the highest mean number of attempts. It is the only sweep where the number of attempted victimisations exceeds (by a reasonable margin) those completed. Therefore, incident

factors which were significant in 1996 may hold some explanatory power as to why the reference individual was predicted to experience more attempted victimisations than completed. Table 8.3 shows 1996 to be the sweep with the fewest indicators that are significantly different from the base category. It is also the year with the lowest model chi-square values (Tables 8.4 and 8.5). This suggests the variables entered into the model are not capturing the full extent of the likelihood that an incident was attempted as opposed to complete. It may also be that what differentiates attempts from completed victimisations in 1996 was either not included in the model or was the result of something that can't be measured (i.e. the offender's likelihood of success was down to chance). The number of variables which are significantly different from the base category increase over time. In addition, the model chi-square values increase which suggests that the explanatory power of these characteristics in explaining the likelihood of a 'failed' victimisation has increased over time. It would be interesting to extend the analysis to include further sweeps to shed more light on this potential trend.

Table 8.6: Estimated Percentage Change in the Likelihood of an Attempted Theft from the Person or Robbery Victimisation for Selected BCS Sweeps[+]

CHARACTERISTICS	1996	01/02	02/03	10/11
Type of incident (Single)				
Series	-25.77	-47.32	93.09	121.67*
Quarter in which incident happened (October-December)				
January - March	-37.94	134.9~	-8.06	17.47
April - June	-45.56	24.73	-17.47	-23.66
July - September	-45.56	67.2	-12.45	-6.67
Force, violence or threats used (Force or violence)				
Threat	311.24~	52.5	264.73#	174.83~
No force, violence or threat	109.8~	97.78*	68.54*	98.97~
Happen within 15 minutes of this area? (No)				
In this area	-28.18	-47.11~	-37.25~	-9.52
Time of day (Dark)				
Daylight	26.74	-28.32	-5.45	-41.9*
Dawn/dusk	63.39	-45.12	53.73	16.77
Aware of incident happening (Aware)				
Not aware	-89.75	-95.0#	-91.18#	-95.44#
Location (Elsewhere – including other street)				
At home/outside home/place of work	-33.7	13.43	31.92	-53.28*
Travelling	-18.94	59.68	-16.56	-5.54
At place of public entertainment	-68.68	85.89	-28.25	26.49
Pub/bar/working men's club/dancehall/disco	NA	-88.93*	-45.12	-48.06
Other public or commercial location	47.99	-1.69	-8.24	-32.7
Contact with offender? (Yes, contact)				
No contact	-53.19~	-67.76#	-61.52#	-63.87#
When victimised? (Weekend)				
Weekday	32.71	-8.88	8.44	38.4
What doing at time of offence? (Travelling)				
At work/working/at school	-43.5	-33.57	-53.79*	-49.34
Shopping	-53.51*	-21.26	-35.14	76.65
Leisure activities	-8.79	-58.73~	-33.77	-43.62*
Other	-44.95	-29.88	15.6	-65.56*
Weapon used? (Weapon used)				
No weapon/no info re: offender/don't know	-8.15	-10.15	216.45#	118.37*
Repeat victim? (Not a repeat victim)				
Repeat victim	-	39.79	-65.97*	270.99~

*0.05 < p-value ≤ 0.10

~0.01 < p-value ≤ 0.05

#p-value ≤ 0.01

[+] Estimates taken from saturated logistic regression models.

8.7 Discussion

The main findings to emerge from the analysis are that the use of threats, force or violence, having contact with the offender and the use of a weapon reduce the likelihood of an attempted victimisation. In addition, contact with the offender and awareness of the offence have the most consistent significant effects over time. This is not particularly surprising but may serve to emphasise the importance of education, particularly of young children with regard to violence and the carrying of weapons. Although the number of crimes where a weapon is used is relatively small, for those who experience such an incident the consequences can be considerable. It demonstrates the impact of a weapon beyond strictly violent crimes (e.g. gun and knife crime). In terms of crime prevention, knife and gun amnesties may be a potentially viable option for reducing the number of weapons on the street and thus hopefully reducing the number utilised in theft and robbery.

In addition, the odds of an attempted victimisation are reduced for incidents which happen within a 15-minute radius of the victim's household. This is an interesting finding and somewhat surprising. You may expect a higher risk of an attempt when closer to home in an area you may be more familiar with and surrounded by familiar potential guardians. It may simply be that individuals spend a larger proportion of their time within a short distance of their home or they live in a high crime area. Thus, the risk may be relative to the time spent in these particular places. It may also be that they conduct the majority of their leisure activities within close proximity to their household.

A number of the findings are in agreement with previous research, particularly those relating to the strong predictive capability of particular leisure activities (Kennedy and Forde, 1990; Arnold *et al.*, 2005; Messner *et al.*, 2007). The majority of incidents happened in daylight and this was also found to decrease the likelihood of an attempt. This may be a reflection of Poyner and Webb's (1992) research which highlighted the issue of purse/wallet theft from women's shopping bags in busy marketplaces. However, these findings are also in slight contrast to some previous research which highlights the importance of night-time activities in predicting personal theft victimisation (Sampson and Wooldredge, 1987; Arnold *et al.*, 2005; Miethe *et al.*, 1987). A variety of factors may influence the time of day a victimisation takes place,

including employment status (Smith, 2003). This would be an interesting avenue to explore in future research.

Changes in technology, particularly the huge increase in the use and capability of Smartphones, may have rendered victims increasingly vulnerable, particularly with the wealth of personal information these devices can store. With such an array of technology available at your fingertips you may be more likely to have valuables on show, i.e. using your phone whilst travelling or 'on the move' to check e-mails, use social networking sites, text, listen to music or play a game etc. Your attention may be diverted in this instance and awareness of the event has been suggested as having a significant effect on the odds of an attempt. This is reinforced by the large increase in mobile phone theft over the period of study and once again highlights the importance of reducing the attractiveness of such devices to thieves and encouraging responsible ownership (see Chapter 9).

This leads to discussion regarding potentially criminogenic environments, in this case, 'other public or commercial locations', i.e. streets, shops, markets and hospitals. A large proportion of incidents also happen when the victim is shopping or in transit. Shopping centres and high streets are generally busy, concentrated environments full of individuals who are highly likely to be carrying mobile phones, cash, and credit/debit cards in wallets and/or bags in order to pay for goods. That these incidents happen in daylight may also reflect shop opening hours. This may also provide an indication as to particular peak times of human traffic and subsequent easier concealment and escape routes (e.g. the offender 'getting lost in the crowd'). An individual may also be less likely to notice something being stolen from them if they are in an area that is densely populated with people. One might suggest this is an ideal theft environment, unrivalled by any other where the likelihood of success is high due to the sheer number of opportunities.

This calls into question the safety of these environments and offers potential to develop crime prevention policy. It may be the sheer volume of traffic often found in these places is contributing to an increased likelihood of theft from the person and robbery victimisation. One recommendation could lie in the designing of items to more securely store values, e.g. the Karrysafe Bag (Design Council, 2010), investing in

education and posters highlighting the importance of securely storing your valuables when in transit, particularly in densely populated areas. Education regarding the safe and responsible use of portable electronic items such as mobile phones whilst in public may also be warranted. The vulnerability of pedestrians is also highlighted by the decreased incidence of theft and robbery for those who own or use a car (see Chapter 7).

8.8 Summary

Hypothesis four suggested that:

> *Risk of theft from the person and robbery victimisation is increased during the evening and at weekends. These crimes also centre around commercial areas and places of entertainment in urban areas.*

The results presented within this chapter suggest that this hypothesis can be partially accepted. Theft from the person and robbery victimisation happens predominantly in *daylight* hours during the week. These crimes often occur in public locations such as shops. In addition, weapon use, if the incident happened within a 15-minute radius of the victim's household, victimisation in 'other public or commercial locations' and whilst shopping or travelling were found to have a significant effect. Threats, force/violence and awareness of the incident have a consistently significant effect on the likelihood of an attempted theft from the person and robbery.

This particular analysis is original in its contribution to knowledge in that no other studies have looked at such a range of incident variables over this time period modelling completed and attempted crimes separately. The findings highlight the importance of crime specific analysis in that differences are found when modelling the likelihood of an attempted crime as opposed to completed by particular incident characteristics – some of which are particularly consistent over time.

There are a number of recommendations arising from this analysis both in terms of future research and crime prevention policy and practice. This research would benefit from the inclusion of other sweeps of the data. This would provide a more comprehensive picture of trends in incident characteristics. There may also be a call for further qualitative research, building on the work of Miller (1998) and Brookman

et al. (2007), regarding the use of violence and weapons in relation to these crime types. It would also be interesting to establish what it is exactly about particular environments or circumstances that make them more attractive places to steal.

Appendix Chapter 8

A8. Incident Characteristics Analysis

A8.1 Variable Harmonisation across Sweeps

Selection was made on the basis that the reference incident was most likely to be completed or 'successful'. Dummy variables were created and are shown in Table A8.1 along with the reference category for each categorical explanatory variable.

Table A8.1: Dummy Variables for Incident Analysis

Explanatory variable	Dummy variables	Reference category
Type of incident	Series	Single
Quarter in which incident happened	January to March/April to June/July to September	October to December
Force, violence or threats used	Threat/No force, violence or threat	Force or violence used
Happen within 15 minutes of this area	In this area	Not in this area
Time of day	Daylight/Dawn or dusk	Dark
Aware of incident happening	Not aware	Aware
Location of incident	At home, outside home or place of work/Travelling/At place of public entertainment/Pub, bar, working men's club, dancehall or disco/Other public or commercial location	Elsewhere – including 'other street'
Contact with offender	No contact	Contact
Weekday or weekend	Weekday	Weekend
What doing at time of the incident	At work, working or at school/Shopping/Leisure activities/Other	Travelling
Weapon used	No weapon or no information regarding the offender	Weapon used
Repeat victim	Repeat victim	Single victim

A8.2 Logit Model Results: Victim and Incident Characteristics

Table A8.2: Single-level Logistic Regression (Reduced) Models of Theft from the Person and Robbery over Demographic, Routine Activity, Area and Incident Characteristics across Selected BCS Sweeps

CHARACTERISTICS	1996	01/02	02/03	10/11
Constant	3.158	-1.078	0.778	0.51
	Exp (b)			
Sex (Female)				
Male	0.98~	-	-	1.77~
Number of children (No children)				
One Child	0.29#	-	-	-
Two or More Children	0.45*	-	-	-
Social Class of HOH/HRP (Routine Occupations)				
Professional	-	1.92	-	3.65#
Intermediate Occupations	-	3.7#	-	2.7#
Never worked/Not classified	-	1.3	-	1.37
Highest Qualification (Secondary (Upper))				
Higher/further educ.(inc. degree and teaching qual.)	-	2.64*	0.51*	-
Secondary (lower) – GCSE/O Level/CSE/SCE	-	1.1	0.67	-
Trade Apprenticeship	-	15.55#	0.66	-
Other Qualifications	-	4.85*	0.74	-
No Qualifications	-	1.23	0.63	-
Ethnic Group (White)				
Black	0.11~	-	-	0.23~
Asian/Mixed/Other	0.83	-	-	0.49*
Household Income (£10,000-£19,999)				
£4,999 and under	-	-	0.55	-
£5,000-£9,999	-	-	1.14	-
£20,000-£29,999	-	-	2.24*	-
£30,000-£49,999	-	-	0.91	-
£50,000 or more	-	-	0.35~	-
Refused	-	-	0.88	-
Don't know	-	-	0.4*	-
Illness or Disability (No disability)				
Disability/long-standing illness	-	-	-	-
Marital Status (Married/cohabiting)				
Single	-	0.99	0.46*	0.46~
Separated/Divorced	-	0.37~	0.65	0.66
Widowed	-	0.28*	1.08	0.78
Employment status (Paid work)				
Waiting or looking to take new job	0.16~	-	-	-

Table A8.2 (contd.): Single-level Logistic Regression (Reduced) Models of Theft from the Person and Robbery over Demographic, Routine Activity, Area and Incident Characteristics across Selected BCS Sweeps

CHARACTERISTICS	1996	01/02	02/03	10/11
Temp. sick or injured/long-term sick or disabled	1.65	-	-	-
Student (full-time)	0.96	-	-	-
Retired from paid work	0.83	-	-	-
Looking after home/family	0.91	-	-	-
Other/Something else	0.37	-	-	-
Tenure (Owners)				
Social rented sector	-	-	-	-
Private rented sector	-	-	-	-
General Health (Good)				
Very Good	-	-	0.55~	1.35
Fair	-	-	1.05	1.04
Bad	-	-	0.39*	1.54
Very Bad	-	-	0.22	0.27
Hours Away from Home (Weekday) (3-5 hours)				
Under 1 hour	0.27*	-	-	-
1-3 hours	1.15	-	-	-
5-7 hours	1.54	-	-	-
7+ hours	0.84	-	-	-
Visits to Pub in Last Month (No visits)				
1-3 times	-	0.79	1.67*	-
4-8 times		1.83	1.3	-
More than 9 times		2.28	2.24~	-
Visits to Club in Last Month (No visits)				
1-3 times	NA	-	-	0.79
4-8 times		-	-	0.31
More than 9 times		-	-	0.66
No. of Cars Owned/Used Last Year? (No car)				
1 car	-	-	1.41	-
2 cars	-	-	3.38	-
3+ cars	-	-	2.65	-
Anyone in Household Owned a Bicycle? (No bicycle)				
Own a bike	-	-	0.55~	-
Area Type (Rural)				
Inner City	0.42*	-	2.77~	2.2
Urban	0.41~	-	2.05*	1.35
Region (South East)				
North East (North in 1994)	-	4.14	1.17	4.6~
Yorkshire & Humberside	-	1.17	0.34~	0.6

Table A8.2 (contd.): Single-level Logistic Regression (Reduced) Models of Theft from the Person and Robbery over Demographic, Routine Activity, Area and Incident Characteristics across Selected BCS Sweeps

