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WHY CRIME OCCURS WHERE IT DOES: A PSYCHO-SPATIAL ANALYSIS OF CRIMINAL GEOGRAPHY

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ABSTRACT

This study investigates the impact of aspects of geographic location on criminal spatial behaviour. It is also concerned with where crimes occurs and how the location of crime may actually limit the behavioural possibilities of criminality, these limitations are derived, in part, from offenders representations of their offending locations and the potential for desired criminal activity in those locations. The underlying behavioural possibilities for criminal movement relate to the background characteristics of the individuals committing offences. The Thesis develops a locational characteristic paradigm, which puts the focus on where crime occurs reflecting the type of the individual who is likely to commit crime there.

This study examines those features of individuals' psychological, physical or cultural backgrounds, as they relate to geography, that prohibit or inhibit forms of criminal movement. The study addresses this by focusing on an offenders' representation of crime opportunities, the distribution of crime locations and offenders considerations when planning their crimes. The study aims to provide a direct challenge to some of the key concepts within the criminal spatial literature, such as routine activity theory, rational choice theory, the psychological importance of the home and the influence of familiarity on crime locations.

Individual differences across features of criminality are examined. Real crime cases are explored in order to unearth the differences within the geographic profile of offences. Offender representations of their offending areas are studied in an attempt to establish what these depictions actually represent. The work explores the distribution of offence locations and the rationale offenders put forward for why they offended where they did to establish if there are barriers to offending and how offenders account for these barriers, if at all.

The first stage of the research is a Case Study introduction to the crime of Tiger Kidnap (TK) in Ireland. TK is an adaptation of a Standard Armed Robbery offence and is the term used to describe the abduction of a person(s) of importance to a target (generally a bank manager) in which that person(s) is used as collateral until the target complies with the requests of the offenders. What makes TK a unique crime is introduced and the substantial distribution of offence locations, something which has not previously been observed in the criminology literature, is discussed.

The first empirical analysis addresses methodological concerns within the measurement of distance data. It challenges the related literature which suggests Crow Flight as a valid and reliable measure of criminal distance data. Previous studies acknowledge that Crow Flight knowingly underestimates the likely distance offenders travel and that it relates to the relative position of locations in the mental representations of distance. It is hypothesised that this difference is likely to be significant, and, that offenders conceptualise distance through routes, not relative positions of

location. This was confirmed in the interviews with offenders. This study compliments previous work on this topic by opening the possibility of a new methodological alternative for measuring criminal distance data. The argument for this conceptualisation of distance is based on the advancement in technology and transport primarily, where offenders now have access to route information much more readily than they will have to deal with the relative position of locations. The advance planning found in the current cases show that offenders have gone as far as to travel the routes that they will use, indicating that these distances are considered in terms of routes and the time it takes to travel these routes. The hypothesis is that there is a significant difference between the Crow Flight measure and the Route Distance measure of distance data. A significant distortion in probable distance travelled compared to the Crow Flight measure was found. The findings provide support for the current argument that distance measures in future studies would have greater methodological precision if they were to favour the route distance measure.

The work moves to examine the geographical profile of TK offences in Ireland. Building on the first study into distance measurements, and how using route distance appears to be, for Irish offences, a more psychologically valid form of measurement. The second study applied these findings onto the measurement stage of a sample of real cases of TK while also looking at the variation between offences. The hypothesis was that there would be a significant difference between TK in the North and South of Ireland. The analysis found that offenders in the North of Ireland had a significantly reduced geographic profile than offenders in the South. These differences relate to the type of offenders that are operating in those locations.

Research from the Home Office and reports from the Police Service of North Ireland has suggested that TK in the North, are committed by ex-paramilitary offenders who are likely to have advanced skills in hostage taking and experience in staging and planning operations of this nature. This type of offender is less bound to the geographical opportunities that offenders in the South can avail of and operate on a much more refined geographic template than their counterparts in the South. This study highlights the distortion that can be found when studying types of offences as a whole, and, specifically, it showed the differences that can exist within the same crime type.

The forth stage of the work explored offenders cognitive maps and the information that can be gleaned from the graphic representations of their crimes. The study tested the validity of a revised model of Appleyard's 1970's Sketch Map Classification Scheme. The study questions whether the multi optional classification schemes are too broad to distinguish one style of map from another. The results supported this position, finding that the rigid classification schemes are unreliable as they are too subjective in the manner in which they can be ascribed. However, it was found that there was a distinction between maps that were basic and simple over more complex maps. It was also found that the context behind the drawing, as in what was being represented by the offender, influenced the style

of map that was presented. This suggests that knowledge of the background to the offender is just as integral to the process of classifying an individual's cognitive map as is the sketch map itself.

The final study explores the role of psychological barriers to crime and offenders interpretation of their offending behaviour. This was achieved through exploring the distribution of crime around the Dublin region in Ireland. The hypothesis was that the distribution of offences would be restricted to the side of the city in which the offender resided. This was supported through the finding that offenders preferred to offend on the side of the city that they lived. This is illustrated in the maps that they marked their crimes on. This was based on the psychological barriers to movement that manifests itself in the River Liffey that divides the North of the city from the South of the City. Offenders rationale for offending on one side of the city over the other highlights an interesting development in that they equate the locations in which they offend to be based on issues removed from the influence of the river partition. Security consideration and closeness to home were offered as reasons why offenders offended where they did. However, when studying the distribution of offence locations they highlight a clear distinction in the form of a geographic arena, based on the river that divides the city. Further examples of this geographic arena are discussed in respect to the distribution of offence locations in the North of Ireland which relate to the border that previously divided the North of Ireland from the South of Ireland. This study highlighted the need for an understanding of not just offender characteristics but also the physical characteristics of the location of crime.

The implications of these studies for how we conceptualise criminal spatial movement are discussed. At present, there exist little to no study into the area of spatial context, which is an understanding of the nature of the differences in movement based on the characteristic background of the offender. The special importance of the crime of TK and the unique contributes of this form of criminality is outlined. A criterion based paradigm for the measurement, analysis and interpretation of geographical data is put forward. An improved understanding of specific influencing aspects of offenders' spatial behaviour will enhance the modelling of offender behaviour. This has implications for policing and the investigation of crime generally.

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"Everything is related to everything else, but near things are more related than distant things."

(W. Tobler, 1970, p. 3)

1.1 Arguments for a Development of Geographic Profiling

Levels of crime fluctuate based on a number of issues, such as age (Farrington, 1986) and gender (Zager, 1994), for instance, but within a broader perspective, crime varies in relation to place (Georges-Abeyie & Harries, 1980). The question of where criminality occurs is not a new research agenda in studies of crime, but one that now has a strong foundation on which it has grown and developed over the past three decades. The earliest studies of Guerry (1833), who identified distinctions between conviction rates in different districts in France, established some of the very principles that are central to our understanding of geography and crime today. Although there has been a seminal history to the study of geography and crime and the influence that one has over the other, it has only been through studies undertaken over the past 40 years that research has attempted to unravel the psychological nature of criminal spatial activity (see, for example, Brantingham & Brantingham, 1981; Canter & Larkin, 1993; Canter & Gregory, 1994; Canter & Hodge, 2000; Lundrigan & Canter, 2001a; 2001b; Fritzon, 2001; Canter & Hammond, 2006; Brantingham & Brantingham, 2008).

As the studies highlighted above have shown, there are a number of important ways in which to explore a variety of crime types in a variety of different ways. However, these simplistic aspects to the analysis of criminal spatial patterns have advanced considerably, with research now looking at ranges in spatial activity (Canter & Larkin, 1993) and the influence of disposal locations in crime (Lundrigan & Canter, 2001a), to name just two.

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1.2 Generalising Geographic Findings

One of the central questions within this research is how generalisable the findings from these studies are, and, also, what is it that they actually represent. As Canter and Youngs (2008) note in highlighting this issue, the proportion of offenders who fit into the various categories, such as marauder (someone who moves out from base to offend) and a commuter (someone who moves out from his/her area and travels a distance to offend), varies for different studies. They gave the example of Meaney, (2004), who reported 35% of burglaries in Australia being marauders, with this figure rising to 93% when a sex offender sample is studied. Canter and Youngs note that the reasons for such variations have not been explored; therefore, one of the central aims of the current thesis is to explore some of these very issues. For instance, what aspects of a location or of an offender's background is likely to make their geographic interactions different from another similar offender or another similar group of offenders.

In the very early studies, (Guerry, 1833) it was noted that there were differences in offending between samples within the same countries, which raises the question of how generalisable certain geographic findings are. In general, these findings highlight range and distance in spatial distribution and are based on specific samples from specific countries. However, it would be a mistake to assume that these findings will be replicated in relation to range and distance in other countries; although the principles will remain sound, the transferability may fluctuate. In this instance, one challenge would be to explore the impact that individual differences have on the ranges and distances that offenders travel. It could be assumed that efforts to explore the population density and geographical land mass might go some way towards accounting for these differences; however, it is the current position that this highlights a more fundamental issue at the heart of geographical profiling, which is the necessity for an advanced understanding of the context of the specific geographies and how

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this can influence spatial behaviour, or, more directly, how the background of an offender is likely to influence the spatial parameters in which they operate. Furthermore, the actual measurement methods for extracting distance data are likely to further add to the difficulties of generalising these findings. This critique relates directly to the use of the Crow Flight distance measure which will be discussed in detail in the next chapter.

1.3 Contextual Backdrop

A 'contextual backdrop' (Canter, 2008), it is currently argued, is essential to advancing our understanding of criminals and can offer important implications in relation to how specific crimes are appreciated and understood. As previous studies have advanced from the early aggregate spatial patterns and have attempted to explore with greater focus the spatial characteristics of an offender's crimes, we must again take things to the next logical stage and make advancements in how locational context can distort or disrupt the geographical profile of an offender's spatial activity. This can be based primarily on cultural aspects to the locations in question, but also, more specifically, on the meaning of a location to a subsequent geographical area. However, the most salient issue is that which relates to the background of the offender and the effect that it will have on their offending behaviour. Taking this into consideration, if facets of an individual's geographic representation are not appreciated or understood, then it will never be possible to move on from the foundation principles that were first identified.

As steps are taken to advance geographical profiling, a number of hypotheses will naturally develop. As a result, studies are continuously carried out that hope to, in part, address some of these issues. Issues relating to how we can model human interaction with the environment are just touching the surface of the possibilities that are available, once

appropriate data can be gathered or generated. Therefore, the limitations to the early studies can then be revisited and explored by taking into consideration the findings of the present-day research.

The interesting aspect to the simplistic notion put forward initially by Canter and Gregory (1994), who indicated that an offender's home base was more likely than not to be within an area circumscribed by his crimes, was that although this idea, commonly referred to as the circle hypothesis, seemed, on the face of things, to work with the majority of crimes, it did, however, fail to appreciate the context behind the dots (locations) when it began to take on a life of its own. In fact, studies emerged, for example, that of Snook, Taylor and Bennell (2004), that challenged the benefit of current geographic profiling software, developed on the basis of these original findings. However, these studies, considered no more than simplistic decision- making in a rebut by Canter (2005), of individuals that have been provided with certain geographical information, in fact, fall into the gap that they set out to exploit in the first place: that the knowledge of some basic geographic principles could allow a lay individual to become proficient at geographic profiling.

Canter (2004, 2005) has gone to great lengths in attempting to explain some of the myths surrounding geographic profiling; the circle hypothesis, for instance, being a simplistic geometric interpretation of the findings that were generated and subsequently replicated in studies that took place nearly 20 years ago. Furthermore, it has continuously been emphasised that any analysis of geographic data should certainly not be bound by these constraints but should incorporate advanced knowledge of the geometric properties to such data. These issues are raised now due to the fact that without an understanding of the pitfalls that have been made by others, it can be impossible to think that advancements can be made in the absence of such knowledge.

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The Snook et al (2004) study does highlight the importance of understanding what is actually occurring in the geometric appreciation of crime, but failure to account for these properties and to assume that the process is a simplistic one that relies on nothing more than knowledge of certain principles will hold back developments that otherwise continue unabated.

The literature into spatial characteristics consistently binds itself to the notion of classification and lacks the ability to capture the range of geometric attributes into the manifestation of an offence. The central arguments that are found in the literature vary from issues related to context (Canter, 2008), relatedness of criminal series (Markson, Woodhams & Bond, 2010), variation within crime types (Canter and Heritage, 1990), and also, most importantly, the salient aspect of a criminal event, such as domocentricity, that being the most important geographical feature of a crime (Carter and Larkin, 1993) .

In addition, those recent studies mentioned above have attempted to highlight the weaknesses in the geographic software, but what some of them fail to acknowledge is that there will naturally be weakness, but exploring these weaknesses and the hypotheses that they generate is just as important as confirming support for the success of these systems. Human spatial behaviour evolves as does all areas of human behaviour; not appreciating this and factoring it into the analysis of crime again holds back the possible advancements mentioned previously.

1.4 In Absence of the Appreciation of Context

This brings us to the question of context and the underlying factors that can influence our understanding criminal spatial movement. To highlight some of the difficulties with the

lack of appreciation contextual factors receive in the geographical literature the following quote emphasises this point.

> *"Whether it is possible to use geographic profiling techniques successfully in this context will largely depend on whether the spatial behavior of terrorists is similar to that of serial criminals."*
>
> (Bennell & Corey, 2007, p. 190)

Bennell and Corey (2007) note that geographical profiling of terrorists will largely depend on how similar their spatial movement is to that of serial criminals. This is a somewhat misguided statement by the authors in relation to how certain crimes should be understood. It could instead have been argued that, in order to establish whether geographic profiling can be of assistance, in this instance, research must first be conducted to establish the contextual aspect to the present sample within the behaviour setting in which it occurs. Terrorist groups, in general, reside in countries where samples of serial murder, serial robbery and serial rape have yet to be investigated to the same extent as other samples. Therefore, there are no available base levels as such to the spatial properties of individuals from such a diverse background. Furthermore, such a statement only serves to create a disparity between what can be effective and what might be effective.

In order to contribute to the study of terrorists' spatial movement, research will need to establish the background factors behind the locations that are being studied, as they will inevitably be different to where serial murderers or serial sex offenders from other locations operate. These might be restrictions of movement, for instance, which would need to be established first. Contributions made when these factors aren't considered will never be able to take geographical profiling beyond inappropriate generalisations.

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1.5 Beyond the Home of the Offender

Research now needs to develop geographical profiling in a way that moves it beyond the consistent desire to be focused solely on the home residence of offenders. There are considerable opportunities that can be explored that do not restrict studies of criminal spatial behaviour to the search for an offender's home location, for instance:

a) Travel patterns after crime – for all criminal offences

b) Auto theft location and its proximity to crime

c) Target location and subsequent disposal locations, for example, in robbery offences

d) Group influence on crime site locations and spatial movement

e) Shifting of nodes – moving emphasis to target location over unknown home location

These are just a few of the opportunities that can move geographical profiling beyond the conventional search for the home location of offenders. The development of such hypotheses can enrich our understanding into a broader conceptualisation of the underlining structure of total geography, and the influence these other facets can have on understanding the spatial feature inherent to certain offences.

1.6 How Context Relates to Geography

What context represents within this thesis is the situation (Geography) in which something (Behaviour) occurs. This contextual notion is grounded in the early ecological psychological framework put forward by Roger Barker in 1968. Barker introduced a framework that highlighted how the environment impacts behaviour in the form of a behaviour setting. Context therefore refers to the behavioural setting. The research of Barker is discussed in greater detail in the next chapter.

Context means not just what the geography represents, necessarily, but what this geography represents where and even what happens there and why. Therefore, it is a broad term used to explain a number of the underlying characteristics of a specific setting, which will hopefully provide a rational basis for any observed differences in spatial behaviour.

There has been little focus applied to the notion of context and its influence on geography within studies of criminal movement. This is primarily due to the fact that gathering data that allows these issues to be explored is rather difficult. However, this highlights one key point: without having an understanding of the geography and the contextual aspects to inherent to certain locations, vital differences may be missed that will influence, or, worse still, distort the picture that is being put forward. Chapter Seven provides an important example of these very issues.

If the researcher is not aware of the contextual background to the area that is being explored, how can they possibly understand the meaning behind any subtle variation that may or may not exist? If the behavioural setting that is being observed has variations in it to other similar settings elsewhere, then this indicates a difference worth exploring. If something is not understood as being an influencing factor, then any outcomes generated in ignorance of this will be distorted.

Finally, in order to try to understand exactly the manner in which context is represented in the present research, the following interlinking explanations are put forward,

1. The context of the location, 'the setting', which is where something happens.

This relates to where a crime occurs. There are a number of theories that have been put forward, and these will be discussed in the following chapter that suggests why crime occurs where it does. A central aspect of this development relates to familiarity of the offender to the location in question. In this context, the setting where crime occurs could be explained by the

theory that it will be somewhere an offender is familiar with. However, this locational context or setting, it is argued, will have a number of other factors that will influence the occurrence, nature and type of crime and also the likely individual who will offend there. Therefore, it is important for researchers to unpack this initial stage of what occurs where. The first initial contextual feature is the context that the location represents, such as the setting for the crime.

2. The context behind the offender, 'the individual', who commits the offence.

There has been a large amount of research conducted on the type of offender who commits crime. How this individual offender relates to the setting in which the crime is committed is another important feature to explore.

3. The context behind what happens in crime, 'the behaviour', what happens there.

This can be the behaviour towards a victim, the method of the crime itself, or, for the purpose of the current study, the spatial behaviour of the individual. As with the other stages, there is a large literature in existence that explores the spatial movements of offenders. However, these studies fail to combine the role of behaviour settings and the expected behaviour profiles that are likely to be accounted for within a given area. The current study aims to open up this as an area of direct focus.

The three contextual aspects to offending that the current research focuses on are where crime occurs, who commits the crime and what actually happens. How these contextual factors relate to and interact with the underlying geography and environment will be discussed in the work ahead. It is proposed that aspects of the physical, psychological and cultural features of a location reflect the background of the individuals found there who have a lot to inform us about the nature and development of generally.

1.7 The Current Thesis

In the following chapters, a number of studies have been put together that aim to explore specific aspects of geographic location on criminal spatial behaviour. It is also concerned with the features of where crimes occur and how they may limit the behavioural possibilities of criminality; these limitations are thought to be derived, in part, from offenders' representations of their offending locations and the potential for desired criminal activity in those locations. The underlying behavioural possibilities for criminal movement are thought to relate directly to the background characteristics of the individuals committing offences. The thesis develops a model of influencing factors on the location of crime, which puts the focus on where crime occurs, thus reflecting the type of individual who is likely to commit crime there. Although the thesis explores the unique crime of Tiger Kidnap, this offences does not form the sole focus of the thesis, a number of other aspects, that relate to why crime occurs where it does, also contribute considerably to the work.

1.8 The Chapters

1.8.1 Chapter 1 -

Chapter One, the present chapter, is a general introduction to the ideas behind the PhD. It covers topics such as how generalisable the findings in previous geographic studies can be and how this is the cornerstone for the ideas that will be generated within the work

Chapter 2 -

Chapter Two is a review of the relevant literature. The area of crime and geography is discussed throughout this section. The chapter opens with a look into the origins of studies exploring crime and geography, such as the work of Guerry (1833), Quetelet (1842) and

Glyde (1856). This section then moves on to explore the research that has uniquely developed the ideas generated in these early studies while also introducing the relevant modern studies into geography and crime..

Chapter 3 -

Chapter Three covers the data collection process for the interviews conducted within Irish prisons. The chapter also covers issues relating to the maps that were collected as well as the distances data that was generated.

Chapter 4 -

Chapter Four covers the data collection process for the cases of recorded Tiger Kidnap (TK) offences in Ireland (North/South). This section highlights details relating to the police forces that were approached and the nature of the relationship that was generated as a result.

Chapter 5 -

Chapter Five is an in-depth case study of a TK in Ireland. It introduces a TK offence that occurred in Dublin in 2008 and explores some of the reasons behind why this is such a unique offence and why it should be given special consideration within research. How TK offences challenge some of the issues relating to the notion of a Journey to Crime is discussed at length

Chapter 6 -

Chapter Six, examines the methodological concerns within the measurement of distance data. A theoretical argument is put forward, challenging the related literature that suggests Crow Flight is a valid and reliable measure of distance data.

Chapter 7 -

Chapter Seven examines the geographical profile of TK offences in Ireland, building on the first study into distance measurements and how using route distance appears to be, for Irish offences, a more psychologically valid form of measurement. The hypothesis is that there would be a significant difference between TK in the North and TK in the South of Ireland in relation to the spatial distribution of offences stages.

Chapter 8 -

Chapter Eight introduces the work into the area of spatial information and the methods that have been used to analyse sketch maps. This chapter is a prelude to Chapter Nine, which is an attempt to explore the manner in which sketch maps are analysed. The chapter sets out initially to explore what is meant by spatial knowledge before delving into the advantages or benefits from analysis sketch maps.

Chapter 9 -

Chapter Nine builds on the notion of a distortion in an individual's geography due to the background characteristics of the offenders, or, in this instance, the role that they had to play in their criminal offences. The study explores offenders' cognitive maps and the information that can be gleaned from the graphic representations of their crimes. The study tests the validity of a revised model of Appleyard's 1970s Sketch Map Classification Scheme. The study questions whether the multi-optional classification schemes are too broad to define one style of map from another.

Chapter 10 -

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Chapter Ten examines further some of the issues indentified in Chapter Nine, such as the importance of understanding the manner in which an individual conceptualises their involvement in criminality and the effects that this will have on the geography of their crimes, and, most importantly where they choose to commit their crimes. Therefore, the final study explores the role of psychological barriers to crime and offenders' interpretation of their offending behaviour.

Chapter 11 -

Chapter Eleven, the final chapter, revisits the findings of the present work and discusses at length the implications of the work. These implications are considered through the theoretical contributions made to our understanding of the factors that influence criminal spatial behaviour and the location of crime. A paradigm of these influencing factors is proposed. Some of the key methodological contributions of the work will be discussed, as well as the practical implications of the work within the investigative process. Finally, directions for future research will be put forward.

"Criminal behaviour can be viewed as a complex form of subjective spatial behaviour in which movement patterns depend on underlying spatial mobility biases, knowledge and experience."

(Brantingham & Brantingham, 1984, p.332)

2. 1 Geography and Crime a Review of the Literature

Where criminality occurs is not a new research agenda in studies of crime but one that has now a strong foundation on which it has grown and developed over the past 30 years. The early work of Guerry (1833), who identified that there were distinctions between conviction rates in different districts in France, established some of the very principles that are central to our understanding of geography and crime today. Although there has been a history to the study of geography and crime and the influence that one has over the other, it has only been studies from the past three decades that have attempted to unravel the psychological nature of criminal spatial activity (see, for example, Brantingham & Brantingham, 1981; Canter & Larkin, 1993; Canter & Gregory, 1994; Canter & Hodge, 2000; Lundrigan & Canter, 2001a; 2001b; Fritzon, 2001; Canter & Hammond, 2006; Brantingham & Brantingham, 2008). The following chapter aims to explore some of the foundation principles and the progressive research in the area of geography and crime.

> *"There is always a choice available to any offender of where to offender. That choice comes from within his criminal being, and understanding how that choice is made opens doors into the criminal's mind."*

(Canter, 2004, p.9)

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As Canter (2004) highlights, insight into criminal's cognitive processes, specifically the processes in which they utilise to interact within a given space or location, can help to shed light on why offenders choose to offend where they do. Furthermore, Canter suggests this choice is internal and that it can be considered unconscious, although it will be driven by previously built heuristics that have been established during the course of offenders individual daily interactions.

Research that exists in relation to criminal spatial movement has focused on understanding a number of pertinent issues, such as,

a) The range over which offenders for particular crimes operate,

b) Why some offenders travel further than others to offend,

c) How they learned of the opportunity to offend,

d) Where an offender is likely to reside in relation to their crimes, and,

e) Why some crimes have a broader geographical distribution than others.

However, as this is a relatively novel research area in comparison to other psychological fields, it is inevitable that the current studies undertaken will be unique in an effort to test and advance the principles on which the original assumptions were based. As a result, there are numerous hypotheses, theories and assumptions that remain unexplored. An example of this, introduced in the first chapter, is the influence of the context of where crime occurs or the behaviour setting in which criminality exist. This 'contextual backdrop' (Canter, 2008), it is currently argued, is essential to advancing our understanding of criminals and can offer important implications to how various types of crime are understood.

2.2 The Origins of Studies into Geography and Crime

In order to understand the contribution of the current thesis, the origin of studies into criminal movement and criminal geography must first be acknowledged. A core group of scientists during the 1980s (Kind, 1987; Canter, 1994; Rossmo, 1995) were making contributions to police investigations based on their research and understanding into criminal movement. Their studies found that they could make reliable estimations of where offenders were likely to live based on the geographic locations of where they were known to have committed crimes. This practice is referred to as geographical profiling and is the inferences that are made into where an offender is likely to reside based on the distribution of their crimes on a map.

However, as outlined by Canter and Youngs (2008), although the direct study of spatial distribution of an individual's crimes only became a focus for study in the 1980s, some of the principles which it drew upon had already existed from studies a previous century. Canter and Youngs cite the work of Guerry (1833), who found that offenders generally lived in specific areas of a city and did not travel a great distance to commit their crimes. In addition, Quetelet (1842) analysed early French criminal statistics in which he mapped convictions for violent crime and property crime. The findings of Guerry and Quetelet were fundamental, according to Brantingham and Brantingham (1981), who put forward a list of their four seminal contributions to the field.

1. They identified that crime was not homogeneously distributed across areas of the country; some areas had extremely high crime rates compared to other areas.
2. They found that patterns of violent crime and property crime varied considerably; with property crime highest in industrialised urban areas and violent crime more prominent in rural locations.

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3. They found consistency for the patterns over time.

4. They identified substantial differences in crime rates across Europe that could not solely be characteristic of legal differences between countries.

Brantingham and Brantingham (1981) revealed that these findings confirm that spatial variance is a feature at the macro level as well as the micro level.

These ideas were advanced further in the early studies of Glyde (1856), who examined the distribution of crime on a more micro level in the countryside of Suffolk. In his findings, he reports varying levels and types of crimes in different locations. His findings contrasted with that of the studies that preceded his, but it is intrinsically related to the current thesis in that it is the first study that highlights specific differences related to the contextual features of the locations: urban versus rural. It is related to the current research because it was the first study to show specific contrasts between the type of location the sample was drawn from. It also adds a principal foundation to the present thesis, which shows that cultural or locational background influences existed and were identified in the very first studies into crime and geography, as would naturally be expected.

This leaves the nature of these differences to be explored. The results of these early studies form the bedrock of the science of geographical profiling and contributed heavily to studies that attempt to advance the analysis of geography and crime beyond these early aggregate studies.

2.3 Advancing Beyond the Early Work

Although the work of Guerry (1833), Quetelet (1842) and Glyde (1856) were the first documented studies into the distribution of crime, there were a number of subsequent theses that were developed a few years later. The detailed work of Mayhew (1861), in which he described areas in London with a high presence of criminals as 'Rookeries', is one such

example. Canter and Youngs (2008) note that these areas were located close to places that offered attractive criminal opportunities, giving the example of the St Giles Rookery between the City of London boundary and Oxford Street. Therefore, the suggestion was that criminals would commit crimes in Oxford Street and then travel back into their nearby area for greater security and possibly also to evade detection. However, this can be taken much further, in that these results showed that these areas were spatially positioned to take advantage of the distribution of possible targets for crime in greater London.

Consequently, this raises the question of whether the presence of an area, or, specifically, the development of an area, is based on the same principles of the requirements of its populace, in this instance, criminals, in much the same way that the early human settlers would position themselves near water to take advantage of the natural benefits they could acquire from it, such as food, travel and security. It also shows an underlying contextual aspect to the pull, or attractiveness, of a given area over another, in that the development and growth, or, more specifically, the identity of a location can be a combination of settlement factors but, more importantly, issues that relate to the opportunity that a location affords. This can be considered in the form of a broader Behavioural Setting, which will be discussed later.

There is further support for this hypothesis as reported by Brantingham and Brantingham (1982), who show persistent criminal residence in the original 'Rookery' area in London right up to the present day. These findings, that criminals live near to where they commit their crimes, have been consistently found in research over the last 150 years, according to Canter and Youngs (2008).

2.4 Contemporary Studies

However, what is known about criminal spatial movements, based on the more recent studies available, is that it appears to be grounded on the same principles of what is known

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about non-criminal spatial movements. What this essentially means is that criminal journeys are no different to the journey that non-criminals make; this very notion is an important empirical finding which underpins the conceptualisation of attempts to study criminal geography.

Lundrigan and Canter (2001a) hypothesised that the manner in which an individual interacts with the environment will be influenced by a number of spatial processes that are generic to both criminals and non-criminals alike. Research has suggested that the rationale behind locations at which criminals commit their crimes is not arbitrary, but instead relates to specific experiences of the criminal (Brantingham & Brantingham, 1981; Rengert & Wasilchick, 1985; Canter & Larkin, 1993). This implies some form of selection on the part of the criminal, even if the foundation of the selection is not always clear (Lundrigan & Canter, 2001a).

A murder, rape or armed robbery might involve extreme acts of violence as a requisite of the crime, though this extreme behaviour is not necessarily transferred on to their spatial movement. The spatial influences that play a role in deciding the locational potential of a disposal site, for instance, have been noted as the psychological importance of the home (Canter & Larkin, 1993), familiarity with surroundings (Brantingham & Brantingham, 1981), individual representations of the environment (Downs & Stea, 1973), rational choice considerations (Cornish & Clarke, 1986) and the obvious need to evade the risk of detection. Lundrigan and Canter (2001a) note that there are a number of factors that must be considered when studying criminal movement and the decisions of where offenders choose to offend for instance,

- Routine Activities
- Rational Choice considerations

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- The proximity or importance of the home

- Familiarity with surroundings

It is important, therefore, to introduce these concepts and what they represent as they have formed the foundation knowledge base for how and why we understand criminal movement. However, there are aspects of these concepts in which limitations can be found. For instance, in relation to the importance of Familiarity, Lundrigan, Czarnomski and Wilson (2010), note that familiarity can relate to a consistency within environments. Therefore, offenders can take advantage of similarities within specific areas that closely relate to other locations in which they might have offended. Although they might not be directly familiar with a specific area, they can, as noted by Brantingham and Brantingham (1981), use environmental cues about what is likely to be available where. This relates to a sort of environmental criminal template, that can be employed by the offender. It is important to introduce, now, what these theories are and how they have contributed to our understanding of spatial behaviour.

2.4.1 Routine Activities

The Routine Activity approach (Cohen and Felson, 1979) is carried by a number of core ideas that come together at the same time, for instance, a motivated offender, a suitable target and the absence of protection over this target. There are further aspects to this approach, such as environmental cues that relate to the physical, spatial and psychological characteristics of a potential location. Furthermore, a motivated offender will learn through experience how to actually identify targets or victims and this is an evolving and dynamic process. All of this information comes together during the daily activities of an individual within their environment. According to Brantingham and Brantingham (2008), crime is a dependant event tailored through the nature of the landscape, the opportunity structure within this landscape, as well as the cognitive and perceptual capacities an individual has to act on them.

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Rhodes and Conly (1981) state that offenders utilise environmental cues during their non-criminal expedition into the environment, in the form of their routine activities: what they do where. Therefore, the difference between offenders and non-offenders in this approach is that the environmental cues that are used are split based on the grounds of legality.

Paul Ekblom's Conjunction of Criminal Opportunities (CCO) (Ekblom, 2003) adds considerably to Routine Activities Theory. The CCO theory is a framework developed to draw on the major, immediate causes of criminal events, and in parallel, the major collective intervention principles in operation to tackle those causes, thereby preventing crime, (Fisher and Lab; 2010). According to Ekblom, (2008) CCO is an ecological framework because it combines individuals, both offenders and preventers, and their environment while also integrating a number of theories, such as, Routine Activities, aspects of Environmental Criminology and Rational Choice. It also adopts the perspective that each of these higher cause has to act through one or more of the components for the CCC before a criminal event can happen. The reason this theory is mentioned presently is that it develops significant the concept of routine activities beyond a coming together of a suitable target a motivated offenders and absence of any protection. For a detailed explanation of CCO see (Ekblom, 2003).

Routine Activity theory, as a concept, is useful in that it draws attention to a number of important aspects that are central to criminal spatial behaviour. For instance, it stresses the importance of the daily activities an offender engages in. This concept was something that Brantingham and Brantingham (1981) built on directly in relation to the importance that an offender places on the familiarity of an area in which they will commit their crimes. However, this concept of familiarity and the specific importance of it to our understanding of offender spatial movements will be disputed in the forthcoming chapters.