CHARACTERISTICS	1996	01/02	02/03	10/11
North West	-	0.62	0.86	0.56
East Midlands	-	1.06	0.9	1.62
West Midlands	-	0.89	0.93	1.14
East (East Anglia in 1994)	-	2.87	0.69	0.9
London (Greater London in 1994)	-	0.67	0.67	0.84
South West	-	4.96*	0.35*	0.5
Wales	-	1.29	0.34	1.22
Age	0.98~	-	0.99	0.98*
Type of incident (Single)				
Series	-	-	1.96	-
Quarter in which incident happened (October-December)				
January - March	0.57	-	-	-
April - June	0.48*	-	-	-
July - September	0.68	-	-	-
Force, violence or threats used (Force or violence)				
Threat	3.6*	1.7	4.24#	-
No force, violence or threat	2.61#	2.42~	1.46	-
Happen within 15 minutes of this area? (No)				
In this area	-	-	0.63*	-
Time of day (Dark)				
Daylight	-	-	-	0.59*
Dawn/dusk	-	-	-	0.72
Aware of incident happening (Aware)				
Not aware	0.1#	0.03#	0.06#	0.04#
Location (Elsewhere – including other street)				
At home/outside home/place of work	-	1.43	-	0.34~
Travelling	-	1.78	-	0.97
At place of public entertainment	-	3.03	-	0.67
Pub/bar/working men's club/dancehall/disco	-	0.09	-	0.52
Other public or commercial location	-	1.28	-	0.84
Contact with offender? (Yes, contact)				
No contact	0.39#	0.25#	0.29#	0.37~
When victimised? (Weekend)				
Weekday	-	-	-	-
What doing at time of offence? (Travelling)				
At work/working/at school	0.45	0.54	0.43*	0.57
Shopping	0.74	0.81	0.47~	1.94
Leisure activities	0.67	0.46*	0.41#	0.48*

Table A8.2 (contd.): Single-level Logistic Regression (Reduced) Models of Theft from the Person and Robbery over Demographic, Routine Activity, Area and Incident Characteristics across Selected BCS Sweeps

CHARACTERISTICS	1996	01/02	02/03	10/11
Other	0.44	1.24	0.77	0.23~
Weapon used? (Weapon used)				
No weapon/no info re: offender/don't know	-	-	3.15#	3.38#
Repeat victim? (Not a repeat victim)				
Repeat victim	NA	-	0.17~	3.79*

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

- did not enter the model

Table A8.3: Estimated Percentage Change in the Odds of an Attempted Theft from the Person or Robbery Victimisation for Selected BCS Sweeps+

CHARACTERISTICS	1996	01/02	02/03	10/11
	100*(EXP(b)-1)			
Sex (Female)				
Male	40.07	1.71	35.26	109.38~
Number of children (No children)				
One Child	-69.88~	-55.25	-14.44	-45.01
Two or More Children	-64.12*	-49.19	-28.53	-27.17
Social Class of HOH/HRP (Routine Occupations)				
Professional	14.68	29.82	33.91	450.69#
Intermediate Occupations	-15.38	378.75#	-45.28	221.56#
Never worked/Not classified	56.83	111.49	17.82	-20.86
Highest Qualification (Secondary (Upper))				
Higher/further educ.(inc. degree and teaching qual.)	-41.49	546.24	-56.7*	-24.65
Secondary (lower) – GCSE/O Level/CSE/SCE	-49.49	97.78	-38.55	-23.05
Trade Apprenticeship	NA	4747.27#	-56.31	-72.72
Other Qualifications	-36.87	1632.24#	-36.05	-50.34
No Qualifications	-55.47	169.12	-30.72	-25.62
Ethnic Group (White)				
Black	-85.47*	-47.85	-26.73	-82.43~
Asian/Mixed/Other	-47.17	34.18	-29.04	-51.95
Household Income (£10,000-£19,999)				
£4,999 and under	-57.77	30.6	-39.41	-38.8
£5,000-£9,999	-28.11	-22.04	65.37	-9.15
£20,000-£29,999	-42.71	52.65	139.17*	-43.62
£30,000-£49,999	-54.39	62.42	-14.79	-35.92
£50,000 or more		-16.14	-77.24#	-47.53

Table A8.3 (contd.): Estimated Percentage Change in the Odds of an Attempted Theft from the Person or Robbery Victimisation for Selected BCS Sweeps+

CHARACTERISTICS	1996	01/02	02/03	10/11
Refused	55.43	-25.84	-7.23	28.53
Don't know	-49.08	-49.84	-55.47	22.26
Illness or Disability (No disability)				
Disability/long-standing illness	28.4	36.75	-2.57	-1.69
Marital Status (Married/cohabiting)				
Single	-54.8	14.8	-56.96*	-67.73~
Separated/Divorced	26.24	-71.58*	-45.12	-28.68
Widowed	-44.95	-69.52	19.48	-30.02
Employment status (Paid work)				
Waiting or looking to take new job	-89.1~	58.57	-60.98	5.65
Temp. sick or injured/long-term sick or disabled	296.3	150.43	-24.12	111.7
Student (full-time)	48.59	1.51	-10.24	24.86
Retired from paid work	46.52	50.08	-11.66	-10.86
Looking after home/family	122.11	53.42	3.36	66.7
Other/Something else	20.56	18.18	-71.35	-78.45
Tenure (Owners)				
Social rented sector	14.34	66.53	70.23	24.48
Private rented sector	-52.57	-44.01	39.1	47.26
General Health (Good)				
Very Good	-44.62	-28.18	-40.37	53.88
Fair	15.6	-34.03	8.98	12.86
Bad	31.78	-38.61	-59.79	88.89
Very Bad	-14.02	-75.04	-84.89*	-89.82*
Hours Away from Home (Weekday) (3-5 hours)				
Under 1 hour	-87.06~	18.89	-26.21	-42.36
1-3 hours	71.43	161.17	2.94	-19.27
5-7 hours	103.81	-54.11	-17.72	55.58
7+ hours	18.18	29.69	11.96	43.62
Visits to Pub in Last Month (No visits)				
1-3 times	32.45	-4.88	68.71	-31.89
4-8 times		181.23*	43.33	-2.66
More than 9 times		394.81*	134.67*	57.93
Visits to Club in Last Month (No visits)				
1-3 times	NA	-30.02	-24.87	-19.59
4-8 times		-57.64	-49.69	-86.25~
More than 9 times		-24.8	76.65	-70.8
No. of Cars Owned/Used Last Year? (No car)				
1 car	104.42	112.34	101.98~	-20.39
2 cars	40.35	-27.53	433.35#	-2.37
3+ cars	-64.97	106.89	347.72~	105.03

Table A8.3 (contd.): Estimated Percentage Change in the Odds of an Attempted Theft from the Person or Robbery Victimisation for Selected BCS Sweeps+

CHARACTERISTICS	1996	01/02	02/03	10/11
Anyone in Household Owned a Bicycle? (No bicycle)				
Own a bike	52.5	108.97	-50.49~	-19.27
Area Type (Rural)				
Inner City	-53.37	-52.62	201.02~	208.95*
Urban	-75.17~	-49.39	116.19*	59.84
Region (South East)				
North East (North in 1996)	8.87	571.94	17.35	307.96*
Yorkshire & Humberside	57.46	21.65	-68.81~	-51.37
North West	289.23	-47.01	-16.72	-61.17
East Midlands	5.23	23.49	-35.08	87.95
West Midlands	262.55	46.23	-20.23	10.19
East (East Anglia in 1996)	18.89	477.77*	-37.81	-4.11
London	122.33	-25.1	-35.92	-20.23
South West	98.58	1109.75~	-70.21*	-58.98
Wales	72.81	108.55	-65.77	30.6
Age	-2.57	-2.47	-1.09	-2.18
Type of incident (Single)				
Series	-1.09	-49.54	135.14*	140.37
Quarter in which incident happened (October-December)				
January - March	-46.1	144.00	-9.61	6.93
April - June	-64.97~	4.81	-21.02	-18.37
July - September	-57.09*	88.7	-25.92	-16.97
Force, violence or threats used (Force or violence)				
Threat	393.82*	33.24	370.21#	127.73
No force, violence or threat	188.06~	188.06*	83.68*	71.43
Happen within 15 minutes of this area? (No)				
In this area	-35.01	4.19	-49.59~	-18.7
Time of day (Dark)				
Daylight	77.89	4.5	18.89	-49.29*
Dawn/dusk	193.0	-25.25	117.06	-38.86
Aware of incident happening (Aware)				
Not aware	-94.34#	-98.32#	-94.63#	-97.45#
Location (Elsewhere – including other street)				
At home/outside home/place of work	-34.43	106.06	78.07	-66.45*
Travelling	-11.49	106.27	-41.43	-17.47
At place of public entertainment	-87.39	339.73*	-14.19	-41.43
Pub/bar/working men's club/dancehall/disco	-	-92.09	-65.94	-46.37
Other public or commercial location	87.39	23.37	-23.66	-22.59

Table A8.3 (contd.): Estimated Percentage Change in the Odds of an Attempted Theft from the Person or Robbery Victimisation for Selected BCS Sweeps+

CHARACTERISTICS	1996	01/02	02/03	10/11
Contact with offender? (Yes, contact)				
No contact	-79.4#	-81.51#	-70.74#	-68.05#
When victimised? (Weekend)				
Weekday	19.96	10.85	14.8	66.36
What doing at time of offence? (Travelling)				
At work/working/at school	-74.69	-63.76	-66.91*	-48.26
Shopping	-60.47	-49.44	-53.33*	113.83
Leisure activities	-40.31	-70.95~	-46.79	-56.31*
Other	-63.8	13.77	7.9	-73.39*
Weapon used? (Weapon used)				
No weapon/no info re: offender/don't know	3.56	45.94	239.74#	268.77~
Repeat victim? (Not a repeat victim)				
Repeat victim	NA	184.06	-84.24~	370.21~

*0.05 < p-value ≤ 0.10; ~0.01 < p-value ≤ 0.05; #p-value ≤ 0.01

- did not enter the model.

+ Estimates taken from saturated logistic regression models of theft from the person and robbery.

Chapter 9 – Theory and Policy Implications

This research has explored both the trends in, and general characteristics of, theft from the person and robbery victimisation over time. It was proposed that in order to make inferences about *why* there have been particularly striking international falls in crime, it was first necessary to develop an in-depth understanding of the nature of specific crime types over time. It is hoped that in identifying risk factors associated with theft from the person and robbery over time this informs subsequent theories regarding the fall in crime, as well as broader policy and local practices to reduce crime (Hough *et al.*, 2007). Understanding the nature and extent of particular crimes can be a powerful tool in the armoury of crime prevention. Although there has been a reduction in the number of single victims of theft and robbery in England and Wales since the mid-1990s, these crimes have experienced the smallest reductions of all crimes recorded by the BCS. Theft and robbery are incidents which capture the headlines and public imagination. There have also been fluctuations in the numbers of thefts and robberies in recent years with the theft of particular items such as mobile phones on the increase. This sensitivity to change and the wider social implications associated with even relatively minor increases in crime emphasise the importance of this kind of research, although the challenge "...from a policy standpoint is to identify those factors that...are amenable to manipulation" (Rosenfeld and Messner, 2012: 221).

There are a number of theoretical contributions, policy recommendations and methodological suggestions which have come to light from this research. As Fleisher (1995: 240) suggests, attempting to alter an offender's criminal disposition is akin to telling a law-abiding individual to: "relinquish his history, companions, thoughts, feelings, and fears, and replace them with [something] else". In addition, the focus of this research has largely been on victim characteristics and the environments in which these incidents occur. From an environmental perspective, the focus is on describing and understanding particular crime patterns in order to provide practical solutions (Wortley and Mazzerolle, 2008). Therefore, suggestions are predominantly based on altering the 'near causes' of crime. They are divided into four overarching sections: theoretical contributions, policy implications, methodological suggestions and recommendations for future research.

9.1 Theoretical Contributions

This research forms part of a wider 'crime drop' research agenda (see Section 1.1). Therefore, one of the main objectives of this thesis was to make an original contribution to existing crime drop literature and provide a platform for further research. This objective led to the formation of hypothesis five, which stated:

Changes in target suitability hold the greatest explanatory power in relation to the nature and composition of theft from the person and robbery trends over time.

In order to accept or reject the above hypothesis, characteristics of the victim, incident and goods stolen between 1994 and 2010/11 were analysed. Informed by this, the author proposes the most appropriate means of explaining the drop in these crimes is not through a 'single-factor explanation' but through the use of a multi-factor model. This model comprises four key elements which relate to: repeat victimisation; target suitability; debut crimes; and emerging crime forms.

9.1.1 Repeat Victimisation

Analysis of the composition of theft from the person and robbery unearthed a number of fascinating findings. Offences of theft from the person and robbery have declined since 1996. The drop is much shallower, particularly for theft from the person, than that found for other volume crime types and is largely comprised of a reduction in single, 'one-off' victims. Previous research and a large body of literature concerning repeat victimisation document that the falls seen for other crime types are, in part, driven by a reduction in repeat victimisation (Thorpe, 2007; Nicholas *et al*., 2007; Farrell 2005). It appears theft from the person in particular has bucked this general trend in that it is driven far more by changes in the prevalence of single incidents than by a change in the number of repeat victims (Hope, 2007a). Interestingly, the BCS documents a larger decrease in robbery offences since 1995 than that found for theft from the person (27 per cent compared to 17 per cent). One reason for this may be that robbery offences are more concentrated and prone to repeat (see Chapter 5) thus suggesting a reduction in the number of repeat victims may have played some, albeit still small, role in the drop in robbery.

This leads the author to question why the mechanisms through which other crimes have declined, i.e. levels of repeat victimisation, do not appear to apply quite so

markedly to theft and robbery. There are three suggestions as to why this might be. Firstly, and perhaps most importantly, the level of repeat victimisation found for theft from the person and robbery offences has been consistently low over time (see Section 5.5). These are crimes which do not appear to disproportionately affect the same victim. Therefore, measures designed to reduce the likelihood of a repeat victimisation are likely to have much less of an impact on the overarching theft trend and may explain why the drop has been much shallower, particularly with regard to theft from the person. It may be that increased attention to repeat victimisation combined with a willingness to invest in security measures after being victimised has led to the greatest reductions in crime for other crime types. Secondly, the application of crime prevention and security to crimes against the person, such as theft and robbery, is less clear cut than for vehicles and households where locks, bolts and alarms are routinely employed. Personal security is often focused upon making changes to your routine or behaviour, such as avoiding a particular area or not walking alone when it is dark. Thirdly, it may be that there is a much longer time period between repeat incidents of theft from the person and robbery, therefore repeat victimisation isn't captured within the one year BCS reference period.

Van Dijk and Vollaard (2012) highlight the important role of opportunity and victim precautions in determining crime trends. Security measures are all-too-often adopted in *response* to a victimisation (ibid). This may help explain why the drop in repeat victimisation appears to have had such an impact (Thorpe, 2007). Not investing in security precautions is somewhat understandable if you have not been a victim of crime:

> ...procrastination is tempting when it comes to victim precaution. The costs are certain and immediate; the benefits incurred with some chance in the future. Peculiarly, most people may never find out whether the precautionary measures were worth taking (van Dijk and Vollaard, 2012: 254).

These findings highlight the important role of repeat victimisation in the crime drop. It is suggested that a reduction in levels of repeat victimisation has driven steeper falls in those crime types where a large number of offences disproportionately affect the same victim. It is hypothesised that this fall in repeat victimisation has been

facilitated by the adoption of increased levels of protection and crime prevention measures, a point very much in agreement with Farrell *et al*.'s (2008) 'security hypothesis'. The increased attention afforded to security, raised public awareness and knowledge regarding the ability to protect your vehicle or household from crime may have also had a knock-on effect on those who have not been a victim of crime. However, remarkably little attention has been paid to the use and effectiveness of personal security measures, the role of victim precautions and what triggers this investment in security. Ultimately, this may have contributed to a lack of market-driven incentive and pressure on industry to adopt security measures at the design and manufacture stages of certain goods. This would form a particularly interesting avenue for future research.

9.1.2 Target Suitability

So far, we have highlighted the role of repeat victimisation in facilitating crime falls. The next element of the multi-factor model concerns target suitability. Chapter 6 established that the overarching drop in theft from the person and robbery is comprised of two underlying trends: one which mirrors the more general decreases in crime, and one which reflects increased theft due to the greater availability of new, valuable and portable electronic goods that are attractive to thieves, including mobile phones. This, in the author's opinion, is a reflection of target suitability, defined in terms of accessibility and desirability, which ultimately influences levels of criminal opportunity. It is suggested that the suitability of particular stolen goods has increased for some products and declined for others.

Theft is concentrated on a far smaller range of items – typically the items we carry on our person – when compared to other crime types. Homes and vehicles offer a wider range of items (see Table A6.3). Therefore, the goods which are stolen through theft and robbery are very susceptible to small changes in consumer demand and prices on the legitimate market. The manufacture of new, inexpensive, increasingly lightweight products has transformed the consumer goods market (Felson, 2012). This is highlighted by the fact that the theft of mobile phones has increased dramatically over the period of the crime drop. A reduction in the suitability of other items carried on our person, i.e. cash, cheque books and documents has contributed to the overall decline. Without the introduction, and subsequent desirability, of mobile phone handsets theft trends are likely to have looked much different.

The data analysed here shows the proportion of theft and robbery incidents where a mobile phone was stolen declined from 2004. More recent BCS data shows a rather large increase from 2011/12 (ONS, 2013b). This may be a reflection of the growing popularity and increasing ownership of Smartphones. These devices may have renewed interest in the mobile phone market (both legitimate and stolen) and have potentially stalled the market saturation that appeared to be setting in prior to 2011. Market saturation for mobile phone handsets may not be likely anytime in the near future due to regular improvements in design, software updates and, ultimately the heavy reliance upon this technology in our everyday lives. These items seem destined to remain in the mass market and growth stages, at least for the foreseeable future. This emphasises the importance of crime prevention, particularly in relation to these devices (see Section 9.2.1).

9.1.3 Debut Crimes and Emerging Crime Forms

It is hypothesised that repeat victimisation and target suitability are key contributors to the crime drop. Two further factors may have plausibly had an impact upon theft from the person and robbery, namely the 'debut crime' hypothesis (Farrell *et al.*, 2011b) and emerging crime forms. These hypotheses are not directly tested here due to a lack of available data; hence discussion is kept relatively short.

As previously discussed, the application of security to theft and robbery is much less clear cut than for offences of residential burglary and vehicle theft. The 'debut crime' hypothesis is intended as a means of applying the overarching 'security hypothesis' to crimes where the impact of changes in the quantity and quality of security over the period of the crime drop is not quite so obvious. The debut crime hypothesis states that increases in household and vehicle security have reduced the ease with which criminals can commit these crimes which results in a diversion from the criminal career path (Farrell *et al.*, 2011b).

By the same token, increases in vehicle security, and thus reduced opportunities to commit this crime, may have led to a higher concentration of offenders concentrating upon non-vehicle theft and robbery offences. As continued 'strategic offences' (Svensson, 2002) combined with a seeming increase in the number of suitable targets, this may explain the shallower drop in theft and robbery over time when compared to other crime types. The application of the 'debut crime' hypothesis to

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theft and robbery is therefore somewhat questionable but it is a worthwhile avenue to explore further. Such a hypothesis is difficult to test, although interviews with convicted offenders may prove a fruitful line of enquiry in establishing motives and offence decisions (Miller, 1998; Wright *et al.*, 2006; Brookman *et al.*, 2007).

Increases in the number of offenders committing for example, cybercrime offences, may not be readily encapsulated by official statistics. Emerging crime forms which are not currently captured by the BCS may be masking a general increase in crime. 'New' crimes, such as e-crime, are not robustly documented over the period of the crime drop thus it is nigh on impossible to compare trends over this period. It may also be that variations *within* particular crime types are taking place. This research has highlighted that this is entirely plausible. A lack of analysis of long-term trends in the type of product stolen may be masking changes in target selection and, as such, warrants further attention.

With regard to the crime drop, it is the contention of the author that the basic premises of opportunity-related theory apply to theft from the person and robbery in that the number and frequency of criminal opportunities have altered, driven by changes in the availability and demand for particular consumer goods. In addition, falling levels of repeat victimisation, largely due to the increased adoption of security measures, are proposed as key contributors to the overarching drop in crime. Other factors, including the 'debut crime' hypothesis and emerging crime forms may have had an impact on theft and robbery trends, although this influence is felt to be much smaller and requires further empirical testing. The proposed multi-factor model passes both the cross-transferability test and 'phone and e-crime test' in that these changes in target suitability happened across a number of Western countries experiencing similar falls in crime.

9.2 Policy Implications

The main research aim was to assist in the development of a more comprehensive understanding of theft from the person and robbery victimisation. From this, it was hoped the research findings could help inform broader policy initiatives. This evidence may help cost-effectively allocate resources and encourage more proactive crime reduction practice. It also emphasises the importance of a continuing focus on repeat victimisation. By analysing the trends in theft from the person and robbery

over time, the level of risk and threat has been established which assists the assessment of what constitutes an appropriate response in terms of resources. This may ultimately lead to fewer victims and a reduction in the costs associated with crime – especially those relating to health care provision, policing and the criminal justice system. Discussion of policy implications is split into three policy themes: stolen goods; victims; and situational crime prevention.

9.2.1 Stolen Goods Policy

Sutton *et al.* (2001) proposes the main mechanism by which intervention in the stolen goods market reduces crime is through the Market Reduction Approach (MRA). This relies upon instilling a message amongst thieves that engaging in the stolen goods market is risky. At the same time this should be matched by actual increased risks in buying, selling and dealing stolen goods for all involved. This could be through the use of local policies, sanctions, legal enforcement or stricter regulation of second-hand dealers. In order to be successful, the MRA requires routine and systematic gathering of detailed information about stolen goods markets and how they operate. These markets will differ across localities, thus the collection of intelligence and knowledge of these local outlets by Police Forces and local partners should be encouraged.

In addition to gathering evidence of the outlets through which stolen goods are sold, analysis of the *type* of goods stolen over time allows us not only to see which items *were* stolen but also anticipate which may be stolen in future. This form of horizon scanning can be incredibly useful in the stemming of potential crime harvests. It moves away from the all too familiar innovation – crime consequence – response tradition (Pease, 1997). With regard to theft from the person and robbery, policy may most effectively focus on a relatively small number of products – those that are routinely carried on our person. Efforts to prevent theft can be concentrated upon these products in order to establish ownership and deny the benefits of their theft (Clarke, 1999). Regular evaluations of the goods stolen through theft and robbery should therefore become the norm in order to stem the theft of particular desirable items. Resources and policy must be focused upon "getting the grease to the squeak" (Hough and Tilley, 1998). In this instance the squeak being those items carried on the person and identified as vulnerable to theft.

Between 2004 and 2010 the proportion of incidents where a mobile phone was stolen was in decline. This may have been suggestive of a waning or saturation in the market for mobile phones or their (albeit slowly) increasing securitisation. It may also be suggestive of victims becoming more astute to their crime risks and increased awareness regarding the responsible and safe usage of a handset. However, latest BCS figures document an upsurge in the theft of these items (ONS, 2013b). This may have been influenced by the popularity and availability of Smartphone devices and suggests saturation in the market for stolen mobile phones has not yet been reached (a sentiment echoed by Wellsmith and Burrell (2005)).

These findings reinforce the importance of the influence of the legitimate market on theft trends. The advent of new products and the introduction of upgrades into the marketplace influence subsequent theft levels, the suitability of a particular target and demand on the stolen goods market. To offset this, pressure must be placed on the wider mobile phone industry to 'design out' crime from handsets at the earliest possible stage, in order that the default becomes "...secure, unobtrusive and liberating" (Farrell, 2010: 45). The ultimate aim is to render the item 'worthless' if not in the hands of the legitimate owner. In addition, the crime prevention attributes of the item must not be obtrusive or an inconvenience to its rightful owner during its everyday use. Ultimately, this will deny the offender the benefits of stealing the item or device and reduce the level of harm, both financially and psychologically, to the victim. It may also make the offender 'think twice' about stealing the item in the first place.

It is important to note that progress has been made – the mobile phone industry should be praised for adopting a number of built-in security measures such as Touch ID and GPS tracking applications (see below). It may be that further securitisation, or making security the default, is difficult in practice as it currently seems to lack a financial, consumer-driven incentive for manufacturers. Yet fostering better working relationships and compiling some form of working agreement between Criminologists and the wider technology industry would be a good place to start. The introduction of legislation to mandate the introduction of security into new, desirable products is, of course, an option, but would represent somewhat of a last resort.

Increased publicity regarding anti-theft technology, such as 'Find my iPhone' and immobilise.com are leading some to suggest we are moving "towards an unstealable object" (BBC News, 10th July 2012). This widely publicised phone application utilises GPS technology, both in reducing the stock of potential offenders (making them 'think twice') or denying them the benefits associated with retaining the item and reducing harm to victims by enabling the recovery of their property. Apple has also installed a number of anti-theft measures in their latest generation of handsets (including Touch ID – a fingerprint scanner). Sadly, these innovations come after an apparent "epidemic of Smartphone thefts" (New York Times, 9th April 2012). Much of this technology also still requires a user to activate it. Embracing innovative, aesthetically pleasing design and new (default) technology to prevent theft must become a primary aim in order to stem future theft levels.

The introduction of the Central Equipment Identity Register (CEIR) in 2002 is likely to have had some impact on trends in mobile phone theft. Blacklisted handsets will no longer work on UK networks and the Mobile Telephones (Reprogramming) Act 2002 made changing the identity of a handset illegal. Unfortunately, these enforcements may have had unintended consequences in that it may have facilitated the shipping and resale of mobile phone handsets overseas where blacklisted handsets will still function. This emphasises the importance of international cooperation in crime prevention strategies such as this.

Policy recommendations with regard to the remaining 'hot products' – cash, purses and wallets and credit/debit cards – must account for wider societal changes in payment methods. There has been a general decline in the use of cash and cheques to pay for items and an increase in the use of new forms of payment. With the advent of 'contactless payments' using a mobile phone and the increasing popularity of debit cards one anticipates this will continue to play a role in future theft trends. Criminologists, Police and local partners should work closely with the financial sector, retail outlets and those responsible for the design and manufacturing of these items, in order to offset or reduce the potential risk.

As a clear and often overlooked target (perhaps because its value is often relatively unknown and usually dependent upon its contents) it seems sensible to call for more

robust crime prevention measures in relation to purses, wallets and bags. A particularly inspiring example comes from the Design Against Crime Research Centre (DACRC). 'In the Bag' is a free online resource aimed at designers which promotes 'anti-crime thinking' in the design of items to help individuals keep safe whilst out in public. One particular example is the 'Karrysafe bag' (Design Council, 2010) which is made from material resistant to abrasion with a built-in alarm. Designers are encouraged to account for common offender tactics and use their creative skills in the formation of 'socially responsive', aesthetically pleasing products to assist in the 'fight' against crime. In embracing innovative design and new technology it may be possible to head off potential crime 'epidemics'. Increased attention should be paid to fostering these innovative design skills within schools and Universities. This also represents a viable call for inter-disciplinary working, particularly between Design Schools and Social Science Departments.

If such measures were successful, some may argue that there will be a displacement to other products. However, thieves appear to concentrate upon a relatively small number of items and in relation to theft from the person and robbery these also happen to be the items that are routinely carried on our person. It may therefore be possible to protect these items against theft and avoid displacement to other products on our person as the likelihood is that an individual is not carrying anything else. There is a danger that increased levels of violence may be employed by the offender to obtain items as a result. For example, the use of a fingerprint scanner to unlock mobile phones has prompted fears of fingers being cut off in an attempt to outsmart the technology (Digital Spy, 17th September 2013). Although this may be somewhat extreme, the threat of increased violence is a very real threat which must be considered in all policy and design recommendations.

9.2.2 Potential Victim Policy

From a practical standpoint, analysis of the characteristics of victims of theft from the person and robbery may be most useful in the provision of a general, over time picture which can then inform local practice. For example, if a particular Police Force witnesses an increase in theft or robbery in their area or towards certain individuals they are likely to want to establish if this is unique to their area or whether this is part of a wider national trend. This kind of information is not always readily available, particularly over such an extensive time period and at this level of detail.

There are a number of crime prevention policy areas where knowing the characteristics of victims could be fruitfully utilised, in particular publicity campaigns and targeted advice. There are three main forms of crime prevention campaign, the first of which attempt to educate potential victims regarding self-protection, the second focus on deterring offenders by warning them of the potential consequences of offending and thirdly those that exist to disseminate a message to the wider public, such as changes in legislation (Barthe, 2004). These methods are heavily underpinned by rational choice theory in that they aim to influence decision-making processes.