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2.4.2 Rational Choice Considerations

According to Canter and Youngs (2009) at any stage of crime the criminal makes choices about where to commit crime. A number of factors will generally influence this decision making, for instance, the cost/benefit of choosing one location over another. Rational Choice theory, developed by Clarke and Cornish (1986), proposes that the criminal is a rational actor who will weigh up the costs and benefits of offending and make a decision based on those factors. The benefits of crime may not be solely related to financial gain; there can be possible social benefits too for offenders, such as greater acceptance within a criminal organisation. These factors should therefore be considered as crime is not always committed strictly for economic reasons.

The rational choice perspective has generally only focused on crimes which retain an element of economic advancement for the offender as it is more applicable to these types of offences. Overly emotional and violent crimes such as spousal murder and gang violence are hard to attach to this model due to the specific nature of their development. However, an argument can always be made that the offender was acting rationally.

There are two central perspectives to the Rational Choice approach. Firstly, the approach comes from Brantingham and Brantingham (1981), who suggest that a criminal is a rational being who weighs up the consequences of their actions and makes a decision based on the perceived outcome. This relates to the geography in the form of a mental map that an offender develops and accesses to select suitable locations in which to commit offences. The benefits of a location will be thus factored in and then a decision to offend there or not will be made.

The second approach comes from Cornish and Clarke (1986), who state that behaviour does not require prior planning for it to be considered rational. Cornish and Clarke

reduce this process to the base-level immediate decisions that are factored in by offenders on whether to offend or not. To develop this further, the first process, as mentioned above, requires careful deliberation with regard to what is suitable to do where; however, on arrival at the predetermined location for crime, for example, additional decisions will have to be made by the offender. They will have to account for the environmental influences that are likely to prohibit or inhibit the subsequent actions. In essence, the first stage is the process of considering committing an offence; the second is the rapid decision to carry it through. Therefore, the Rational Choice approach can be seen as a dynamic and progressive model that is as much dependant on the decisions made in the lead up to offending than it is on the decisions made immediately prior to offending.

Regardless of where an offender chooses to offend, the location in which they commit their crime is likely to link into their cognitive map. Therefore, the decisions of an offender, be it rational or not, is generally going to be influenced by their cognitive map before any rational choice aspects become a focal consideration. Nevertheless, as mentioned previously, the importance and influence of these very concepts to all forms of criminality will be challenged in the coming chapters.

2.4.3 The Proximity of the Home

The importance of the home as a base which an offender moves out from to offend is another feature of the literature into criminal spatial movement. Canter and Larkin (1993), in discussing the importance of the home in shaping the spatial distribution of crime, provide the distinction of 'Commuters and Marauders'. This dichotomy was a useful starting point to examine the influence of the home to an offender and their offending areas. This theory is based on the notion that an offender will likely have a fixed base from which they carry out

their crimes; they also suggest that they will have what they term a criminal range, that will possess some non-arbitrary relationship to that base.

The Commuter style of offender is someone who travels out from their base but who is less influenced by it. They may travel into other areas or locations to offend, and although it will have a relationship to the base, there is no connection between the size of the area in which they offend. This type of spatial pattern is much more difficult to identify within models of criminal spatial behaviour.

In contrast, the Marauders are offenders that have a strong association to their home or base and it directly influences the spatial distribution of their crimes. A Marauder will move out from their base to offend and will then move back into the area of their base afterwards. As a result, there is a much more powerful relationship between the offender's base and where they have committed their crimes. These approaches are of more relevance to a singular offenders as opposed to groups whose geographic parameters are hard to postulate.

2.4.4 Familiarity

The concept of familiarity as being an influencing factor on the spatial distribution of crime has been put forward continuously in the literature (Amir, 1971; Brantingham & Brantingham, 1981; Gabor, Baril, Cusson, Elie, LeBlanc & Normandeau, 1987; Beavon, Brantingham & Brantingham, 1994; Wiles & Costello, 2000; Goodwill & Alison, 2006). There are a number of positions to be understood when discussing familiarity, firstly the notion that offenders commit crimes in areas in which they are familiar, Secondly the issue of increase recognition and finally how offenders in fact become familiar with an area in the first place.

When an offender does commit a crime in a familiar area, they are likely to be more recognised there, which has both positive and negative implications for the offender. The positives rest on the fact that they can blend in with the area and will have great knowledge of routes within the area which can assist a quick getaway if necessary. The negative aspects are that due to this familiarity with the area they will be recognisable and therefore possibly identifiable by members of the community or the police. The importance of this in today's society is important to consider, the increase of CCTV along with an increase local police officers could challenge the relevance of recognition as an influencing factor on the decision of where to offend.

The vast majority of studies that have been conducted have primarily been concerned with single offenders. There have been few, if any, studies that have attempted to address the influence of group geography, possibly due to the difficulty of acquiring a suitable sample with which to test these developments. The issue regarding the influence a group's geographical make-up will have on the distribution of their offences is again noted and does require some focused research attention. There are many examples of offenders that work in groups and the processes and theories discussed previously are likely to be difficult to apply to a group's geographic profile. Some of these issues are discussed in greater detail in the later chapters.

2.5 Optimal Foraging and Criminal Hotspots

According to Johnson and Bowers (2004) one influential behavioural ecology perspective, that has relevance for understanding criminal movement patterns, is the theory of Optimal Foraging. This theory, published originally by MacArthur and Pianka (1966), was concerned with the foraging strategies that animals use to increase the rate of reward, while

reducing the amount of energy needing to be expended when searching for food. Johnson and Bowers (2004) state that offenders similarly can be supposed to seek to increase the rewards to be gained from crime whilst also reducing the amount of time required and also the risk of detection. They use the example of a burglar targeting similar houses in the same area they are familiar with, in which escapes routes are known and the possible value of good high, rather than committing offences in the same house where the police might be aware of repeat attacks. This type of offence is likely to form a slight advantage for the offenders but over time police are likely to target there resources to reduce the raise in time. Therefore, this would suggest that, if they offenders continue to offend they would have to move locations, which means that crimes of this nature are likely to cluster in space and time. As a result Johnson and Bowers (2004) were able to report that domestic burglary offences cluster in space and time which produce temporal changes in crime hotspot patterns.

Building on this research Johnson, Summers and Pease (2009) explored the offender as a forager concept and found that crimes of the same type occurring close to each other in time and space could be cleared to the same offender. This research contributes to understanding how offenders operate within the environment of volume type acquisitive offences. However, although the foraging theory that explores animal behaviour accounts for a large number of animals foraging strategies there are always those who fail to fit into this explanation. For example, the Scorpion, a desert insect, does not forage for its food, rather its waits for its food to come to them. As useful as understanding hotspots of criminal activity and the optimal foraging strategies of offenders are for our understanding of criminal movement, it will not always help to understand certain forms of criminal behaviour and movement.

2.6 Space Syntax and Agent Based Simulations

Space Syntax, according to Hillier and Shu (2000), is a set of techniques for representing and analysing the street networks of cities in order to understanding the underlying patterns which influence activity space, such as movement and land use. This model works at the level of interactions between streets and their research has shown that there are ways of analysing the networks that allow potential movement rates along each network to be formed while identifying the impact of centre's and subcentres in how this network is formed.

Space syntax research, as it relates to crime, suggests that the circulation of people and the appreciation of public activity spaces are central to reducing criminality. For instance, areas in which there are higher levels of footfall can help reduce certain types of crime, such as burglary. However, according to Baran Smith and Toker (2007), not all space syntax studies support this position, stating that differences in crime types studied contributed to inconsistency in research findings. As a result, as useful as research into space syntax is, the current review is concerned more with high level organised crime as opposed to a methodology, such as space syntax, which is more concerned with the analysis of volume crime.

Agent based modelling is, according to Malleson, Evans and Jenkins (2009), comprised of autonomous, decision making entities called agents, who can interact with each other and within their modelled environment. They can also be used to create systems that mimic real life scenarios. In their study, Malleson, Evans and Jenkins (2009) found that they were able to predicted the location in which crime occurred matched to real crime data. There research highlights the possible advancements that computer systems can make to our understanding of crime. Although it important to credit these novel types of studies, their work relates to

volume type offences, such as burglary in a specific defined city, it is unclear how useful this approach could be for organised robbery offences for instance. As a result, the well organised high end offences in which this current thesis is primarily concerned with are likely to offer some challenges to this predictive framework, even though these early results certainly warrant further enquiry.

2.7 Mental Map

A cognitive map is a cognitive process that allows individuals to gather, structure, retain and manipulate spatial information or knowledge (Downs & Stea, 1973; Murray & Spencer, 1979; Saarinana et al., 1988). The first use of the term cognitive map was by Tolman (1948), who used it to explain the behaviour of rats in a maze that escaped and moved directly towards a food source. Recently, Klippel, Hirtle and Davis (2010) stated that creating a solid spatial awareness of your surroundings is a crucial necessity for successful orientation, way-finding and navigation activities. Possessing spatial awareness about a location affords an individual the advantage of navigating through an environment efficiently. Furthermore it is possible to make the assumption that having a dynamic mental representation of your environment can enable the creation of additional complex interactions with this environment. It is also possible to use the generic processes generated within mental representations of a specific location for areas in which a cognitive structure does not exists. The environment and physical structure of places are generally consistent in relation to what is possible where. Therefore, possessing a solid conceptualisation of how any environment works makes it easier to interpret and navigate an environment which an individual may have no prior experience of.

To put this into modern terms, when a petrol light comes on in your car in a location you have no prior mental knowledge of, the information to access the nearest resource in your environment to fill the tank needs to be acquired. Although we do not possess information about where a fuel source is in the area, it is possible to access information retained from our mental representations of locations which we are aware of with regard to the likely location of such services. This is a good example of the process behind the way in which cognitive maps are generated, learned and thus acted upon in locations which we do not have a basis of knowledge on.

According to Kitchen (1994), a cognitive map is the purpose of rehearsed spatial behaviour in the mind so that it may be later acted on with a relevant degree of confidence. Canter (1977) also highlights that people's cognitive systems contain information not only in relation to where places are, but also about what places are and what is likely to occur or happen within those places, and, subsequently, who is likely to be present there. As mentioned above in the petrol tank analogy, this information can be accessed and utilised in a number of unique and helpful ways.

In the findings of their mapping studies with offenders and non-offenders, Summers, Johnson and Rengert, (2010) report that the two groups had similar awareness of the same space but ranked attractiveness for burglary differently, which is hardly a profound development in regards to the manner in which these groups actively use the environment. Summers, Johnson, and Rengert (2010) also state that although sketch maps within interview settings present a number of problems, they argue that they are beneficial for helping to elicit information that might otherwise not have been revealed, this is something that certainly warrants further investigation. Building on the issues in regards to the difficulties of sketch maps with offenders, and interviewing in prisons in general, Polisenska (2010) put forward a comprehension framework for interviewing offenders in prison but also the use of sketch

maps within this interviewing process. In addition to the detailed framework for interviewing in prisons, Polisenska (2010) also states that it is possible to classify mental maps according to certain criteria.

In relation to the classification of sketch maps, Shalev (2004) set out to empirically test the sketch map classification system of Appleyard (1970) on offenders' sketch maps. Her results suggested the reliability of previous model to be unacceptably low. Shalev stated that the revised classification system enabled the two dimensions that individuals consider in their judgment of sketch maps to be established. These two dimensions were map complexity and a distinction between spatial and sequential elements. This resulted in a revised classification scheme on the basis of the findings of her study into the reliability of Appleyard's 8-point model. The details of the work and its centrality to the current thesis are discussed directly in Chapter 9.

2.8 The Journey to Crime Dilemma

One core principle that has been established through the investigation of an offender's spatial movements, and that was introduced previously, is the finding that offenders do not travel far from the home or a significant base to offend. This is incorporated under the concept generally referred to as the *Journey to Crime* (JTC). The JTC is essentially the movement of the offender prior to, or in the build up to, committing the offence. This consistent empirical finding, differing in range between crime types, is known as the distance decay function, garnering its name from the negative exponential relationship between distance from a base and the frequency for a sample (Van Koppen & De Keijser, 1997). There are numerous reasons offered for this decay function in offending behaviour, but the most logical one reported in the literature in addition to familiarity, is that offenders are lazy

and are not willing to stray too far from their home base to offend (Canter, 2008). In order to validate the principles on the spatial movement of offenders, it is important to test these principles across all types of offences.

However, one of the key issues with the concept of the JTC is that it predisposes that an offender makes a structured move out from a base in order to offend. It also implies that once the act is complete they return on this similar journey. It is extremely difficult to establish with any certainty the journey that offenders make within a crime. As a result, the term JTC can be seen to be somewhat misleading as a figurehead concept or principle within the geography and crime literature. It may, in fact, be that the reverse term the *Journey After Crime* (JAC) may be more fruitful to develop, as it can be possible to establish some of this information regarding where offenders went after the crime. This can be done in terms of analysing the disposal of getaway vehicles, weapons, body dump locations and even money exchange locations.

At present there are only a handful of studies exploring the JAC concept, for example, Lu (2003) who explored the journey after car theft in Buffalo New York and found that crime trips are short biased in direction. The reason for this dearth in research is most likely due to the lack of accessible data as it is difficult to acquire data on where offenders go after they commit their crime. However, car theft, as Lu (2003) explored, is one form of criminality where data on where an offender went after crime can be gathered, through accessing the theft location and disposal location of the vehicle. However, even though the vehicle theft and disposal locations may be known, it is still unlikely that information on where the offender went after the disposal location will be available. The current research aims to explore some of these issues though the use of the TK style offence, with regard to how criminal movement can be understood, much removed from the approach of an offender moving out from a base to offend. The stages of measurement, as briefly discussed above, are

not likely to go beyond the tangible locations connected to the offences. Which again means that it is unlikely that where offenders went after the offence will be found. However, there is likely to be important implications that can be generated through the measurement and analysis of the JAC stages within the offences, such as the hostage location and money exchange location, which will be discussed in greater detail in the coming chapters.

2.9 Measuring the Distance

Within studies of criminal geography The Crow Flight distance is the most common form of measurement. It is it straight point to point distance from point A to point B. This measurement does not take into consideration land marks, road networks or any other form of boundary or barrier. Canter and Tagg (1977) suggested that this point to point measure is preferable to, for instance route distances, due to the fact that individuals conceptualise space in the form of the relative position of things (Canter & Tagg; 1977). Some academic commentary exists within the literature (Larson and Odoni, 1981; Kind, 1987; Rossmo, 2000; Canter & Youngs, 2008) on the topic of the appropriateness of the Crow Flight as a reliable distance measure. This appropriateness forms one of the research questions within this thesis and builds on the early work of Turner (1969) whose study was one of the first to use route distance in his study of delinquency.

The form in which criminal data is measured is important to be aware of for two reasons, firstly, the emerging possibility that new technology affords researchers, and, secondly, and of more importance, addressing the question of the nature in which distance is conceptualised in space being due to the relative position of things, as suggested by Canter and Tagg, (1977).

2.10 Behavioural Settings

One approach that is taken from ecological psychology and would appear to be relevant to the study of criminal spatial movement can be found in the work of Barker and Associates (1978). Barker and his associates developed the concept of Behavioural Settings. Behavioural Settings are settings where things occur; they can provide opportunities for action but also can constrain certain behaviour too. For instance, what is acceptable in regard to the type of behaviour found at football stadiums during a game is likely to be not found acceptable at a poetry recital session in a local café. A Behavioural Setting is essentially the concept that the setting dictates the type of behaviour that can occur there. The location or place in which one finds themselves will have governed rules regarding what is acceptable to happen there, or what they can expect to happen there.

There have been extensive studies of Behavioural Settings that have found evidence that they are, in fact, the ecological environments of most molar actions (Barker & Wright, 1955; Barker, 1968; Barker & Schoggen, 1973). These settings are important as they provide a number of opportunities to the people that occupy them and because they also impose notable obligations on occupants. According to the traditional view of Barker and Associates, Behavioural Settings are critical, functionally led systems categorised by a number of crucial features, including spatial and temporal boundaries (Wicker, 2012).

These spatial and temporal boundaries are relevant for the study of crime as it will help impose an understanding of what is acceptable where, within a setting. This relates to where an offender considers it behaviourally suitable to commit crimes. Therefore, moving away from the concept of JTC and focusing on the theory of Behavioural Settings would possibly be a more suitable way to approach where crime occurs.

The Behavioural Setting is the location in which a criminal finds themselves. A decision is made there on whether it is suitable for a crime to occur there or not. The distance

between 'Behavioural Setting' and 'No Crime/Crime' influences factors on which the decision is based. If a crime occurs, it relates to the type of offence and the opportunities that a given Behavioural Setting affords for this offence to occur. It is also based on the type of offender naturally. Although this is a simplistic model, it shows how the process is interlinked. Crime that occurs within a Behavioural Setting will have met the needs of the offender as much as the locations affords these to him. Therefore, Behavioural Settings for a specific crime, for instance, 'Date Rape', may originate in a nightclub initially as it is a suitable setting for this behaviour to be acted on. Other settings, such as a coffee shop during the day, does not afford the same opportunities to an offender; however, it may be suitable for another form of offence, for instance, a handbag snatch. Therefore, the Behavioural Setting is a useful way to consider where crime occurs removed from the simple travel distances that offenders make.

It also implies that the location affords opportunities to offend and also possibly prohibits opportunities to offend. How an offender specifically gets to these locations has always been difficult to extrapolate; however, focusing on the Behavioural Setting will enable a slightly more intrinsic understanding of where crime occurs, removed from the distance studies that criminal geography has previously been concerned with.

2.11 Geographic Knowledge and Commerce

Some of the ideas introduced above form the basis of planning and development for large corporations. For instance, research that looks at the geographical distribution of fast food restaurants shows that they purposefully set up in locations that are likely to bring higher profit margins, although this is hardly a profound development. Austin, Melly, Sanchez, Patel, Buka and Gortmaker (2005) found that fast food restaurants in the city of Chicago, for instance, were closer in proximity to schools in the city than if they were distributed throughout the city unrelated to the location of the schools. Aside from the

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obvious public health and moral issues, this is a clear example of a how a location and, specifically, those who reside in a location, will dictate the form, structure and likely development of that location. This brings us back to the idea introduced earlier of what is available where, and then, ultimately, how this can be exploited.

Studies such as the one above highlights how factors associated with a geographic location to be a large, complex issue that works from the outside inward, different to what was the case in the past, when locations were chosen by people because of the benefits it provided. Other examples are the development of bookmakers and gambling shops around the UK in areas where there are a high concentration of social issues, as the profile of the issuer of these services comes from such socially and economically specific backgrounds.

Research conducted by a non-profit organisation, FairerGambling.org, found that in the 50 parliamentary constituencies in the UK with the highest concentration of unemployed people, there were over 1250 betting establishments, which generated over £5 billion pounds in turnover through fixed-odds betting terminals. The striking results here are that in the 50 constituencies in the UK with the lowest levels of unemployment, there were under 300 betting shops with similar numbers of fixed-odds betting terminals, just over 1000, turning over £1.4 billion. These figures highlight the practical implications of understanding geography and what certain locations represent and who can be found there and then how they can ultimately be exploited. This is in much the same way as a criminal will identify opportunities within a location which can be exploited. The role location and what that location may signify to an offender is a complex and dynamic process as observed through the exploitation of individuals based on the geographic location that they reside in and what that represents to a third party out to exploit this information.

2.12 Individual Differences

Canter and Youngs (2008) note that the proportion of offenders who fit into the various categories such as Marauder (someone who moves out from base to offend) and a Commuter (someone who moves out from his area and travels a distance to offend) varies for different studies. They provide support for this in an example from Meaney's (2004) study, where he reported 35% of burglars in Australia as being Marauders, whereas that figures rises to 93% when a sex offender sample is studied in the same location. Canter and Youngs state that the reasons for such variations have not yet been explored. Such differences are likely to relate to the contextual factors of the individual locations in question. Therefore, differences between samples within the same country raise the question of how generalisable aggregate studies of criminal geography can be.

Ordinarily, these findings highlight range and distance in spatial distribution and are based on a specific sample from a specific country. However, it is mistaken to think that these findings will be replicated in relation to range and distance in other counties, although the principles will remain sound. One challenge in this instance is to explore the impact that individual differences have on the ranges and distances that offenders travel. One could assume that efforts to explore the population density and geographical land mass might go somewhat towards accounting for these differences; however, it is the current position that this highlights a more fundamental issue at the heart of geographical profiling, which is the necessity for an advanced understanding of the factors that influence aspects of locational decision-making. These aspects can relate to cultural, social and physical distinctions within and between areas of focus. Attempts at trying to unpack some of these aspects will hopefully provide a novel framework on which to progress studies on geography and crime. It is, in essence, an argument for applying focus back to where it began and taking note of what is unique about where crime is occurring.

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Consequently, as previous studies have advanced from the early aggregate spatial patterns and have attempted to explore with greater focus on the spatial characteristics of an offender's crimes, the next logical stage should be a focused study into how the location of where crime occurs can distort or disrupt the geographical profile of criminal spatial activity. This can be based primarily on cultural or social aspects inherent to a given location as mentioned previously, but, more specifically, it could be based on the meaning of a location to an individual and how that might reflect the background of an individual.

Canter (2008) argues that there is a need for new studies to be concerned with how an individual's personal understanding and geographic knowledge of their area can influence their behaviour. Taking this into consideration, if facets of an individual's geographic representation are not appreciated or understood, then it will never be possible to move beyond the foundation principles highlighted earlier.

2.13 Modelling Human Interaction

Studies relating to how we can model human interaction with the environment are just touching the surface of the possibilities that exist once appropriate data can be gathered. Limitations to early studies can then be revisited and explored by taking into consideration the findings of the present-day research. The interesting aspect to the simplistic notice put forward by Canter and Gregory (1994), which indicated that an offender's home base was more likely than not to be within an area circumscribed by his crimes, was that although this idea of the circle hypothesis seemed, on the face of things, to work with the majority of crimes, it failed to appreciate the context behind the dots when it began to take on a life of its own.

Canter has gone to great lengths (Canter, 2005; Canter and Youngs, 2008) to try to explain that this was a simplistic interpretation of the findings that were generated and that any analysis of geographic data should certainly not be bound by these constraints. Therefore, these developments go even further to highlight the importance of geographical context.

2.14 The Geographic Narrative

Research has shown that economic motivations and emotional components can be a determining factor in the distance that an offender travels to commit a crime (Fritzon, 2001). However, there is a new school of thought that reports on the impact of the narrative that an offender is thought to be acting out and the possible implications that this has for their spatial behaviour. Canter and Youngs (2009) state that narrative drivers for a crime can lead a criminal to operate over a larger area and/or a greater distance from home. They develop this through the idea of a personal criminal narrative, relating to a desired action, leading to a crime location as a setting reflecting this offender's inner narrative. Research by Presser (2009) argues that an offender's narrative will impact directly on the key instigator of their actions. Therefore, the possibility of exploring further the influence that an offender's narrative has on the location of crime is likely to be of significant benefit towards our understanding of criminal spatial behaviour.

Narrative theory, originally developed from personality theory, has been studied within psychology for a number of years. However, it was Canter (1994) who first identified the efficacy of exploring the 'inner narrative' of criminals, in his seminal work *Criminal Shadows*. He explained that a criminal can reveal their life story through the crimes they commit and the manner in which they choose to commit them. This was a novel starting point into a currently active area of research focus within Investigative Psychology.

Maruna (1999) stated that for a true, complete understanding of criminal behaviour, an in-depth analysis of narratives in essential. McAdams (1988) notes the importance of connections within the studies of literature and argues that there is a limit to the variety of possible structures to an identity and to all life stories. Frye's (1957) connection to the study of literature from Aristotle's *Poetics* proposes that stories make up one of four dominant forms, calling these the 'mythic archetypes'. These four forms were labelled *comedy, romance, tragedy* and *irony*. For example, Frye states that *romance* portrays the social ideals of the virtuous heroes and beautiful heroines who would then be threatened by the villain in the story. Frye describes the essential element of the plot and role of the characters in the *romance* story form as an adventure that naturally develops and builds to form a drama. In Canter and Youngs (2009), the four 'offender roles' are presented based on the four archetypal story forms discussed by Frye (1957). These canonical forms (i.e. mythoi) are referred to as the *victim, professional, revenger* and *hero.*

The contribution that narrative theory can have in explaining the geographic aspects of criminal behaviour has yet to be established. It may be that there is some success to be found in exploring this in comparison to the development of mental representations of offending locations, known as mental maps. Canter and Youngs (2009) highlight this when they state that it may be possible to derive personal narratives of criminal mental maps. However, presently, the effect that an offender's narrative is likely to have on the location in which they commit crimes is hard to envisage. It may be that a further understanding of the meaning behind the location of crime is needed initially before we can develop an understanding of how that fits in with an offender's narrative relating to their criminal behaviour.

2.15 The Individual

The central idea that runs to the core of geographic profiling models is that the criminal is a reasoning actor who makes a considered decision about where to offend (Canter, 2004). It has been suggested that criminals make a reasoned decision about where to offend even though they may not, in fact, be aware of this process. A crime location might seem to be arbitrary when first encountered, but there must be a reason why an offender has come to reside at this place. For instance, there must be a reason that an individual has ended up where they have, which implies that they may have learned of the opportunities that exist there. However, the difficult aspect is in trying to unearth how this learning has been acquired.

Therefore, the rationale behind the distribution of locations at which criminals commit their crimes is not arbitrary, but relates to specific experiences of the criminal (White, 1932; Shaw & McKay, 1952; Turner, 1969; Brantingham & Brantingham, 1981; Le Beau, 1987; Brantingham & Brantingham, 1981; Rengert & Wasilchick, 1985; Canter & Larkin, 1993). As previously mentioned, this implies some form of location selection on the part of the criminal, even if the foundation of the selection is not always apparent (Lundrigan & Canter, 2001a).

Therefore, it can be said that crime locations are based on the experience that an individual has with their immediate environment and any decision to commit an offence will be based on their geographic cognition on what would be achievable where. Furthermore, there are a number of influences which come under the remit of their geographic cognition, which may, in fact, be based on heuristic decisions that the offender might not even be aware of. Although the decision on where to offend is generally within the control of the offender, psychological barriers may also subtly influence their movement and thus their offending

behaviour. The current research touches on these issues directly when exploring the impact of barriers to criminal movement.

2.16 The Challenge Ahead

It appears that the decision of where to offend depends on a number of related factors comprising of a range of influences that are structured within our internal representation of the environment. The factors that are most likely to influence the decision of where to offend have yet to be fully understood. However, it is clear, even at this early stage, that the decision on where to offend is a dynamic and complex one likely to be influenced by social, economic, cultural, physical and psychological aspects within the geographic environment. What these factors represent and how they influence spatial behaviour is currently lacking within the criminology literature.

Therefore, the challenge for the present work is to investigate the impact of the background of the offenders on their spatial movement, the manner in which offenders conceptualise their offending behaviour and how they choose to represent this visually, and, finally, an understanding of why offenders offend where they do.

2.17 The Assumptions Within Theory

This thesis sets out to tests the theories mentioned within this opening chapter through the use of data on TK offences, interviews with offenders in prison, sketch maps and self reported crime locations. The theories and concepts that are used to explain why crime occurs where is does, such as, Rational Choice, Routine Activity, Familiarity and Influence of the Home, have been effective for because they make some fundamental assumptions. The

general assumption underlying these theories are that we are dealing with incompetent criminals getting caught up in crime opportunistically as they go about their day to day business. Such assumptions automatically rule out offenders who are, and offences which are, organised, involve high levels of planning and are carried out by large groups of offenders. Therefore there are questions to be asked of the existing literature, that raise doubts that about the applicability of certain theories to certain forms of criminality and certain types of criminals.

2.18 Research Focus

The Thesis sets out to develop and contribute to the gaps in our knowledge of why crime occurs where is does. This will be done through the following research questions and case study.

2.18.1 Case Study

TK is not a new form of criminality but it is one in which there is no focused commentary within academic literature in regards to its uniqueness as an offence. The contribution of this Case Study is to document and detail the exact process of a TK offence in order to highlight the specific demands of the crime, how it is undertaken and why it is successful, whilst also accounting for its uniqueness as a crimes itself, in specific regards to its geographical make up. It has been useful to see that there are patterns within criminal movement centres foraging strategies, but this is still limited. What offenders have done in complex offences, such as TK, highlights that there are a number of other issues at play, and will help to contribute to our understanding of why crime occurs where it does.

Research Questions

2.18.2 Research Question 1

Will there be a significant difference between the Crow Flight Measure of Distance and the Route Distance Measure of Distance Data.

2.18.2.1 Contribution to literature

As mentioned previously, the Crow Flight distances measurement is the preferred method of measurement within the literature. This has been primarily due to the lack of access to route information. The variation between the route distance and the crow flight distance has only sparingly been discussed within the literature, with no real focused analysis exploring the differences. However, advancements within computer technology over the past number of years allows these issues to be explored. In order to provide a rational basis for the use of route distance measures within the dataset of TK offences (see research question 2), it was important to establish the variations between to the two measurements in order to highlight the methodological advantage for using the route distance within the analysis of real crime cases. Furthermore, there are also contributions to our understanding of the manner in which space is conceptualised.

2.18.3 Research Question 2

Is there a significant difference between TK in the North and South of Ireland and what does this represent.

2.18.3.1 Contribution to literature

In addition to the contribution of the Case Study on TK this research question will contribute to our understanding of variations in criminal geography based on specific locational factors

and through challenging the manner in which spatial behaviour is understood. As mentioned previously, it has been useful to identify these patterns in criminal spatial structure but it is still limited to a degree. There is a considerable amount of information concerning criminal spatial behaviour that is still to be understood, for instance, what accounts for the same crime committed in different locations having a different spatial profile. Within this there are contributions to the influence of subculture, elements of risk, escape opportunities and offenders backgrounds that are addressed within this research question, and which have important implications for understanding why crime occurs where it does.

2.18.4 Research Question 3 and 4

Is the revised classification system of Shalev a reliable indicator for classifying sketch map styles?

If there is a high reliability for any of the classification style what does this actually represent?

2.18.4.1 Contribution to literature

In addition to the analysis of distance measures in order to understand why crime occurs where it does, other forms of extracting special information exist, one such method is through the use of the sketch maps. The contribution of this work is towards ascertaining if the previously used classifications schemes are a reliable indicator of mapping styles. Furthermore, if there is a foundation to this process what in fact do sketch maps, by offenders, actually represent. This work, therefore, contributes directly to the literature on criminal mental maps by moving away from systematic classifications, to a more narrative centred approach in there interpretation.

2.18.5 Research question 5

Are there barriers to movement that can be identified through an offenders self reported crime locations?

2.18.5.1 Contribution to literature

What a barrier to movement represents is something that has yet to be fully established within the literature. Within this research question the very nature of what constitutes a barriers is discussed in addition to developing the argument between physical and psychological barriers to movement. This therefore addresses the theme of the thesis, why crime occurs where it does, but exploring the distribution of crimes in which a defined barrier can be identified. The contribution here, is by highlighting that criminal spatial behaviour is a considerably complex area of study. Furthermore, through reducing crime analysis down to measurements of distance, a number of contextual aspects are removed from analysis which are likely to be significant at the individual level.

3.1 Data and Methodology

The current chapter introduces the data gathered for the main studies of the current thesis. This chapter discusses the collection of case material and methodological issues surrounding analysis and measurement of this data. It will also introduce the participant sample and provide details relating to the process of gaining access to that sample. Some of the information that is presented in this chapter will also appear later on in the work to describe more directly the relationship between to the data and the studies in question. The various forms of data collected and the samples that were involved were as follows,

3.2 Data and Sample

Sample

1) Interviews with Offenders in Prisons around Ireland

2) Tiger Kidnap Cases

3) Generated Distance Data

4) Offender Sketch Maps

5) Self reported Offences Locations

Sample

1) Thirty-Three Offenders Interviewed in Prisons around Ireland

2) Thirty-Two Masters Students in Investigative Psychology

3.2 Ethical Clearance

Due to the sensitive nature of the study and the fact that access was being requested to interview offenders in prison, the research required prior ethical approval from the University of Huddersfield, before any approaches were made to the prison. Ethical approval was granted by the University of Huddersfield's School Research Ethics Panel (SREP) which enabled an approach to the Irish Prison Service (IPS) to be made. As a result, an approach was made to the (IPS) to seek access to interview offenders in the Irish Prison System. Following an extensive period of ethical review, permission from the Director General of the Irish Prison Service (IPS) and the Prisoner Based Research Ethics Board Committee was grant (See Appendix D).