Victim-focused campaigns have had varying success as the message often doesn't reach its intended target (van Dijk and Steinmetz, 1980; Sacco and Silverman, 1982; Wortley *et al.*, 1998). However, offender-oriented campaigns have often had more success, particularly those which advertise the increased likelihood of arrest (Laycock, 1991). The most effective publicity campaigns contain a clearly defined message targeted toward a very specific audience in a particular geographic area (Johnson and Bowers, 2003; Barthe, 2004). In sum, the most successful campaigns contain "...information that the police or other agencies are taking action of specific kinds in circumscribed places" (Smith et al., 2002: 79). Such campaigns not only have the potential to reduce crime and the fear of crime but can also increase confidence in the Police and local partnerships. There may also be a number of anticipatory benefits (Johnson and Bowers, 2003) where reductions in crime occur prior to the intervention.

Targeted advice may also be provided to potential victims of theft from the person and robbery. It is important that any such advice is given sensitively in order to balance evidence-based policing with an avoidance of scaremongering or targeting particular individuals or lifestyles and causing unnecessary distress. It is also important to remain cautious of the fact that some individuals may see others being treated differently and receiving preferential treatment or assistance as perceived injustice (Tseloni and Pease, 2010).

In order to identify particular individuals who may benefit from advice, it would be beneficial to first carry out a pilot study in a particular area utilising police recorded crime statistics in the same manner as shown here (subject to the level of detail in the available data). It is vital to gain a detailed understanding of the local problem (Tilley *et al.*, 2004). A pilot study acknowledges that areas are unique and the findings presented here may not be reflected in local data. This would also establish if similar patterns were being witnessed at a local level and reinforce findings. Ultimately, the need to focus on identifying and communicating with 'potential' victims and offenders is paramount. In the interests of transparency and improving services, it may also be useful in establishing just what steps are being taken to protect the public and encourage a shift to more proactive policing in this respect. If individuals with similar characteristics have consistently been targeted over time then it would be helpful to evaluate the steps being taken to protect such people and move toward an understanding of *why* they are consistently targeted.

After a pilot study, and if findings were corroborated, one recommendation would be to carry out very specific publicity campaigns in the particular localities identified as higher risk. Resources could then be allocated and communication targeted toward the younger, female, unmarried population. Awareness of the demographic, lifestyle and area characteristics of those who face an increased number of victimisations means that targeted communication and strategies can be employed in the prevention of crime. Demographic characteristics also provide insight into the most appropriate and effective communication tools and strategies to be used, for example social media, leafleting or face-to-face. As demonstrated by previous research, generic advice to individuals to be mindful of protecting their valuables may go relatively unnoticed. Therefore campaigns should include reference to particular geographic areas or specific operations.

Crime prevention posters and advice in nightclubs and shopping centres, particularly in inner city and urban areas may be an effective strategy. With regards to nightclubs, providing a visible police presence at entrances and conducting ID scanning of all entrants may discourage offenders from entering and increase awareness amongst the general public. Confidence in policing and formal security may also be enhanced as a result. With regards to shopping centres, increasing the level of formal security

and surveillance in such establishments may reduce crime and the fear of crime. 'Naming and shaming' particular places which are theft or robbery hot spots could provide an incentive to employ crime reduction strategies. Paying attention to the reason why frequenting such environments appears to place individuals at an increased risk would be beneficial, for example the design, access, door and drink policies. Organising regular regional meetings, awareness raising events and a communications network for particular business sectors, particularly those in the retail and entertainment industry, may prove fruitful in that best practice and intelligence could be shared.

Use of threats, force, violence or a weapon decreased the likelihood of a 'failed' victimisation in the majority of sweeps analysed. From a policy perspective, this reinforces the importance of education, particularly of young children, with regard to the consequences of carrying weapons and the use of violence. Offender-focused publicity campaigns could highlight the potential cost of carrying a weapon in the hope of reducing the number utilised in robberies.

9.2.3 Situational Crime Prevention Policy

There were a number of findings in relation to the characteristics of the incident which could be utilised in future policy. The area in which an individual lives is clearly important and perhaps indicative of where they spend the majority of their leisure time. 'Other public or commercial locations' are clearly hot spots for theft and robbery. Incidents also occur most frequently in daylight whilst the victim is shopping or in transit. That incidents happen in daylight may be a reflection of shop or commercial opening hours. The criminogenic attributes of such environments would be a useful focus of further research. In the meantime, it may be that the design of a particular shopping centre or cinema facilitates crime and there lies potential to better re-design these areas to alter the "person-situation interaction" (Cornish, 1993). In addition, increased levels of surveillance, for example CCTV and highly visible policing, may be warranted in these areas due to the higher risk of victimisation. By altering the environment, the effort and risk involved in committing these offences is increased and potential rewards are reduced. Finally, targeted publicity campaigns (both offender- and victim-oriented) may be particularly effective in these locations.

In conclusion, the main policy recommendations revolve around: denying the benefits of particular gadgets to thieves; maintaining a watchful eye on legitimate market data; increasing the number of specific, area-based crime prevention publicity campaigns (targeted toward both potential victims and offenders); and enhancing the resilience of particular high-risk environments, be that through re-design or formal surveillance. Although most of the recommendations outlined here focus upon situational mechanisms to reduce crime, any future policy should also seek to incorporate criminal justice, social intervention and individual treatment strategies (Tilley *et al.*, 2004).

9.3 Methodological Suggestions

The BCS is an incredibly rich and reliable data source. However, as with most analysis of secondary data, there are a few methodological limitations which have somewhat restricted the analysis. The majority of suggestions presented herein relate to changes in BCS question wording or content. The author recognises that questionnaire space and analytic resources are already stretched but feels the suggested changes would make a valuable contribution to future research. The main recommendation concerns the level of detail collected regarding goods stolen. The rest of the discussion outlines a number of broader suggestions regarding additional questions or amendments.

9.3.1 Stolen Goods Detail

As previously mentioned, the coding categories assigned to the stolen goods question within the BCS are often very broad, e.g. 'mobile phone', 'clothing', 'jewellery', 'MP3 player/personal organiser'. The level of analysis that can be conducted is therefore somewhat limited. This is particularly important in relation to mobile phones. No information has been consistently collected concerning the make and model of phone stolen. This data would be incredibly useful in that it would allow a direct comparison of market data with the proportion of incidents where that item was stolen in a particular six-month period. This would enable us to establish if the theft of a particular item was proportionate to their share of sales. It would also potentially be of benefit in anticipating future trends before the introduction of new, desirable products on the legitimate market. In this sense, much more pressure could be placed on particular manufacturers to design-out crime (in much the same way as the Car Theft Index introduced in 1992 (Laycock, 2010)). In terms of future policy, if we are

to make more accurate predictions, there is a need for the collection of richer data concerning stolen goods.

9.3.2 Suggestions for Additional Questions

Data concerning the availability of household and vehicle security measures has been collected relatively consistently in the BCS since the early 1990s. This has led to a wealth of interesting research regarding security availability and its subsequent impact on crime (Farrell *et al.*, 2011a; Farrell *et al.* 2011b; Tseloni *et al.* 2010). The same cannot be said for personal security devices as this information has not been routinely collected across sweeps. If collected consistently, the impact of particular personal security devices, such as personal attack alarms, on theft and robbery victimisation could be modelled. These findings could then be used to inform decisions regarding future crime prevention policy after having established which, if any, devices are effective in the prevention of particular crime types.

Measurement of routine activities is currently restricted to a number of rather vague measures, such as number of visits to a pub in the last month and number of hours spent outside the home on an average weekday. These measures should be updated (whilst continuing to retain the original measures to allow continued comparison with older sweeps) to include more reliable and up-to-date measures of routine activities. These could include detail regarding the exact location of particular leisure activities, hours spent shopping per week (distinguishing between retail and food), alcohol consumption per week etc. The effect of these variables may have proved significant in more cases had they been available.

A number of studies have highlighted the strong role of prior victimisation on current victimisation risk both within and across crime types (Ellingworth *et al.*, 1997; Wittebrood and Nieuwbeerta, 2000; Hope *et al.*, 2001; Tseloni and Pease, 2003). It is thus vital to remain aware not only of the current risk, but also the potential 'life-course' of victimisation (Hope *et al.*, 2001: 613). Therefore, a new variable should be devised to measure prior victimisation including the year and crime suffered. This would assess whether an individual had been a victim of crime prior to the reference period and would allow researchers to establish if previous victimisation has an influence on current crime risk.

9.4 Recommendations for Future Research

Each component part of the research has generated further questions and avenues for future research. The most obvious would be to extend the analysis to other crime types, building up a comprehensive picture of victimisation in England and Wales since the early 1990s. This would also allow for the testing of the crime drop model outlined herein, particularly the concepts of repeat victimisation and target suitability. It is approximately three years since the data used in this project was collected thus it would also be beneficial to extend the analysis to utilise more recent sweeps of the survey. Comparison of goods stolen across crime types would be particularly useful in light of recent evidence of an increase in mobile phone theft. Crime specific analysis would hopefully foster crime specific prevention strategies.

The BCS sample, until 2009, was restricted to those aged 16 and above. Previous research suggests young people are often both victims and perpetrators of these crime types. Over one in five robberies are thought to involve victims under 17 targeted by offenders falling within the same age group (Tilley *et al.* 2004). Analysis of the BCS over 16 sample is therefore likely to underestimate the level of theft from the person and robbery in England and Wales. Future research could extend this analysis to the sample of ten to 15 year olds. It could then be established if the victims, goods stolen and circumstances in which they are stolen changes for this age group.

Where the data is available, the effectiveness of personal security devices could be calculated in the form of Security Protection Factors (SPFs) (Farrell et al. 2011b; Tseloni et al. 2010). This would estimate the change in the odds of theft and robbery victimisation due to the availability of individual and combined personal security devices. This analysis could also be extended to include BCS data concerning the behavioural security precautions taken to reduce the likelihood of becoming a victim of crime, such as only using licensed cabs, taking self-defence classes etc. This would form an incredibly interesting area of future research and help more clearly establish the role of security in theft from the person and robbery during the crime drop.

Due to the marked local variations found in previous research, and the importance of area in Chapter 7, it may be beneficial to use multilevel models to analyse BCS data by

region (Lower Super Output Area) or obtain police recorded crime data for specific localities. Potential hotspots, for example ATMs and nightclubs could be mapped against incidents of theft and robbery. Although this will depend upon the level and accuracy of the information inputted within police systems. The testing of interaction effects may also prove a fruitful avenue of research as the effect of a particular variable may be conditional upon the area in which an individual resides (Sacco *et al.*, 1993; Lauritsen, 2001).

A particularly interesting avenue of research may lie in the influence of victimisation on general health. Analysis of the characteristics of victims (Chapter 7) repeatedly highlighted that bad or very bad general health had the significant effect of increasing incidence of theft from the person and robbery. This may be indicative of individuals in poorer health being more vulnerable or, perhaps more plausibly, it may be a reflection of the impact of victimisation on their general health. Unfortunately, the direction of causality in this case cannot be established but would form an interesting proposal for more research, particularly with regard to the impact of victimisation upon health. There is also data available regarding the financial value of items stolen, injuries sustained during the incident and fear of crime which could be explored in greater detail alongside these health indicators. This could be incorporated alongside interviews with offenders regarding their perceptions of vulnerability.

Acquisitive crime rates are highly correlated cross-nationally (Tseloni *et al.*, 2010). Another promising line of comparative research could therefore lie in extension of the analysis to international datasets to ascertain if similar patterns are seen further afield than England and Wales. Similar data on stolen goods is available from the National Crime Victimization Survey (NCVS) which covers the USA.

Future work could thus build on the current work by extending analysis to other crime types and samples, using multilevel models to incorporate area effects in more detail, explore the role of personal security devices, the impact of victimisation on general health and, finally, extend analysis to international datasets.

9.5 Summary

The main objective of this chapter has been to identify key findings which are amenable to policy recommendations and further testing. This has brought together

the analysis contained within Chapters 6 through 8 in order to make an original contribution both to the field of knowledge and broader policy initiatives.

With regard to the crime drop, a theoretical contribution is made in the form of a multi-factor model. This model is comprised of four elements deemed as influencing the falls in crime, namely: repeat victimisation; target suitability; 'debut crimes'; and emerging crime forms. Repeat victimisation and target suitability are proposed as key contributors to the overarching drop in crime. It is suggested that the 'debut crime' hypothesis and emerging crime forms may have also had an impact on theft and robbery trends, although this influence is seen to be much smaller and requires further empirical testing.

A number of policy recommendations have been made. These include, denying the benefits of particular items to thieves, routinely evaluating legitimate market data, increasing the number of specific, area-based crime prevention publicity campaigns, and enhancing the resilience of particular high-risk environments, be that through re-design or more formal surveillance. In addition, a wide range of potential avenues for future research have been identified. The methods and strategies employed in the current work could be extended to other crime types and samples, using multilevel models to incorporate area effects in more detail. The role of personal security devices in facilitating falls in crime would also make a valuable contribution to wider crime drop research. Finally, the analysis could be extended for use on international datasets. It is hoped this chapter highlights the potential scope and impact that this research could have beyond the thesis.

Chapter 10 – Conclusions

Summarising the main conclusions from nearly three and a half years of work is by no means an easy task. The primary aim of the thesis was to explore the nature of theft from the person and robbery of personal property in England and Wales over the period of the 'crime drop'. Fourteen sweeps of the BCS were employed (1994 to 2010/11) to discern if there are particular vulnerable consumer goods and victimisation risk factors associated with these crime types and, if any changes in their nature and composition coincided with the falls in crime. This endeavour was embarked upon in the hope that potential risk factors could be identified and studied over time to inform both subsequent theories regarding the crime drop and future crime prevention strategy. It is felt that, as a whole, this work constitutes the most in-depth analysis of these offence types than any previously available.

10.1 Summary of Findings

This research was guided by four research questions:

1. Can 'hot products' be identified in relation to theft from the person and robbery between 1994 and 2010/11? In addition, have these stolen goods changed over time?

2. Do particular demographic, area and lifestyle characteristics affect theft from the person and robbery incidence and have these characteristics changed over time? In other words, are there particular high-risk population subgroups?

3. Are there certain characteristics of an incident that render encounters with offenders more likely to fail, i.e. result in an attempted victimisation, as opposed to completed theft from the person and robbery? If so, have these remained consistent over time?

4. Can these elements help explain changes in theft from the person and robbery victimisation between 1994 and 2010/11?

With regard to question one, analysis of the proportion of incidents where particular goods were stolen over time allowed for the identification of a number of 'hot products' in relation to theft and robbery (Chapter 6). Two products, namely cash and purses/wallets were consistently the 'hottest' products over the period of the crime drop, although their dominance clearly diminished. By contrast, the theft of

credit/debit cards and mobile phones increased dramatically over this period. It was concluded that the overarching trend in theft from the person and robbery is therefore made up of two underlying trends: one which mirrors the more general decreases in crime, and one which reflects increased theft due to the greater availability of new, valuable and portable electronic goods that are attractive to thieves.