As a result of ethical permission being granted a number of guidelines had to be adhered to in order to protect the identity of the participants. Therefore, all personal details that relate to the individuals that took part in the study have been removed. Where quotes have been used in the thesis they will be done so through the use of a pseudonym. This is to ensure the anonymity of the participant who took part in the study. No other information will be included other than the pseudonym. In relation to the maps that have been collected, both self reported crime locations and sketch maps, no identifying information in relation to places and locations, that could be obviously linked to a participant through an associated quote will be used.

3.3 Interviews with Offenders

3.3.1 The Interview Setting

The most appropriate data collection method for the study into individual presentations of offending space was to conduct semi-structured interviews in prison. The

interviews were conducted at a number of minimum and maximum security prisons in Ireland. Five prisons in total were visited over the course of a three-week period in August 2012:

- o Mountjoy Prison (Dublin, Ireland)

- o Wheatfield Prison (Dublin, Ireland)

- o Portlaoise Maximum Security Prison (Laois Ireland)

- o Limerick Prison (Limerick Ireland)

- o Castlerea Prison (Roscommon Ireland)

3.3.2 The Prison Sample

Thirty-three offenders were interviewed in various prisons around Ireland. Between them they had convictions ranging from Armed Robbery and Burglary to Fraud and Murder. The large majority of those interviewed were Irish. However, one participant was Polish and another was Scottish. The majority of offenders held convictions for Armed Robbery or Robbery offences, which was a requisite for being included in the analysis. The majority of offenders interviewed were male; however, there was one female offender who was interviewed. The average age of the offenders was 29 with an age range of 23-54. The average number of convictions for the offenders was 34. The average age of first conviction was 17. The average number of times in prison including the current sentence was 5 with a range of 1 to 17.

12.5% were in employment at the time of the offence that they were convicted of. A number of offenders, nearly half, reported committing the offence that they were convicted of with a co-offender (47%), and that the co-offender was a family member 50% of the time and

a friend 20% of the time. 37.5% of offenders wore some type of disguise during the offence they were convicted of. 80% of offenders interviewed admitted to carrying a weapon with them during their crime.

Previous drug use was found in the vast majority of offenders in the sample. However, although 41% reported being drug abusers or having chronic drug habits at the time of their offences, the current study makes a distinction between drug use and drug abuse, as it is the current position that these are two vastly different processes. 72% of offenders interviewed lived in Dublin and 96% of crimes and sketch maps produced were of various areas of Ireland. One sketch map was a drawing of an offence that took place in Sweden.

All interviews and maps were retained for analysis, regardless of the offence history. The underlining area of exploration of the current research was to develop issues relating to contextual factors that influence spatial movement of offenders to address the question of why crime occurs where it does. Therefore, it was possible to extract valuable material to explore, regardless of the participant's offence history.

It was not possible to acquire the actual details of each offender's previous convictions from the IPS. This would have been beneficial in supplementing their self-reported offence histories. However, this was not considered a major disadvantage, as the study was concerned with offender's representation of their offending space primarily, not with how honest they were in regard to their offence history. It was the current assumption that a detailed history of their convictions would not have had any major impact on the reliability of their sketch maps. Furthermore, there was no reason not to take a participant's self-reported offence history as genuine.

Nearly all participants held convictions for offences other than robbery, which was the requirement for being considered initially for interview. Convictions generally consisted

of Burglary, Robbery, Drug-related Offence, Auto Theft and, in some cases, Murder and Fraud. There were participants, however, who were not involved in a Robbery offence and held no convictions for Robbery. It was decided that the interview would proceed regardless as it would have been possible to explore certain issues regarding context and geography.

3.3.3 Interview Design

The guidelines for the interview were developed from a self-report Investigative Psychology questionnaire that relates to a participant describing the details of a crime from the initial stage of the signature offence to the completion of that offence. The interview consisted of five stages, with each stage being a development of the last, which enabled the participant to develop a clear understanding of the line of questioning and the direction of the interview. This was beneficial because when it came to the sketch map stage, the participants were able to have a clear understanding of what it was that the study was about; they also would have had a sufficient amount of time to form a representation of their offence, in that they were thinking and talking about their crime. The stages comprised of five stages, outlined below, (see Appendix A and B).

Stage 1

Stage one consisted of a briefing about the nature of the study and why they had specifically been singled out to take part. This briefing stage was where consent was obtained from the participants and also the rights that they had regarding confidentially and their right to withdraw.

Stage 2

The second stage related to the acquisition of demographic information and a number of other relevant issues, such as,

- o Offence history
- o Offence details
- o Personal circumstances at the time of their offence
- o Details relating to any victims involved
- o Family history

Stage 3

The third stage of the interview was a semi-structured analysis of the participant's signature offence and was referred to as 'the description of a crime'. This involved a line of exploratory questioning that developed a number of important aspects that related to the planning and undertaking of their offence. Within stage three there were five subcategories of open-ended topics.

- o Description of the crime type
- o Planning the crime
- o Location of the crime
- o Lead up to the offence
- o Post offence details

Stage 4

Stage four consisted of the participant taking the information that they had just discussed and representing it in the form of a sketch map. There was no restriction to what they could draw as they were told basically to 'draw me a map of the crime that

you have just talked to me about'. In some instances, this might have been a series of crimes that the participant chose to discuss, but, in the majority of cases, it was a drawn representation of a single offence that was developed in the interview.

Stage 5

In the final stage of the interview, a narrative roles questionnaire was administered. This questionnaire aims to explore how an individual felt about the crime that they committed. This was administered last as it allowed the participants to have a sufficient amount of time prior to the questionnaire where they would have been thinking in depth about the offence that they had committed.

3.3.4 Barriers to Access

The route for gaining access into the Prison System was an extremely long and drawn-out process. Polisenka (2010), in her work on Interviewing offenders in a penitentiary environment, outlined some of the very issues that the current research faced. For clarity and understanding, it is important to outline the extent of this process so as to emphasise the amount of work that was involved in gaining access to a prison sample in Ireland.

3.3.5 Accessing the Sample

While on site, a Prison Guard was assigned as a liaison to assist the researcher throughout the entire time inside the prison. The liaison officer would be present at the gate each morning and afternoon and would stay close by the researcher throughout the time inside the prison.

The success of accessing an appropriate sample rested very much on the standing of the Liaison Officer with the prison population and, also, importantly, how motivated they were to assist with the research. A list of inmates who held convictions for armed robbery offences was compiled by the Governor in most of the prisons, and it was then up to the Prison Guard to approach the specific inmates to determine if they would be willing to take part in the interview. As a result, the success of the study relied a great deal on how motivated the Prison Guard was in conveying the confidential nature of the study, something that was very important to most of the individuals that were interviewed. It is unclear exactly what the prisoners who were contacted were told, but the researcher was careful to brief the Prison Guards as clearly as possible about what to say and, specifically, what not to say when speaking with the prisoners. A specific incident in the first prison that was attended drew specific attention to this issue. It turned out that the Prison Guard had been telling prisoners that the researcher was from the probation board in order to get prisoners to agree to be seen. One of the very first individuals who was spoken with said that he was told that he was meeting someone from the Probation Office and that he wasn't interested in speaking about anything other than that. The central problem here was that they felt duped into speaking with the current researcher, so it was very important that the appropriate means of communicating with the prisoners was relayed to the prison guards.

Some Prison Guards had a very good working relationship with the prisoners and, as such, were able to get participants who were willing to speak openly and honestly about their criminal history. Some of the participants stated that they were helping out the 'screw' because he was good to them in the past. Therefore, as previously mentioned, the number of individuals that the researcher was able to speak with related directly to how motivated the Prison Guard was and also how good a relationship they had with particular prisoners.

3.3.6 Temporal Issues

Another issue that was not anticipated prior to undertaking the interviews was the timing demands that would influence the number of individuals that could be interviewed and length of time that could be spent with them. The IPS operates on a standard day across all prisons; this is based around the following time restriction.

- o Breakfast 8am - 9.30am (Prisoners return to cells after collecting food)

- o Lunch 12.30pm - 2pm (Prisoners return to cells after collecting food)

- o Dinner 4.30pm - Onward (Prisoners return to cells after collecting food)

As the times above indicate, the prisoners are locked in their cells for a large proportion of the working day. This means that there are two time periods in which interviews could take place: a 3-hour window between breakfast and lunch and a two-and-a-half-hour period between lunch and dinner. However, this does not fully explain further timing issues that occurred. Gaining access through security took between ten to fifteen minutes in the morning and afternoon. A further waiting time of fifteen minutes occurred while waiting to be collected by the liaison Prison Guard, who was required to bring the researcher from the front gate into the prison to where the interviews would be undertaken. The interviews generally took place in the school area of the prisons. Taking all of this into consideration, half an hour to forty-five minutes was lost just coming back into the prison. Furthermore, the Prison Guard was still required to approach prisoners about taking part in the study, some of whom not have been in the immediate vicinity. Therefore, it might have been 10.30am in the morning and 3pm in the afternoon before it was possible to even sit down and brief a participant on whether they would even be interested in taking part in the study.

It must be highlighted that only a very small number of prisoners (4 in total) who were brought to the interview room declined to be interviewed once they were briefed on the

nature of the study. Therefore, the maximum number of interviews that were able to be completed in a day was between four and six, generally with two in the morning and three in the afternoon as the Prison Guard might have been able to arrange participants during the morning so as to speed up the process in the afternoon. In addition to these standardised time restraints, further delays occurred within the maximum security prison at Portlaoise due to the heightened level of checks that naturally take place within a maximum security prison.

3.3.7 Pre-interview

Only the researcher and the participant were in the room during the interview, the prison guard waited outside until the interview was finished. All of those who were presented for interview were extensively briefed as to the nature of the study. They were presented with an information sheet (see Appendix A) which the current researcher went through with them, outlining what the nature of the study was. In addition, any questions that they may have had were addressed. A significant amount of time was spent making sure that the participants absolutely understood the nature of the confidentiality agreement between participant and researcher, and that they were comfortable with the process and the knowledge that the researcher was bound by strict ethical guidelines. A number of older participants, in fact, confirmed that they were aware about ethical standards, possibly through being involved in other studies prior to the present interview. However, some younger participants were suspicious as to the nature of the confidentiality agreement. Time was spent addressing some of their concerns as the present researcher was interested in information about crimes that they possibly may not have been convicted for. It was important that they understood that they were able to speak about anything and that there was no way that any details that might lead to a participant being identified would be revealed.

Participants were also informed about the possibility of the interview being recorded with the Dictaphone. Once more, participants were told that the same confidentiality issues applied and that nobody other than the present researcher would have access to it. The participants were told that the purpose of the Dictaphone was to help with the write-up of the issues discussed and developed during the course of the interview. Once this was explained to each participant and they were happy to take part in the study, a consent from was presented that they were required to read and then indicate that they understood the details of it before signing it. Participants were told that the consent form would be removed and then destroyed and that they would be provided with a unique participant reference number for the duration of the study. This was to keep their personal details anonymous.

3.3.8 Ethical Issues

Due to the nature of the material that was going to be explored in the interview, it was necessary to brief the participants extensively before they agreed to take part. Furthermore, it was important that participants understood the background to the study and that of the researcher so as to make informed decisions about their ability to participate positively during the interview process. As such, the signing of the consent form was a definitive action by each participant to confirm that they were aware of what was involved with agreeing to take part.

Another rationale for spending considerable time explaining in detail what would happen during the interview was that although the participants presented themselves to the interview, they were approached by the Prison Guards. It was therefore important to ascertain that no coercion or pressure was put on any of the participants to participate in the study. Speaking to the participants prior to the interview taking place, it was possible to determine

that they were willing to take part and that the requirements to do so were entirely voluntary. This was achieved through building up a quick rapport with the participant and making sure that they were aware of the nature of the interview that they were taking part in. Therefore, all participants included in the present research volunteered willing and were fully aware of the right to remove themselves from the study at any time.

3.3.9 Disclosure of Crimes

The participants who were to take part in the study were all asked to be as honest and as open as possible regarding their criminal histories. This raised the issue of disclosing information on crimes that an individual may not have been convicted of. In order to gather accurate information on their crimes for the purpose of the current study, it was important to encourage participants to freely discuss crimes that they may not have been convicted of. It was explained to them that any information that was disclosed would remain confidential. However, participants were informed that if they conveyed information about any crime that they may commit in the further against a person, then the researcher would be obliged to inform the appropriate authorities. It was important for the participants to be able to discuss all of their offences due to the fact that a greater amount of useful information might be explored about the planning of a successful offence. This is one such issue that is consistently highlighted in the studies on crime in that it is generally only solved offences that come under investigation. This is naturally due to the difficulty in accessing information and details about unsolved offences. Therefore, as previous studies may have told participants to not disclose information about past crimes that they had not been convicted of, the current study encourages participants to talk about robbery offences which they may not have been convicted of.

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The rationale for this was that it was thought that unsolved crimes would disclose a greater level of planning and organisation. This would provide important information into the planning of a successful offence. Information about criminal spatial movement is based on solved crimes, therefore how realistic are assumptions about offender spatial movement when they are based on only those individuals who had been convicted? It was thought that encouraging participants to disclose information about offences which they may not have been convicted of would provide a greater insight into the total spatial movement of offenders.

3.3.10 Disclosure of Abuse

There were two incidents where participants brought up the issue of abuse that they suffered when they were young. It was clear that one of the participants was alluding to sexual abuse, whereas the other participant was indicating physical abuse; however, it was extremely likely that this participant may have been sexually abused too, considering his background.

One of the participants mentioned above brought the conversation around to some previous psychological issues that he had. This was brought up when he was discussing how he became involved in crime. He stated that he suffered from depression when he was younger, and he alluded to the fact that he had been sexually abused by a member of his family and that he had received treatment for this abuse in the form of anti-depressant medication. The abuse he suffered was discussed for a short time and he related his involvement in crime to this incident.

The other participant who indicated abuse was another interesting case, as he was considerably older than the participant who claimed that he was sexually abused. This individual was an extremely professional offender who held convictions for armed robbery and kidnap. He was not willing to discuss any details of his offences and replied no comment to any questions that were asked of him about anything relating to his crimes. He said that he would assist with the study but that he would not disclose any information about anything he might have been involved in. It was decided during the interview to explore how he became involved in criminality, considering he was unwilling to discuss any details of his offences but was willing to talk about other things.

He stated he was sent to an industrial school for young people in 1970. The school was St Joseph's Industrial School, Letterfrack, County Galway, which operated from 1887 until 1974. This was one of the most notorious institutions in Ireland, according to the Ryan Report, which was the Commission to inquire into Child Abuse in Ireland. The abuse at Letterfrack was both extreme physical and sexual abuse at the hands of the Christian Brothers. He talked openly about his time there, referring to abuse and beating but never fully highlighting issues of sexual abuse; however, it is likely that he would have been under threat of this based on the systematic and protected levels of abuse that occurred here. It is therefore interesting to note what he said in relation to his time there and his involvement in crime. He stated that his involvement in crime is directly related to his time in Letterfrack. He noted that when he was finally successful in escaping – he made in total six attempts at escaping – he said he made a promise to himself that he would never let another person put their hands on him again. It was then that he became involved in a number of violent incidents and from there he developed a reputation as a man who could 'handle themselves'. As such, he was recognised as a good go-to 'hard man' by the criminal gangs operating at the time and was therefore brought into assist with robberies and enforcement.

3.4 Tiger Kidnap Cases

TK is a term used to describe the abduction of one or more individuals, in which the abduction forms a part of the robbery. A total of (N=70) TK cases were identified with the assistance of An Gardai and the PSNI. The following chapter (Chapter 4) outlines, in detail, this data.

3.5 Generated Distance Data

In an attempt to examine the various between crow flight distance and route distance, 50 randomly selected locations containing A to B points, around the various areas of where the majority of crimes in the present sample were committed, were generated. There was no rigid basis for where the locations were selected; however, they would have to contain two points and those two points would be based on the island of Ireland. Furthermore, due to the nature of the cases that were analysed, it was decided that it was not valid to have locations that were on main roads or motorways. This was because there were no locations in the actual cases that were on main roads or motorways for the obvious reason of evading detection.

Therefore, once two points on the map were selected, they were moved to the nearest appropriate area to reflect the type of spatial patterns that were evident in the real cases. Appropriate areas were defined as not being directly on main roads or motorways and not in the middle of a town or city.

A variety of random, criteria appropriate, locations were generated, measured and recorded. The actual Crow Flight distance was recorded by measuring the straight line between point A and point B on a computer generated map. The route distance between location A and B was then generated through the Google Maps Route software, which provides a route distance figure and a temporal approximation of the journey travelled. As

such, there were 50 distance measurements for Crow Flight and 50 distance measurements for the Route distance. All distances measured were recorded in kilometres

3.6 Sketch Maps

In order to examine the classification schemes developed for interpreting sketch maps with offenders, a total of N=24 sketch maps were collected for analysis (see Appendix E). The maps were collected from convicted offenders in a number of prisons around Ireland, during the interviews that were previously discussed. These maps consisted of graphic representations of locations where offenders committed their signature offence. The majority of these were drawings of locations in which robberies occurred. In order to explore the validity of these classification schemes a group of participants were asked to distinguish between the various styles of classification, based on the revised classification scheme of Shalev (2004), and assign one style to each sketch map presented to them.

Ethical clearance was granted by the University of Huddersfield in order to conduct this study. Participants consisted of N=32 who were members of the International Research Centre for Investigative Psychology. The maps were presented to participants through a PowerPoint presentation. Participants were asked to select which map they thought best represented the map shown based on the revised classification scheme of Shalev (2004) with which they were provided (See Appendix F). The task took 30 minutes to complete, and once each individual was comfortable with the choice that they had made the next map was then presented on screen. For clarity and reliability in the selections, the current researcher showed the maps for a second time to allow participants to change their selection if they so wished. In order to determine if there was a distinct difference between the 5 styles of the revised model,

a Smallest Space Analysis (SSA) procedure was conducted. Further information in relation to this form of analysis is outline in Chapter 9.

3.7 Self Reported Maps

Having completed a number of interviews, the present researcher decided to also provide actual maps of Dublin city and also the greater Dublin area so participants could indicate locations in which they committed their crimes, in relation to the areas that they resided in. This was done to establish any observable bias in offending areas or to establish whether there were any identifiable barriers to movement that could be distilled. This would assist in developing further, the reasons behind why offenders offended where they did. However, It was not always possible for all participants to indicate on actual maps the locations of where they committed their crimes. There were a variety of reasons for this,

1. They were not willing to do so.

2. They didn't actually commit offences in that area covered by the map (not all participants held offences for crimes committed in Dublin).

3. Time ran out before this part of the interview was able to be completed (it was the final stage of the interview).

4. The participant's offence background did not fit the purpose of the mapping task, for instance, the singular offence of Murder.

5. Participants were not convicted of these crimes and were not willing to provide specific locational details relating to areas of criminal activity.

3.7.1 The Maps of Dublin

In order to explore the role of barriers to movement in crime a total of N=12 maps of self reported crime locations were collected during the interviews in prison. During the interviews, offenders who lived in Dublin, were presented with one of two printed maps. The first map consisted of Dublin's inner city, primarily covering the central shopping areas on the north and south of the city. The second map was of the whole area of Dublin (see Appendix G). The offenders were asked to indicate on the map, in the form of an X, the areas in which they committed their offences. Offenders who lived within the city centre chose the detailed map of the city centre of Dublin to mark their offences, whereas the offenders who lived outside the city marked their offences on the larger map. The number of crimes that were marked on the maps were counted and assigned to either the North of the city or the South of the city. The River Liffey acts as a natural diversion between the North and the South and it was therefore easy to make the distinction between an offence occurring on the Northside and an offence occurring on the Southside.

The maps were qualitatively analysed in the form of a series of specific Case Studies. They were explored through an understanding of the distribution of the crimes and how they relate to the specific areas on the map in which the crime occurs. Although this is a somewhat subjective approach, it is supported with a central theme running throughout, which is that there is a division with the city and that this will be manifested within the distribution of offenders crimes and what they perceive to be opportune locations to offend. A total of 153 crimes were marked on the 12 maps collected with a mean of 12.7 crimes marked per map.

3.8 Uniqueness of the Data

What makes the data collected within this thesis unique is that it is the first time an Investigative Psychology study has received clearance to interview Irish offenders within Irish Prisons. Furthermore, the sample of offenders interview cover a board range of individuals across a number of Prisons throughout Ireland which provides a unique mix of different backgrounds and offence histories.

Another unique feature of this sample is that the offenders interviewed are considered to be high-end professional or career offenders involved in some high profile organised offenses within Ireland. Therefore this sample is unique in that it represents a specific group of offenders, those who are relatively organised, which enables us to explore some specific aspects of offending behaviour as it relates to the organisation of offenders geography and movement. To emphasize this point further, access was obtained for the largest maximum security prison in Ireland which houses some of the most high profile offenders within Ireland. This highlights the nature of the offenders interviewed within this sample and shows why it is unique.

The data that was obtained from these interviews initially offers unique supplementary support for understanding and interpreting the results of case material that has been collected and analysed. The unique interpretation of some of the trends that appears within the analysis of the data would not have been achievable, to the same degree, if it was not for the interviews with these offenders who were able to offer up distinctive processes for these developments while also putting forward a rationale for the in-depth decision making that took place which shaped the form and structure of their crimes.

In addition to this, the offenders in the sample also provided graphic representations of their offending behaviour and also some self reported maps of offending locations. These

distinct forms of data enabled the researcher to explore the manner in which they conceptualised their environment and also the locations in which they choose to offend too.

The data obtained from the interviews with the offenders in Irish prisons was unique for a number of reasons, as indicated above, and it features throughout this thesis. This data provides support in the form of quotes, for example, which help in understanding and interpreting results,. Furthermore, this data is also used directly as the basis for analyses in the chapters exploring mental maps and the distribution of offenders locations.

4.1 Tiger Kidnap Data

TK is a term used to describe the abduction of one or more individuals, in which the abduction forms a part of the robbery. A person of importance to the victim, typically a family member or loved one, is held hostage and used as collateral until the victim has complied with the requests of the offenders. The victim (that forms part of the robbery) will be instructed to attend their place of employment, typically a bank or other financial institute, and withdraw a quantity of cash. This has been accomplished by using a picture of the victim's loved one(s) under gunpoint, or, through the desperate persuasion of the victim, to get the assistance of their colleagues to complete the act. When the money has been secured, the victim will then be told of a location in which to meet the criminals to hand over the cash. This method has proved extremely successful for criminals in the past number of years; as such, it is natural to assume that other possible offenders will identify TK as being a viable crime; therefore, further efforts should be made to try and prohibit or reduce incidences of this offence.

One of the hallmark features of this crime is the vast number of individual locations that are incorporated within the offence. As a consequence, these features facilitate the possibility of a systematic analysis into the locations used and the spatial processes inherent to them. TK offences offer a different, albeit unique, challenge to the investigative psychologist and one that deviates slightly from the principles that have been highlighted above. The key issue for consideration in TK is the active learning of, and interaction with, the environment. This somewhat goes against the influence of the home as being directly related to offending locations, via propinquity, which means the closeness of things, but leans more toward the theory of a 'mental map', which is a mental representation of how an individual appreciates their external environment (Canter & Youngs, 2008).

The 'Tiger' aspect of the offence is related to the surveillance or stalking type of behaviour that the criminals engage in prior to the offence, in the same way a tiger stalks its prey before attack. Such behaviour can undoubtedly influence an individual's mental knowledge of an environment in which they are now exposed. Garda Commissioner, Fachtna Murphy[1], summed up the 'tiger' aspect of the offence in a report to delegates in December 2009,

> *"It describes the prelude to the incident itself where the perpetrators engage in a predatory, tiger-like stalking of the kidnap victim and their family, often gathering intelligence and carrying out surveillance on their partner's and children's movements and activities."*

It is important for the offender to learn the daily routines of their victim in order for them to effectively plan the assault. If their intelligence is flawed their whole operation can become unhinged; this requires, as reported through anecdotal accounts in the media, around-the-clock monitoring and surveillance.

The active learning of the environment and how this influences active engaging within this environment is important for our understanding of the psychological process associated with spatial learning. Furthermore, the contextual backdrop to the locations used by offenders is another important area where understanding is paramount. How the context of the offence influences choice and thus spatial opportunities, or more appropriately, spatial restrictions on a given location, is important to appreciate. Unearthing the geographical features of the offence of TK will advance further the theory of a mental map and how this plays a role in everyday environmental learning and interaction.

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[1] This quote was taken from a conference hosted by the Irish Police Force (An Garda) in Dundalk, Ireland. It was given to representatives of large businesses, banks and other institutes that were the victims of TK or who are likely to be open to the threat of such an attack.

4.2 Ethics

The cases used in the current study were collected with the full assistance of An Garda Siochana (Republic of Ireland Police Force) and the PSNI (Police Service of Northern Ireland). Before the process could begin, the current researcher was required to have the details of the study assessed by the University of Huddersfield's School Research Ethics Panel (SREP). As the data that was requested for the present study was unobtrusive in nature, the research was not bound by the same ethical constraints as other studies that may have, for instance, used participants or sought access to sensitive information. However, when working with police data there will always be issues of confidentiality; as such, these issues were addressed and efforts were made to ensure that all names, addresses and locations of specific personal relevance were removed. The current study was granted a research waiver by the SREP.

In addition to passing through the SREP review, the present researcher was required to be cleared and vetted by both police forces. Once this process was successful achieved, the current researcher was independently assigned a liaison officer from both. Meetings were held in person with An Gardai and over the phone with the PSNI; during these discussions the basic outlines of the study were provided and the information that was required was discussed in detail.

4.3 Specific Locational Data

The locational details that were requested were details relating to the geographical features of TK, along with other information relating to the temporal aspects of the attack as well as the presences of any vehicles. The locational information requested was

1. Where the Kidnapping occurred

2. Where the Robbery location was

3. Where the hostage was transported to

4. Where the money exchange was

5. Where the disposal location was where the getaway vehicle was recovered

6. Where a secondary getaway vehicle was found

7. Where the getaway vehicle was found in relation to the hostage

8. Where the vehicles used in the robbery were stolen from

4.4 An Gardai Soichana

The initial request for access to information about TK offences in Ireland was made to the Commissioner of An Gardai Soichana (See attached Letter). After a short time the current researcher received contact from a Detective Inspector (DI) of An Gardai. The DI was instructed to establish the exact nature of the details that were requested. The process took about six months as the information on TK offences in Ireland was held in the files of the station of the investigating officers. A centralised database in which An Gardai record crimes does exist. This database is called PULSE (Police Using Leading Systems Effectively) and has been in use by An Gardai since the late 1990s.

However, the nature of the information that was sought was often not available on this system. The system requires a police officer to manually record details of an offence on PULSE. It is during this time where information might not be recorded correctly or accurately. The DI informed the current researcher that this is a major problem for the force in trying to train officers in the importance of accurately recording crimes on the system. As the information on TK were not always on the system, this required the DI to establish who the investigating officers of each crime were. He then needed to draft a letter to them in order

to request the information that was required. This took some time as the officers in question did not view this as important, and, suffice to say, they needed to be contacted a number of times in order for them to provide the information.

The process of developing a fully complete dataset of locational details relating to TK offences in Ireland took about two years in total. The final number of cases from An Gardai consisted of (N=23).

4.4.1 Issues with An Gardai Data

Once the data had been passed over to the current researcher it needed to be worked through fully in order to assess the quality of information that had been provided. There were (N=23) cases provided; however, a number of these cases (N=8) were omitted for a variety of reasons. The most common reason for rejecting a case was a lack of sufficient information relating to locational information. Case 18, for example, only contained one location, the Robbery location. This was because it was classified in error by the investigating officer. Furthermore, there were issues related to missing information that was not possible to establish; as a result, those cases needed to be removed also.

4.5 Classification of an Offence

The manner in which TK offences are classified in the police systems was a consistent problem in both datasets. This was again due, in part, to the fact that there is no classification of a TK that the police can record the crime as. TK is a hybrid offence made up of a serious of crimes, for example, Armed Robbery, Extortion, Kidnapping, Hostage-taking and generally Auto Theft too. Actually trying to ascertain if an offence was, in fact, a TK was a

difficult task itself. Consequently, in order for a case to be included in the dataset the presence of the following core locational aspects was needed.

1. Abduction location

2. Hostage location (Where the hostage was left)

3. A Robbery location

4. A money exchange location

Therefore, in order for a case to be included in analysis it needed to have a place where someone was abducted from to commit the offence, a loved one of importance to the victim needed to be taken as hostage and then used as collateral also. Furthermore, the victim needed to enter their place of employment and secure funds that they would later exchange with the offenders. Once all of these features were established a case would then be included in the dataset.

4.6 Police Service of Northern Ireland

Gaining access to PSNI TK cases also proved to be a rather different challenge. Initial contact was made in September 2010 providing the proposed direction of present study. This was passed to the Service Leader for TK in the North of Ireland, having been originally submitted to a member of the Higher Police Analyst unit of the PSNI Organised Crime Task Force. The early feedback received was positive in regard to assisting the request for data on TK cases in the North of Ireland. As such, a full spreadsheet containing locational information on TK offences that the PSNI possessed was passed to the present researcher. These consisted of (N=47) cases.

However, the same issues arose as with the An Gardai data, issues such as incomplete information and actually not being able to confirm if a TK case was, in fact, a TK case. This

again highlights the difficulty of working with police data as outlined by Canter and Alison (2003). Police data is not collected for the purpose of research, so it is often in a muddled, incorrect and incomplete format. Extensive cross-referencing of cases against media reports was required in order to ascertain whether there may have been information that was missing.

Case No. 29, for instance, reported a money exchange taking place at location X when, in fact, in the media it was reported across several papers that the money was exchanged in location Y. The cross-referencing of cases through media accounts proved useful as it was a basis to question the validity of information that was released over to the current researcher by the police. Therefore, the validity of a location was checked through submitting a confirmation request to address any possible inaccuracies in the data provided. In relation to Case No. 29, the media reports were, in fact, correct and the location that was provided initially was, in fact, the wrong location. This cross-referencing process added to the validity of the information that was put forward to analysis. As a result of excluding cases, the study was left with (N=37).

4..7 Total Cases

To summarise, a total of (N=70) case that fitted that criteria require were identified from both An Gardai and the PSNI. The PSNI had a total of (N=47) and An Garda provided a total of (N=23) cases. However, a number of the cases from both police forces had to be discarded from the study as previously mentioned. Having taken into consideration inaccurate and incomplete information and having discarded these cases from the sample if it was not possible to cross-check the information, it left the study with total of (N=51) for An Garda

(N=15) and the PSNI (N=36). The current sample reflects all known offences of TK over the

past ten years in the republic and the last five years in the North of Ireland[2].

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[2] Due to the fact that the PSNI only formed as a police force in 2001 they have a number of difficulties in relation to historical data on crime; this accounts for the short time period for the North of Ireland crimes.

5.1 Tiger Kidnap: A Case Study

TK is a term used to describe the abduction of one or more individuals, in which the abduction forms a part of the robbery. A person of importance to the victim, typically a family member or loved one, is held hostage and used as collateral until the victim has complied with the requests of the offenders. The victim (that forms part of the robbery) will be instructed to attend their place of employment, typically a bank or other financial institute, and withdraw a quantity of cash. This has been accomplished by using a picture of the victim's loved one(s) under gunpoint, or, through the desperate persuasion of the victim, to get the assistance of their colleagues to complete the act. When the money has been secured, the victim will then be told of a location in which to meet the criminals to hand over the cash. This method has proved extremely successful for criminals in the past number of years; as such, it is natural to assume that other possible offenders will identify TK as being a viable crime; therefore, further efforts should be made to try and prohibit or reduce incidences of this offence.

One of the hallmark features of this crime is the vast number of individual locations that are incorporated within the offence. As a consequence, these features facilitate the possibility of a systematic analysis into the locations used and the spatial processes inherent to them. TK offences offer a different, albeit unique, challenge to the investigative psychologist and one that deviates slightly from the principles that have been highlighted above. The key issue for consideration in TK is the active learning of, and interaction with, the environment. This somewhat goes against the influence of the home as being directly related to offending locations, via defined propinquity, but leans more toward the theory of a 'mental map', which is an individual mental representation of an external environment (Canter & Youngs, 2008).