Question two explored the possibility that there are particular high-risk population subgroups in relation to theft and robbery. It was also interested to ascertain whether these high-risk groups had remained consistent over time. This involved utilising BCS data in order to model the number of victimisations experienced (theft and robbery incidence) against a set of demographic, lifestyle and area characteristics. Negative binomial regression techniques (Cameron and Trivedi, 1986) were used to model the entire distribution of crime in order to gain a clearer understanding of the *process* of victimisation. It was soon established that there are particular characteristics which consistently have a significant influence on theft from the person and robbery incidence over time, namely age, sex, marital status and general health. In general, victims of completed victimisations are predominantly young, single females. In addition, frequency of activity outside the home (in particular 'nightclub or disco' visits), housing tenure and car ownership/use also influenced incidence across BCS sweeps. Living in London or an inner city area significantly increased the predicted incidence of theft and robbery. These findings were very much in agreement with previous empirical research.

Chapter 8 analysed characteristics of theft from the person and robbery incidents. This involved using BCS incident data and binomial logit models to ascertain the change in likelihood of an attempted (as opposed to completed) victimisation by particular incident characteristics and environmental factors. It was concluded that theft from the person and robbery victimisation happens predominantly in daylight hours during the week. These crimes largely occur in commercial areas such as shops. In addition, weapon use, if the incident happened within a 15-minute radius of the victim's household, victimisation in 'other public or commercial locations' and whilst shopping or travelling were also found to have a significant effect. Threats, force/violence and awareness of the incident have a consistently significant effect, in

that they unsurprisingly reduce the likelihood of an attempted theft from the person and robbery.

With regard to the final research question, the analysis contained within Chapters 6 to 8 helped to formulate a multi-factor model regarding why theft and robbery have fallen since 1994. It is argued that the basic premises of opportunity-related theory apply to theft and robbery in that the number and frequency of criminal opportunities have altered, driven by changes in the availability and demand for particular consumer goods. In addition, a reduction in the number of repeat victims, largely due to the increased adoption of security measures, are proposed as key contributors to the overarching drop in crime. Other factors, including the 'debut crime' hypothesis and emerging crime forms may have had an impact on theft and robbery trends, although this influence is felt to be much smaller and requires further empirical testing. This multi-factor model accounts for varying offence trajectories across countries and crime types and passes the 'phone test'.

10.2 Recommendations

There are a number of recommendations which arise from this research, both in terms of policy and future research. The main policy recommendations focus upon: denying the benefits of particular gadgets to thieves; maintaining a watchful eye on legitimate market data; increasing the number of specific, area-based crime prevention publicity campaigns (targeted toward both potential victims and offenders); and enhancing the resilience of particular high-risk environments, be that through re-design or formal surveillance.

Future research should be undertaken to extend the analysis to other crime types, building up a much more comprehensive picture of victimisation in England and Wales since the early 1990s. This would also allow for the testing of the crime drop model outlined herein, particularly the concepts of repeat victimisation and target suitability. It is approximately three years since the data used in this project was collected thus it would also be beneficial to extend the analysis to utilise more recent sweeps of the survey. Other potential avenues for further research include, using multilevel models to incorporate area effects in more detail, exploring the role of personal security devices, establishing the impact of victimisation on general health and, finally, replicating the analysis with other international datasets.

10.3 Four Key Messages

In sum, there are four key messages to take away from this work. Firstly, contrary to other crime types, the drop in theft from the person and robbery victimisation is largely composed of a reduction in single victims. Repeat victimisation therefore appears to play less of a role in the drop in crime compared to other crime types where the reduction is largely comprised of repeat victims. This may also explain why the overall decline in theft and robbery victimisation is much shallower than that seen for other crimes.

Secondly, over the period of study the theft landscape has changed considerably in terms of the items stolen. The proliferation of lightweight electronic goods has undoubtedly contributed to this shift in the stolen goods landscape. Overarching theft and robbery trends are seemingly composed of two underlying trends: one which mirrors the more general decreases in crime, and one which reflects increased theft due to the greater availability of new, valuable and portable electronic goods, namely mobile phones. It is argued that the basic premises of opportunity-related theory apply to theft from the person and robbery in that the number and frequency of criminal opportunities may have altered, driven by changes in security in 'everyday environments' and the availability and demand for particular consumer goods. The evolution of 'hot products' has major implications for crime prevention policy. Knowledge of legitimate market trends and payment preferences is vital to the understanding of which items are targeted and why, in order to predict future crime harvests. The most effective prevention measures are seen to lie in establishing ownership and denying the benefits of theft. In this vein, much like the improvements in vehicle security, efforts should be fixed upon changing "...the default to be secure, unobtrusive and liberating" (Farrell, 2010: 45) *prior* to the introduction of new and desirable products to the market.

Thirdly, age, sex, marital status and general health consistently have a significant effect on theft from the person and robbery incidence over time. In particular, young, unmarried females experience an increase in the predicted mean number of victimisations across sweeps. In addition, frequency of activity outside the home, housing tenure, area of residence and car ownership/use also affect incidence across BCS sweeps. This is very much in agreement with findings from previous studies and serves to emphasise the importance of the characteristics of the victim. Efforts should

be placed upon both protecting these individuals and conducting further research to establish exactly why they are vulnerable targets.

Fourthly, the analysis of 'completed' crimes separately from those which are 'attempted' has proved a fruitful line of research. There were clear and significant differences in the predicted incidence of individuals suffering a completed victimisation or an attempt. A number of incident characteristics were also identified as increasing the likelihood of an attempted victimisation, for example if no force, violence or weapons were used. Attempted and completed victimisations are more often than not grouped together in analysis of this kind. This research has demonstrated that there are clear and important differences which warrant separate analysis.

10.4 Original Contribution

In the exploration of three core elements of theft from the person and robbery victimisation the thesis has achieved the main objectives set out in the introduction. It has reviewed existing literature on victimisation risk, the stolen goods market and the 'crime drop' and integrated (where appropriate) existing theory with present findings. In analysing the type of goods stolen over time it has highlighted the importance of marketplace dynamics in shaping overarching theft trends. In addition, it has explored which variables, both in terms of victim characteristics and the incident, are key determinants of theft and robbery victimisation. By combining literature on victimisation risk, the crime drop and stolen goods the thesis is able to explore each of these fields in detail and apply the relevant concepts to theft from the person and robbery. The work also makes a valuable contribution to the literature on the crime drop. Results from the analysis suggest the most appropriate means of explaining *why* crime, and theft and robbery in particular, has declined is through the use of a multi-factor model. The concepts of repeat victimisation and target suitability are deemed as the most important contributors to the drop in all crime.

As a whole, this thesis has made an original contribution to knowledge in its analysis of theft from the person and robbery in England and Wales over a 17-year period. The main contribution lies in the generation of knowledge regarding the demographic characteristics, lifestyles, consumer goods, environments and circumstances which appear to foster greater exposure to theft from the person and robbery victimisation

during this period. In sum, victimisation risk is contingent upon the exposure that arises in particular areas, for particular lifestyles, exacerbated by the ownership of certain desirable consumer goods. It is clear that offenders have an established "repository of crime targets" (Jacobs, 2010: 523). No other work (to the author's knowledge) has studied theft and robbery so comprehensively. Nor has previous research modelled the entire distribution of both completed and attempted victimisation. The time frame covered also allows the reader to explore changes over the entire period of the 'crime drop' and marks a departure from previous research.

10.5 Final Thoughts

It is hoped this work may reinforce the importance of crime victimisation research and highlight the potentially valuable role that the BCS can play in furthering this field of expertise and criminological theory at large. National surveys are incredibly useful tools for knowledge generation but ultimately they are designed to explore general features of a population (Maxfield *et al.*, 2007). In doing so, a wide range of issues can be analysed; the findings from which often enhance and inform both broader policy and local debate. For this reason, the BCS provides a fantastic starting point to robustly explore particular national issues and enable us to look at the bigger picture. It is hoped that in looking at the bigger picture of theft from the person and robbery victimisation, the impetus is provided to further unpick this complex phenomenon.

References

Aaltonen, M., Kivivuoru, J., Martikainen, P. and Sirén, R. (2012) 'Socioeconomic Differences in Violent Victimization: Exploring the Impact of Data Source and the Inclusivity of the Violence Concept', *European Journal of Criminology*, 9 (6), pp. 567-583.

Aebi, M.F. and Linde, A. (2010) 'Is There a Crime Drop in Western Europe?' *European Journal on Criminal Policy and Research*, 16, pp. 251-277.

Aebi, M.F. and Linde, A. (2012) 'Crime Trends in Western Europe according to Official Statistics from 1990 to 2007' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 37-75.

Apple Inc. (2013) 'iPhone 5s – Technical Specifications'. Available at: http://www.apple.com/uk/iphone-5s/specs/ Accessed on: 10th January 2014.

Arnold, R., Keane, C. and Baron, S. (2005) 'Assessing Risk of Victimization through Epidemiological Concepts: An Alternative Analytic Strategy Applied to Routine Activities Theory', *Canadian Review of Sociology and Anthropology*, 42: pp.345-364.

Arvanites, T. and DeFina, R. (2006) 'Business Cycles and Street Crime', *Criminology*, 44(1), pp. 139-164.

Bachman, R. and Paternoster, R. (2009) *Statistical Methods for Criminology and Criminal Justice*, 3rd Edition, New York: McGraw-Hill.

Barker, M., Geraghty, J., Webb, B. and Key T. (1993) 'The Prevention of Street Robbery', *Crime Prevention Unit Series Paper 44*, London: Home Office.

Barthe, E.P. (2004) 'Publicity and Car Crime Prevention' in Maxfield, M. and Clarke, R.V. (eds) *Understanding and Preventing Car Theft – Crime Prevention Studies, Volume 17*, New York: Criminal Justice Press, pp. 193-216.

BBC News, 5th January 2000, 'Mobile Phone Sales Surge'. Available at: http://news.bbc.co.uk/1/hi/business/591443.stm Accessed on: 14th January 2014.

BBC News, 26th May, 2005, 'iPods 'Fuelling Street Robbery'. Available at: http://news.bbc.co.uk/1/hi/england/london/4583327.stm Accessed on: 14th January 2014.

BBC News, 10th July 2012, 'Towards an Unstealable Object'. Available at: http://www.bbc.co.uk/news/magazine-18504424 Accessed on: 14th January 2014.

Beaujouan, E. and Bhrolcháin, M.N. (2011) 'Cohabitation and Marriage in Britain Since the 1970's', *Population Trends*, 145, pp. 35-59.

Bennett, R.R. (1991) 'Routine Activities: A Cross-National Assessment of a Criminological Perspective', *Social Forces*, 70(1): pp. 147-163.

Bennett, T. (1986) 'Situational Crime Prevention from the Offender's Perspective' in Heal, K. and Laycock, G.K. (eds) *Situational Crime Prevention: From Theory into Practice*, London: HMSO.

Bennett, T., Holloway, K. and Williams, T. (2001) *Drug Use and Offending: Summary Results from the First Year of the NEW-ADAM Research Programme*, London: Home Office.

Block, R.L., Felson, R. and Block, C.R. (1984) 'Crime Victimization Rates for Incumbents in 246 Occupations', *Sociology and Social Research*, 69(3), pp. 442-451.

Block, R.L. and Block, C.R. (1995) 'Space, Place, and Crime: Hot Spot Areas and Hot Places of Liquor-related Crime' in Eck, J.E. and Weisburd, D. (eds) *Crime and Place*, New York: Criminal Justice Press, pp. 145-184.

Blumstein, A. (2000) 'Some Recent Trends in US Violence' in Blumstein, A. and Wallman, J. (eds) *The Crime Drop in America*, New York: Cambridge University Press.

Blumstein, A. and Rosenfeld, R. (1998) 'Explaining Recent Trends in U.S. Homicide Rates', *Journal of Criminal Law and Criminology*, 88, pp. 1175-1216.

Blunkett, D. (2002) 'David Blunkett on the Spot', *Labour Party Conference Magazine*, London: Labour Party.

Brantingham, P.J. and Brantingham, P.L. (1991) 'Introduction to the 1991 Reissue: Notes on Environmental Criminology' in Brantingham, P. and Brantingham, P. (eds) *Environmental Criminology*, 2nd Edition, Illinois: Waveland Press, pp. 1-6.

Brantingham, P.L. and Brantingham, P.J. (1993) 'Environment, Routine, and Situation: Toward a Pattern Theory of Crime' in Clarke, R. and Felson, M. (eds) *Routine Activity and Rational Choice, Advances in Criminological Theory, Volume 5*, New Jersey: Transaction Publishers.

Britton, A., Kershaw, C., Osborne, S. and Smith, K. (2012) 'Underlying Patterns within the England and Wales Crime Drop' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 159-181.

Brookman, F., Mullins, C., Bennett, T. and Wright, R. (2007) 'Gender, Motivation and the Accomplishment of Street Robbery in the United Kingdom', *British Journal of Criminology*, 47: pp. 861-884.

Budd, T. (1999) 'Burglary of Domestic Dwellings: Findings from the British Crime Survey', *Home Office Research Bulletin, Issue 4/99* London: Home Office.

Burney, E. (1990) *Putting Street Crime in its Place*, London: Centre for Inner City Studies, Goldsmiths' College.

Bursik, J.J.R. and Grasmick, H. (1993) *Neighborhoods and Crime: the Dimensions of Effective Community Control*, New York: Lexington Books.

Cameron, C.A. and Trivedi, P.K. (1986) 'Econometric Models Based on Count Data: Comparisons and Applications of Some Estimators and Tests', *Journal of Applied Econometrics*, 1, pp. 29-54.

Cameron, C.A. and Trivedi, P.K. (1998) *Regression Analysis of Count Data*, Cambridge: Cambridge University Press.

Cantor, D. and Land, K.C. (1985) 'Unemployment and Crime Rates in the Post-World War II United States: A Theoretical and Empirical Analysis', *American Sociological Review*, 50, pp. 317-332.

Carrera, S. and Beaumont, J. (2010) *Social Trends: Income and Wealth*, Newport: ONS.