The 'Tiger' aspect of the offence is related to the surveillance or stalking type of behaviour that the criminals engage in prior to the offence, in the same way a tiger stalks its prey before attack. Such behaviour can undoubtedly influence an individual's mental knowledge of an environment in which they are now exposed. Garda Commissioner, Fachtna Murphy[3], summed up the 'tiger' aspect of the offence in a report to delegates in December 2009,

> *"It describes the prelude to the incident itself where the perpetrators engage in a predatory, tiger-like stalking of the kidnap victim and their family, often gathering intelligence and carrying out surveillance on their partner's and children's movements and activities."*

It is important for the offender to learn the daily routines of their victim in order for them to effectively plan the assault. If their intelligence is flawed their whole operation can become unhinged; this requires, as reported through anecdotal accounts in the media, around-the-clock monitoring and surveillance.

The active learning of the environment and how this influences active engaging within this environment is important for our understanding of the psychological process associated with spatial learning. Furthermore, the contextual backdrop to the locations used by offenders is another important area where understanding is paramount. How the context of the offence influences choice and thus spatial opportunities, or more appropriately, spatial restrictions on a given location, is important to appreciate. Unearthing the geographical features of the offence of TK will advance further the theory of a mental map and how this plays a role in everyday environmental learning and interaction.

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TK, as outlined in the previously, is a unique offence in criminality for a number of specific reasons that relate to the requirements, demands and detail of the offence, such as,

- The manner of the strategies that are employed

- The geographical distribution of locations contained within a TK

- The number of offenders involved

- The level of planning involved

- The number of resources that are needed, such as vehicles, weapons, etc.

But also,

- The success that offenders have had with it in Ireland, and,

- The possible ramifications for an increase in this offence based on this success.

In an effort to outline some of the intricacies within the offence of TK, the following chapter will provide a detailed TK case study which occurred in Dublin, Ireland, in 2009. The rationale behind selecting this specific case as an example is due to the fact that it is the most well know TK offence in the Republic of Ireland and is the single biggest robbery in the history of the Irish free state. Furthermore, it illustrates perfectly the form and structure of the standard TK style offence in Ireland. The relevance of this form of criminality to the established research concerning criminal spatial geography and the subsequent challenges to the literature are discussed at length.

5.2 The 2009 Bank of Ireland TK

The following is a case study example of the most high-profile robbery in the history of the Irish state, and one which is a example of the structure and form of a typical TK offence. The 2009 Bank of Ireland robbery will be studied for two central reasons. Firstly,

this particular crime was the largest robbery the history of the Irish state with criminals acquiring funds of over 7 million euros. Secondly, it was the first time that the term TK came into the Irish public's lexicon.

On the 26th of February 2009, Patrick, an employee at the Bank Of Ireland in College Green, Dublin, was in his girlfriend's home close to Kilteel, County Kildare. Kilteel is situated 25km outside Dublin City. Patrick's partner and his mother and his five-year-old nephew were out for the evening and they arrived back to the house that evening at about 10pm. When entering the house they were approached by six well-built, masked men, dressed in black and carrying firearms. The men were hiding in the bushes beside the house when the family arrived home. The gang of men forced their way into the property and took the three individuals and Patrick hostage. The gang tied up the victims in the house and confiscated their mobile phones. It was reported that there was a moderate level of violence administered on the victims, particularly Patrick's partner, who was struck over the head with a vase that was acquired at the property.

The family members were held overnight by the gang members. During this time, the gang spent the time trying to calm down the hostages as they were in shock. As the morning approached the gang moved the two women and the young child into the family car that was found at the property. They were then driven to Ashbourne, County Meath, which is approximately 42km, using the shortest route distance, away from the hostage-taking location.

While this was taking place, Patrick was given a mobile phone and instructed to travel to his place of employment as normal. He was instructed to collect various denominations of notes ranging from €20 to €200 from the bank he worked at. He was given a photograph that the gang took of his family being held at gunpoint. The photo was given to him to help him

convince his colleagues at the bank that his family was under threat and to comply with the requests of the offenders. Patrick travelled in his own vehicle from his base in Kilteel to the Dublin branch at College Green he worked at. He managed to convince staff of the threat on his family's life with the photo that he carried and was able to acquire their assistance in getting access to the money. Patrick then carried four large laundry bags full of money from the bank to his vehicle. When he was in the car he received a call from the gang in which they told him to drop the money at the Clontarf Road railway station. This station is approximately 3.7km away from the bank.

Patrick drove his vehicle to this instructed exchange point which takes about ten minutes to travel to. He was met by the gang and subsequently handed over the cash that he managed to take from the bank. The gang left him at the station and took his vehicle, with the cash, to another location in Glasnevin, approximately 4km away from the money exchange location and with a driving time of approximately 11 minutes, where they burnt out the vehicle.

Following the exchange with the raiders, Patrick made his way to the nearest police station on Clontarf Road, about 500 metres from the train station, where he reported the incident. This was the first point in which the Gardai became aware of the offence.

A full hour after the robbery, the hostages that were moved to Ashbourne Co Meath managed to free themselves and made their way to the nearest police station. Patrick's partner required medical treatment for the injury she sustained from the raiders at her home. All members of the family involved in the incident were naturally treated for shock.

Figure 5.1 is a map profile of the various locations that were actively used during the offence outlined above. It is quite clear from the geographic layout of the city and the distribution of the locations that were used that this type of offence differs significantly from

other forms of robbery. Such as the notable differences that occur with hostage-taking being remote from the location that is being robbed, the actual scale in distribution of the offence locations, and, also, the fact that the offenders do not enter the place that they are robbing. Furthermore, there are a number of more prominent differences that relate to the geographical setting or profile of the entire offence. The most important differences relates to the number of active locations which come together at the same time to form the offence as a whole. This is certainly something that has yet to be observed, with any great consistency, as a form of criminality. There are aspects of kidnap and robbery offences that involve great distances being covered and a number of locations incorporated within this, however not necessarily in conjunction with other forms of movement running concurrently with the offence, such as we find with Tiger Kidnap offences, in the movement of the hostage and then the robbery location to the exchange locations.
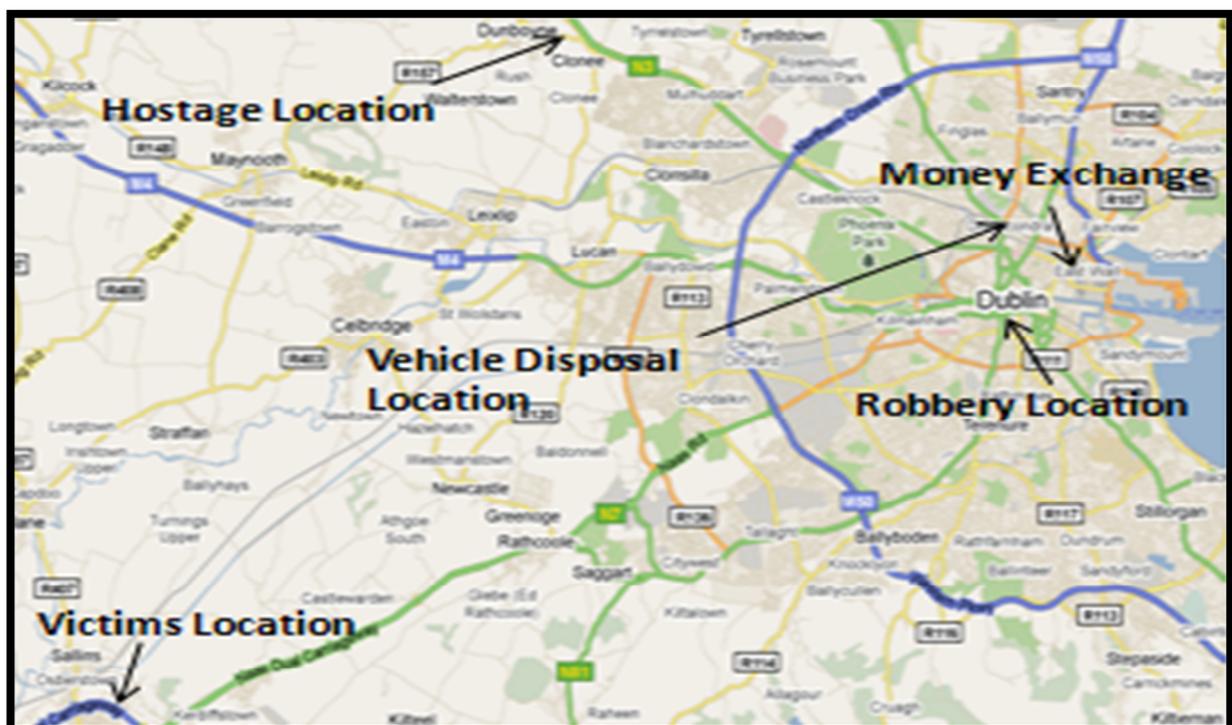
Figure 5.1: Map of TK, Dublin, 2009. The active locations of TK marked on the map by arrows.

The total offence locations as observed on the above map are spread out over three counties: Dublin (the right half of the map), Meath (the upper left of the map) and Kildare (the bottom left of the map). There is a minimum driving distance by the offenders of 75km, when the distances are calculated using the stages below.

a) The home to hostage location

b) The home to robbery location

c) The robbery location to the exchange location

d) Exchange location to disposal location

The distance but also the distribution of locations distinguishes this type of offence from other forms of robbery where the distance ranges are not nearly as broad and vast as those found presently. One of the central issues that the crime of TK raises is a challenge to what is known about criminal spatial movement generally. This relates to the psychological concept of the *Journey of Crime* and also, importantly, crime occurring in areas which offenders are familiar with.

5.3 A Challenge to the Journey to Crime Concept

In recent years, researchers such as Brantingham (1981; 1993; 2008), David Canter and his colleagues (e.g. Canter & Larkin, 1993; Lundrigan & Canter, 2001a; Canter & Hammond, 2006; Sarangi & Youngs, 2006) and others within the geography of crime field (Warren et al., 1998; Rossmo, 2000; Chainey & Ratcliffe, 2005; Levine, 2006; 2007) have successfully drawn out consistencies in the *Journey to Crime* across various samples whilst also offering up a theoretical basis for these findings. However, the so-called 'Journey to

Crime' has a broader meaning than those studies above that explored aspects of distance between home and offence location.

The so-called 'Journey to Crime' concept implies that an offender travels out from a home or significant base to offend. However, the changing landscape of criminality, presently in the form of TK, is beginning to put pressure on the applicability of this concept of criminal travel to all forms of crime. The notion that an offender travels out from a base to offend or commit crime has long been the conventional starting point within criminal geography. The reason for this is due to the fact that it provides a framework with which to test and analyse, of which the studies highlighted above have been successful in doing so, although this approach makes some assumptions about the nature of travel and crime.

Where offenders travel in the lead-up to an offence is extremely difficult to establish. However, recently, certain crimes have allowed for certain rational assumption to be made. TK, for instance, allows us to follow the route the offenders take for one specific stage of the offence, the exchange location to the disposal location. Interviews that form the basis of this PhD research have indicated that this will always be done via the shortest and quickest route available. As a result, these routes can be developed from the case information and subsequently analysed directly. Furthermore, the professional make-up of the Tiger- Kidnap-style offence challenges the manner in which offenders arrive at an offending location. Vast amounts of research is required for this offence to be carried out effectively; this is, in fact, where the term 'Tiger' comes into it, as mentioned previously. How this advanced planning and reconnaissance approach can relate to the Journey to Crime concept of travelling out from a base to offend is difficult to consider. Regardless of the TK offence, the logic that the Journey to Crime puts forward appears even trickier to consider when dealing with the psychology of travel in general.

The overall concept regarding criminal movement has included a number of factors that have been put together to offer an example for why offenders offend where they do, for instance,

- Routine Activities

- Rational Choice considerations

- The proximity or importance of the home

- Familiarity with surroundings

- Obvious need to avoid detection

It is important, therefore, to unpack how these concepts, so central to our understanding of criminal geography, link into the crime of TK.

5.3.1 Routine Activities

As previously outlined the Routine Activity approach is carried by a number of core ideas that are brought together at the same time for instance, a motivated offender, a suitable target and the absence of protection over this target. There are further aspects which relate to how an offender will learn through experience how to actually identify.

Rhodes and Conly (1981) note that offenders exploit environmental cues that they learn about from their non- criminal journey. The use of this interaction differs form no criminals in terms of legality. This approach helps us to understand how offenders learn of the opportunities for crime. However, what does this approach tell us about TK offences?

The crime of TK is a well-researched event by offenders while also being geographically unique in its development. It involves a number of key strategic and structural

approaches, which make the link between Routine Activity Theory and its influence on the offence hard to appreciate. TK involves the following core elements,

1. a large team of offenders ranging from 4-8 including a competent driver

2. surveillance equipment, vehicles, weapons, phones, etc.

3. route and temporal learning of victims' routine activities

4. 3-4 additional locations other than home of victim and location of bank

An offence such as a TK requires the focused study of a number of individuals over a significant period of time. To state that an event like this occurs because there is a motivated offender and an opportunity to offend and that this information was acquired through the routine activities of a member of the gang is a rather simple explanation for the processes at work. Generally, in TK, a bank or financial institute is selected and an individual that works within that institution is identified. There are anecdotal reports suggesting that, in some cases, the victim is in on the attack; however, presently there exist no solid foundations to this claim in any of the available cases, but it should also not be dismissed. The Routine Activity approach to the crime of TK nullifies or reduces the extremely complex active engaging and learning that takes place to a simple motivated offender meeting a suitable target that is not protected. In fact, the target in most cases is protected, through the standard methods of security, but the complexity of the offence of TK is that it utilises techniques to overcome these deterrents or security features.

5.3.2 Rational Choice Considerations

The knowledge and availability of opportunities for offenders to commit crime will influence the choice of where they commit their crime. A number of factors will generally influence this, for instance, the cost/benefit of choosing one location over another. Targeting

is another issue that is discussed in the literature and one that is directly relevant to the crime of TK.

In general, Rational Choice theory, according to Clarke and Cornish (1986), proposes that man is a rational actor who will weight up the costs and benefits of offending and make a decision based on those factors. TK, due to the large number of offenders required to undertake the offence and the number of resources also required, such as time invested into the planning stage, for example, highlights the rather uniqueness of the offence. Therefore, Rational Choice considerations in TK need to factor in issues that a lone offender considering robbing a shop will not encounter.

Firstly, the number of offenders means that there will need to be a sufficient payout to be able to justified the time and energy needed to invest in such an offence. The likely amount that will be obtained will also need to be established, in order to assist in recruiting suitable members. Resources such as weapons and vehicles will need to be sourced in advance of the event, which again applies more demands on the offenders. In addition to this, safe houses and the manner in which the money is distributed directly after the offence must be factored in.

Rational Choice theory therefore allows us to make some assumptions on the type of individuals who consider an event like this to be a rational one. It would indicate that the type of offender is quite different to an armed robber or shoplifter. Therefore, Rational Choice considerations highlight the level and experience of the likely offender based on the manner of the offence and what they consider to be a rational endeavor.

5.3.4 The proximity or importance of the home

The importance of the home as a base from which an offender moves out from to offend is another feature of the literature into criminal spatial movement. As previously discussed in Chapter Two the theory is based on the idea that an offender will likely have a fixed base from which they carry out their crimes and that this base will have an influence on their movement and the location in which they commit their crimes.

To summarise for clarity, the Commuter style of offender is someone who travels out from their base but who is less influenced by it. This type of spatial pattern possible has a close link to the Tiger-Kidnap-style offender, although the fact that this is a group offence make it especially difficult to classify the offenders in this manner. In contrast, Marauders are offenders that have a strong relationship to their home or base which directly influences their criminal spatial behaviour. This is of more relevance to a singular offender as group geographical psychological parameters are hard to postulate.

In terms of TK it is hard to associate either of these two types of offending styles to TK offenders. The location of the TK crimes is target-specific in a unique way unlike anything that has been studied before. This relates to the fact that the target location (home location) is not related to the subsequent offending locations in the way the home location of a prostitute, for example, is likely to relate directly to the location of an possible encounter with a rapist, and this location, then, will likely influence to the location of a subsequent attack. To expand on this further, if a prostitute is targeted in an attack, the location of where prostitutes operate from are likely to have an influence on the location of the attack. Therefore, this moves it away from the Circle Hypothesis explanation, as offenders will have to travel to attack this specific type of target. However, TK is different again due to the vast locations used during the offence, it could be argued that there are two, or even three target

specific locations contained within a TK, for example, the home of the victim, the location of the premises being robbed and the money exchange location. This results in a rather unique and dynamic form of offending behaviour.

Furthermore, there are aspects that relate to group geography, TK is committed by a large group of offenders, which challenge the applicability of the circle hypothesis while also raising important questions. Questions such as, which member of the groups geographic background is an offense likely to be built around, or, does the group leader's geographic background have more of an influence on offending locations. Exploring these types of questions are important for our understand of criminal behaviour, although they encounter obvious difficulties such as accessing suitable data.

The additional locations in a TK, are more dependent on the location of the target, than on any influence of the home of the offenders. For instance, the spatial distributions within the offence have little to do with the location of the offender's residence. The distances between the crime locations also accounts for this. The distribution around the target in the exchange and disposal stages are influenced by the preceding stage. However, there may be a directional bias within the chosen locations, but attempting to establish this when there has been no notable convictions will remain difficult. Therefore, the core anchor point will be the Robbery location initially, then the exchange location. The disposal location will, as a result, be influenced by the exchange locations.

In essence, the crime of TK exists within its own defined geographical template, and the influence and movement within this offence rests solely on the active location that precedes it. The influence or importance of the home is much less of a factor for this form of crime, something which has yet to be observed so directly in the geographical literature on

criminal spatial movement and which should open up debate on the influence of group geography on offending locations.

5.3.4 Familiarity

As previously highlighted in Chapter Two, familiarity has been established as an influencing factor on the spatial distribution of crime. The basic premise here is offenders commit crimes in areas in which they are familiar. The vast majority of studies have been concerned with of single offenders. As previously mentioned, this is likely due to the difficulty with accessing suitable data on group geography. In what way does the issue of familiarity fit in with the style of TK offences currently being discussed?

If familiarity is of the core rational basis for understanding why offenders offend where they do, then the TK offence offers a challenge to this conception. As can be observed solely by looking at the distribution of locations on the map presented previously (Figure 5.1), the broad range of locations that are included suggests that if familiarity plays a central role in location choice, then the geographic activity space of an offending group is likely to be extremely large. However, what this really suggests is it that members of the group reside in these areas, which opens them up to the possibility of being used within the offence, or, more plausibly, is it that we are looking at a different style of offender within this different and unique style of offence? Is the offence of TK, in which offenders research locations specifically for the purpose of what they offer in terms of utility to conduct a TK offence, something that has yet to be previously exposed in the literature? If this is to be the case, then this means that offenders are actively seeking out and learning about areas and locations in which they previously held no knowledge of. Therefore, TK will challenge a number of the principles of criminal geography as the locations are so broad that they are unlikely to be

influenced by the home, to be learned about through routine activities and also to be in areas in which the offender has high levels of familiarity.

Within TK offences the offenders are researching locations and areas that they need, based on the locations of the targets they are planning on attacking. Targets are acquired through the stalking of individuals with direct access to large amounts of cash, the majority of bank officials held this type of access to cash. Naturally, Rational Choice considerations will play a role, but this will be more of a driving influence than the importance of the home, familiarity and learning through Routine Activities as has been suggested. In fact, the routine activities, in this instance, are conducted with the sole purpose of learning. Therefore, it appears that we are looking at an offender who is interacting with the environment purposely and directly in a unique way.

5.4 Conclusion

Therefore, to sum up the issues of familiarity, it appears that the focus of study should ignore the influence of the home for a moment and explore the influence of the target's location and what that can provide information on. The location of the subsequent crime stages within TK are based on the location of the target, not any preconceived influence of the home of one of the offenders. The challenge now is the approach of the psychological aspects of location choice, and what they afford the offender as well as the range with which they feel comfortable travelling during the offence. As such, the TK offence challenges some of the principles that have been put forward as directly influencing the offending location of criminals. They may have some influence for how the information about how a target was acquired, but the levels of advance geographic learning and the specific and direct influence that the target has now forces researchers to address criminal spatial movement in a way that

is removed from previous concrete principles of offending behaviour. Naturally, the offender will have some relationship to general regions, for instance, Dublin city, but what the competent parts of this offence mean is something that requires a rather direct assessment. The next chapter aims to explore some of these challenges relating to variations within the same offence occurring in different locations.

6.1 Analysis of Distance: Testing the Validity of Distance Measurements.

The present chapter aims to explore how criminal spatial data is measured; however, it also examines how appropriate the use of these traditional measurements is. The issue of accuracy and also validity with using certain spatial measurements will also be raised. The current chapter will refer to case samples that were collected and that will be presented in the next study, Chapter Seven, as the current arguments are based on difficulties that were encountered in the measurement of data from these cases. Therefore, reference will be made to cases that are not included in this chapter but that are the driving force behind the rationale for the study.

The locational information concerning 51 TK offences on the Island of Ireland was collected. As previously highlighted in Chapter Four, the information collected contained a number of locations, for example, robbery locations, money exchange locations and hostage locations. Distance measurements were established between the various locations included in the offence. However, when attempts were made at measuring and recording these distances it became apparent that there was a severe disparity between the Crow Flight distance measurement and the actual Route distance that was available through Google Maps software. As a result, it warranted a direct study of what the variation within these different distance measurements is.

6.2 Crow Flight Distance

It has been a convention in the geographical profiling literature to use what is referred to as the Euclidean or 'Crow Flight' distance. The Crow Flight distance measurement is the A to B distance between two locations, which is the shortest possible distance between two

points. It does not take into consideration landmarks or road networks; it is the direct distance between point A and point B. The distance (D) between location A and location B is established using Pythagoras' Theorem, thus:

$$D \sqrt{\text{(x-location A – x-Location B)}^2 + \text{(y-Location A – y-Location B)}^2}$$

Equation 6.1: Crow Flight Distance Formula

The Crow Flight distance is the most common form of measurement in criminal spatial studies. As mentioned, the rationale behind why this is the case is that travel routes offenders take are generally not available, or, more appropriately, readily accessible. Furthermore, another rationale for its use is that researchers have suggested that individuals conceptualise space in the form of the relative position of things (Canter & Tagg; 1977). Another argument for its use is as a means for comparing differences or similarities across studies.

The acceptance is that this is the only accurate manner in which to get a distance measurement between two points, or, for the purpose of the current study, two locations attached to a crime. However there has been some academic comment within the literature (Larson and Odoni, 1981; Kind, 1987; Rossmo, 2000; Canter & Youngs, 2008) on the topic of the appropriateness of the Crow Flight as a reliable distance measure. It is important at this stage to first introduce the origins from which this study is based which is found the work of Stanley Turner.

6.3 Early Work of Turner

The current study draws on the early work of Stanley Turner (1969), whose study into Delinquency and Distance in Philadelphia was one of the first to attempt to use Route

distance as a measurement over the Crow Flight measure. However, there are a number of reasons why Turner's study differs to the present one. Turner had no evidence that the offenders travelled the routes that they did; his dataset contained a point of offence and point of residence, but this was historical data and he did not have access to information that stated specifically the route that was travelled by the offender.

Not having access to route information is one of the main reasons that the Crow Flight measure is the standard measurement method in the literature; it makes no assumptions regarding the nature of the routes travelled. It was highly possible that an offender might have travelled to a number of different areas before committing a crime at the location that Turner had access to. Furthermore, he could not have been sure of the routes travelled by offenders and, as a result, he makes a large assumption about the travel pattern of each offender in his sample. Nevertheless, as shall be discussed later, his method does provide a more accurate measurement to the real distance travelled by the offender than the Crow Flight method. According to Sellin and Wolfgang (1969), Turner himself stated that the Crow Flight distance

" understates the true distance by a roughly calculable figure"

(Sellin & Wolfgang, 1969, p.12)

Unfortunately, Turner failed to quantify what this calculable figure is, although he is likely referring to the Manhattan measurement popular at the time. Irrespective of the assumptions that Turner made, he did recognise the potential of the Route distance measurement. As a result, the current study will aim to advance on this early work and address the issue of distance measurement more directly.

6.4 Further Support for Crow Flight

According to Canter and Youngs (2008), there has been some discussion on whether travel route would be a more appropriate method of calculating distances. In addition to this, Philips (1980) states that using street distance is problematic as there is no guarantee that that was the route the offender travelled.

Hitherto, Crow Flight has been seen as an acceptable approximation of the Journey to Crime as there is a high correlation between street distance and straight-line Euclidean Distance (Philips, 1980). In discussing the seminal work of Kind (1987), Canter (2004) highlights that when working on the Yorkshire Ripper case, Kind used Crow Flight distance when calculating the distance measurements between crime sites. Kind stated that road distance is approximate to Crow Flight the further the distance that is travelled. Canter supported Kind's assertion in making reference to his own work (see Canter, 1977) that found working with straight lines to be of greater benefit, in that they reflect the mental process related to space as opposed to route.

However, Canter's (1977) study used individual estimates which correlated better to actual travel time and distance around London; however, this is not really applicable to the study of criminals, who, in the present cases, have generally studied their routes and even timed themselves from one location to another. In response to being asked about how a particular offender planned a getaway route, P021 stated that,

> *"Ah yea…yea. I went with him once or twice. He would sit there with a stopwatch*
>
> *stuck to the dashboard. And he would say right when I take off press start and I*
>
> *will see how long it takes me to get from this road to that road. The crime scene to*
>
> *the second car."*

This is one of the delicate aspects of applying information from the general population to an offender population, as noted previously. It is a struggle to comprehend how straight line distance is viewed as being of greater benefit to mental processes relating to space when studying a criminal population and the travel patterns within their crimes. The present position is that space, in this context, can only be reflected internally based on the experience of the individual. Unless operating out from a base in a helicopter, for instance, in which it is easy to cover distances in a straight line, it is difficult to then think that straight line measures are more reflective of space related directly to an offender's understanding.

The present argument is that efforts should be made to use the Route distance as opposed to the Crow Flight measurement when studying certain types of advanced crimes. This is especially advantageous when studying criminal movement in cities and countries that don't operate on a grid or block system network, such as Ireland. The reasons why this should be the preferred method are outlined in the following paragraph.

6.5 Exploring the Route Distance

Although Crow Flight is a standardised measure to use when studying geographical crime data, it was felt that, in the current study, it was not applicable to use the Crow Flight measure. This was due to the fact that the make-up of Irish road networks would considerably distort the distance actually travelled. Furthermore, in a crime such as TK, which is so geographically distinct to other offences, it was best to try and measure these distances as accurately as possible. Van Koppen and Jansen (1998) make reference to type of road networks in their study of Commercial Robberies. They suggest that Dutch scenery provides problems for measurement as the cities are not built on a grid network like those in the United States.

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Therefore, considering that point, certain assumptions need to be made in relation to the type of measurement that would be used to explore the present data. It was determined that it would be of practical benefit to use the Route distance in favour of the Crow Flight measure when measuring the distances contained within TK in Ireland.

The Route distance was calculated using the Google Maps software[4]. Google Maps provides a distance figure that is calculated on the quickest time between point A and point B but based on the actual route between these locations. Preference for the Route distance over the Crow Flight distance, it is currently argued, is based on the fact that it will offer more accurate measurement of likely distance travelled. The accuracy is based on the more valid travel distances between locations as this is what, in essence, is being explored. Hence, being able to establish the Route distance measure will result in a more valid dataset and also be more representative of the psychological process associated with these distances. This is based on the understanding that offenders conceptualise distance through the route they wish to travel and not by means of a straight point-to-point internal evaluation. Evidence of offenders timing the driving distance between points, and also the advanced importance some of them placed on understanding routes and distance, provides evidence for the approach to conceptualising distance between locations as being route dominant.

There is a broader argument that is worth developing, which concerns the nature of distance conceptualisation generally. The advancement in technology that now provides instant access to directions, routes and locational information are possibly changing the nature of the development of spatial knowledge. Spatial knowledge, as touched on by Canter (1977) as being essential to our survival based traditionally on how people would navigate around their environment, is becoming less and less of a necessary tool. It is therefore possible that this naturally occurring form of spatial learning is not being developed to the

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[4] For an analysis of the mathematics behind this type software, please see Sanders and Schultes (2005).

same levels as it once was. Spatial learning through experience is possibly being eroded by the increase in the use of smart phones, GPS systems and computer software generally.

6.6 Rationale for Crow Flight

There are a variety of reasons why the Crow Flight measure has been used as a means to measure travel patterns generally. In relation to its use within criminal studies, the primary reason rests on the difficulty of acquiring offenders' actual routes that they have used during their criminal excursions. Furthermore, early studies, as documented by Canter (1977), indicate that individuals conceptualise distance through the relative position of locations, which makes using the Crow Flight measure appropriate as it measures the directness between two points. This research was concerned with how individuals make sense of the space in which they find themselves and reports some novel findings in this regard. The current research complements these studies but also understands how some subtle differences within its subject focus may lead to certain distortions. For instance, the requirements of an ordinary population sample, as studied in the work of Canter, are likely to be different to a criminal population. It is especially true when considering the planning nature of certain types of crimes, particularly those examined in this thesis. Therefore, it may be possible that offenders who engage in advanced planning may conceptualise distance in the form of Route distances and related temporal factors, vital for the undertaking of certain types of crimes, rather than the related position of things, as suggested by Canter.

Relating more directly to criminal studies, Hammond (2009) notes that offenders may operate from a number of anchor points, meaning that they may not have travelled directly from their home location to their crime location. For instance, it may have been that they travelled from another base or anchor point; furthermore, it is also possible that they may also

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have made a number of stops along the way, as indicated by Gabor and Gottheil (1984). Gabor and Gottheil also point out that given that the route is unknown, the use of the Crow Flight measurement is more appropriate because it is a systematically biased estimator of distance travelled, meaning that they are acutely aware that it underestimates the distance.

Therefore, this raises the question of how this can actually be considered a valid rationale for its use, as a measurement, considering the measure is accepted to be wrong but that continued use of the measure is argued as appropriate because this error is acknowledged. This could only be appropriate if an error rate was accessible, in which the Crow Flight distance figure could then be altered or adjusted after the fact to provide a better and more valid distance figure. Again, this is one of the central aims of the current study. Nonetheless, it is acknowledged that there will naturally be difficulties in the comparability of this to previous studies.

Hammond (2009) makes a correct, albeit rather inflated, claim that it is impossible to establish with certainty where an offender has travelled. This may be the case for certain crimes; however, it may be possible to distil the routes travelled by offenders in other types of crimes, for example, TK (see Chapter Four). Furthermore, certain stages of crime, for instance, a robbery location to a disposal location of a getaway vehicle may itself lead to the possibility of extracting routes travelled by offenders. This assumption is based on interviews conducted with offenders who in all cases stated that travel to a disposal location in the immediate aftermath of a robbery will always be via the quickest possible way. When discussing the importance of the getaway, Jimmy, one of the 33 offenders that were interviewed, stated, when talking about the driver, that,

"because you see the quicker he gets you away the quicker he gets you out of the area."

It appears that speed is paramount at this specific stage of a robbery offence. Hence, developing this knowledge with possible police information about the direction that offenders may have travelled, at this particular stage, can allow researchers to make some relatively rational assumptions regarding direction and route.

In sum, the reasons that Crow Flight measures have been used over Route distance measures in the available literature is down to a number of factors.

1. A large proportion of the research in the area was conducted at a time when the software that is presently available had not been developed. This made gaining access to the Route distance figures an extremely difficult and time-consuming task.

2. Gaining access to data that includes specific information on the route in which journeys were made is also extremely difficult.

3. Studies in American cities have used Manhattan distance due to the block network system that exists in American cities.

However, in fact, Crow Flight distorts the distance travelled as they will always,

a) Be shorter than the route travelled

b) Ignore geographical barriers

c) Ignore road networks (for example, one-way systems)

Therefore, taking these into consideration, can it then be possible for Crow Flight measures to be considered a reliable reflection of distances travelled? In order to establish if there is any disparity between Crow Flight and Route distance, it must be tested directly. The specific nature of this possible difference is what the current study will attempt to explore.

6.7 Route Distance vs. Crow Flight

In the absence of Turner's early work, this is the first study in Investigative Psychology, to the best of the current researcher's knowledge, to use the Route distance over the Crow Flight distance measure. Therefore, this adds to the reliability of the distance measures under analysis as they will be more reflective of the journeys travelled by offenders.

However, as this current research utilises Route distance, it is important to initially establish the difference or error rate between using the Crow Flight distance over the Route distance measure. This will,

a) Enable the researcher to establish if there is a difference of significance between the two measures;

b) Support the rationale as to why it is a more appropriate measurement to use; and

c) Provide some type of quantitative framework.

Therefore, the present chapter introduces a short study that sets out to explore the difference between Crow Flight distance and Route distance measures.

6.7.1 Research Question

Will there be a significant difference between the crow flight Measure of distance and the route distance measure of distance data.

6.8 Methodology

In an attempt to examine this issue, 50 randomly selected locations containing A to B points, around the various areas of where the majority of crimes in the present sample were committed, were generated. There was no rigid basis for where the locations were selected;

however, they would have to contain two points and those two points would be based on the island of Ireland. Furthermore, due to the nature of the cases that were analysed, it was decided that it was not valid to have locations that were on main roads or motorways. This was because there were no locations in the actual cases that were on main roads or motorways for the obvious reason of evading detection.

Therefore, once two points on the map were selected, they were moved to the nearest appropriate area to reflect the type of spatial patterns that were evident in the real cases. Appropriate areas were defined as not being directly on main roads or motorways and not in the middle of a town or city.

A variety of random, criteria appropriate, locations were generated, measured and recorded. The actual Crow Flight distance was recorded by measuring the straight line between point A and point B on a computer generated map. The route distance between location A and B was then generated through the Google Maps Route software, which provides a route distance figure and a temporal approximation of the journey travelled. As such, there were 50 distance measurements for Crow Flight and 50 distance measurements for the Route distance. Following on from this, an error rate was generated in the form of a percentage difference. The percentage distance (PD) between Crow Flight (X) and Route distance (Y) calculated as,

$$(Y \div X)100 - 100 = PD$$

Equation 6.2: Percentage Distance Formula

Finally, all distances measured were recorded in kilometres. In instances where a random A to B profile was generated in the North of Ireland, the Google Map software provided a distance in miles. This figure was subsequently converted into kilometres to allow

for consistency across the sample. The alternated figure from miles to kilometres was rounded up to two points after the decimal in all cases.

6.9 Results

N=100 distance measurements in total were collected, with n=50 of these being Crow Flight measurements and n=50 being Route distance measurements. Descriptive statistics were generated (See Table 6.1).

	Crow Flight	Route Distance
N	50	50
Mean	8.21	11.38
Standard Deviation	15.965	20.096

Table 6.1: Descriptive Statistics Crow Flight and Route Distance

Correlational analysis was conducted on the two measurements. A strong positive correlation was found between the Crow Flight and Route distance measurements, which was to be expected $(r=.993)$. This was expected because the measurements are all taken from the same two points across the 50 cases; therefore, it is natural that they would strongly correlate. This finding is in accordance with previous research (Philips, 1980) that shows Crow Flight and Route distance to have a strong positive correlation.

The result for the error difference for the randomly generated distance measures was found. The percentage distance (PD) between Crow Flight (X) and Route distance (Y) was

calculated. A percentage difference of *37.9%* between the Crow Flight and Route distance was observed. This finding indicates that there is just over *one third* of a difference between the Crow Flight and the Route distance, according to the data that was generated.

Finally, parametric assumptions were not met; as a result, an independent t-test was conducted to determine if there was a significant difference between Crow Flight and Route distance. A statistically significant difference was found between the Crow Flight and the Route distance *(t(49) = -4.810, p =.001)*. The higher mean was found in all cases for the Route distance.

Figure 6.3 is a real case illustration from the generated data that highlights the type of difference that occurs between the Route distance and the Crow Flight distance measure. It can be observed from Figure 6.3 that there is a noticeable difference in the travel features but also, specifically, in the distance that an offender must travel to move between these two points. It is put forward that this type of travel pattern provides supplementary support for the argument that advance offenders do not conceptualise space in straight point distance. This is due to the fact that it is not possible to move between locations in that manner; therefore, it is highly suspect for an individual, offender or otherwise, to cognitively represent this space in straight distance. Furthermore, the demands of the environment and the physical nature of the geography force the representation that occurs of this space, due to the presence of barriers, for instance, between accessing a location directly.
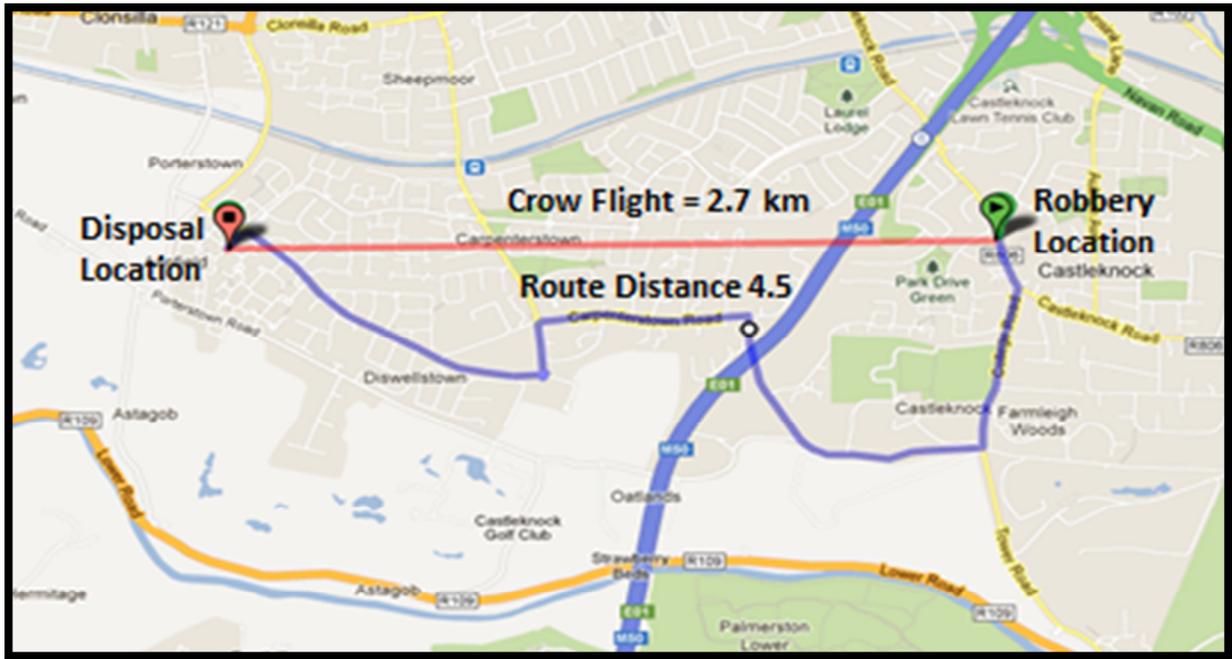
Figure 6.1: Case illustration from generated data

Finally, in order to build up a representation of an activity space, one must have the faculties to envisage their environment. The current example highlights that it would be unlikely to be feasible for an individual to build up a representation of this space in the manner of Crow Flight, whereas, in fact, their spatial comprehension is likely to be based on the route between these two locations, again providing support for the analysis of Route distance over the Crow Flight measure.

6.10 Discussion

The results of this study show that there is a substantive significant difference of over one third between Crow Flight and Route distance for travel data generated on Irish roads. As previously stated, Canter and Youngs (2008) note that Crow Flight distance is a reliable measurement for spatial data because there is a high correlation between street distance and Euclidian street line distance. Although the current study found support for a high correlation

between the two different measurements, this is not surprising. It is natural that the two measurements would correlate as they are based on the same location points across the sample. This high correlation means that for any relative comparison that it does not matter which measurement you use. However it must be noted that the distance will obviously still not relate closely to the actual distance travelled as it will underestimate it, as has been shown. Although these findings support the assertion put forward by Canter and Youngs (2008), it does not really address the more fundamental issue of validity and accuracy when working with distance data in a criminal context.

For instance, highlighting that there is a correlation between measure A and measure B and arguing that this relates to it being an appropriate measure to pursue academic focus ignores the fact that this measure grossly underestimates the actual distance under inquiry. Therefore, it is important to explore the error difference, as the current study did, between the two correlating measurements.

The results therefore suggest that if there had of been studies into Irish criminal travel patterns using Crow Flight distance measurements, which there has not been, they would be likely to find a 1/3 of a variance between the straight line distance and the actual distance There are also possible implications for studies outside of Ireland that have a similar geographic make-up, although most European cities would come under this banner. It may, in fact, be possible through supplementary analysis to quantify that error rate further, thereby making it more concise. However, it must be restated that the 1/3 of a variance found in this study relates to Irish distance data and may not be applicable to other countries and their associated cities. It does, however, open up the possibility of revisiting earlier studies and re-evaluating the likely distances that had been found, in order for them to be more representative of the distances actually travelled. Furthermore, the use of the Route distance

measure makes it difficult to make direct comparison between the calculations of this study to previous studies that used the Crow Flight measure.

It is important to acknowledge some of the arguments that have been put forward as being an appropriate rationale for using the Crow Flight measurement when examining distance data. One such argument is that the further the offender travels, the more likely it is that the distance will relate to the Crow Flight distance (Kind, 1987). This seems obvious when first considered; however, there were cases in the current study that had distances of greater than 50 kilometres which allowed this to be quantified. Thus, while taking these larger distances into isolation, there was still a quite a considerable percentage difference between the two measurements; *21.1%* for instance, in one case. Therefore, it can be put forward that this reduces the percentage difference to 1/5 in this instance.

It is important to state the reason why generated distance data was included in the current study in the form that it was. The reason distance data was generated and was not directly examined from the TK cases that were available was that there were parts of the country in which there were no TK crimes. The current researcher though that it was important to include some locations with which there might not have been offences but which would represent some unique distances and geography based on the themes found in the cases, in order to explore the distinction between the two measures. The research question grew out of initial examination of the TK data but this study is very much an methodology examination of distance measures, therefore, the use of generated data over case data is unlikely to have any influence on the results.

There are a number of issues that need consideration at this stage. Firstly, it brings the question of the geographic context of the distances studied. The majority of the travel distances in the real sample were distances under 10 kilometres. Therefore, the argument that

the further an offender travels means that the Crow Flight measure will relate more closely to the actual distance is of little or no relevance to actual crime travel distances. This is because the distances found in the majority of crime are unlikely to go beyond 10 kilometres, as was the case with the current study, and as has been observed in other studies also. Therefore, it makes the argument that the further an individual travels the more likely it is to relate to the Crow Flight measure somewhat superfluous, as it has been observed that offenders, in general, do not travel extreme distances to offend, which is the foundation principle of criminal geography.

In the small amount of academic comment that this issue has received, Rossmo (2000) makes reference to the validity of the measure of both Manhattan metric and Crow Flight measurements when he states that,

> *"The Manhattan metric slightly overestimates travel in a concentric street layout,*
> *but the crow flight distance in turn results in a small underestimate."*

> *(Rossmo, 2000, p.198)*

What Rossmo constitutes as 'slight' or 'small' is unclear, as he failed to clarify this. As such, it makes any comparison with the measurements in the current study difficult, as the present research can not speculate in quantifying slight or small. Rossmo (2000) does, however, state in reference to the accuracy of the measures that neither are far off.

Larson and Odoni (1981) conducted a study exploring the issue of differences between measurements. The problem that Larson and Odoni aimed to explore was the possibility of developing an algorithm that considers the ratio of what they referred to as the right angle (also called Manhattan distance) to the Euclidean distance. This would provide insight as to the nature of the extra distance travelled due to the requirement of travelling on street systems as opposed to the direct point-to-point measurement. They referred to a mobile

unit (a system travelling on the Manhattan distance) travelling on average about 1.273 times the Euclidean or Crow Flight distance. This novel study is of particular interest to the current study, specifically due to the fact that is quantifies differences between two distance measurements. As such, the Manhattan distance has just over 1/5 of a variance to the Crow Flight distance. Yet this relates to distance data that has been recorded in cities that operate grid or block pattern systems. Attempting to use right angle measurements (Manhattan distance) to quantity distance that may be travelled on Irish road networks, for instance, or, in fact, any European city for that matter, is just not applicable due to the design and make-up of these road networks.

Rossmo (2000) states that wheel distance or Route distance is the most accurate estimate available for travel distance, although this may or may not be the actual route taken. This is one of the arguments for using Crow Flight distance over Route distance, that gaining access to routes travelled by offenders is extremely difficult. However, considering that the Crow Flight distance, as shown in the present study, is considerably wide of the mark when it comes to accuracy at distance, it raises the question of why it is used as a measure at all anymore.

To outline this point, consider the following: location X and location Y have a Crow Flight straight distance of 2km and the route distance of 3km, based on the quickest route. How can it be considered appropriate to use the reduced estimation Crow Flight distance, regardless of possessing information on the actual route travelled as this measurement will always be in error? Therefore, it would appear to be of more practical benefit to use the Route distance between X and Y as it will represent the distance based on the most efficient route there. So, in the absence of information relating to the route that an individual has travelled, the measurement will be a closer approximation to the distance that the individual is likely to have travelled between X and Y. It will not be possible for the individual to travel a shorter

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distance than the generated quickest route distance. Although this distance might not relate to the actual travel pattern the individual makes, it will always be closer in approximation to the actual distance than the Crow Flight measure will ever be.

6.11 Conclusion

The limitations to the current study relate to its small sample size. As a result, it may be worthwhile generating a larger dataset in which to conduct a follow-up study. However, it is a very time-consuming task generating and measuring these individual locations, and, as such, the sample of 50 cases for both measures was considered satisfactory. In addition, there are a number of biases that must be noted when examining distance patterns of offenders. One of those, as previously referenced, was the bias that relates to offenders travelling shorter distances. This means that when analysing the comparative error rates for distance measures used with criminal data, the fact that offenders travel short distances needed to be reflected in these generated measurements. Therefore, the biases that are observed in the real case data for preference of shorter distance over longer distance was accounted for and was reflected in the data that was generated.

The more representative Route distance allows for the specific psychological factors that relate to movement to be explored, as the offenders had control over the distances that they travelled. Therefore, if the distance from the actual cases reflect distances that the offender had control over, then information relating to geographical decision-making and consistency in range can be developed further.

Another issue that must be highlighted is that locations used in certain crimes are specifically chosen for the advantages inherent to them, for instance, an isolated area where a

vehicle might be disposed of. Therefore, the context of the travel relates to the distance undertaken, and as previously noted, all this relates to decision-making by the offenders. As such, it seems impractical to reduce travel patterns to strict straight line distances. Efforts should be made to extrapolate Route distances where possible, as Crow Flight distance measurements do not offer any kind of valid representation of demands and requirements that the offender is faced with but also needs to utilise.

The implications of this study relate to a more valid and accurate form of measurement for distance data. Theoretical implications relate to how the concept of space and movement is understood, whereas the practical benefits could be, for instance, in more precise investigative advice to the police on search parameters, but also, possibly, in the generation of geographical profiles.

To expand on some of these issues further, this study has direct investigative contributions in, for instance, ascertaining temporal travel patterns of offenders. This could be useful for building up a profile of an offence such as TK, for instance, as we shall see in the next chapter. If there is a concern over the movement of possible suspects and also their involvement in an offence or presence at one of the stages of an offence then distance routes may prove to be useful in establishing their involvement. It is possible that the crow flight distance might place them within the area of the crime but in reality the route distance may in fact highlight that it would not be possible to move from one location to another in that time frame. This also could provide evidence in establishing the number of possible offenders involved in a particular crime based on the stages and distribution of locations while also possibly being able to categorically dismiss their presence at one site over another. This would be useful if, for instance, one suspect attempts to take the responsibility for the whole offence, by using the more accurate route distances may be possible to either support or reject their claim when dealing with location rich offences, such as TK.

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To conclude, it has been highlighted repeatedly in the literature on criminal spatial movement that offenders do not travel very far to commit their offences. Furthermore, this finding holds for the majority of crime. However, the extent of distance will have little or no influence on the reliability or validity of using the Crow Flight measure to analyse this difference. As such, the current chapter puts forward an argument for the use of Route distance as the preferred measurement for analysing criminal spatial data, primarily based on the fact that it will always be a closer estimation of the distance the offender actually travels and because it is unlikely that offenders conceptualise distance in straight points. As such, the present theatrical argument is both a geometric one and a psychological one based on how to appropriately measure distances but also how offenders are likely to conceptualise this distance and how this factors into the way in which they are likely to plan and organise their offences. In order to provide more robust and valid measures all references to distance between locations should now be based on the shortest route as defined by software that is freely and readily accessible such as Google Maps. The following chapter introduces a novel study into the offence of TK using the route distance measure, outlined in the present chapter, to calculate the distances between locations within this offence.

7.1 Context and Crime and A Tale of Two Cities

Research that exists in relation to criminal spatial movement has focused on understanding: a) The range over which offenders for particular crimes operate; b) Why some of these offenders travel further than others to offend; c) How they learned of the opportunity to offend; and d) Where an offender is likely to reside in relation to where he/she commits their crimes. However, as this is a relatively novel research area, in comparison to other psychological fields, it is inevitable that the current studies undertaken will be unique in an effort to test and advance the principles on which the original assumptions were based. As a result, there are numerous hypotheses, theories and assumptions that remain unexplored. An example of this is the context of the background of the offender, for instance socio-political context, on the observed distances that offenders travel. This 'contextual backdrop' (Canter, 2008), it is currently argued, is essential to advancing our understanding of criminals and can offer important implications for how we conceptualise criminal movement.

As previously mentioned, what is known about criminals' spatial movements is based on the same principles of what is known about non-criminals' spatial movements. One core principle that has been established through the investigation of offenders' spatial movements is the finding that offenders do not travel far from their home or a significant base to offend. This is incorporated under the concept of a *Journey to Crime,* which is essentially the movement of the offender, prior to, or in the build up to, committing the offence.

The consistent empirical finding of short distances between home location and offence location – differing in range between crime types – is known as the distance decay function, garnering its name from the negative exponential relationship between distance from a base and the frequency for a sample (Van Koppen & De Keijser, 1997). There are

numerous reasons offered for this decay function in offending behaviour, but the most logical one is that offenders are indolent and are not willing to stray too far from their home base.

Although there currently exists a large literature that explores the Journey to Crime that offenders take prior to committing an offence there are very few, if any, that have attempted to explore the journey that offenders take during or after crime. One of the central reasons why this area of research has lacked any meaningful scientific focus is down to the difficulty in acquiring accurate information relating to where an offender travels during or after they commit an offence. Many crime types, by their very nature, do not allow researchers to explore this phenomenon; although this excludes the initial work of Tonkin, Woodhams, Bond and Loe (2010) that explored the *Journey After Crime* using auto theft robbery and disposal sites. However, the offence of TK lends itself perfectly to the possibility of being able to investigative these processes further, as the locations in which offenders have used can be identified.

7.2 Contributions to Criminal Spatial Behaviour

Applying academic focus to the crime of TK can make some significant contributions to the Geographical Profiling and Criminal Spatial Behaviour literature, in addition to gaining insight into a crime type that has lacked any meaningful exposure. Studying TK opens up a new avenue to explore previously difficult to acquire material, such as locational information on where offenders travel during and after their crimes. The central contribution of studying TK can be considered through three main points.

Firstly, the offence is highly planned, which makes previously important geographic considerations, such as 'Friction Effect' which refers to the resistance to movement over

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space (Canter, 2005), insignificant. Furthermore, Routine Active theory, which refers to the need for a motivated offender, a suitable target and the lack of any meaningful guardian for crime to occur (Cohen & Felson, 1979), is also irrelevant to a certain degree.

Secondly, TK as a study focus contrasts with other studies in the Geographical Profiling literature, for instance, because of the quantity of locations that occur within the same offence. Therefore, a number of issues can be explored due to the geographical properties of the offence in comparison to other types of crime and the geographic restrictions inherent to those crimes, for instance serial murder.

Finally, the current sample of TK cases from the North and South of Ireland allows the current researcher to explore the concept of contextual aspects to spatial behaviour. For instance, the current sample of TK come from two independent police forces on the same small land mass of Ireland with broadly similar socioeconomic backgrounds, therefore issues relating to the offenders' backgrounds and the nature of the effect of this on their movement, if any, can adequately be examined.

As a result, the current study explores a range of developmental issues in Spatial Behaviour. The central aspect to the current study will be in exploring the same crime in two comparable locations that share a number of similarities. By applying focus to the same crime albeit in different cultural contexts, it allows the research to establish something about the nature of the individual differences between offenders in different locations and the influence that this has on spatial movement. This makes exploring the nature of spatial movement a direct study of offenders' planned decision-making, which provides a more fluid and accurate picture of how offenders choose to engage with the physical environment before, during and after crime. As previously noted, TK adequately allows the research to explore these issues.

As indicated previously TK offences offer a different, albeit unique, challenge to researchers and one that deviates slightly from the principles that have been highlighted earlier. The key issue for consideration in TK is the active learning of, and interaction with, the environment. This moves away from the influence of the home as being directly related to offending locations, via defined propinquity, but leans more towards the theory of a 'mental map', which is an internal representation of an external environment (Canter & Youngs, 2008).

The active learning of the environment and how this influences active engaging within this environment is important for our understanding of the psychological process associated with spatial learning. Furthermore, the underlying backdrop to the locations used by offenders is another important area where understanding is paramount. How where the offence occurs effects spatial opportunities, or more appropriately, spatial restrictions on a given location, is important to appreciate for understanding differences between the spatial properties of offending behaviour. Unearthing the geographical features of the offence of TK will advance further the theory of a mental map and how this plays a role in everyday environmental learning and interaction.

7.3 Complexities of Studying Serious Crime in Ireland

When examining serious crime in Ireland, specifically in the North of Ireland, the likely backgrounds of the offenders must be understood, although this is an difficult issue to assess as it relates to the possible ex-paramilitary backgrounds of specific offenders. A number of reports that suggest offenders of serious crime in the North of Ireland are ex-paramilitary offenders are based only on anecdotal evidence; however, it is not to suggest that it is in any way inaccurate.

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The nature of the paramilitary history of the North of Ireland makes confirming involvement in a paramilitary group extremely difficult. Therefore, reports that suggest, anecdotally or otherwise, that the majority of serious crime in the North of Ireland is committed by ex-paramilitary offenders must be taken seriously. Furthermore, reports by the House of Commons Northern Ireland Affairs Committee (2006a, 2006b) and The Cost of Crime in Northern Ireland (2010) both suggest paramilitary involvement in all serious organised crime in the North of Ireland. As noted in The Cost of Crime in Northern Ireland report,

"Incidents of blackmail, kidnapping and hijacking were also noted by the House of Commons, again often said to be linked to the actions of ex-paramilitaries."

(The Cost of Crime in Northern Ireland, 2010, p.18)

This reflection goes some way towards highlighting the difficulty in conclusively proving paramilitary involvement in specific offences. However, this also emphasises the general appreciation from various related committees that all serious crime in the North of Ireland has some paramilitary element, or sanctioned approval, to it.

There are a number of rational assumptions that can be made in relation to examining a sample of offences from the North of Ireland,

1. It can be considered that the offenders involved in highly organised offences have a paramilitary background and possess related training, and that,

2. This paramilitary background will be evident in the planning and undertaking of an offence.

7.3.1 Military Training and Serious Crime

The role of military background or training and how that relates to criminality is important to consider. According to Bouffard and Laub (2004), historically, military training and service have been viewed as an effective corrective tool. However, very little research has been undertaken to explore the relationship between military background and criminal behaviour. In one of the few studies that have addressed this, Bouffard and Laub (2004) found that military service may provide desistance to crime, especially for the most serious offenders. There are, however, conflicting reports; for example, a study by Galiani, Rossi and Schargrodsky (2011) found that, in Argentina, conscription increases the likelihood of developing a criminal record.

An additional study by Bouffard (2005) found that although some groups with military service do become involved in violent offending, military service was found to reduce the risk of violence for certain ethnic groups, such as African Americans. Castle and Hensley (2000) explored the role of a military background in serial killers and found that although military background was evident in a number of the sample, military background or training alone could not account for all cases of serial homicide. Castle and Hensley discuss at length the way in which the American military train their soldiers by highlighting significant increases of the level of service men willing to shoot to kill from the American Civil War to the Korean War.

Grossman (1996) notes the various methods that the military use to increase the killing rates of service men, techniques such as brutalisation, classical conditioning, operant conditioning and role modelling. The theory is that killing outside of the military then becomes a learned behaviour and a natural response when faced with conflict. However, research to back up this assertion is lacking. These studies highlight the significance of an

individual's background on influencing offending behaviour such as location, ethnicity, type of military training and seriousness of offence.

The background of the offenders in the North of Ireland offers a unique challenge to understanding the relationship between criminality and military training. Generally, the offender in the North is committing these crimes as per his duty as a paramilitary member. Therefore, service to a particular group may not be viewed as criminal behaviour but as part of their requirements of being a member of a paramilitary group. This makes comparisons between military experience, training and criminal behaviour as it relates to the North of Ireland a difficult matter to unravel. As such, it is one that requires an understanding of what constitutes a criminal group and how that may differ from an organised paramilitary group in the behaviour that they exhibit during criminal enterprises. This, naturally, is regardless of the banner this form of criminality may come under.

7.4 Barriers to Movement

In addition to an understanding of offender backgrounds, there are also some important psychological barriers that may play a role in influencing the geographical movement of offenders in both the North and South of Ireland. Some of these issues will be discussed at greater length in the coming chapters. However, it is important to provide some historical underpinning to this initially in order for it to be appreciated.

In 1925, a physical border was formally put in place between the North of Ireland and the South or Republic of Ireland. This was to distinguish the jurisdictions under different rule: the Republic of Ireland, which is the Irish Free State to the South, and the North of Ireland, which was under British rule. This border was physically occupied by military forces up until

2005 when it was fully dismantled in conjunction with the 1998 Good Friday Agreement between the Irish and British governments.

Although the border has now been removed, it still represents what the present researcher terms a psychological barrier between the North and South of Ireland. Furthermore, it will be of significant interest to establish whether there are any offenders who cross over the border in the process of committing an offence of TK. This would give weight to the notion of psychological barriers to movement, something which is particularly difficult to explore in offending behaviour, as the nature of what a barrier represents is difficult to establish. The sample of TK offences discussed in the current study enables us to touch on some of these rather complex issues directly.

7.5 Current study

The current research will explore the variation in distance travelled between TK offences in the North and South of Ireland. In addition, the current research will explore a number of pertinent issues relating to offenders' backgrounds and its influence on movement, as well as developing the concept of a psychological barrier to movement. These two countries exist on the same island and share very similar characteristics relating to population density, geographic landscape and ethnic background. However, the two countries do differ significantly in relation to geographic scale: the South of Ireland covers 70,283 sq. km and the North of Ireland covers only 14,148 sq. km. Furthermore, they also differ significantly in relation to the historical landscape of each region – specifically relating to 'the Troubles'[5]. Therefore, it will be interesting, for a variety of reasons, to note whether the conflictual background of the North of Ireland has any significant role in the travel patterns of offenders.

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[5] 'The troubles' refers to the period of political conflict in the North of Ireland from the 1960s to the 1990s.

The central aim of the current study is thus to explore the variation in travel patterns during crime in the North and South of Ireland.

7.5.1 Research Question 2

Is there a significant difference between TK in the North and South of Ireland and what does this represent.

7.6 Method

7.6.1 Data Collection

The cases used in the current study were collected with the full assistance of An Garda Siochana (Republic of Ireland Police Force) and the PSNI (Police Service of Northern Ireland). Having been cleared and vetted by both police forces, the current researcher was independently assigned a Liaison Officer from both forces. Meetings were held where the basic outlines of the study and the information that was required were discussed. All details relating to the geographical features of TK were requested along with other information relating to the temporal aspects of the attack, as well as the presence of a vehicle. A total of (N=70) case that fitted that criteria require were identified. The PSNI had a total of (N=47) and An Garda provided a total of (N=23) cases. However, a number of the cases from both police forces had to be discarded from the study. The most common reason that a case was excluded was incomplete or inaccurate information, which came to light when cross-referencing the case material. Another example of why a case was removed from analysis was that it was not actually clear if the offence was, in fact, a TK; in this instance, all cases where there were doubts regarding the actual offence at hand were removed. Having taken into consideration the above inaccurate and incomplete information and discarded it from the

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sample, there was a total of (N=51) cases left – An Garda (N=15) and the PSNI (N=36). The current sample reflects all known offences of TK over the last ten years in the republic and the last five years in the North of Ireland[6].

7.6.2 Interview

Supplementary to the above data, interviews with a number of prolific armed offenders from the South and North of Ireland were also undertaken. These interviews were carried out at prison facilities throughout Ireland and were secured with the prior permission of the Director General of the Irish Prison Service and the Prisoner Based Research Ethics Board Committee (see Chapter Three for full details). Participants were informed that any details regarding their criminal history that they may convey during the interview would be kept strictly confidential, and they were also informed that they could opt out at any time during the interview. The interviews lasted just under an hour in the majority of cases and were recorded by a pen and paper in most cases; some interviews were recorded electronically, again with the prior permission of the participants. The interviews took place during July and August 2012 at Limerick Prison, Mountjoy Prison, Wheatfield Prison, Castlerea Prison and Portloaise Maximum Security Prison all in the Republic of Ireland.

In total, there were 33 interviews conducted with 32 males and 1 female participant. At the end of the interview participants were informed of the details of the current study and any questions that they had were addressed. All names used in the current study are pseudonyms; the identity of the participants is protected at all times throughout the present study. The current purpose of these interviews is to offer brief supplementary support for the

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[6] Due to the fact that the PSNI only formed as a police force in 2001 they have a number of difficulties in relation to historical data on crime; this accounts for the short time period for the North of Ireland crimes.

arguments made in the present chapter. However, these interviews were primarily undertaken to form the basis of subsequent studies in criminal spatial movement in Ireland that will advance and develop the present findings further.

7.6.3 Route Distance vs. Crow Flight

It is a convention in the Criminal Geography literature to use what is referred to as the Crow Flight distance. The Crow Flight distance measure is the A to B distance between two locations. It does not take into consideration landmarks or road networks; it is the direct distance between point A and B. Although this is a standardised measure to use when studying geographical data, it was felt that it in the current study it was not applicable to use the Crow Flight measure as the make-up of Irish road networks considerably distort the distance actually travelled. Therefore, considering that, certain assumptions could be made on the data in relation to the offence that is under investigation. It was determined that it would be best to use the Route distance in favour of the Crow Flight measure. This is one of the first studies to use the Route distance over the Crow Flight distance and, as a result, adds to the reliability of the distance measures under analysis as they will be more reflective of the actual journeys travelled by offenders (see Chapter Six for a detailed analysis on this topic).

7.6.4 Data Coding

Each case was assessed independently and all of the geographic locations available were extracted from the files. In general, this consisted of the following,

1. Home location (victim)
2. Robbery location

3. Hostage location (where the hostage was held)

4. Money exchange location

5. Disposal location (not available in the majority of TK in the North)

The disposal location was not used in the current study as the sample from the PSNI had very few incidences of reported vehicles being recovered after the offence[7]. Each location was plotted on Google Maps, and then the route distance was calculated between certain locations using the Google software. For example, the Route distance from the home to the robbery location was established, in addition to the Route distance between the home and the hostage location. However, the distance between the hostage location and the robbery location were excluded from the calculation as mentioned previously because the offence of TK is self-serving. What is meant by the offence being self-serving is that each location exists within its own template; therefore, the two stages mentioned above have no functional relationship between them, although they do have a relationship with other locations within the offence. All distance measures were measured as kilometres recorded once they had been established.

7.7 Results

In order to explore the difference between offences in the North and South of Ireland, a descriptive analysis was initially conducted to establish what, if any, differences existed. Statistical analysis was conducted to compare the distance travelled between offences in the North of Ireland and offences in the South of Ireland for the three identified stages below:

1. The home location to the robbery location.

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[7] This will form a future study that will build on the findings of the current study, and is dependent on a great search through the police data in relation to disposal locations after offences.

2. The robbery location to the money exchange location.

3. The home location to the hostage location.

The results from the descriptive analysis (Table 7.1) showed the differences in the distance travelled between offences in the North and offences in the South. The range for distances were calculated for three separate stages within the journey of the offence: the Home to the Robbery location, the Abduction to the Hostage location and the Robbery location to the Money Exchange location. The Median scores both North and South were calculated and the p values are reported in the table below (Table 7.1),

	Range North	Range South	Median South	Median North	p value	
Home Loc to Robbery Loc	0-50 km	0-100 km	8.7 km	4.05 km	p= .024	
Abduction Loc to Hostage Loc	0-43.8 km	0-61 km	32.4 km	.00 km	p=.000	
Robbery Loc to Money Ex	0-9.7 km	0-16.3 km	1.70 km	.20 km	p= .165	

Table 7.1: Range and Median scores for both North and South and p values for 3 TK Offence Stages

The distribution of the distances revealed that they were not normally distributed. Therefore, as the data was nonparametric a Mann Whitney U Test was conducted on the three locations. The analysis found a statistically significant difference in the distance travelled between offences in the North and offences in the South during the home location to the robbery location (U=161.000, N_1 = 36, N_2 =15, p < .05). It was found that offenders in the North travelled considerably less than offenders in the South between the home location to robbery location. A statistically significant difference was found in the distance travelled between offenders in the North and offenders in the South of Ireland during the hostage abduction stage of the offence (U=47.00, N_1 = 36, N_2 =15, p < .001). The analysis found that

offenders in the South travelled considerably further to the hostage location than offenders in the North. There was no statistical significance between distance travelled by offenders in the North and offenders in the South during the money exchange stage of the offence ((U=204.00, $N_1 = 36$, $N_2 = 15$, $p > .05$).