Chaplin, R., Flatley, J. and Smith, K. (2011) *Crime in England and Wales 2010/11: Findings from the British Crime Survey and Police Recorded Crime*, 2nd Edition, London: Home Office.

Chappell and Walsh (1974) 'Receiving Stolen Property: The Need for Systematic Inquiry into the Fencing Process', *Criminology*, 11: pp. 484-97.

Chenery, S., Ellingworth, D., Tseloni, A. and Pease, K. (1996) 'Crimes Which Repeat: Undigested Evidence from the British Crime Survey 1992', *International Journal of Risk, Security and Crime Prevention*, 1(3), pp. 207-216.

Clarke, R.V. (1980) '"Situational" Crime Prevention: Theory and Practice', *British Journal of Criminology*, 20(2), pp. 136-147.

Clarke, R.V. (1997) *Situational Crime Prevention: Successful Case Studies*, 2nd Edition, New York: Criminal Justice Press.

Clarke, R. V. (1999) 'Hot Products: Understanding, Anticipating and Reducing Demand for Stolen Goods', *Police Research Series Paper 112*. Policing and Reducing Crime Unit. Research Development and Statistics Directorate, London: Home Office.

Clarke, R.V. (2004) 'Technology, Criminology and Crime Science', *European Journal on Criminal Policy and Research*, 10: pp. 55-63.

Clarke, R.V. and Mayhew, P. (1980) *Designing Out Crime*, London: HM Stationery Office.

Clarke, R.V. and Eck, J. (2005) *Crime Analysis for Problem Solvers in 60 Small Steps*, Washington: United States Department of Justice.

Clarke, R.V. and Newman, G.R. (2006) *Outsmarting the Terrorists*, New York: Praeger Publishers.

Cohen, L.E. and Felson, M. (1979) 'Social Change and Crime Rates and Trends: A Routine Activity Approach', *American Sociological Review*, 44: pp.588–608.

Cohen, L.E. and Cantor, D. (1980) 'Determinants of Larceny – An Empirical and Theoretical Study', *Journal of Research in Crime and Delinquency*, 17 pp. 140-159.

Cohen, L.E. and Cantor, D. (1981) 'Residential Burglary in the United States: Life-Style and Demographic Factors Associated with the Probability of Victimization', *Journal of Research in Crime and Delinquency*, pp. 113-127.

Cohen, L.E., Kluegel, L.E. and Land, K.C. (1981) 'Social Inequality and Predatory Criminal Victimization: An Exposition and Test of a Formal Theory', *American Sociological Review*, 46: pp. 505-524.

Cohen, M., Rust, R.T., Steen, S. and Tidd, S.T. (2004) 'Willingness-to-Pay for Crime Control Programs', *Criminology*, 42(1), pp. 89-109.

Colquhoun, P. (1796) *A Treatise on the Police of the Metropolis*, London: Dilley.

Computer Networking and Telecommunications Research (2013). Available at: http://www.cntr.salford.ac.uk/comms/mobile.php Accessed on: 14th January 2014.

Cornish, D. (1993) 'Theories of Action in Criminology: Learning Theory and Rational Choice Approaches' in Clarke, R.V. and Felson, M. (eds) *Routine Activity and Rational Choice: Advances in Criminological Theory, Volume 5*, New Jersey: Transaction Press.

Cornish, D. & Clarke, R. (1986) *The Reasoning Criminal*, NY: Springer-Verlag.

Cornish, D. and Clarke, R.V. (2003) 'Opportunities, Precipitators and Criminal Decisions: a Reply to Wortley's Critique of Situational Crime Prevention' in M. J. Smith & D. Cornish (eds) *Theory for Practice in Situational Crime Prevention, Crime Prevention Studies, Volume 16*, New York: Criminal Justice Press.

Cozens, P.M., Saville, G. and Hillier, D. (2005) 'Crime Prevention Through Environmental Design (CPTED): a Review and Modern Bibliography', *Property Management*, 23(5), pp. 328-356.

Crowe, T. (1991) *Crime Prevention Through Environmental Design: Applications of Architectural Design and Space Management Concepts*, Massachusetts: Butterworth-Heinemann.

Curran, K., Dale, M., Edmunds, M., Hough, M., Millie, A. and Wagstaff, M. (2005) *Street Crime in London: Deterrence, Disruption and Displacement*, London: Government Office for London.

Design Council (2010) 'Karrysafe Bag'. Available at: http://www.designagainstcrime.com/projects/karrysafe/ Accessed on: 14th January 2014.

Detica (2011) *The Cost of Cybercrime*, London: Cabinet Office.

Digital Spy, 17th September 2013, 'iPhone 5S Touch ID Fingerprint Scanner 'Won't Work With Severed Finger''. Available at: http://www.digitalspy.co.uk/tech/news/a515953/iphone-5s-touch-id-fingerprint-scanner-wont-work-with-severed-finger.html Accessed on: 23rd January 2014.

Duggan, M. (2001) 'More Guns, More Crime', *Journal of Political Economy*, 85(4), pp. 741-788.

Eck, J.E. (1994) 'A General Model of the Geography of Illicit Retail Marketplaces' in Eck, J.E. and Weisburd, D. (eds) *Crime and Place, Crime Prevention Studies, Vol. 4*, New York: Criminal Justice Press.

Ekblom, P. (2005) 'Designing Products Against Crime', in Tilley, N. (ed) *Handbook of Crime Prevention and Community Safety*, Devon: Willan.

Ekblom, P. and Sidebottom, A. (2008) 'What Do You Mean, 'Is It Secure?' Redesigning Language to be Fit for the Task of Assessing the Security of Domestic and Personal Electronic Goods', *European Journal on Criminal Policy and Research*, 14, pp. 61-87.

Ellingworth, D., Farrell, G. and Pease, K. (1995) 'A Victim is a Victim is a Victim?' *British Journal of Criminology*, 55(3), pp. 360-365.

Ellingworth, D., Hope, T., Osborn, D. R., Trickett, A., and Pease, K. (1997) 'Prior Victimization and Crime Risk', *International Journal of Risk, Security and Crime Prevention*, 2, pp. 201-214.

Farrell, G. (2005) 'Progress and Prospects in the Prevention of Repeat Victimization' in Tilley, N. (ed) *Handbook of Crime Prevention and Community Safety*, Devon: Willan Publishing, pp143-170.

Farrell, G. (2010) 'Situational Crime Prevention and its Discontents: Rational Choice and Harm Reduction versus 'Cultural Criminology', *Journal of Social Policy and Administration*, 44 (1), pp.40-66.

Farrell, G. (2013) 'Five Tests for a Theory of the Crime Drop', *Crime Science*, 2(5), pp. 1-8.

Farrell, G. and Pease, K. (1993) 'Once Bitten, Twice Bitten', *Crime Prevention Unit Paper 46*, London: Home Office.

Farrell, G. and Bouloukos, A. (2001) 'International Overview: A Cross-National Comparison of Rates of Repeat Victimization', in Farrell, G. and Pease, K. (eds) *Repeat Victimization: Crime Prevention Studies, Vol. 12*, New York: Criminal Justice Press.

Farrell, G. and Pease, K. (2007) 'Preventing Repeat Residential Burglary Victimization' in Welsh, B.C. and Farrington, D.P. (eds) *Preventing Crime: What Works for Children, Offenders, Victims, and Places*, The Netherlands: Springer, pp. 161-178.

Farrell, G., Tilley, N., Tseloni, A. and Mailley, J. (2008) 'The Crime Drop and the Security Hypothesis', *British Society of Criminology Newsletter*, 62: pp. 17-21.

Farrell, G., Tilley, N., Tseloni, A. and Mailley, J. (2010) 'Explaining and Sustaining the Crime Drop: Clarifying the Role of Opportunity-related Theories', *Crime Prevention and Community Safety*, 12(1), pp: 24-41.

Farrell, G., Tilley, N., Tseloni, A. and Mailley, J. (2011a) 'The Crime Drop and the Security Hypothesis: An Empirical Test in Two Countries', *Journal of Research in Crime and Delinquency*, 48(2), pp. 147-175.

Farrell, G., Tseloni, A. and Tilley, N. (2011b) 'The Effectiveness of Car Security Devices and Their Role in the Crime Drop', *Criminology and Criminal Justice*, 11(1), pp. 21-35.

Felson, M. (1997) 'Technology, Business, and Crime' in Felson, M. and Clarke, R.V. (eds) *Business and Crime Prevention*, New York: Criminal Justice Press, pp. 81-96.

Felson, M. (1998) *Crime and Everyday Life*, 2nd Edition, Thousand Oaks, CA: Sage.

Felson, M. (2002) *Crime and Everyday Life*, 3rd Edition, Thousand Oaks, CA: Sage.

Felson, M. (2012) 'Crime in the Broad Sweep of History' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 279-285.

Felson, M. and Clarke, R.V. (1998) Opportunity Makes the Thief, *Police Research Series, Paper 98*, London: Home Office.

Field, S. (1990) 'Trends in Crime and their Interpretation: A Study of Recorded Crime in Post-war England and Wales', *Home Office Research Study 119*, London: Home Office.

Field, S. (1999) 'Trends in Crime Revisited', *Home Office Research Study 195*, London: Home Office.

Fielding, N.G., Clarke, A. and Witt, R. (2000) *The Economic Dimensions of Crime*, New York: St Martin's.

Financial Fraud Action UK (2012) *Fraud the Facts 2012: The Definitive Overview of Payment Industry Fraud and Measures to Prevent It*, London: FFA UK.

Fitzgerald, J. and Poynton, S. (2011) 'The Changing Nature of Objects Stolen in Household Burglaries', *Crime and Justice Statistics Bureau Brief No. 62*, Sydney: NSW Bureau of Crime Statistics and Research.

Fitzgerald, M., Stockdale, J. and Hale, C. (2003) *Young People and Street Crime: Research into Young People's Involvement in Street Crime*, London: Youth Justice Board for England and Wales.

Fitzpatrick, A. and Grant, C. (2011) *The 2010/11 British Crime Survey (England and Wales) Technical Report Volume 1*, London: TNS-BMRB.

Flatley, J., Kershaw, C., Smith, K., Chaplin, R. and Moon, D. (2010) *Crime in England and Wales 2009/10: Findings from the British Crime Survey and Police Recorded Crime*, London: Home Office.

Fleisher, M. (1995) *Beggars and Thieves: Lives of Urban Street Criminals*, Wisconsin: University of Wisconsin Press.

Forrester, D.P., Frenz, S., O'Connell, M. and Pease, K. (1990) 'The Kirkholt Burglary Prevention Project: Phase II', *Home Office Crime Prevention Unit Paper 23*, London: Home Office.

Fujita, S. and Maxfield, M. (2012) 'Security and the Drop in Car Theft in the United States' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 231-249.

Gale, J. and Coupe, T. (2005) 'The Behavioral, Emotional and Psychological Effects of Street Robbery on Victims', *International Review of Victimology*, 12(1), pp. 1-22.

Garofalo, J. (1987) 'Reassessing the Lifestyle Model of Criminal Victimization' in Gottfredson, M. and Hirschi, T. (eds) *Positive Criminology*, California, Sage, pp. 23-42.

Genn, H. (1988) 'Multiple Victimization', in Maguire, M. and Ponting, J. (eds) *Victims of Crime: A New Deal?* Milton Keynes: Open University Press.

Gill, M. (2000) *Commercial Robbery: Offenders' Perspectives on Security and Crime Prevention*, London: Blackstone Press.

Gill, M., Burns-Howell, T., Hemming, M., Hart, J., Hayes, R., Wright, A. and Clarke, R. (2004) *The Illicit Market in Stolen, Fast-Moving Consumer Goods*, Leicester: Perpetuity Research and Consultancy Ltd.

Goldstein, H. (1995) *Multilevel Statistical Models*, 2nd Edition, London: Arnold.

Gottfredson, M.R. (1984) 'Victims of Crime: the Dimensions of Risk', *Home Office Research Study No 81*, London: HMSO.

Gottfredson, M.R. and Hirschi, T. (1990) *A General Theory of Crime*, California: Stanford University Press.

Gould, L. (1969) 'The Changing Structure of Property Crime in an Affluent Society', *Social Forces*, 48, pp. 50-59.

Greene, R. (1592) 'The Blacke Bookes Messenger'. Available in: Kinney, A.F. (1990) *Rogues, Vagabonds and Sturdy Beggars: A New Gallery of Tudor and Early Stuart Rogue Literature*, Massachusetts: University of Massachusetts Press.

Greene, W.H. (2002a) *LIMDEP Version 8.0*, New York: Econometric Software, Inc.

Greene, W.H. (2002b) *LIMDEP Econometric Modeling Guide: Version 8.0*, New York: Econometric Software, Inc.

Greene, W.H. (2002c) *Econometric Analysis*, 5th Edition, London: Prentice Hall.

Groff, E.R. (2007) 'Simulation for Theory Testing and Experimentation: An Example Using Routine Activity Theory and Street Robbery', *Journal of Quantitative Criminology*, 23: pp. 75-103.

Hale, C. (1998) 'Crime and the Business Cycle in Post-War Britain Revisited', *British Journal of Criminology*, 38(4), pp. 681-697.

Hale, C., C. Harris, S. Uglow, L. Gilling, and A. Netton (2004) 'Targeting the Markets for Stolen Goods – Two Targeted Policing Initiative Projects', *Home Office Development and Practice Report No 17*, London: Home Office.

Hall, J. (1952) *Theft, Law and Society*, 2nd Edition, Indianapolis: Bobbs-Merrill Co.

Harrington, V. and Mayhew, P. (2001) 'Mobile Phone Theft', *Home Office Research Study 235*, London: Home Office.

Harris, C., Hale, C. and Uglow, S. (2003) 'Implementing a Market Reduction Approach to Property Crime', in Bullock, K. and Tilley, N. (eds) *Crime Reduction and Problem Oriented Policing*, Devon: Willan.

Henry, S. (1978) *The Hidden Economy: The Context and Control of Borderline Crime*, London: Martin Robertson & Company Ltd.

Hindelang, M.J., Gottfredson, M.R. and Garofalo, J. (1978) *Victims of Personal Crime: An Empirical Foundation for a Theory of Personal Victimization*, Massachusetts: Ballinger Publishing Company.

Hochstetler, A. (2001) 'Opportunities and Decisions: Interactional Dynamics in Robbery and Burglary Groups', *Criminology*, 39(3), pp. 737-764.

Home Office (2010) *User Guide to Home Office Crime Statistics*, London: Home Office.