The central finding is that there is a significant difference between the distances travelled by offenders in the North and the South of Ireland for two out of the three stages of the offence of TK. This is an interesting discovery, considering both offences are occurring on the same land mass within relatively short distances from one another.

7.7.1 Home location to robbery location

The mean distance between the home location and robbery location for TK offence is just under 10km; however, when broken down to North versus South, the means drastically change from 4.5km (North) to 22.8km (South). This finding confirms support for the basic principles of human geography and Geographic Profiling, which suggests human spatial movements are common to both criminals and non-criminals alike. Therefore, in this instance, people live in a relative vicinity from where they work. The observed difference between the North and South is that in the South we are dealing with much broader geography; therefore, it is logical to assume that in a larger country people will live slightly further away from their place of work.

7.7.2 Abduction location to hostage location

The mean distance between abduction location and hostage location is just over 10km; however, the difference between North and South is quite striking at 2.1km (North) and 29.6km (South). This is the stage of the offence with the most variation and therefore requires the most attention. The central question for consideration at this stage of the offence

is, why is there such variation between the same crimes? It would appear that this is due to factors related to the locations in which the offence is being committed. For example, offences in the North, according largely to police statements, anecdotal reports and governmental research, are likely to have been committed by ex-paramilitary personal, for example, The Northern Bank robbery in Belfast in 2006 (£26.5 million) has been widely reported as being committed by the Provisional Irish Republican Army (IRA). The offences in the North differ to those in the South of Ireland where offences are, in general, committed by organised crime gangs.

A prerequisite for being able to undertake an offence of TK is that offenders must have a high level of organisation and group cohesion. They must also be skilled at managing hostages or hostile individuals, something that an ex-paramilitary group would be likely to excel at. As a result, it appears that the type of offenders committing such offences in the North of Ireland do not feel that they need to travel as far in order to reduce risk as they are fully capable of managing situations where hostages are present. Criminal gangs committing these offences in the South may feel they have to travel further away from the hostage's home location to be more secure in managing the hostage situation. As suggested previously, the paramilitary background of offenders in the North should be observable in the geographic structure of their offences; this appears to be the case. It seems that offenders with paramilitary backgrounds undertake offences in a geographically different manner to offenders in the South. It is therefore logical to make the assumption that this is a direct reflection of their paramilitary training.

Furthermore, a number of the offences in the North of Ireland reported the hostage location as being the same as the home location, which means that the offenders held the hostages in their own home for the duration of the crime. This is something which would put them at a significant risk unless they were fully comfortable in holding a hostage(s) there.

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Offenders in the South, in all cases, moved the hostages to another location far removed from the abduction location. This is a clear representation of the type of offender that is being dealt with in these different locations and is the central finding of the present study.

7.7.3 Robbery location to money exchange location

The robbery location to money exchange location stage of the robbery showed the least amount of variance and no statistical significance was observed at this stage. The total mean was under 2km (1.7km North/5.2km South); again, a shorter distance was observed for the offences in the North. This stage of the offence offers the most investigative useful information as it is at this stage where all aspects of the offence merge: the victim, the offenders and the money. The reason why the shortest distances and the least variance is observed at this stage may be that all offenders will a) want to acquire the money as quickly as possible and b) want to complete the offence once the victim has acquired the cash as the longer he/she travels with the money, the greater the risk of the victim or the offenders being intersected. In the interview with Seamus, he offered support for this finding when he states that,

> *"The aim is to spend as little time in the car as possible so it will be driven no longer than 1 mile from the robbery to the predetermined second location."*

As Seamus notes, the distance is considered by offenders in the planning stage of the offence; this indicates that offenders actively consider the distance travelled during the offence, which can offer important investigative information. If offenders do not wish to travel too far at this stage, this would be the key time for police to focus their search area as this would be a much smaller distance than they may previously have considered.

It is reported by Michael, who holds convictions for armed robbery, that offenders will actually drive the routes they travel and learn them,

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"He (the driver) would do as they call it a reconnaissance run, this is where he drives down the streets and memorises them."

Additional reports of something similar were noted by Nathan, who holds convictions for Cash in Transit Robbery, and who says that they actively think about this in the planning of the offence,

"…I was the enforcer but I picked the routes. I am not the best behind the wheel but I knew quick routes and what will work best like."

Nathan even notes later on in the interview that his direction was predetermined in most cases. This provides additional insight into the level of planning that goes into routes used during crimes and how offenders develop their own styles of route-taking behaviour,

"….you see you always go back in a sort of, in a way back the way the van came because people think you won't go back the way the van came. That you go in the opposite to get away. Whereas I would drive back towards where he has come from."

Reports such as these highlight the level of advance planning and decision-making that goes into route behaviour in organised offences. Nathan, for instance, has a directional bias in his travel patterns justified by what he thinks the expectations of others are,

".. it's not what people expect, it's not what the police expect."

7.7.4 Psychological Border

It is also important to note that out of all of the offences committed both in the North and the South, none of them cross over where the military border used to reside. This is a rather interesting discovery and one worth exploring further. As highlighted previously, it was suggested that there might be what was referred to as a psychological barrier or border between the border regions. There are a number of reasons why offenders might not have

crossed over the border during one of their offences, such as proximity to the various locations for the crime. However, it is still an interesting development in that all of the offences in the current sample were committed in a period after the removal of the border. Further rationale behind these suggested psychological borders to crime were generated and then developed in the prison interviews. When discussing the issue of offenders from Dublin travelling outside of Dublin to commit crime, some interesting issues were developed. Paddy, a convicted armed offender from Dublin stated, when asked if offenders from Dublin would travel toward the North to commit crimes, that,

"No, it doesn't happen. You would never travel into the north to do a job."

Paddy's comment was based on the fact that he was not will to engage in crime in the North due to the socio-political factors inherent to that location, specifically relating to the paramilitary organisations that are in operation in those areas. In support of this finding, there was not one single incident of a crossover between the North and the South for any of the stages of the offence. It is a particularly important discovery and gives weight to the notion of a psychological barrier that may still exist in the minds of the offenders, both North and South. Padraig, a convicted kidnapper from the border region, offers some powerful evidence as to why this might be the case,

> *"Well let's put it like this there is a barrier around the north the people that live on the border regions are players. They will have lived there for years since it all begin. They would have been involved in smuggling guns and people since all this began. Therefore regardless of the removal of anything these people with these profiles, that no one knows, still exist there…. say something goes wrong. Someone breaks into the wrong house you know, that is unacceptable, that person will be found and they will be terrorized and something like that will never happen again…. In the old days of the provos (Provisional IRA) if you were involved in stealing cars or drugs you would be beaten. They didn't want the heat in the areas they were working in. People now still have that fear that respect is still there in areas. People still have the fear in the border areas, it's always there."*

This is observed through the current case of TK in that there was activity during the stages of the offence for both North and South in and around the border areas. Naturally, this could be accounted for through the location of the target's residence. Although there are a number of locational opportunities within the offence of TK to expect, that in the absence of a border ever existing, that at least one of the locations would appear to have crossed over the border. As a result, this provides some initial evidence of a psychological barrier to movement.

7.8 Discussion

The central issue under investigation in the current study was the variation in travel patterns of a sample of TK offences from the North and South of Ireland. Three stages were identified and explored: 1. The home to robbery location; 2. The abduction location to the hostage holding location; and 3. The robbery location to the money exchange location. Statistical significance was found for stage 1 and stage 2 of the robbery offence but not for stage 3. The current research supports the central principle of human geography that people live close to where they interact on a day-to-day basis, in this case, where individuals work (Downs & Stea, 1973; Brantingham & Brantingham, 1981; Cornish & Clarke, 1986; Canter & Larkin, 1993). Due to the nature of the crime type under investigation and, as mentioned previously, that TK is a self-serving geographic template and the targets are sourced as oppose to being opportunistic attacks, this will distort the relationship between the offenders' home location and the locations of the attacks. Therefore, the current study explored the variation between two similar countries in the *Journey During Crime* and the *Journey After Crime*.

The theoretically significant issues to be drawn from this study are based on an offender's active learning and advanced mental mapping, which develops further the conceptualisation of how certain criminal offences can be mapped when active environmental learning is evident. However, through understanding previous research on human and criminal geography, we can therefore begin to further build on the role environmental learning has on offenders' spatial movement and how certain types of offenders can have considerably distorted variations in their travel patterns based on their backgrounds. This focuses on the context of the location under evaluation and brings forward the notion of a Contextual Geographic Profiling, which should integrate the knowledge of previous studies (Brantingham & Brantingham, 1981; Rengert & Wasilchick, 1985; Canter & Larkin, 1993) that highlighted how location or target selection choices were based on the experiences of the individuals, while incorporating knowledge relating to the location of where the offence occurs.

In order to understand the variations, we must be able to appreciate the story behind the locations certain offences are being committed in. This then develops what is currently referred to as the contextual geographical paradigm (Figure 7.1) in which 'the where' reflects the underlining context or background which leads onto 'the who', which is, for example, from the current study, in the North of Ireland, serious crime by ex-paramilitary groups. This leads to 'the how', which is the geographical profile of the offence. Understanding these intrinsic aspects to the development of various forms of crime can allow a broader understanding of geographic movement and the role that an individual's background can play in relation to offender movement. As has been shown, this relates to the background of the offenders and the important developments that can be unearthed when studying this directly.
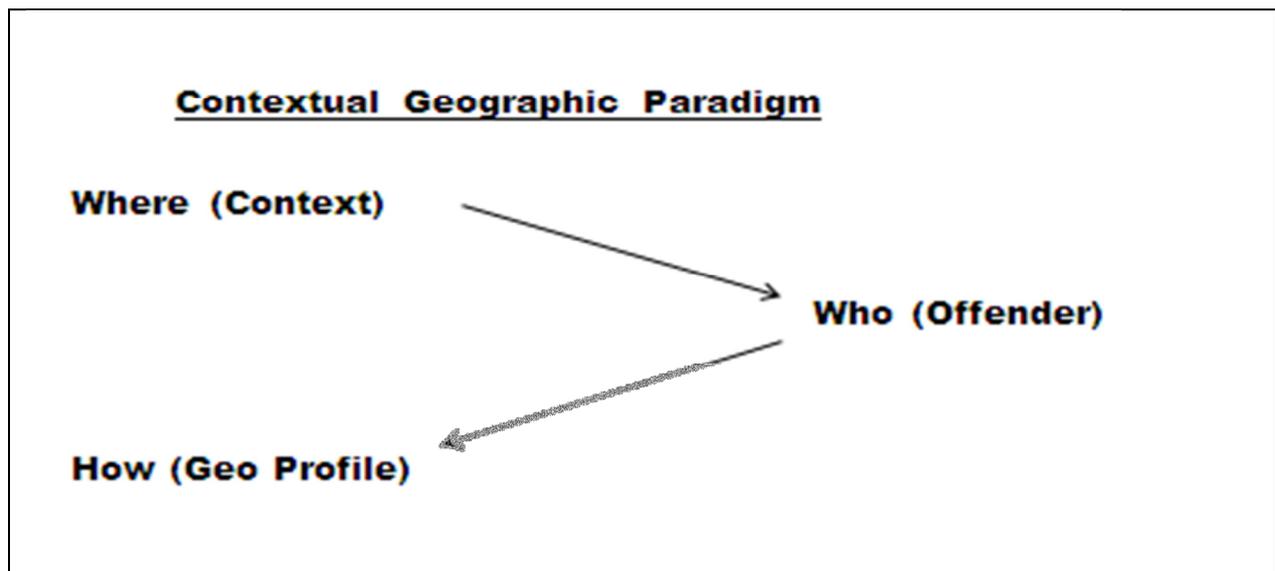
Figure 7.1: Contextual Geographic Paradigm

One of the limitations to the current study relates to the geographic comparisons made between two countries of different size. Although this is an issue for concern, the position currently held is that the rationale behind why offences in the North have shorter travel distances between them than those in the South is that this is offender-driven and does not fully relate to the size of the country in question. One of the key strengths to the current study, as mentioned previously, is the use of the Route distance measure over the Crow Flight measure for a real sample of criminal offences (see chapter 6). Through altering the method of measurement in favour of the Route distance, it has enabled the current research to acquire much more conclusive travel patterns, which provide a better reflection of the actual spatial process at play. Furthermore, if this study had used the Crow Flight measure it raises the question of whether the clear difference in distance that have been shown would be found for that measure. It is unlikely when considering the nature of the road networks in Ireland. This then highlights that difficulties of using this measurement to acquire accurate data for the travel distances undertaken by offenders.

The study is also unique in that it is the first academic study into the offence of TK. This is important as it provides the first insight into the processes of this novel form of criminality, something which the literature has yet to develop. Therefore, it is an essential study as it introduces the crime of TK initially, as well as the psychologically relevant aspects to this offence. It focuses on the journey's offenders make before, during and after the offence and it also explores the role of environmental learning and advanced planning on the spatial properties of this type of crime. In addition to these strengths, the study focuses on all of these issues through a sample of Irish offences. Currently, there is a severe lack of studies into Irish crime, and from an Investigative Psychological perspective, this study address directly this dearth of research into Irish criminality. As a result, the contributions of this study from both a theoretical and methodological position are considerable.

One of the important findings within the result of this study was the lack of a significant difference between robbery locations and money exchange locations. This finding shows the complexities of the decision making process of the offenders and how the issues in relation to distance variations between the two locations are only relevant for some aspects of the crime locations or stages, and that other issues come into play for this specific stage of the offence. Although there are differences between the two countries for certain stages there is consistency between the offences at one particular stage, the robbery location and money exchange location. This finding indicates a commonality within the decision making of both groups of offenders and suggests that while there is variation between distance for certain aspects of the offences there is also consistency within the type of offence being explored at a particular stage. This has obvious implication for investigative advice to police forces in addition to an understanding of the decision making processes that offenders engage in during the planning stage of the offence.

There are also a number of important issues that can be developed that can have direct implications for other crimes that are highly planned, involve a number of organised offenders, that incorporate a number of locations, involved vehicles and are target-specific. An example, for instance, would be Kidnap for Ransom and forms of Serial Killing. Therefore, the current study not only opens up the possibility of further insight into a specific crime but has ramifications for how other offences may be appreciated. In relation to the role of a military background, further research should focus on exploring offending behaviour during service in order to unearth possible links between offending behaviour during service and after service. However, this would be a particularly tricky area of study in relation to acquiring accurate information on soldier activities while on active service. Although the paramilitary offenders involved in the crimes discussed in the present research are not considered to be part of a legitimate military force, their levels of training and expertise should not be considered any different to that of any recognised military force. The fact that the various paramilitary organisations in the North of Ireland have had very few incidences of defectors highlights the level and manner of the organisation being studied.

7.9 Conclusion

The present chapter opened up debate on the role that the geographic location has on the journeys travelled by offenders but also the importance that understanding the influence that offenders' backgrounds can have for how we understand various other forms of offending behaviour.

The core finding in the current chapter is that travel distance relates to the specific contextual factors behind the location where the offence occurs. This reflects the type of offenders committing the act in those locations, for example, ex-paramilitary. As noted

previously, all offenders in the South moved hostages to another location that was far removed from the offence; this finding has practical implications for the police in how to manage their resources and how to also account for search parameters.

Further appreciating the influence of where crime occurs and how that relates to the type of offenders operating there enables us to interpret the variation in distances travelled. In essence, the context behind where the crime occurs must be understood before investigation begins into the internal workings of the offence itself. This naturally has implications for how crimes other than TK are studied.

Finally, within this chapter various assumptions have been drawn out which suggest that there are certain cognitive processes that govern location choice. Furthermore, issues relating to how offenders cognitively represent there offending locations now appear to be the next logical step towards offering an understanding of why crime occurs where it does. In addition to this, the manner in which they conceptualise distance as was discussed in Chapter 6, also appears to be of primary importance. These issues are inferred from the locations of the crimes examined in this chapter and raise the psychological question of whether there is any way in which to it may be possible to get closer to what these cognitive processes are? The following chapter introduces the concept of Sketch Maps and how this novel from of data may help to uniquely address some of these issues.

8.1 Spatial Knowledge, Spatial Information and the Methods of Analysing Sketch Maps

The central aim of this chapter is to put forward a rationale for how Spatial Knowledge can be distilled through sketch maps and why it can be beneficial in exploring mental representations of an individual's activity space.

A cognitive map is a cognitive process that is comprised of a series of psychological transformations through which an individual obtains, retains, develops, recalls and manipulates the relative locational information within their environment (Downs & Stea, 1973; Canter, 1977; Murray & Spencer, 1979). Individuals use cognitive maps in order to engage with their environment and to operate successfully, efficiently and safely within it. As a result, it is an important part of not just our spatial decision-making but our day-to-day decision-making in general.

A number of studies have attempted to explore the unique factors that relate to movement. In order to gather this data for empirical analysis, a variety of techniques have been employed. For instance, the drawing of a sketch map of an area or location (Lynch, 1960), the estimation of distance (Golledge et al., 1969) or direction (Kirasic et al., 1984) between two locations and describing verbally a route within an area (Vanetti & Allen, 1988) have all been used to measure internal representations of an individual's environment.

According to Golledge and Stimson (1997), the many different metaphors that have been used for the term cognitive map has produced confusion among the various disciplines that use the concept. They state that the most enduring of these is the idea that a cognitive map contains the same properties as a cartographic map. However, cross-disciplinary studies in the 1970s produced an overwhelming amount of evidence indicating that cognitive maps are not simple internalised cartographic maps.

The earliest attempt at trying to directly explore the nature of the cognitive map was through the work of Lynch (1960) and his sketch mapping studies in American cities. According to Golledge and Stimson (1997), other measurement procedures have been explored, such as requesting participants to imagine scenes from different perspectives, construct images of unseen objects, estimate street lengths and angles of intersections and develop cognitive distance estimates from multidimensional scaling configurations. However, sketch maps have been a productive method for generating information about an individual's interpretation of their environment.

8.2 Advantages or Benefits gleaned from Sketch Maps

There are a number of advantages to using sketch maps to explore an individual's representation of their environment. In the work of Canter (1977), he outlines a number of studies that develop the effectiveness of using an individual's drawings or representations to unearth the cognitive process used to appreciate what he refers to as place. Place can be considered as undefined locational boundaries that are unique to each individual.

The main advantage of using a sketch map is that it can be thought of as a way to understand how an individual represents a place. In the context of the current study, then, the sketch map can enable the researcher to explore the place or area that an offender considers important, in relation to their crime. When presented with the task of drawing a sketch map, an individual is left with infinite options, such as where to begin, what the map will be developed around, if there is a purposeful centrality to it and, if so, what does that represent.

The advantage primarily, according to the present researcher, is that a sketch map asks a number of seminal questions as opposed to providing specific answers. It is the job of

the researcher to make progressive attempts towards unravelling the nature of this representation.

Hitherto, the personal or emotional element of the mapping process is something that has been somewhat neglected in the research, even though it is something that is inherently important towards understanding the nature of the mapping process. For instance, the offenders in the present study were asked to draw a map of their crime. Some of them may have had rather painful memories associated with their crimes. Therefore, if the offenders had some form of emotional connection to the memories of their offence, how will this be represented in their sketch maps? Furthermore, are there any important psychological factors at play that will provide an explanation for what type of sketch might be developed? It is possible to assume that crimes with a greater level of emotion attached to them will elicit a much more detailed representation. In other words, the a more emotional offence, is likely to be rehearsed more often, coding the specific memories of the event more securely than if there was no emotional attachment. These issues are discussed in more detail towards the end of this chapter.

Secondly, the sketch map is considered to be an honest account of an event as it relates to a person's representation of their environment. It is therefore hard to be deceptive in a drawing task because there is no obvious motivation to do so. The fact that the current sample is based on offenders, a group synonymous with deceptive behaviour, they did have the option of not taking part in the task. Therefore, all the maps that were drawn are considered to be truthful, as there is no obvious need to try and be deceptive in the drawings. The use of the interview in combination with the map drawing process also makes fabricated drawings less likely, as there would have to be some form of continuous deceptive behaviour throughout the interview; this was not observed during the interviews with any of the offenders. It is therefore unlikely that the maps were not a genuine representation of an actual

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offence an individual was involved in. Furthermore, as the maps were presented at the end of the interview it meant that the offender would have had little time to generate a manufactured representation when asked to draw a map of an offence that they had been involved in.

Furthermore, it was possible to cross-reference the drawings in order to support this position. Therefore, the sketch maps in the current study are considered to be a good, honest interpretation or representation of an individual's environment as they choose to express it.

Thirdly, there are no restrictions on what an individual may develop in their drawing. The image that they developed had no restraints at all. For instance, in the few scenarios where the offender's drawing required an additional sheet of paper in order to proceed with the direction of their drawing, it was provided. The only instruction was that they should continue with the drawing that they were doing regardless. If additional paper wasn't available, then it would not have been an accurate depiction of how the individual chose to present their offending environment.

Fourthly, participants can talk themselves through their map to help them remember details. This is a form of route-drawing in some instances and it is the way the offender has thought through the development of the map. It is important to observe the cognitive processes that go into developing a mental map. Some individuals just draw the map straight away, whereas others confirm to themselves the details of the routes that they took. An additional advantage of this is that the offenders were actively thinking about the map and were fully engaging in the process of a cognitive representation.

Finally, map-drawing is a simplistic data collection method that does not require anything other than a willing participant and a pen and paper, although collecting this material from incarcerated offenders is obviously difficult in terms of gaining access to the sample. Therefore, sketch maps are a rather neat way of gathering environmental knowledge

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that an individual possesses. Furthermore, it is not considered to be an overly demanding task. This was evident during the interviews as none of the offenders found the task taxing. However, there were some extreme variations in the quality of the maps produced and the time some people committed to the task.

8.3 Measuring and Analysing Sketch Maps

Sketch maps can be considered as a pictorial representation of spatial information. According to Canter (1977), sketch maps can help access the representation and impact on an individual that a place or location holds. The purpose of the sketch map for this current study is to utilise this method to develop an offender's mental representation of their offending space.

A number of studies have explored the measurement of the environment and movement based on various criminal activities. These studies, for instance, have examined the psychological importance of the home (Canter & Larkin; 1993), familiarity with surroundings (Brantingham & Brantingham; 1981) and individual representations of the environment (Downs & Stea, 1973). Furthermore, methods to analyse spatial information have generally been made up of studies that relate to distance measurements based on solved cases. These studies of criminal movement have explored the distance between home and offending locations (Brantingham & Brantingham, 1981; Canter & Gregory, 1994), connections between a series of offences (Markson, Woodhams & Bond, 2010), distance issues relating to the disposal location of bodies (Canter & Lundrigan, 2001a), the environment range of rapists (Canter & Larkin 1993), identifying the location of improvised explosive devices (Hammond, Canter, Youngs & Ioannou, 2012) and distance and motivation (Canter & Fritzon, 1998).

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The current study exploring offender sketch maps advances on previous research (Shalev, 2004) which explored the sketch maps of burglary offenders that tested and built on the original work of Appleyard (1970). Shalev cites the work of Golledge (1976) for the classification of methods of measuring environmental information and that it is based on three terms,

1. Whether the map is based on Naturalistic vs. Experimenter – control behaviour.
2. Whether inferences are made by direct observations or are based on past experiences.
3. Whether the responses are elicited directly from the respondents.

As with Shalev's study, the present sample had to be naturalistic and based on past experiences due to the specific demands of the research. As a result, the best method for extracting information on an offender's cognitive representation was to stimulate the offenders to produce a graphic representation of one of their offences. The process was made up of discussing details of the offence in order to evoke memories of the offence prior to the drawing task. Moreover, specific aspects that related to the offence were noted and utilised in order to understand the context of the graphic representation that was generated.

The type of sketch map used was a basic sketch map, which, according to Kitchin (1995), is a technique designed to obtain from an individual a freely drawn sketch that has been minimally defined by the researcher. In essence, this simply means that the respondent is presented with a blank piece of paper and asked to draw a map of a location of their choosing.

8.4 Problems with Sketch Maps as a Basis of Study

Firstly, the sketch map is dependent on the basis that the individual who is tasked with the production of a map understands the nature of the task. This is particularly important to note in a prison population where IQ levels are generally found to be lower than that of the average population (Jones, 2008). Therefore, the ability to grasp the nature of the task can have an influence on the production of any graphic representation.

Secondly, in addition to being able to appreciate the nature of the task, the participants will also be sensitive to the instructions that they receive. The instructions given to the offenders will define the type of information that will be stimulated. Furthermore, it may be the case that the offenders dismiss information that they may feel irrelevant, based on the requests of the researcher. Canter (1977) illustrated this point further, when he states that drawing a map of an area for a friend new to a town will result in considerably different outputs if, for example, your friend was interested in museums, walking trails or access to and from the airport. Knowledge of this information, or in the current sense, instructions, will result in different representations of the same area. The instructions that were given by the interviewer in the current study were for the offenders to draw a map of the area of the crime that had previously just been discussed. The participants were also instructed to indicate any details that they considered relevant. This may have meant highlighting the actual robbery location on the map or the location of any getaway vehicles that may have been used.

Another limitation is in just using drawing guidelines alone for the production and subsequent analysis of the sketch map. However, Golledge and Stimson (1997) note that it is rare that sketch maps are produced as part of an isolated effort to develop spatial information. Sketch maps are generally produced with an accompanying interview, detailing the nature or context of the sketch map being developed. The present study was able to include a sketch

map and an accompanying interview discussing the specific details of the representation prior to the drawing being undertaken. However, Spencer and Dixon (1983) suggest that sketch maps are a good starting point on which to develop an interview, although, on the contrary, the present researcher thought the reverse method to be more desirable. The rationale behind positioning the mapping task at the end of the interview was that it gave the participant time to engage with the interviewer and to build a rapport, something vital to establish within a prison setting. However, it also, more fundamentally, gave them time to think about the offence which they were discussing. It is therefore the assumption that the sketch maps produced are the result of some prior, deliberate cognitive attention on the part of the offender. It is thought, then, that the maps produced in the current study are a better example of how the individual internally represents their offending area through having more time to develop and consider this representation.

The third limitation is based on proficiency and how comfortable an individual may find the task. Murray and Spencer (1979) found a 10 to 25% of variance that could be accounted for by performance and they concluded that it should not be exaggerated as a core influencing factor. However, they fail to acknowledge that skill levels can have a paradoxical influence on the sketch map produced. The graphic skills of an individual may result in an automated response, for example, the situation of being presented with a drawing task, possessing the requisite skills to draw and then producing something that is not a valid representation of how they actually construct the environment internally, but, in fact, an abstract representation of a map based on their drawing talents. Therefore, it may be that the skill is being exploited and not the internal spatial appreciation that they possess. Additionally, the opposite is also true, in that an individual may not be able to actually portray the representation that they desire, due to their lack of motor skills in this area.

Sketch maps are difficult to interpret due to the fact that missing information may be deliberately absent or be based on a lack of knowledge. As the information in the current study is based on sensitive information, such as details of criminal offences, it is possible that certain information may have been left out on purpose. However, due to the fact that the majority of maps were of robbery locations, it is the current position that any information included in the map is an accurate representation of how the offenders perceive it. There are two reasons for this.

1. All the details regarding the offence had previous been openly discussed, and,

2. There is no real motivation for them to leave out any information.

Therefore, missing details in the map, it is currently put forward, is based on a lack of knowledge, or that the offender didn't consider it relevant to include it. As Canter (1977) states, a sketch map can be examined to reveal where an individual's interest lies. So, when asked to represent a map of the area of their crime, it is likely to only concern details that relate to the offence or that they may feel relevant or important to highlight. This was certainly observed in a number of the maps collected.

By accounting for some of these limitations, sketch maps still provide a useful and productive insight into how an individual is able to represent their environment. Therefore, the maps that have been collected provide a unique insight into the manner in which offenders view their offending environment for a specific offence. As such, these maps lend themselves to an analysis process that will develop an understanding into how offenders see their crimes in relation to the geography, routes and paths that encompass their offending areas. It will provide information on what they see as important aspects of the environment by what they choose to represent, and it will also shed light on aspects such as possible barriers to movement and influencing aspects on routes selected and pathways travelled.

8.5 Feedback

As this was a mapping exercise that required small elements of creative or technical ability, the researcher found it beneficial to reassure the participants that an exceptional drawing was not expected. When asked to provide a sketch of their crime, a number of offenders expressed anxiety about the fact that they were not good at drawing. The researcher overcame this creative issue by clarifying that anything they drew would be of an adequate standard and that the researcher had very little talent in this area also. Due to the fact that an excellent rapport was developed between researcher and the majority of participants, this technique worked very successfully. Therefore, reassuring participants gave them the confidence to initiate the mapping task and, as such, it gave a number of participants who displayed a lack of confidence the necessary encouragement to attempt the sketch. Furthermore, all participants were all thanked and given positive feedback about their drawings once completed, regardless of the standard and quality of the picture. The researcher deemed it important that they were confident in what they had just completed.

8.6 Theoretical Advances on Memory Retention for Traumatic Events

There is debate that exists in the literature into memory for specific traumatic events. On the one hand, empirical studies have shown that recollection is poorer for details of a violent event than for details of a nonviolent event (Clifford & Scott, 1978; Clifford & Hollin, 1981; Loftus & Burns, 1982). However, this contrasts with the observation that certain traumatic events seem subjectively accessible and remembered (Brown & Kulik, 1977; Winograd & Killinger, 1983; Rubin & Kozin, 1984). Furthermore, issues relating to the actual accuracy of these memories have also been challenged (Neisser, 1982).

Christianson and Loftus (1987) state that,

> *"it appears that the occurrence of at least one type of emotional event, as crime incident, is fairly well remembered. While some aspects of those events may also be well remembered, other details are not particularly well remembered. Of course we have little means of comparing these recollections to the recollections of more mundane events.....While a number of perspectives can be brought to bear to explain the deficits in memory for emotional events (e.g increased cognitive activity such as self-preoccupation, worry or distraction.....These do not easily encompass the notion that some aspects of emotional events are well remembered while other aspects suffer."*

(Christianson and Loftus, 1987, p.277).

Therefore, it appears that there are competing arguments as to the manner in which we code and store details of emotional events. However, there is the coherent rationale that a sufficiently traumatic or emotional event is likely to cause an individual to expend time on deliberately focusing on the details of that event. Furthermore, it is likely the details relating to a traumatic or emotional event will be rehearsed. According to Rubin and Kozin (1984), there is ample evidence that our most vivid memories are those that have been rehearsed.

How is this information then transferable to a sketch mapping task? If an individual is asked to generate a graphic representation of a location where they had committed a crime that holds deep emotional significance to them, are they likely to generate a more detailed map or a not so detailed map? One of the positive benefits of using sketch maps for the purpose of geographic memory recall is that it enables us to see if geographic information for a traumatic event is coded and accessible in the same manner that other information is stored.

This can be taken a stage further in that it is possible to acquire information that will allow the sketch maps to be actually compared for accuracy to the actual areas that they are representing. In previous studies, according to Christianson and Loftus (1987), it was not possible to check the details of the autobiographical studies that had been done. The analysis

of geographic memory can be accurately checked once the sketch map drawings' location has been verified.

8.9 Cognitive Maps

According to Downs & Stea (1977), cognitive mapping is an abstraction that covers those cognitive or mental abilities that enable us to collect, organise, store and manipulate information about the spatial environment. He moves on to say that these abilities fluctuate with age or development and use or learning. In essence, cognitive mapping is the manner in which each individual grapples with their understanding of their spatial environment. The way we acquire or store this information will generally relate to outside cues which may have been brought to our attention, for instance, a map. However, it must be stated that a cognitive map, or what we currently refer to as a mental map, is not a schematic map representation that exists within our own cognition to be called upon at any given time. In essence, it is a development of a geographic heuristic.