Home Office (2013) *Home Office Counting Rules for Recorded Crime*, London: Home Office.

Hope, T. (2007a) 'The Distribution of Household Property Crime Victimisation: Insights from the British Crime Survey' in Hough, M. and Maxfield, M. (eds) *Surveying Crime in the 21st Century: Commemorating the 25th Anniversary of the British Crime Survey, Crime Prevention Studies Volume 22*, Devon: Willan Publishing, pp. 99-124.

Hope, T. (2007b) 'Theory and Method: the Social Epidemiology of Crime Victims' in Walklate, S. (ed) *Handbook of Victims and Victimology*, Devon: Willan, pp. 62-90.

Hope, T., Bryan, J., Trickett, A. and Osborn, D.R. (2001) 'The Phenomena of Multiple Victimization: The Relationship between Personal and Property Crime Risk', *British Journal of Criminology*, 41, pp. 595-617.

Hough, M. and Tilley, N. (1998) *Getting the Grease to the Squeak: Research Lessons for Crime Prevention*, London: Home Office.

Hough, M., Maxfield, M., Morris, B. and Simmons, J. (2007) 'The British Crime Survey After 25 Years: Progress, Problems, and Prospects' in Hough, M. and Maxfield, M. (eds) *Surveying Crime in the 21st Century: Commemorating the 25th Anniversary of the British Crime Survey, Crime Prevention Studies Volume 22*, Devon: Willan Publishing, pp. 7-31.

IBM Corp. (2012) *IBM Statistics for Windows, Version 21.0*, New York: IBM Corp.

Jacobs, H. (1984) *Using Published Data: Errors and Remedies*, California: Sage Publications.

Jacobs, B.A. (2010) 'Serendipity in Robbery Target Selection', *British Journal of Criminology*, 50(3), pp. 514-529.

Jacobs, B.A. and Wright, R. (1999) 'Stickup, Street Culture and Offender Motivation', *Criminology*, 37(1), pp. 149-173.

Jansson, K. (2007) *Measuring Crime for 25 Years*, London: Home Office.

Jansson, K., Budd, S., Lovbakke, J., Moley, S. and Thorpe, K. (2007) *Attitudes, Perceptions and Risks of Crime, Supplementary Volume 1 to Crime in England and Wales 2006/07*, 2nd Edition. Home Office Statistical Bulletin, London: Home Office.

Jochelson, R. (1997) *Crime and Place: An Analysis of Assaults and Robberies in Inner Sydney,* Sydney: New South Wales Bureau of Crime Statistics and Research.

Johnson, B.D., Mangali, N. and Sanabria, H. (1993) 'Successful Criminal Careers: Towards an Ethnography within the Rational Choice Perspective', in Clarke, R.V. and Felson, M. (eds) *Routine Activity and Rational Choice: Advances in Criminological Theory*, New Jersey: Transactions Publishers, pp. 201-221.

Johnson, S. and Bowers, K. (2003) 'Opportunity is in the Eye of the Beholder: The Role of Publicity in Crime Prevention', *Criminology and Public Policy*, 2(3), pp. 497–524.

Johnson, S., Bowers, K.J., Gamman, L., Mamerow, L. and Warne, A. (2010) *Theft of Customers' Personal Property in Cafes and Bars, Problem Oriented Policing Guide No. 60*. US Department of Justice COPS Programme.

Johnston, J. (1984) *Econometric Methods*, Singapore: McGraw-Hill.

Kennedy, L.W. and D.R. Forde (1990) 'Routine Activities and Crime: An Analysis of Victimization in Canada', *Criminology*, 28(1): pp. 137-152.

Kettlewell, L. (2007) *Report on Government Office for London Personal Robbery Project, January-November 2007*, London: Government Office for London.

Klockars, C. (1974) *The Professional Fence*, New York: Free Press.

Kock, E., Kemp, T. and Rix, B. (1996) 'Disrupting the Distribution of Stolen Electrical Goods', *Crime Detection and Prevention Series Paper 69*, London: Home Office.

Kornhauser, R. (1978) *Social Sources of Delinquency: An Appraisal of Analytic Models*, Chicago: University of Chicago Press.

LaFree, G. (1999) 'Declining Violent Crime Rates in the 1990s: Predicting Crime Booms and Busts', *Annual Review of Sociology*, 25: pp. 145-168.

Lagrange, H. (2003) 'Crime and Socio-Economic Context', *Revue Française de Sociologie*, 44, Supplement : An Annual English Selection, pp. 29-48.

Langan, P. and Farrington, D. (1998) *Crime and Justice in the United States and in England and Wales, 1981–96*, Washington DC: US Department of Justice.

Langworthy, R. and Lebeau, I. (1992) 'The Spatial Evolution of Sting Clientele', *Journal of Criminal Justice*, 20 (2): pp.135-145.

Lauritsen, J.L. (2001) 'The Social Ecology of Violent Victimization: Individual and Contextual Effects in the NCVS', *Journal of Quantitative Criminology*, 17(1), pp. 3-32.

Laycock, G. (1991) 'Operation Identification, or the Power of Publicity?' *Security Journal* 2(2), pp. 67–72.

Laycock, G. (2010) 'The U.K. Car Theft Index: An Example of Government Leverage" in Maxfield, M. and Clarke, R.V. (eds) *Understanding and Preventing Car Theft – Crime Prevention Studies, Volume 17*, pp. 25-43.

Levitt, S. (2004) "Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that do not", *The Journal of Economic Perspectives*, 18(1): pp.163–190.

Levitt, S. and Dubner, S. (2005) *Freakonomics*, London: Allen Lane.

Lewis, L. (2006) 'Organized Retail Crime: Retail's No. 1 Security Issue' *California Grocer*, April, pp. 2–11.

Linnell, D. (1988) 'The Geographic Distribution of Hot Spots of Robbery, Rape, and Auto Theft in Minneapolis', *Masters Thesis*, University of Maryland.

Long, J.S. (1997) *Regression Models for Categorical and Limited Dependent Variables*, California: Sage Publications.

Lynch, J.P. (1987) 'Routine Activity and Victimization at Work', *Journal of Quantitative Criminology*, 3, pp. 283-300.

Mailley, J., Whitehead, S. and Farrell, G. (2006) 'Progress and Prospects in the Prevention of Mobile Phone Theft', *Justice of the Peace*, 170, pp. 404-407.

Mailley, J., Garcia, R., Whitehead, S. and Farrell, G. (2008) 'Phone Theft Index', *Security Journal*, 21, pp. 212-227.

Maxfield, M.G. (1984) 'Fear of Crime in England and Wales', *Home Office Research Study No. 78*, London: Her Majesty's Stationery Office.

Maxfield, M.G. (1987) 'Household Composition, Routine Activity and Victimization: A Comparative Analysis', *Journal of Quantitative Criminology*, 3, pp. 301-320.

Maxfield, M.G. and Clarke, R.V. (2004) (eds) *Understanding and Preventing Auto Theft, Crime Prevention Studies Volume 17*, New York: Criminal Justice Press.

Maxfield, M.G., Hough, M. and Mayhew, P. (2007) 'Surveying Crime in the 21st Century: Summary and Recommendations' in Hough, M. and Maxfield, M.G. (eds) *Surveying Crime in the 21st Century: Commemorating the 25th Anniversary of the British Crime Survey*, Crime Prevention Studies Volume 22, New York: Criminal Justice Press, pp. 303-316.

McClave, J.T., Dietrich, F.H. and Sincich, T. (1997) *Statistics*, 7th Edition, London: Prentice-Hall, Inc.

Measuring Worth (2013) 'Annual Inflation Rates in the United States 1775 - 2012, and United Kingdom, 1265 – 2012'. Available at: http://www.measuringworth.com/inflation/ Accessed on: 14th January 2014.

Meier, R. and Miethe, T.D. (1993) 'Understanding Theories of Criminal Victimization' in Tonry, M. and Morris, N. (eds.) *Crime and Justice: A Review of Research, Vol. 17*, Chicago: University of Chicago Press.

Messner, S.F., Lu, Z., Zhang, L. and Liu, J. (2007) 'Risks of Criminal Victimization in Contemporary Urban China: An Application of Lifestyle/Routine Activities Theory', *Justice Quarterly*, 24(3): pp. 496-522.

Miethe, T.D., Stafford, M.C. and Scott Long, J. (1987) 'Social Differentiation in Criminal Victimization: A Test of Routine Activities/Lifestyle Theories', *American Sociological Review*, 52(2), pp. 184-194.

Miethe, T.D. and Meier, R.F. (1990) 'Opportunity, Choice, and Criminal Victimization: A Test of a Theoretical Model', *Journal of Research in Crime and Delinquency*, 27(3), pp. 243-266.

Miethe, T.D. and McDowall, D. (1993) 'Contextual Effects in Models of Criminal Victimization', *Social Forces*, 71: pp. 741–749.

Miller, J. (1998) 'Up It Up: Gender and the Accomplishment of Street Robbery', *Criminology*, 36(1), pp. 37-66.

Ministry of Justice (2013) *Criminal Justice Statistics Quarterly Update to March 2013, England and Wales,* London: Ministry of Justice.

Monk, K.M., Heinonen, J.A. and Eck, J.E. (2010) *Street Robbery, Problem Oriented Policing Guide No. 59*. US Department of Justice COPS Programme.

Mustaine, E.E. and Tewksbury, R. (1998) 'Predicting Risks of Larceny Theft Victimization: A Routine Activity Analysis Using Refined Lifestyle Measures', *Criminology*, 36(4), pp. 829-858.

National Mobile Phone Crime Unit (NMPCU) (2013) 'Crime Trends'. Available at: http://www.nmpcu.police.uk/crime-prevention/crime-trends.php Accessed on: 14th January 2014.

Naylor, R.T. (2003) 'Towards a General Theory of Profit-Driven Crimes', *British Journal of Criminology*, 43(1), pp. 81-101.

Nazaretian, Z. and Merolla, D.M. (2013) 'Questioning Canadian Criminal Incidence Rates: A Re-analysis of the 2004 Canadian Victimization Survey', *Canadian Journal of Criminology and Criminal Justice*, 55 (2), pp. 239-261.

Nelson, D., Collins, L. and Gant, F. (2002) *The Stolen Property Market in the Australian Capital Territory*, Australia: Australian Institute of Criminology.

Nelson, J.F. (1980) 'Multiple Victimization in American Cities: A Statistical Analysis of Rate Events', *American Journal of Sociology*, 85, pp. 870-891.

Newman, G. (1997) 'Introduction: Towards a Theory of Situational Crime Prevention', in Newman, G., Clarke, R.V. and Shoham, S.G. (eds) *Rational Choice and Situational Crime Prevention: Theoretical Foundations*, Aldershot: Dartmouth Publishing Company Limited, pp. 1-23.

The New York Times, 9th April 2012, 'National Database Planned to Combat Cellphone Theft'. Available at: http://www.nytimes.com/2012/04/10/technology/national-database-planned-to-combat-cellphone-theft.html?_r=2 Accessed on: 14th January 2014.

Nicholas, S., Kershaw, C. and Walker, A. (2007) *Crime in England and Wales 2006/07*, London: Home Office.

OECD (2010) 'A Family Affair: Intergenerational Social Mobility Across OECD Countries' in Economic Policy Reforms (ed) *Going for Growth. Organisation for Economic Co-operation and Development*, Paris: OECD.

Ofcom (2010) 'UK Consumers Revealed as Early Adopters of New Technologies'. Available at: http://media.ofcom.org.uk/2010/12/02/uk-consumers-revealed-as-early-adopters-of-new-technologies/ Accessed on: 14th January 2014.

Ofcom (2013) *Communications Market Report 2013*. Available at: http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr13/2013_UK_CMR.pdf Accessed on: 14th January 2014.

Office for National Statistics (ONS) (2012a) 'Marriages in England and Wales 2010', *Statistical Bulletin*, Newport: ONS.

Office for National Statistics (ONS) (2012b) '2011 Census: Key Statistics for England and Wales, March 2011', *Statistical Bulletin*, Newport: ONS.

Office for National Statistics (ONS) (2013a) 'Unemployment'. Available at: http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Unemployment Accessed on: 14th January 2014.

Office for National Statistics (ONS) (2013b) *Crime Statistics, Focus on Property Crime, 2011/12*, London: ONS.

Office for National Statistics (ONS) (2014) *Assessment of Compliance with the Code of Practice for Official Statistics: Statistics on Crime in England and Wales*, London: UK Statistics Authority.

Osborn, D.R. and Tseloni, A. (1998) 'The Distribution of Household Property Crimes', *Journal of Quantitative Criminology*, 14, pp. 307-330.

Palmer, E.J., Holmes, A. and Hollin, C.R. (2002) 'Investigating Burglars' Decisions: Factors Influencing Target Choice, Method of Entry, Reasons for Offending, Repeat Victimisation of a Property and Victim Awareness', *Security Journal*, 15: pp. 7-18.

Payments Council (2010) *The Way We Pay 2010: the UK's Payment Revolution*, London: Payments Council.

Pease, K. (1991) 'The Kirkholt Project: Preventing Burglary on a British Public Housing Estate', *Security Journal*, 2, pp. 73-77.

Pease, K. (1997) 'Predicting the Future: the Roles of Routine Activity and Rational Choice Theory' in Newman, G., Clarke, R.V. and Shoham, S. (eds) *Rational Choice and Situational Crime Prevention: Theoretical Foundations*, Aldershot: Dartmouth Publishing Company Limited, pp. 233-245.

Pease, K. (1998) 'Repeat Victimisation: Taking Stock', *Crime Prevention and Detection Series Paper 90*, London: Home Office.

Poyner, B. and Webb, B. (1992) 'Reducing Theft from Shopping Bags in City Center Markets' in Clarke, R.V. (ed) *Situational Crime Prevention: Successful Case Studies*, New York: Harrow and Heston, pp. 83-89.

Rasbash, J., Charlton, C., Browne, W.J., Healy, M. and Cameron, B. (2009) *MLwiN Version 2.1*, University of Bristol: Centre for Multilevel Modelling.

Reiss, A.J. (1986) 'Why Are Communities Important in Understanding Crime?' in Reiss, A.J. and Tonry, M.J. (eds) *Communities and Crime*, Chicago: University of Chicago Press.

Rice, K.J. and Smith, W.R.C. (2002) 'Socioecological Models of Automotive Theft: Integrating Routine Activity and Social Disorganization Approaches', *Journal of Research in Crime and Delinquency*, 39: pp. 304-336.