Heuristics are methods or techniques that are developed, through experience and learning, that we can call upon, often without conscious thought, to solve, explore and evaluate a given situation. Geographic heuristics, therefore, might be observed as an accessible store of geographic or spatial information that we might draw upon to address a given situation. For example, you might remember a time when the petrol light in the car has come on, indicating that you need to fill up the petrol tank. In a situation like this, individuals will access stored information to help identify or locate the nearest petrol station to help address the sudden predicament. This information might not just relate to spatial information, but it could also be a combination of facets; for instance, temporal issues might also be relevant to solving the situation. For example, even though the petrol light is highlighted,

you might know from where you are that you will have time to make it home before the lack of petrol becomes a serious issue. These cognitive actions that are performed often unconsciously are an example of how this process works. Garling (1995) explains this further when he states that our ability to efficiently orientate and navigate in a familiar urban environment, or any familiar environment, is only possible because of a mental representation that we have of the spatial layout of our environment.

The origin of studies into conceptualisation and formulated representation of the spatial environment is found in the seminal work of Kevin Lynch (1918-1984), author of *The Image of the City* (1960) and Appleyard (1928-1982), first author of *The View From the Road* (1964). His work, according to Sidjanin (2001), was a rich, innovative way of conceiving the urban environment and was presented with a profound design knowledge, and he was the first to penetrate the theory of urban form consisting of physical and psychological elements, which was a comparatively unique approach at the time. The basis of his studies was the urban form, which is a complex system of interactions between individuals and objects. Lynch distinguished the two aspects to his theory as being made up of the initial physical elements of the environment and, subsequently, the psychological mental image of this environment.

Lynch distinguished the physical elements into natural and manmade elements. However, according to Garling (1995), Lynch's work was primarily a philosophical one concerned with the elements making up a representation. In the intervening time, the work of Lynch has been developed further in much broader and more methodological and sophisticated ways (see Garling, 1996, for further information).

8.10 Accessing the Mental Map

A cognitive map is a cognitive process that allows individuals to gather, structure, retain and manipulate spatial information or knowledge (Downs & Stea 1973; Murray & Spencer, 1979; Saarinana et al., 1988). The first use of the term cognitive map was by Tolman (1948), who used it to explain the behaviour of rats in a maze that escaped and moved directly towards a food source. Tolman's study indicates that it is the motivation that essentially leads us to learning and developing our cognitive map. He explains in his study that once the rat learned that it would get food at the end of the maze, it was able to navigate it more dramatically and more efficiently than it previously had. Toulman explains this when he describes the outcomes of his study.

"… during the non-reward trails these animals had been learning much more than they had exhibited. This learning, which did not manifest itself until after the food had been introduced…we would say that as long as the animals were not getting any food at the end of the maze they continued to take their time in going through it-they continued to enter many blinds. Once, however, they knew they were to get food they demonstrated that during these preceding non-rewarded trails they had learned where many of the blinds were. They had been building up a 'map', and could utilise the latter as soon as they were motivated to do so."

(Tolman, 1948, p.194/5)

To put his into modern terms, going back to the petrol light analogy, the information to access the nearest resource in our environment to fill the tank can be retrieved, but we are not consciously apparent of it until we are motivated to be. This is a good example of the process behind the way in which cognitive maps are generated, learned and thus acted upon.

There has been similar support in the literature when describing cognitive maps. Kitchen (1994) states that a cognitive map is the purpose of rehearsed spatial behaviour in the

mind so that it may be later acted on with a relevant degree of confidence. Canter (1977) also highlights that people's cognitive systems contain information not only in relation to where places are, but also about what places are and what is likely to occur or happen within those places, and, subsequently, who is likely to be present there.

8.11 Mental Maps by Offenders

According to Canter and Hodge (2000), considerable potential for understanding criminals' ways of thinking in relation to their crimes and the locations in which they commit them rests in asking offenders to draw a map that indicates where they have committed crimes. This, according to the authors, can be a way to access information about how offenders explore their local world. In their study they asked offenders to draw a mental map of where they committed their crimes. These maps revealed a number of decision making process that the offenders utilised to navigate their environment through there offending behaviour. In addition, Polisenska (2008), in her work in with offenders in Czech prisons, highlighted that the mental map approach could be useful for accessing new information in relation to criminal mobility. These studies highlight the utility of the mental map approach with offenders.

8.12 Conclusion

According to Canter (1977), the significance of a sketch map lies in its power as a metaphor for what is contained within an individual's representation. Therefore, the sketch maps used in this thesis can provide some insight into how an offender represents their offending area internally. The nature of this representation, what it means, and, importantly,

how it is measured have been put forward in the current chapter. The following chapter aims to test these issues directly be establishing if offenders sketch maps can be categorised through the classification schemes in existence. If offender sketch maps can be systematically analysed within a rigid framework, as has been shown within non criminal samples, it may be possible to develop a further insight into a number of important decision making features of crimes. The following chapter tests these issues by analysing a sample of offenders generated sketch maps.

9. The Analysis of Sketch Maps and the Problems with Classifications Schemes

"Mapping is a method of representing spatial arrangements. In fact it is many methods, because many forms of projection, many sets of symbols, scales and so on can be used.... Therefore, before we can begin to say what any consistent sketch map implies for the respondents cognitive system, we must obtain a better idea of what it is sketch maps may most readily represent and the variation possible within that. "

(Canter, 1977, p.57)

9.1 Sketch Maps

It has been noted (Canter 1977) that sketch maps are a unique insight into an assortment of information that is recorded and then represented graphically about the environment. Furthermore, as previously highlighted, sketch maps are a graphic illustration of what is considered to be the cognitive appreciation of place. When set with the task of drawing an area or location, individuals will highlight what they consider this area or location to be. In essence, place and our depiction of it, is a highly unique and personal abstract conceptualisation. However, there are a number of biases that will influence, to a certain degree, how these illustrations are generated. For instance, they are likely to have a strong link to cartographic maps, because this is what people will generally understand a map representation to be. Therefore, it is naturally assumed that sketch maps should have some link in structure and design to ordinary maps.

One reason why current sketch maps are more likely to resemble actual maps in structure and design is due to an increase in travel, the accessibility of the internet and the use of GPS systems in cars and on mobile smart phones. Therefore, the cognitive maps generated at the present time have different stimuli to lean on, which previous studies would have not

been able to acknowledge. In order for this to be understood further, the origins of the work into the development of cognitive maps and their graphic representation must first be considered.

9.2 The work of Kevin Lynch

In Kevin Lynch's seminal 1960s' work *Image of the City*, he focused attention on the perceptual and cognitive aspects of the urban environment. Moreover, he put forward a conceptual framework for the discussion of the structural components of city images that still, according to Golledge and Stimson (1997), occupy a primary place in the literature on city structure.

Lynch (1960) put forward a five-category classification system that individuals use to understand and interact with their environment. Lynch defines these elements as,

1. Paths – Paths are basic channels which people would occasionally, customarily or potentially move around. The may be considered streets walkways, canals or railway lines. For certain people, Lynch considers these aspects to be the central focus in their environment.

2. Edges – Edges are the linear elements not used or considered to be paths by the individual. In essence, they are boundaries between two differential spaces. These barriers may be penetrable but, nonetheless, are considered barriers for whatever reason. Lynch notes that these barriers or borders are useful for people holding together generalised areas, such as the start or the end of the city. They will be unique to each individual, but sketch maps can shed light on these personal borders.

3. Districts – Districts are the medium to large sections of the city that were defined as recognisable areas within a set of edges or borders. Districts do not necessarily depend solely on the individual but also lend heavily on the structure of the city too.

4. Nodes – Nodes are points, the strategic aspects of the city into which an individual can enter. They may be junctions, bus stations, recreational space, a centrality of paths coming together, or areas that shift from one structure to another. Nodes may also be the concentration of points that gain their importance through the condensation of some use or physical character, such as university sports grounds.

5. Landmarks – Landmarks are simply defined physical objects, such as buildings or specific places of importance to the city, for example, the football stadium or a historical feature unique to the city.

Lynch's initial work incorporates fundamental concepts from the psychology of perception; it indicates that individuals tend to favour paths and routes when graphically representing their city. However, a number of later contributors move this work beyond the fundamental perceptual aspects to develop the meaning and significance of both the social and cultural elements of the city, according to Golledge and Stimson (1997).

The work of Florence Ladd (1970) into how black youths view their environment is important to consider in the timeline of studies on sketch maps. Ladd (1970) asked children between the ages of twelve and seventeen to draw a map of their neighbourhood. She classified the drawings into four categories: pictorial, schematic, those that resemble a map and a map with identifiable landmarks. According to Canter (1977), the four categories can be considered as stages, from the progression of a pictorial form of a map to one that looks like an actual map. However, the central difficultly with using children to represent an area and to explore the progression is that their development in motor skills, particularly cognitive abilities, is very difficult to determine. Therefore, it raises the question of whether this

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representation is a result of a proficiency at drawing, age, education, familiarity with the area or even socioeconomic backgrounds. It is useful, then, to explore different maps of the same area, although what this represents is another matter of discussion altogether.

9.3 Classification Schemes

Appleyard (1969; 1970) developed a classification scheme, building on the early work of Lynch (1960), in his sketch map studies of the rather distinctive city of Ciudad Guayana. Appleyard firstly divided his sketch maps between those that were either primitive or not, and those that dealt with part of the city, for instance, some sequential way by means of links, or spatially by making reference to the relative location of a place, although without noting the links between them (Canter, 1977). Appleyard put forward eight map styles in his classification system which has become the most favourable model for researchers when analysing sketch maps. Shalev (2004) outlined three central advantages of the Appleyard model:

1) Maps are analysed through both structure and accuracy;

2) It shows a progression in the development of the sketch map; and

3) Differences in style allow for different populations to be compared.

However, using the Appleyard approach as a basis for classification is not practical in the current study as the difficulties with the sample that he worked on, sketches of the city of Ciudad Guayana, make it very difficult to compare to the current sample of sketch maps. This is primarily based on the structure of that city but, more specifically, the related cultural differences also. The current sample of sketch maps were collected from convicted offenders,

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who, as will be discussed later, offer contrasting demands that differ from individuals in the ordinary population.

Furthermore, Appleyard even noted that 78% of the maps produced were classified as being sequential, with the rest being spatial. With such a small number being spatial, it may be that those maps are, in fact, representing something else other than a spatial style. This could be developed if there was further study into the backgrounds of those who choose to represent their city in that way over those who settled on a sequential style. However, like any good study, it raises more questions than answers.

Although it is expected that sketch maps will link in some manner to standard maps, there will naturally be information missing when attempting to compare a sketch map to an actual map. This is where the real interest lies for the researcher when the question of what this represents is considered. Is it, for example, information missing due to a lack of knowledge, or is it information deliberately missing because the participant didn't feel it important enough to include? This raises the question of how to analyse a sketch and, more importantly, what it is that it portrays or represents.

9.4 Application of Research

One important issue that should be highlighted initially and is based on the direction of the current research is the difficulties associated with how research conducted on the general population can be applied to a criminal one. This is an issue that has been a hotly contested debate in the Psychiatric and Forensic Psychiatric field, for instance. A diagnosis of a disorder in an offender as compared to an individual with no criminal background has a variety of competing aspects to it that must be considered. This most notably relates to the

motivation of the offenders providing the information, which has important implications for how psychiatric conditions are diagnosed in a forensic setting. Therefore, when diagnosing a psychiatric disorder in an offender, the motivations behind the individual in question must be carefully considered. For a full review of some of these issues, see Cima, Nijman, Merckelbach, Kremer and Hollnack (2004).

In relation to sketch maps drawn by offenders, this may result in information being actively omitted or excluded for reasons such as identifying particular locations that the individual may have committed crimes in but that they have not been convicted of. Caution must therefore be applied to the analysis of sketch maps drawn by offenders.

9.5 Classification of Sketch Maps

Only a small number of studies (Lynch, 1960; Appleyard, 1970; Pocock, 1976; Matthews, 1984; Shalev, 2004) have endeavoured to develop a classification scheme to analyse sketch maps or aspects of sketch mapping techniques. This does raise an interesting question: if sketch maps could be explored or analysed in a reliable or systematic manner, then surely there would exist some agreement on the most appropriate method to approach this issue by now, especially considering the early work in this area began over fifty years ago with Lynch (1960).

Consequently, if only a small number of studies have developed classification systems for analysing sketch maps, this suggests one of two outcomes:

a) Previous classifications systems were sound, effective and consistently replicated, meaning that there were no further advancements that could be made, or

b) The classification of sketch maps is something that is not possible as there is too much variation within sketch maps in order for a solid classification system to be developed.

9.6 Shalev's Model: Testing the Classification of Sketch Maps

Shalev's revised model is the only notable study in which the sketch maps have been collected from a sample of offenders' drawings and then analysed. As a result, the current study will aim to test the reliability of Shalev's revised classification of Appleyard's model.

Shalev (2004) set out to empirically test the most widely used sketch map classification system of Appleyard (1970) on offenders' sketch maps. The results suggested the reliability of Appleyard's model to be unacceptably low. As a result, she subsequently developed and tested a revised model of Appleyard's classification scheme, which reduced the 8-point classification scheme down to a 5-point measure. Shalev stated that the revised classification system enabled the two dimensions that individuals consider in their judgment of sketch maps to be established. These two dimensions were map complexity and a distinction between spatial and sequential elements.

Shalev's revised classification scheme was developed on the basis of the findings of her study into the reliability of Appleyard's 8-point model. Shalev found that there was disagreement on the groups between the various Appleyard styles. The rationale for her revised style was based on maintaining a distinction between route dominant and landmark dominant styles. Her aim was therefore to create distinct styles which would allow judges to select with greater clarity the specific style the map was portraying. Furthermore, it took into consideration the development in graphic complexity. This relates to the notion that the more

elements and features included in a map the more complex that map will be. Table 9.1 contains the Revised Sketch Map style put forward by Shalev (2004).

Disperse	**The most primitive map style. It contains fragments of sequences or elements unconnected to each other and out of serial order.**
String	A schematic type of map, which contains curves and bends.
Border	The map distinctly contains districts and borders.
Link	Places or districts are clearly connected by a road system.
Pattern	The most complete type of map, which resembles a cartographic map.

Table 9.1: Shalev Revised Sketch Map Style

The current study aims to test the revised classification system of Shalev (2004) in order to establish if this revised system is a reliable method to distinguish between sketch maps drawn by offenders. Shalev's revised system is chosen over a repeated testing of the Appleyard model, as her sample was a criminal sample which reflects the current collection of sketch maps. Also, due to the fact that the Appleyard scheme is so broad and that the results of Shalev's study found unacceptably low reliability, it was decided that it would be better to focus on the reduced scheme of 5 styles.

9.6.1 Research Questions

Is the revised classification system of Shalev a reliable indicator of sketch map styles?

If there is high reliability for any of the particular styles, what does this actually represent?

9.7 Methodology

A total of N=24 sketch maps were used in the current study (see Appendix E). The maps were collected from convicted offenders in a number of prisons around Ireland. These maps consisted of graphic representations of locations where offenders committed their signature offence. The majority of these were drawings of locations in which robberies occurred. Ethical clearance was granted by the University of Huddersfield in order to conduct this study. Participants consisted of N=32 who were members of the International Research Centre for Investigative Psychology. The maps were presented to participants through a PowerPoint presentation. Participants were asked to select which map they thought best represented the map shown based on the revised classification scheme of Shalev (2004) with which they were provided (See Appendix F). The task took 30 minutes to complete, and once each individual was comfortable with the choice that they had made the next map was then presented on screen. For clarity and reliability in the selections, the current researcher showed the maps for a second time to allow participants to change their selection if they so wished.

In order to determine if there was a distinct difference between the 5 styles of the revised model, a Smallest Space Analysis (SSA) procedure was conducted. SSA analyses the relationship of every variable to every other variable, the co-occurrence is represented by distance in abstract space. In SSA, the closer the proximity of the variables in the Euclidean space, the greater the relationship of those two variables co-occurring. In order to fully appreciate this analysis, the relationship is presented visually. The further the variables are to one another is the inverse of their association. SSA subsequently allows for the interpretation of the data to be configured into separate dimensions. The degree of fit between the rank of the co-occurrence and the rank of the distance in the derived space is indicated by the Guttman-Lingoes coefficient of alienation (Borg & Lingoes, 1987). The coefficient of

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alienation is a measure of stress, the better the fit between the correlations and the visual representations. A coefficient of .019 was recorded and is considered a reasonably good degree of fit (Borg & Lingoes, 1987).

9.8 Results Measuring Maps Study 1

The results found that there was a 43% agreement level across the different styles of maps between the 32 judges based on the Shalev revised scale, which was extremely low. In fact, in the first test of this model, Shalev (2004) found agreement of 68% when testing her revised 5-point model. These results suggest initially that this is a poor classification model, based on the sketch maps that were tested. There is also quite a disparity between the findings of Shalev and that of the current study in which there is a 25% lower level of agreement between judges. However, this just highlights the highly subjective process of analysing sketch maps.

Map No	Disperse	String	Border	Link	Pattern	% agreement
8	*75% (24)	15.6% (5)	3.1% (1)	3.1% (1)	3.1% (1)	75%
11	0	3.1% (1)	3.1% (1)	12.5% (4)	*81.3%(26)	81.3%
12	3.1% (1)	25% (8)	6.3% (2)	56.3% (18)	9.4% (3)	56.3%
13	3.1% (1)	0	0	9.4% (3)	*87.4 (28)	87.5%
20	3.1% (1)	0	*90.6% (29)	6,3% (2)	0	90.6%
21	0	0	9.4% (3)	9.4% (3)	*78.1%(25)	78.1%

Table 9.2: Map which scored over 75% agreement (marked by asterisk)

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There were, however, some maps selected that received inter rater agreement of over 75%. In order to establish how there were levels of agreement amongst these maps, it is important to explore them directly. Table 9.2 shows the breakdown of scores where there was 75% agreement and over. That three of the highest scores represent the Pattern map classification suggests that this is one classification in which there appeared to be good agreement amongst participants. It may be due to the fact that the Pattern style maps, with a guide of reference as "Pattern - The most complete type of map, which resembles a cartographic map" to go by, is the easiest style of map to identify. This is most obviously due to the fact that it relates the closest to the Cartographic map, which most people will be familiar with. Table 9.3 shows the breakdown of scores between the different styles.

Map No	Disperse	String	Border	Pattern	Link	% agreement
15	3.1% (1)	6.3% (2)	6.3% (2)	37.5% (12)	43.8% (14)	43.8% Link/Pattern
22	3.1% (1)	3.1% (1)	3.1% (1)	40.6% (13)	*50. (16)	40.6% Link/Pattern

Table 9.3: Breakdown of Map styles () indicate number of styles > 75% agreement

The most common style of map selected by participants was the Link style classification. However, there was no agreement over 75% for the Link style, with the highest level of agreement for the Link style being 62.5% for Map No. 3 and the majority of the Link Style selections being under the 45% agreement mark. However, there were two cases in which Link style and Pattern style scored similar agreement scores, Map No. 15 and Map No. 22 (see Table 9.4).

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Map Style	Disperse	String	Border	Link	Pattern
Selected Style	5 (1)	5 (2)	4 (0)	9 (3)	4 (1)

Table 9.4: Maps scoring similar levels of agreement for Link and Pattern Styles

It is clear from this that the judges had trouble distinguishing between maps that had cartographic elements to them but also displayed aspects of the Link style. "Places or districts are clearly connected by a road system." As a result, it is possible that the Pattern style of map might have had even higher agreement amongst participants if they gave priority to the development process of the map towards the Pattern style. In other words, if there were elements of a map that displayed both Link and Cartographic elements, preference should be given to the more developed version. Unfortunately, participants were not issued with these instructions.

9.9 Offender Behind the Map: Study 2

Due to the fact that Pattern style had by some distance the highest levels of agreement it was decided to explore further why this might be the case. It has long been a conviction in the Geographic Profiling literature that criminals commit offences close to where they live. It would also be natural to assume that they have more advanced cognitive maps for the areas that they know well. Therefore, taking these two hypotheses, it would be likely that those who replicated maps in which agreement was found would have been likely to have drawn maps of areas that they were familiar with. Furthermore, there is also the possibility that the context of the offenders' crimes will also influence the type of map that they will draw. It is possible to explore these issues further through examples from the collected sketch maps.

For the purpose of this analysis, the two maps which straddled between Link and Pattern in their levels of agreement have been reassigned to the Pattern style of map. This therefore creates 5 sketch maps that fall under the Pattern style of offence in which there has been strong levels of agreement. If the above assumption has merit then the 5 high agreeability Pattern style maps will reflect offenders that are likely to live in close proximity to that area. In other words, of the 5 Pattern style maps in which there was agreement, it is expected that all of those offenders who drew them will live within the immediate radius of their drawing. This is defined as living less than 1 kilometre from the area of the maps.

9.10 Results Study 2

Of those 5 Pattern style maps, it was established that 100% of the offenders lived directly within the area that their sketch map represented. This indicates that individuals who lived within the areas on which the sketch map was based produced a conclusively higher level of agreement about the style amongst the judges. Furthermore, it suggests that there is greater evidence for a more accurate cognitive map when offenders visually represent areas in which they live.

This, however, is not a particularly profound development as it would be expected that people who are drawing an area that they have offended in, in which they also live, will receive a higher level agreement amongst judges on the style of map that it represents. Therefore, these offenders have a greater knowledge of the layout and structure of the area that they are drawing, thus being able to replicate it closer to an actual map, which makes selecting that as a style slightly easier for the judges.

9.10.1 Smallest Space Analysis

An SSA analysis was conducted on the raw scores of the 32 respondents for the 24 maps (see Figure 9.1 below). Based on the visual representation of the data in the SSA, it shows a relatively clear distinction between two styles of map: the side which incorporates the styles of Link and Pattern (Advanced) and the side that contains the style of Disperse Link and Border (Basic). There are two maps, Map No.7 and Map No. 3, that fall on the opposite side of the division, suggesting that there is some confusion over the style of map that these appear to be portraying. However, the SSA plot does show that there is a division that can be made on whether a map is basic over whether a map is more progressive and advanced in its design.

The SSA analysis offers support for the argument that sketch maps are difficult to analyse beyond the level of simple or complex. Furthermore, it suggests that the best method in which to distinguish between styles of map are to dichotomise them into those maps which are somewhat complex and those maps that are basic in nature and design. Any classification beyond this simple format, at this stage, is likely to be fully subjective and less rigid.

The previous confusion that occurs within map analysis is the over classification of maps and the styles that they represent. Although the SSA does show distinction between the progression of the map form, from the basic Disperse String and Border styles to the advanced Link and Pattern style, no real distinction can be made between these 5 individual styles within the SSA. However, there is enough evidence from these results to warrant a further investigation of these issues.
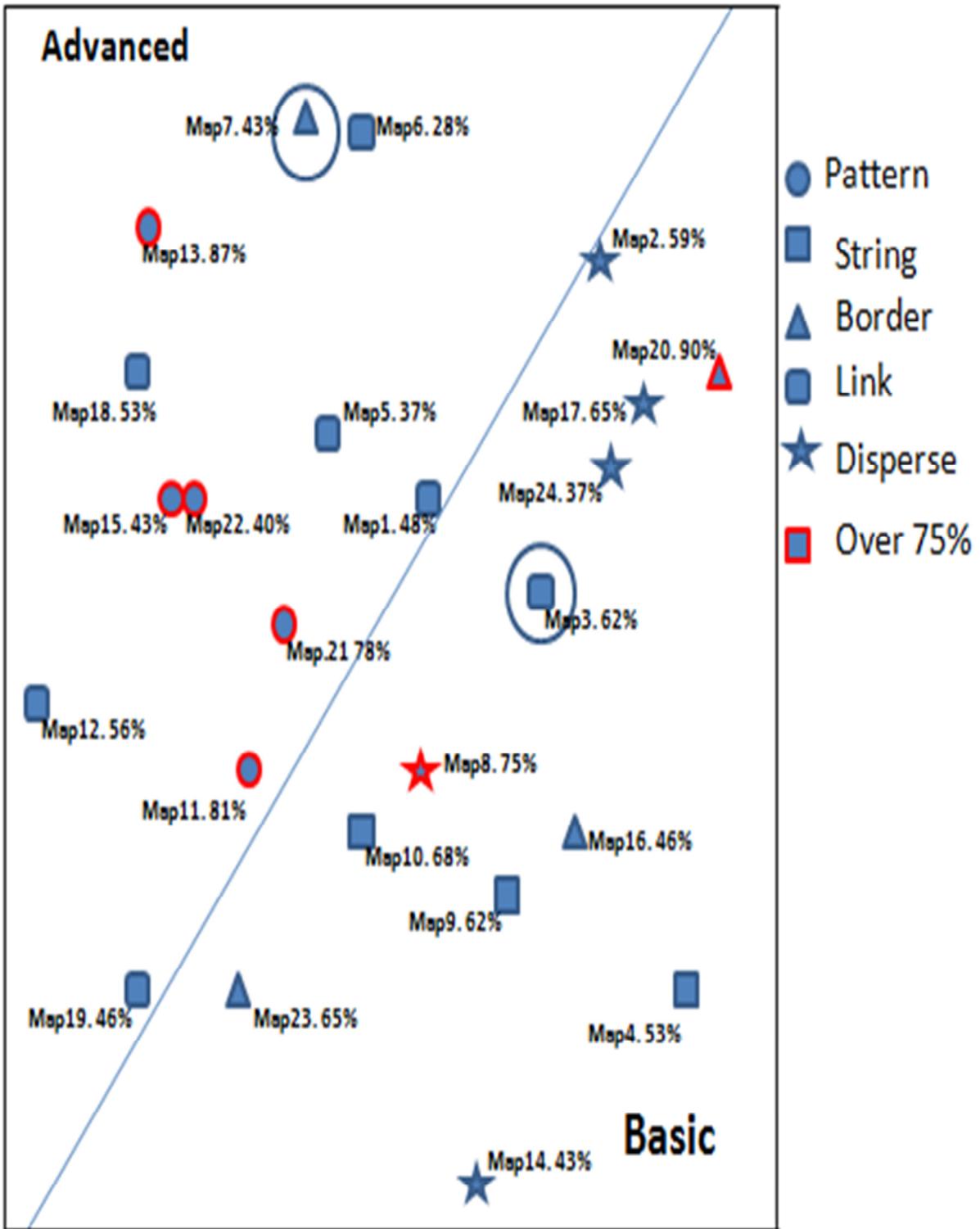
Figure 9.1: Smallest Space Analysis on Raw Scores of the 32 respondents for the 24 maps. SSA 1x3 projection. Coefficient of Alienation .019.

9.11 Discussion

The results of this study into the classification of offender sketch maps indicate that there is poor reliability between classification systems that have been developed to analyse sketch maps. The current research tested a revised model of Appleyard's classification scheme (Shalev, 2004). In that original study, with burglary offenders, agreement of 68% was found for the sketch maps in their sample. However, the current study found a much lower inter rater agreement level that rejects the model, based on the sample of sketch maps that were used. There were indications that the Pattern style map had a moderate to strong inter rater reliability level. However, as previously discussed, this was likely due to the fact that the guidelines for this map style were based on instructions that stated that Pattern style was a map that mostly resembled an actual map. Therefore, it is likely to expect that there would be less disparity based on these instructions.

The SSA analysis showed that the maps could be distinguished by either a Basic style or an Advanced style. This again supports the idea that classifying sketch maps can be a difficult process. However, this is not to suggest that there is no worth to the sketch map process, but to state the best manner in which to explore sketch maps might be on an individual basis in which the context behind the map and the person drawing it can be established and explored further.

This naturally raises the issue of the Geographic Narrative, touched on at the beginning of the work, and the possible utility that there may be in exploring how an offender's narrative is revealed within the mental map that they produce. The contribution that narrative theory can have in explaining the geographic aspects of criminal behaviour has yet to be established. However, it is certainly possible that there may be some success found in exploring this in comparison to the development of mental representations of offending

locations. Furthermore, Canter and Youngs (2009) highlighted that it may be possible to derive personal narratives of criminal mental maps. When taken in comparison with complete details of the offence and the full background of the offender, this is an approach which certainly warrants further consideration.

The difficulty with the classification of sketch maps appears to be felt strongest when these maps are reduced to quantifiable figures which move away from the rich detail that they reveal in their construction. The real beauty of the sketch map approach is that it offers such a unique and rich amount of material that can be analysed in a number of fashions; trying to establish the best method for this is of primary concern.

The central finding to be taken from the above results is that analysing sketch maps, through predetermined classification styles, is an extremely subjective process. However, there is a more fundamental issue, relating directly to conceptual development of the current thesis, which concerns the context underpinning the development of the map drawing. There is also a further methodological issue for classifying sketch maps in general, which relates to the manner in which, or, more appropriately, the credibility of, an independent judge being reliably able to classify any sketch map. This issue is even removed from some of the legitimate considerations concerning the classification of offender-driven sketch map designs. These two concerns relate to the question posed at the beginning of this chapter, of what, in fact, a sketch map is essentially representing.

This requires revisiting the original instructions that had been given to the offenders. For instance, the sketch maps that were drawn were graphic representations of the offending area of one of the offenders' crimes. For instance, some offenders committed offences that were relatively close to where they lived. On further inspection, the maps that had high levels of inter rate reliability for the Pattern style were drawn by offenders who actually lived

directly in the areas in which they committed their crimes. Therefore, it is natural for them to have a greater cognitive map of their own area and represent it as such, which they did. In essence, the background details of an offender's map related to how effectively judges were able to agree on the classification. It is important to consider this point as it sheds light on the manner in which these background issues can influence inter rater reliability for sketch map classification.

9.11.1 Away from the Classification Schemes

Although this chapter aimed to test classification schemes, it is not always necessary to use such methods in order to be able to distil some vital information from Sketch Maps. However, it was important to initially test if this classification scheme could be used for the sample of maps within the current thesis.

To build on this directly Map no. 4 (Figure 9.2) (see Appendix E) provides a perfect illustration of these issues. It is suggested that the type of offence will dictate the type of map that is drawn. Moreover, the role that the offender had to play in the offence further dictates the style of map that will be produced.

Figure 9.2: Map No 4 Getaway Journey after Robbery Offence.

Map No. 4 is a drawing of a getaway route by a getaway driver of a robbery offence in Dublin, Ireland. As a result, the context behind the drawing of this crime that is developed represented the offender's role in it, or his functional behaviour setting as it related to the offence. The map received judge ratings between 'String' and 'Link' because the map represented these two styles. It is clear that this offender developed a map that was based on his offence, which made it biased towards either String or Link style as his part in the offence reflected this. This just highlights the subjective nature of not just the judges' analyses of the maps but also the understanding of those who are drawing them and what their cognitive maps represent when they are asked to tap into them.

The map presented above does not need to be any more or less complex than it already is, as it represents perfectly the role this individual had to play in the crime. It also

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matches up well in terms of the position and angle of roads as they would relate to an actual map[8]. This again raises the subjective nature of analysing sketch maps, but also issues surrounding what they represent beyond just the location of where offenders commit their crimes. Are they just a simple graphic representation of an offender's location of crime, or can they tap into something more than this when the underlying context or behaviour setting that is being developed is understood? Therefore, when exploring sketch maps for an offender population, it may be better to move away from the rigid classification process that has previously been used and instead employ a more focused analysis of the context of the drawing together with the background of the individual involved, which can then help to develop what is referred to above as a Geographic Narrative of the offence. Therefore, the narrative to the map should remain the prime focus for studies into offenders' mental maps where it may be possible to unearth the story that it is portraying. This is likely to open up a new and possibly fruitful avenue for future explorations into offender-based sketch maps.

It appears from the results of this study that sketch map analysis is a deeply subjective process. Based on the results of this study and that of others, it raises the question of the validity of this approach within offender generated samples. It may be possible to document the development of map drawings, but what the drawings are actually representing is unclear using this process. Moreover, it appears that it is hard to subject sketch maps to a rigid style classification process. One reason why there were such varied responses and low levels of reliability might be due to the fact that untrained judges were used to classify the maps. One way to address this methodological concern might be through testing the classifications scheme on groups that have a more intrinsic understanding of mapping techniques, such as geographers. It is, however, unclear if there is likely to any substantial difference, but it

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[8] In order to ensure confidentiality issues are not breached, it was not possible to publish the real map illustration of the route taken.

would possibly produce a more valid selection of map styles. This is one area where further research might provide a more accurate selection process.

Through including the narrative behind the sketch together with the map itself it provides a more unique approach to interpreting the drawing. It is argued that this is where the sketch map process is likely to be of greater benefit while also revealing some core aspect of the decision making offenders make and how they construct the location of their crimes when asked to represent it visually.