Roman, J. and Chalfin, A. (2007) *'Is there an iCrime Wave?' Research Report*, Washington: Urban Institute.

Roselius, T. and Benton, D. (1973) 'Marketing Theory and the Fencing of Stolen Goods', *Denver Law Journal*, 50, pp. 177-205.

Rosenfeld, R. (2009) 'Crime is the Problem: Homicide, Acquisitive Crime and Economic Conditions', *Journal of Quantitative Criminology*, 25: pp.287-306.

Rosenfeld, R. and Fornago, R. (2007) 'The Impact of Economic Conditions on Robbery and Property Crime: the Role of Consumer Sentiment', *Criminology*, 45, pp. 735-769.

Rosenfeld, R. and Messner, S.F. (2009) 'The Crime Drop in Comparative Perspective: the Impact of the Economy and Imprisonment on American and European Burglary Rates', *The British Journal of Sociology*, 60(3), pp. 445-471.

Rosenfeld, R. and Messner, S.F. (2012) 'The Crime Drop in Comparative Perspective: The Impact of the Economy and Imprisonment on American and European Burglary Rates' in

van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 200-228.

Rountree, P. W. Land, K. and Miethe, T. (1994) 'Macro-micro Integration in the Study of Victimization: a Hierarchical Logistic Model Analysis across Seattle Neighborhoods', *Criminology*, 32: pp. 387–414.

Sacco, V.F., Johnson, H. and Arnold, R. (1993) 'Urban-Rural Residence and Criminal Victimization', *The Canadian Journal of Sociology*, 18(4): pp. 431-451.

Sacco, V. and Silverman, R. (1982) 'Crime Prevention through Mass Media: Prospects and Problems', *Journal of Criminal Justice*, 10(4), pp. 257–269.

Sampson, R. (1985) 'Neighborhood and Crime: The Structural Determinants of Personal Victimization', *Journal of Research in Crime and Delinquency*, 22: pp. 7-40.

Sampson, R. J. and Wooldredge, J. (1987) 'Linking the Micro- and Macro-Dimensions of Lifestyle Routine Activity and Opportunity Models of Predatory Victimization', *Journal of Quantitative Criminology*, 3: pp. 371–393.

Schneider, J.L. (2005) 'Stolen-Goods Markets: Methods of Disposal', *British Journal of Criminology*, 45, pp. 129-140.

Shaw, C.R. and McKay, H.D. (1942) *Juvenile Delinquency and Urban Areas*, Chicago: University of Chicago Press.

Sidebottom, A., Belur, J., Bowers, K., Tompson, L. and Johnson, S.D. (2011) 'Theft in Price-Volatile Markets: On the Relationship between Copper Price and Copper Theft', *Journal of Research in Crime and Delinquency*, 48, pp. 396-418.

Smith, C., Bowers, K. and Johnson, S. (2006) 'Understanding Bag Theft Within Licensed Premises in Westminster: Identifying Initial Steps Towards Prevention', *Security Journal*, 19, pp. 3-21.

Smith, J. (2003) 'The Nature of Personal Robbery', *Home Office Research Study 254*, London: Home Office.

Smith, M.J., Clarke, R.V. and Pease, K. (2002) 'Anticipatory Benefits in Crime Prevention' in Tilley, N. (ed) *Analysis for Crime Prevention, Crime Prevention Studies, Volume 13*, Devon: Willan Publishing, pp. 71-88.

Smith, M.J. and Cornish, D.B. (eds) (2006) *Secure and Tranquil Travel: Preventing Crime and Disorder on Public Transport*, London: UCL Jill Dando Institute of Crime Science.

Sparks, R.F. (1981) 'Multiple Victimization: Evidence, Theory and Future Research', *Journal of Criminal Law and Criminology*, 72, pp. 762-778.

Stein, R.E. (2010) 'The Utility of Country Structure: A Cross-National Multilevel Analysis of Property and Violent Victimization', *International Criminal Justice Review*, 20(1): pp. 35-55.

Stevenson, R.J. and Forsythe, L.M.V. (1998) *The Stolen Goods Market in New South Wales: An Interview Study with Imprisoned Burglars*, Sydney: New South Wales Bureau of Crime Statistics and Research.

Sutton, M. (1995) 'Supply by Theft: Does the Market for Second-hand Goods Play a Role in Keeping Crime Figures High?' *British Journal of Criminology*, 35(3), pp. 400-416.

Sutton, M. (1998) 'Handling Stolen Goods and Theft: A Market Reduction Approach', *Home Office Research Study 178*, Research, Development and Statistics Directorate, London: Home Office.

Sutton, M. (2004) 'The Market Reduction Approach is Route Level Situational Crime Prevention' in Hopkins Burke, R. (ed) *Hard Cop, Soft Cop: Debates and Dilemmas in Contemporary Policing*, Devon: Willan Press.

Sutton, M. (2008) "How Prolific Thieves Sell Stolen Goods: Describing, Understanding, and Tackling the Local Markets in Mansfield and Nottingham: a Market Reduction Approach Study", *Internet Journal of Criminology.*

Sutton, M. (2010) *Stolen Goods Markets, Problem Oriented Policing Guide No. 57*. US National Institute of Justice COPS Programme.

Sutton, M. (2012) 'On Opportunity and Crime'. Dysology.org: http://www.dysology.org/page8.html. Accessed on: 26th January 2014.

Sutton, M. (2014) 'Fencing/Receiving Stolen Goods', in Bruinsma, G. and Weisburd, D. (eds) *Encyclopedia of Criminology and Criminal Justice*, New York: Springer, pp. 1627-1637.

Sutton, M. and Schneider, J.L. (1999) 'Theft, Stolen Goods, and the Market Reduction Approach: Operation Radium and Operation Heat', in Brito, S. and Allen, T. (eds) *Problem-Oriented Policing: Crime-specific Problems Critical Issues and Making POP Work*, Washington: Police Executive Research Forum, pp. 27-61.

Sutton, M., J. Schneider, and S. Hetherington (2001) 'Tackling Theft with the Market Reduction Approach', *Crime Reduction Research Series Paper Number 8*, London: Home Office.

Sutton, M., Hodgkinson, S. and Levi, M. (2008) 'Handling Stolen Goods: Findings from the 2003 Offending Crime and Justice Survey', *Internet Journal of Criminology.*

Svensson, R. (2002) 'Strategic Offences in the Criminal Career Context', *British Journal of Criminology*, 42(2): pp.395-411.

Thorpe, K. (2007) 'Multiple and Repeat Victimisation' in Jansson, K., Budd, S., Lovbakke, J., Moley, S. and Thorpe, K. (eds) *Attitudes, Perceptions and Risks of Crime, Supplementary Volume 1 to Crime in England and Wales 2006/07*, 2nd Edition, London: Home Office.

Tilley, N. (2009) *Crime Prevention*, Devon: Willan Publishing.

Tilley, N., Smith, J., Finer, S., Erol, R., Charles, C. and Dobby, J. (2004) *Problem-solving Street Crime: Practical Lessons from the Street Crime Initiative*, London: Home Office.

Tipping, S., Hussey, D., Wood, M. and Hales, J. (2010) *British Crime Survey: Methods Review 2009, Final Report*, London: NatCen.

Tonry, M. and Farrington, D.P. (eds) (2005) *Crime and Punishment in Western Countries 1980-1999, Crime and Justice: A Review of Research, Vol. 33*, Illinois: University of Chicago Press.

Treadwell, J. (2012) 'From the Car Boot to Booting it Up? eBay, Online Counterfeit Crime and the Transformation of the Criminal Marketplace', *Criminology and Criminal Justice*, 12, pp. 175-191.

Tremblay, P., Clermont, Y. and Cusson, M. (1994) 'Jockeys and Joyriders: Changing Patterns in Car Theft Opportunity Structures', *British Journal of Criminology*, 34(3), pp. 307-321.

Trickett, A., Osborn, D.R., Seymour, J. and Pease, K. (1992) 'What is Different about High Crime Areas', *British Journal of Criminology*, 32(1), pp. 81-89.

Trickett, A., Osborn, D. and Ellingworth, D. (1995) 'Property Crime Victimisation: The Roles of Individual and Area Influences', *International Review of Victimology*, 3, pp. 273-295.

Tseloni, A. (1995) 'The Modelling of Threat Incidence: Evidence from the British Crime Survey', in Dobash, R.E., Dobash, R.P. and Noaks, L. (eds) *Crime and Gender*, Cardiff: University of Wales Press, pp. 269-294.

Tseloni, A. (2000) 'Personal Criminal Victimisation in the U.S.: Fixed and Random Effects of Individual and Household Characteristics', *Journal of Quantitative Criminology*, 16: pp. 415-442.

Tseloni, A. (2014) 'Understanding Victimization Frequency: Risk and Protective Factors and Their Conditioning by Area' in Bruinsma, G. and Weisburd, D. (eds) *Encyclopedia of Criminology and Criminal Justice*, New York: Springer, pp. 5370-5382.

Tseloni, A., Osborn, D.R., Trickett, A. and Pease, K. (2002) 'Modelling Property Crime Using the British Crime Survey: What Have We Learned?' *British Journal of Criminology*, 42, pp. 89-108.

Tseloni, A. and Pease, K. (2003) 'Repeat Personal Victimization: 'Boosts' or 'Flags'', *British Journal of Criminology*, 43: pp. 196-212.

Tseloni, A., Mailley, J., Farrell, G. and Tilley, N. (2010) 'Exploring the International Decline in Crime Rates', *European Journal of Criminology*, 7(5), pp. 375-394.

Tseloni, A. and Pease, K. (2010) 'Property Crimes and Repeat Victimization: A Fresh Look' in Shoham, S.G., Knepper, P. and Kett, M. (eds) *International Handbook of Victimology*, Florida: CRC Press, pp. 127-150.

Tseloni, A., Farrell, G., Tilley, N., Grove, L., Thompson, R. and Garius, L. (2012) 'Towards a Comprehensive Research Agenda on Opportunity Theory and the Crime Falls' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 286-299.

Tseloni, A., Thompson, R., Grove, L., Tilley, N. and Farrell, G. (*under review*) 'The Effectiveness of Burglary Security Devices'.

UK National Accounts (1997) Unpublished Office for National Statistics document. Cited in Sutton, M. (1998) 'Handling Stolen Goods and Theft: A Market Reduction Approach', *Home Office Research Study 178*, London: Home Office, p. 1.

Van Dijk, J.J.M. (1994) 'Understanding Crime Rates: on the Interactions between the Rational Choices of Victims and Offenders', *British Journal of Criminology*, 34, pp. 105-121.

Van Dijk, J.J.M. (2006) 'What Goes Up, Comes Down', *Criminology in Europe, Newsletter of the European Society of Criminology*, 5(3), pp. 17-18.

Van Dijk, J.J.M. and Steinmetz, C.H.D. (1980) *The RDC Victim Surveys, 1974-1979*, The Hague: Ministry of Justice.

Van Dijk, J.J.M. and Mayhew, P. (1992) *Criminal Victimization in the Industrialized World: Key Findings of the 1989 and 1992 International Crime Surveys*, The Hague: Ministry of Justice.

Van Dijk, J.J.M., Manchin, R., van Kesteren, J., Hideg, G. and Navala, S. (2005) 'The Burden of Crime in the EU', *Research Report: A Comparative Analysis of the European Survey of Crime and Safety 2005*, Europe: Gallup.

Van Dijk, J., van Kesteren, J. and Smit, P. (2007) *Criminal Victimization in International Perspective: Key Findings from the 2004-2005 ICVS and EU ICS*, The Hague: Ministry of Justice, WODC.

Van Dijk, J.J.M. and Tseloni, A. (2012) 'Global Overview: International Trends in Victimization and Recorded Crime' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 11-36.

Van Dijk, J.J.M., Tseloni, A. and Farrell, G. (2012) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan.

Van Dijk, J.J.M. and Vollaard, B. (2012) 'Self-limiting Crime Waves' in van Dijk, J.J.M., Tseloni, A. and Farrell, G. (eds) *The International Crime Drop: New Directions in Research*, Hampshire: Palgrave Macmillan, pp. 250-267.

Van Steden, R. and Sarre, R. (2007) 'The Growth of Private Security: Trends in the European Union', *Security Journal*, 20, pp. 222-235.

Van Wilsem, J. (2004) 'Criminal Victimization in Cross-National Perspective: An Analysis of Rates of Theft, Violence and Vandalism across 27 Countries', *European Journal of Criminology*, 1(1): pp. 89-109.

Webb, B. and Laycock, G. (1992) *Reducing Crime on the London Underground: An Evaluation of Three Pilot Projects*, Crime Prevention Unit Series, Paper No. 30, London: Home Office.

Wellsmith, M. and Burrell, A. (2005) 'The Influence of Purchase Price and Ownership Levels on Theft Targets: The Example of Domestic Burglary', *British Journal of Criminology*, 45, pp. 741-764.

Whitehead, S. and Farrell, G. (2008) 'Anticipating Mobile Phone 'Smart Wallet' Crime: Policing and Corporate Social Responsibility', *Policing*, 2(2), pp. 210-217.

Wikström, P-O.H. (2010) 'Explaining Crime as Moral Actions' in S. Hitlin and S. Vaisey (eds.) *Handbook of the Sociology of Morality*, New York: Springer, pp. 211-239.

Wiles, P. and Costello, A. (2000) *The 'Road to Nowhere': the Evidence for Travelling Criminals*, London: Home Office.

Wittebrood, K. and Nieuwbeerta, P. (2000) 'Criminal Victimization During One's Life Course: The Effects of Previous Victimization and Patterns of Routine Activities', *Journal of Research in Crime and Delinquency*, 37: pp. 91-122.

Wortley, R., Kane, R. and Gant, F. (1998) 'Public Awareness and Auto-Theft Prevention: Getting It Right for the Wrong Reason', *Security Journal* 10(2), pp. 59–64.

Wortley, R. and Mazerolle, L. (2008) 'Environmental Criminology and Crime Analysis: Situating the Theory, Analytic Approach and Application' in Wortley, R. and Mazerolle, L. (eds) *Environmental Criminology and Crime Analysis*, Devon: Willan Publishing, pp. 1-18.

Wright, R., Brookman, F. and Bennett, T. (2006) 'The Foreground Dynamics of Street Robbery in Britain', *British Journal of Criminology*, 46: pp. 1-15.

Zimring, F. (2007) *The Great American Crime Decline*, New York: Oxford University Press.