9.12 Conclusion

Canter's (1977) assertions that before we can say what any consistent sketch map implies for the cognitive system we must obtain a better picture of what sketch maps represent appears to still be a long way off. It appears that these classification schemes were developed before a detailed understanding of what a sketch map represented was achieved and also what this technique was actually exploiting in the first instance. Until these issues are resolved it is still possible to qualitatively explore sketch maps when the information relating to the background of the individual that created it is available, in addition to the context behind what the representation actually symbolises. If a need to classify sketch maps into various styles is required, then it should be straightforward initially; for instance, a distinction between maps which are basic and simple over maps that are detailed and more complex.

The results suggest that the classification systems available should not be used in isolation and should be explored with the full background details of the drawer and the context behind the how and what that has been produced. Further attention should also be

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given to the instructions that are supplied to the drawer as this will also directly influence the manner in which they develop a sketch map.

The fact that there appeared to be little value in analysing the current sample of sketch maps through classification schemes suggested that alternative methodology was needed. In addition, to the sketch map drawings that were collected from offenders in prison a number of cartographic maps were also obtained. The cartographic maps had self reported locations of crime marked on them by the offenders. The question that is raised now is that although there was no support for the classification schemes of offender drawn sketch maps within this chapter, would it be possible to distil some psychologically relevant material from another form of map in which the offenders also interacted with?

A cartographic map has the layout of a defined location which means that it may be possible to examine if there are barriers to movement, for instance, something that was touched on briefly in Chapter Seven. The design of a cartographic map and the fact that landmasses and disruptions in the geography can be clearly observed means that when an individual is reporting the location of their crimes it is possible to observe directly the location in which there is a preference for. The ability to establish the influence, or, lack of influence, of certain aspects of the environment is important to help understand how the image of a city and the opportunities that are, not available, but, considered suitable, are structured within an individual. This opens up some exciting possibilities for understanding how offenders choose where to offend, but also by being able to directly examine in some cases the primary importance of the home to the distribution of offences. The following study builds on the utility of maps, introduced within this chapter, by studying whether it is possible to generate some psychologically influencing factors on criminal movement from a collection of self reported offence locations on a cartographic map.

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10.1 Physical and Psychological Barriers to Movement

Barriers to movement exist in much the same way that barriers exist to trade. For example, the most obvious barrier to trade is a geographic restriction, such as the sale of goods from one side of the world to the other; essentially, whether goods are moved from the point of origin to the point of sale will largely depend on economic viability. If the cost exceeds the worth or value of the goods, then it is likely that this transition will not occur. There are, however, ways to bypass this economic barrier, such as increasing the quantity of goods being moved at a single time, therefore increasing the possible profits to be gained. In addition, this can be broken down further with the actual transportation options available to move goods from one location to the next. In recent times, the threat of piracy has become a very real problem for large cargo ships passing by the coast of Somalia (Baniela & Rios, 2012). This again is seen as another barrier to movement where the risk of attack when passing through a certain stretch of water must be taken into consideration.

These examples above are of tangible and easier to identify forms of barriers to movement that relate to trade, but what about barriers to movement at the individual level? Is it possible that there are psychological barriers, which individuals may not even be aware of obeying? Considering different types of barriers allows the nature of the effect that they may have on movement to be identified and explored. The current chapter aims to explore the role of barriers, both physical and psychological, to the offending behaviour of criminals.

10.2 What Constitutes a Barrier

Peeters and Elffers (2007) state that physical barriers are identifiable obstacles to movement that block direct access from one location to another; examples include rivers, railway crossings and motorways. Peeters and Elffers note that physical barriers require a

person to undertake more effort to bypass or get across, and they use the example of a river as being a physical barrier, in that crossing a river is only possible at locations in which a crossing or tunnel is present. They also state that the presence of this barrier will increase the travel distance. However, the idea of barriers increasing travel distance and therefore making them obstacles to movement is tricky when one considers the very nature of what a physical barrier represents. It appears that Peeters and Elffers are working off the principle that the movement occurs in straight A to B point progressions, when, in fact, as was highlighted in Chapter Five, this may not be the case.

Consider the following: if an individual lives in a city that has a distinct 'barrier', such as a river dividing the city, then how can this be considered a barrier if it has always been there? In fact, movement within and around this city will always have factored in the presence of this river. Therefore, crossings over a river should be considered as access points to movement. If there was, however, prior alternative routes that an individual could take that have subsequently been removed, then it is very natural to consider this changed landscape as a barrier to movement. However, when the natural make-up of this city consists of bridges over a river, they should be considered access points for movement where movement previously might not have been possible.

Peeters and Elffers stated that having to cross a bridge or a railroad line is what a barrier represents, as it will naturally increase travel distance. However, this again is a flawed argument as this can only be considered valid if it is not the quickest route to a subsequent location. If there exists no other way to get there, you cannot necessarily increase your travel distance as it is not possible to get to where you need to go without using, for example, this bridge, footbridge or tunnel.

It would appear that a new conceptualisation is needed on what constitutes a barrier to movement and what can be considered an access point. One unique way to look at this problem may be through exploring the concept of psychological barriers to movement instead of physical barriers to movement. As already stated, it is difficult to travel in a straight point-to-point distance; therefore, this model of physical barrier seems to suggest that any friction that diverges from a straight course of movement can be considered a barrier. The problem is a lot more intricate than this. In fact, there are ways in which a physical environment can dictate or influence the behaviour that can occur there, as has been found within criminology theories such as crime prevention through environmental design.

10.3 Crime Prevention Through Environmental Design

There is a movement in criminology theory that exploits some of these very issues, for example, the theory of Crime Prevention Through Environmental Design. This incorporates the concepts of designing the environment in such a way that it prohibits the opportunity for crime or even the desire to undertaken crime (Newman, 1972). It comes under 3 main points:

1) Natural surveillance – increasing the visibility across a landscape or area.

2) Natural access – denying access to targets, through doors or gates, increases the perception of risk.

3) Territorial reinforcement – designed to distinguish between private space over public space.

Designing the physical environment to reduce or prohibit crime is a novel method. One of the key focuses of this approach is in the use of physical barriers to crime, specifically

in the form of Target Hardening. Although the concept of CPTED is slightly removed from the train of the current thesis, it is important to appreciate the philosophical concept of this approach as it is heavily influenced by psychology. In order to explore this, one aspect of the CPTED approach has been chosen: Target Hardening.

In Target Hardening the concept is that by making your home or business, for instance, difficult to attack, its attractiveness as a target will diminish. This can be done through larger fences with barbed wire, anti-climbing paint, gates and road blocks or barriers reducing access within an estate. Aside from the aesthetic appearance of these measures, which will naturally reduce the attractiveness of an area, do they actually work? Hirschfield and Newton (2010) note that Target Hardening has been employed internationally and has been widely cited (Hamilton-Smith & Kent, 2005; Hirschfield, 2004; Millie & Hough, 2004) as an effective strategy for burglary reduction.

The fact that Target Hardening has been found to be effective in reducing crime to a certain degree has some implications for the current argument that physical and psychological barriers will influence the movement and distribution of crime. However, the nature of this influence needs to be examined closely.

10.4 Barriers to Criminal Movement

The results in relation to the effect of physical barriers on crime have been mixed, according to Peeters and Elffers (2007). They note that Greenberg, Rohe and Williams (1982) and Greenberg and Rohe (1984) found positive effects on criminal movement for highways and railroad lines in the United States. Conversely, they also highlighted the work of Ratcliffe (2003), who found no effect of vegetation and major roads on criminal movement in

Canberra, Australia. However, it is important to raise the central distinction between these studies as primarily relating to the contextual differences that will naturally be found in these different cities, for instance, cultural differences and geographic distinctions that are likely to be unique to the location. As a result, these differences must be factored in for any comparison to be valid. It is these differences that the current thesis aims to explore as they can distort any results or findings if they are not accounted for. These issues were highlighted directly in Chapter Seven.

Recently, Clare, Fernandez and Morgan (2009) found that in a sample of Australian burglars, physical barriers exert significant influence on offenders' decision-making. Their results suggested that the closer in proximity the barriers are to the offenders' origin point, the more influence they have on offender movement. This is interesting as it appears that physical barriers in this sense could, in fact, entirely influence the direction of offending; the closer the barriers are to the offender, the more influential they are likely to be. This could result in forcing a directional change or directional bias in offender movement, something that is certainly important to consider when exploring the distribution of crime.

10.5 Directionality in Crime

One interesting, albeit under researched, area is the direction in which offenders commit their crimes. Often, this decision is likely to have been made for them, as the opportunity to learn of possible places to offend are likely to have been acquired through non-criminal enterprises, as is the hallmark of Routine Activity theory (Cohen & Felson; 1979). The trips that we make are likely to have a predetermined directional orientation, as is to be expected, when considering the routes to work or to school that are regularly taken.

According to Frank, Andresen and Brantingham (2012), due to the constrained nature of the built environment individuals develop routines between regularly visited destinations, such as work or school. These trips, they suggest, will have a directional orientation to them as we routinely travel along routes that are directed towards our destination.

In addition to our routines that influence the directionality of our movement, temporal features also play a significant part. According to Ratcliff (2006), time and space are intertwined, and in relation to directionality, movement can only occur when time restraints permit it. This again provides a barrier to movement but also specifically in the form of directionality. However, as unique and important as these studies into directionality are, they fail to appreciate that an offender's movement might have a directional bias for other reasons. Barriers, for instance, can influence movement in one direction or another, over the routine movement on an individual in general. The directional movement of crime may also be crime-specific, in that only certain types of crime fit the directional model, for instance, burglary, whereas other, more target-specific crimes, TK (see Chapter Seven), for instance, do not adhere to the same directional restrictions.

10.6 Gravitational Models

One method that has been used to explore the effect of barriers on crime has been through gravitational models (Smith, 1976; Ratcliff, 2003; Reynald, Averdijk, Elffers & Bernasco, 2008; Elffers, Reynald, Averdijk Bernasco & Block, 2008). According to Peeters and Elffers (2007), this approach envisages the origin location as generating the criminal journey and the destination area as attracting criminal activity, and between these two points there are likely to be locations in which criminals encounter barriers to movement, or what they refer to as friction. For instance, an example of this would be a residential area in which

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a shoplifter resides and the shopping district in which they operate. The obvious barrier to movement here would be the travel distance between the locations. How the offender would transport themselves between the two locations is the direct barrier to their movement.

This model draws heavily from a type of cost-benefit economic model that is reflected in criminal geography. It states that the further away from an offender's home a target is, the less likely that the target will attract the offender, considering that there may be other opportunities to offend closer to home. There has been some research that has found that the higher the value of a target, the further an offender is likely to have travelled (Van Koppen & Jansen, 1998). This operates off the model of risk and reward. In general, the central principle of criminal geography is that offenders do not travel far from their home to commit crimes.

If offenders do not travel far to commit crimes, then what other factors may influence their movement? Bernasco and Nieuwbeerta (2005) found that factors such as ethnic heterogeneity, percentage of single family dwellings and the proximity of the offender's home all played significant roles in offending locations of residential burglaries. In not so much a barrier as an attractor, Bernasoc and Nieuwbeert (2005) have been able to show that there are factors that actively influence where offenders choose to offend, although it is certainly possible that there are barriers within these locations that further disrupt the natural distribution of crimes in those specific areas. Therefore, can such barriers to crime be identified when there should be a normal distribution of opportunities, for instance, the distribution of crime in a city centre of a large town or city?

10.7 Where Offenders Choose to Offend

Where criminals choose to offend has been a reoccurring area of focus in the criminology literature for many decades. Two central theories have been put forward to explain this. Firstly, crime occurs close to where the offender lives (Boggs, 1965; Erlanson, 1946; Georges-Abeyie & Harries, 1980; White, 1932; Wiles & Costello, 2000; Canter & Youngs, 2008a), and, secondly, crime locations are learned during routine non-criminal enterprises in offenders' daily lives (Cohen & Felson, 1979). However, in the TK case study (Chapter Four), some of these foundation points might not be suitable to apply to certain type of crimes. Therefore, it is important to remain conscious of this when exploring developing areas of criminal spatial behaviour, in that these theories may not always be suitable to explain some of the developments that are found in new and emerging criminal enterprises.

Where offenders offend can be broken down further, incorporating barriers that will exist in parallel to these two theories of influence of the home and routine activities. As previously identified, social and economic factors play a part in where crimes occur, as does the proximity of barriers to an offender's home location. This highlights that where crime occurs is a much more complex issue than just an offender living close to where a target exists in which no suitable guardian is protecting this target from being exploited.

The possibility of geographic influencing barriers that effect the psychological understanding of opportunities for the offender are the next obvious area of exploration. The manner in which to test these barriers, however, remains unclear, as what constitutes a barrier, be it psychological or physical, is up for debate, as noted earlier in this chapter. The extent to which someone has a preference for offending in one area over another area and the specific factors that may be affecting this decision might be difficult to establish. Therefore, settling on what can be a suitable barrier in order to test these principles is difficult.

10.8 Exploring a Psychological Barrier to Crime

Any effort to test a barriers influence on crime would have to be something in which there could be clear agreement that it was,

a) An actual barrier that was clearly defined, and

b) This barrier was responsible for any observed influence on movement

The city of Dublin, Ireland, offers a possible appropriate template in which to explore some of these very issues. There is a long-standing division between the origin of the north of the city and the south of the city in the form of a river. The river is called the River Liffey and it is accessible to cross over at a number of points throughout the city, but it does, however, clearly divide the city in two. Studying the effects of crime on either side of a physical, albeit non-restrictive, barrier, allows the psychological effects of this barrier to be developed and explored.

The city of Dublin is naturally divided by the River Liffey. The River Liffey was the focal point to trade in the city dating back many years, and the first official crossing between two sides of the city dates back to 1428. The presence of the river is the central reason behind why the city developed where it did, as a means for trade, as a food source and also for safety considerations. The river separates the north side of the city from the south side of the city.

The aim of the current chapter is to explore further the notion of physical barriers to crime, through the concept of a psychological barrier to crime. The natural division of Dublin allows the distribution of where crime occurs, according to offenders' self-reporting on maps, to be explored. Therefore, it is possible to investigate the influence of this physical barrier, in order to establish if it may be considered as a psychological barrier to offenders' movements.

The current study aims to explore whether there will be a bias towards preference to offend on the side of the city that an offender lives. Moreover, it also aims to ascertain if this is an unconscious psychological barrier that manifests itself in the form of a physical barrier to movement.

10.9 Method

Interviews were conducted with offenders in various prisons around Ireland (see Chapter Three) who were asked to discuss details that related to where they would and would not offend. Quotes from those interviews will be presented below to offer support for the arguments that are put forward. During theses interviews, offenders who lived in Dublin, were presented with one of two printed maps. The first map consisted of Dublin's inner city, primarily covering the central shopping areas on the north and south of the city. The second map was of the whole area of Dublin (see Appendix G). The offenders were asked to indicate on the map, in the form of an X, the areas in which they committed their offences. Offenders who lived within the city centre chose the detailed map of the city centre of Dublin to mark their offences, whereas the offenders who lived outside the city marked their offences on the larger map. A total of N=12 maps were collected. In some instances, offenders actually marked the area in which they lived, as can be seen on some of maps, but their home area was acquired already during the early part of the interview. The details of the type of crimes which they committed and also the specific background regarding the individuals in question will not be disclosed in this section so as to not inadvertently indentify any of the offenders. This allows for the home location to be used as it only relates to an area in Dublin and how that links to ticks marked on a map.

The number of crimes that were marked on the maps were counted and assigned to either the North of the city or the South of the city. The River Liffey acts as a natural diversion between the North and the South and it was therefore easy to make the distinction between an offence occurring on the Northside and an offence occurring on the Southside.

The maps discussed and presented in this study were qualitatively analysed in the form of a series of specific Case Studies. These are explored through an understanding of the distribution of the crimes and how they relate to the specific areas on the map in which the crime occurs. Although this is a somewhat subjective approach, it is supported with a central theme running throughout, which is that there is a division with the city and that this will be manifested within the distribution of offenders crimes and what they perceive to be opportune locations to offend.

10.10 Results

10.10.1 Descriptive Results

A total of 153 crimes were marked on the 12 maps collected with a mean of 12.7 crimes marked per map. It was found that 82% of offences committed by offenders occurred on the side of the city in which they lived, either North of the city or South of the city. In 4 of the maps 100% of the crimes marked were committed on the same side of the city that the offender lived.

Of the 153 crimes marked on the 12 maps, only 26 occurred on the opposite side of the city to where the offender lived, and of those 26 crimes, 3 offenders accounted for 17 of the offences. Table 10.1 shows the breakdown of crimes and distribution of offences both north and south.

Total Maps	Total Crimes	% crime per offender	Total North	Total South	Offenders North	Offenders South
12	153	12.7	65	88	3	9

Table 10.1: Breakdown of Crimes marked on Map and distribution of offences North and South

The results indicate a tendency or bias for which side of the city an offender chooses to offend, and that this is based on the side of the city that they live on. As a result, these findings indicates that the River Liffey acts as form of barrier to crime, not necessarily a physical barrier in the manner in which it is difficult to cross, but, in fact, a psychological barrier in that offenders prefer not to offend on the opposite side of the city to which they live. It is possible for offenders to easily cross over both sides of the city, be it in the city centre or the Dublin region as a whole, but it appears that they choose not to do so. However, it is important to explore these issues more directly in order to really get an understanding of what these simple figures represent.

10.10.2 The Maps

If the crime of an offender who lived in Dublin was evenly distributed through the Dublin city and the Dublin region as a whole, then it would be expected that offenders would offend across the whole Dublin area; both the north and south sides of the city. Figure 10.1 shows an example of a randomly generated even distribution of crimes around a map of Dublin.

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Figure 10.1: Randomly generated distribution of crime locations in Dublin. Blue Star indicates crime location.

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10.10.3 Offending on One side of the City (South)

Figure 10.2 shows an actual map in which an offender, Dave, marked the areas in which they committed their crimes around the city. It can be observed from the map above that the crimes go up to the border of the River Liffey at the towns of Palmerston and Kilmainham on

Figure 10.2: Map where Dave indicated the location of his crimes. Arrows indicates crime location

the south side of Dublin, but that there are no offences marked in the north side of the map. This suggests a preference for Dave to not cross the river in order to offend. The fact that he commits crimes beside the areas close to the river but does not cross over the river certainly indicates some interesting restrictions in his spatial behaviour. These developments raise the possibility that a mental barrier of some sort does exist for Dave.

10.10.4 Offending on one side of the city centre (North)

Figure 10.3: Map where Conor marked (x) the location of his crimes.

Figure 10.3 above is another example of a map in which an offender, Conor, marked the areas of his crimes. This map, however, is the marked locations of offences that occurred within the city centre of Dublin. This map highlights how the offender's crimes are contained within an area of the city to the north of the river. It shows that, with this particular offender, there is a distinct bias towards not offending on the south side of the city.

It is clear that this offender chooses not to offend on the south of the city. A clear division exists between the south, where he has no marked offences, and the north of the city, which contain all the areas in which he has committed crimes.

The only rational basis for these two offenders to prefer to offend on one side of the city to the other is that the river forms a barrier which they are not willing to cross. This is based on the fact they have committed offences right up to where the river is, but they indicate that they did not cross over it to offend.

The maps above provide some initial support for the developing argument regarding a psychological barrier to crime. However, for those offenders that do offend on the other side of the city, it will be less frequently than the number of offences on their own side of the city, according to the descriptive figures distilled from the current maps. It is important to look at other developments in offenders' marked crime locations to ascertain whether there are additional aspects to consider.

10.10.5 Offending both sides of the city centre (North/South)

The map below (figure 10.4) contains offences marked by James, a prolific armed robber, shoplifter and burglar, and shows an interesting development within his offending locations. Based on the map in which James has marked where he committed his crimes, it can be seen that he has committed offences on both sides of the natural divide. Therefore, this

may suggest that he is comfortable offending on both sides of the city and therefore does not have the same appreciation for this barrier. However, when the specific locations of where James actually offended is considered, an interesting feature can be observed.

The map below shows that James offends in a number of locations in and around the area of his home, which he marked the location of on the north of the city. However, the locations in which he marked that he committed offences on the south of the city all occur on Grafton Street, the central shopping thoroughfare in Dublin city centre. The nature of the offending areas on the south now become apparent and are somewhat restricted based on the marked locations. Although there is a small proportion of offences that occur on the south of the city, these are all concentrated around the central shopping street in the capital.
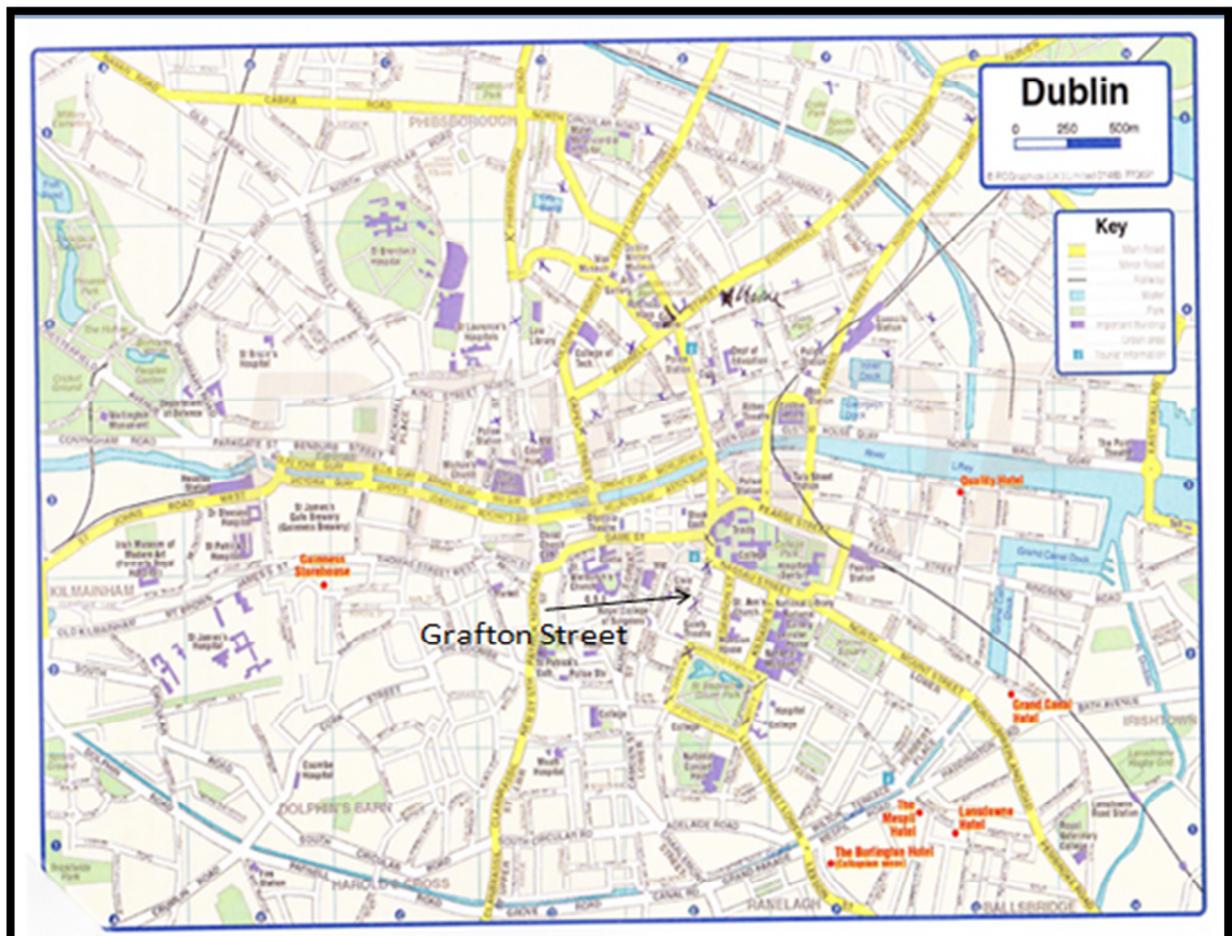
Figure 10.4: Marked locations (x) where James committed offences in Dublin City Centre

James does not indicate on the map that he committed offences outside of this zone, whereas he had committed offences regularly outside of the shopping districts on the north of the city, where his home is based. However, this does pose the question of what it is that is restricting the geographical distribution of James's offences, considering he offends at will on the far side of the city. Furthermore, it would appear that James does not cross the city at any other point to offend, even though it would be easy for him to do so. It appears that James's behaviour is restricted by what the present researcher refers to as a psychological barrier. James doesn't appear to consider similar opportunities for crime that are also near his home either side of Grafton Street[9].

It would be too straightforward to suggest that this is due to the fact that he is not familiar with these areas, as the literature might suggest. Furthermore, there may also be an explanation for his movement parameters based on aspects of territorial control that may be at play. In fact, a new development, one that the literature fails to acknowledge, might be occurring, where offending locations are blocked, reduced or internally restricted through a mental representation that an offender might hold in regard to where it is possible to offend. Moreover, this barrier or restriction is not based on a lack of familiarity with the area but on other factors that relate to, not his awareness space, but a space that he actively chooses not to offend in that he is likely to be fully aware of; a psychological barrier to movement, for instance.

As stated previously, there are no real restrictions to James crossing to the south of the city; in addition, the opportunities to offend there do exist, in the same way as they do in the

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[9] It would have been useful to note the progression of his offences temporally in order to establish the development of his geographic movement; unfortunately, this information was not available for James, or, in fact, any of the offenders interviewed.

north. However, James displays a clear preference for not offending in areas across the river, except for the central shopping area of Grafton Street. The map above provides some evidence for the concept of barriers to movement represented in a psychological conceptualisation of what is available where. This appears to be manifested in the River Liffey and where James is not willing to cross to offend, other than at one point to gain access to the Grafton Street area, but beyond that, nowhere else.

10.10.6 Why I Offend Where I Do

In order to understand some of the distribution of offences on the maps, it is important to understand what the offenders consider to be the rationale for why they offended where they did. This will enable an insight into the psychological considerations and decision-making that they had, in addition to any obvious strategic considerations.

Where possible, the offenders were probed during the interviews as to why they thought they offended where they did, but, also, why they did not offend in certain locations, either. Jerry, an armed robber, makes reference to this spatial inclination when discussing why he had a preference for the north side of the city over the south side of the city, for instance,

"Ye, ye, ye, Northside of Dublin. I know my escape routes."

Jerry said that he offended in the north of the city due to the fact that it offered him a level of protection and security in the form of escape routes.

Mark, an offender based on the south side of the city, indicates that it is not advisable to commit robberies on the north side of the city,

"You didn't really want to be travelling over the north side of the city."

This was because of the fact that, even though he was brought up on the north side of the city, you needed to be

"near your home base."

Mark noted that he did, in fact, commit crimes on the north side of the city,

> *"if there was something that you thought was easy enough... If you think you're going to get a 100 grand out of this, right where is it? It's in such and such a place – right we will go and have a look at it. You didn't care where it was then."*

He also noted, however, that there are other people who are strict about the areas in which they offend, and who have a solid preference for a particular side of the city,

"Some of the lads I have met with don't travel over one side of the city."

It is important to delve deeper into Mark's comments as it appears that he is making reference to his home location being the reason why he won't offend over on the other side of the city; however, he directly equates his home with being distinctly on the south side, therefore showing that he internalises this division in his decision-making.

Essentially, Mark has a concept of the city in which it is divided in two; this division governs his thought processes in regard to his offending areas, which unconsciously form a barrier for him in that he does equate not offending on the north side to be based on it not being near his home base. Mark resides in an area of Dublin which is quite close in proximity to the north of the city, therefore even if he offended on the 'other side', he would still, in theory, be close to his home. It appears that this notion does not feature into his thinking as the North/South divide is a more apparent barrier to him, even if there are no real geographically restrictive foundations on which to base this belief.

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10.10.7 Offending on Both Sides of the City

There were, offenders, however, who did actually offend on both sides of the city, for instance Jason (see Figure 10.5). While it is not possible to go into direct detail concerning the type and manner of offences that these crime locations represent, it can be noted that the offender in question had a history of armed robbery offences and would be considered a more advanced or professional offender in regard to his offending history. The offender in question, had a residential base on the south side of the city around the area of Ballyfermot (directly below Phoenix Park on the map). Based on the map below, it is clear that this offender observes no real barrier to his offending spatial behaviour, in that he offends throughout the entire Dublin region.

The location of the crimes on this map would fit with what previous research has suggested in relation to more organised offenders being willing to travel greater distances in order to partake in offences (Capone & Nichols, 1976; Rengert, 1989; Von Koppen & Jansen, 2008). More organised or professional offenders are less likely to be influenced by these subtle and often unconscious barriers to movement as they generally commit target-specific offences in which target locations are not necessarily chosen but acquired, as is the case with TK (see Chapter Seven for details).

Figure 10.5: Map in which Jason marked (x) the location of his crimes.

10.10.8 Barriers on a Larger Scale

As was briefly touched upon earlier, there may be territorial issues at play that will possibly influence where a crime can be committed by one individual over the next. For instance, there were reports within the interviews that were conducted in which offenders stated that they would not offend in a particular area because of the fact that there were other groups connected to those locations. There is one obvious territorial factor that this relates to; the border between the North of Ireland and the paramilitary strongholds that still exist there (see Chapter Seven for a review of these issues). However, before these issues are explored further, a little background is needed in order to understand the present landscape of the more serious and more organised crime that exists in Ireland today.

Recently, there have been reports of criminals, specifically those from Dublin, who are travelling around various parts of the country to commit crimes. The offenders are committing these crimes in isolated areas and towns and villages that do not have the same levels of security attached to them that would naturally be a feature of the bigger cities.

Colm, a prolific armed offender, notes why he and his associates have recently been moving away from the cities to offend,

> *"I don't like working in the city there are too many cameras you know what I*
> *mean the country there is fuck all."*

Colm also states that what is great about offending outside of the city is the country roads and the level of protection they offer,

> *"The country roads were great you see, as we could cut open farmers gates, you get me? days*
> *before or 20 hours before so if it came to it if there was a road block or a Garda blockade*
> *you would open up a field and drive through it and get out the other end..."*

However, as these reports highlight, some offenders are now travelling around the country to offend, based on the perceived lack of security these isolated locations possess. This raises questions as to whether there are barriers affecting offending behaviour, on a larger scale, when moving out great distances from an area to offend. Essentially, there are some key issues that will influence the location and direction that offenders will choose to offend in Ireland. However, more interestingly, there are locations which offenders will not offend in for particular reasons.

Mark makes reference to some of these issues when he reveals that there are areas in which he would never offend. This is due to the fact that certain areas are controlled by certain groups and there would be repercussions for operating in such an area. Mark states that,

> *"If you're after doing something and you travel into their neck of the woods to burn out a vehicle or something or get rid of something they will automatically find out and they will be down to your gaf and if they don't knee cap you they will smash you up to bits. They know that you are after doing a robbery and it's been for 100 grand they will tax you 50 grand for bringing heat."*

Mark is referring to the paramilitary personal that exist around the border areas between the North and South of Ireland. He marked them out on the map below (Figure 10.6) to show the perimeter which he would never offend near to.

There appears to be an element of a psychological barrier that exists in and around the border regions for offenders such as Mark. It is also logical to make the assumption that this possibly applies to other offenders too, specifically those from the south of the country. Mark also states, when asked if he would ever actually offend in the north, that

> *"Jesus no you can't be going up doing work there, you are just looking for trouble then."*

This view was expressed by a number of the offenders who were interviewed. Not one individual stated that they would offend in the north or knew of individuals who would offend in the north.

Figure 10.6: Map marked by Mark showing barrier he would not offend near. Pen mark at the top right of the map indicate barrier.

However, recently there have been some media reports that offenders from the south are operating in the areas around the border regions. It is possible that the individuals that were interviewed in prison are referring to a time period going back a number of years, and

because of the fact that they have been imprisoned in recent years, they have been less likely to have observed these developments directly. However, although this is just speculation, it is important to note as it highlights the possible developing nature of criminality, and, also, the complex aspects of understanding spatial properties to crime, especially in Ireland.

The border is no longer a physical manned barrier anymore as it has been decommissioned in recent times. However, as suggested by a number of the offenders that were interviewed, they do not consider it acceptable to operate in those areas. Therefore, this is likely to influence their movements, through forming a psychological barrier to their offending behaviour. Peter, a senior armed offender, alludes to this when he states that,

> *"The thing is, right across the border areas there are houses which are with 'the cause', you know, they have been there for years, just because the border is not manned anymore doesn't mean that these individuals will have gone away, it's not tolerated you know."*

Peter is referring to the fact that although the border is no longer there, the same restrictions that existed previously still apply, to a certain degree. Essentially, unwanted attention being drawn to these areas is not warranted and repercussions for individuals who do not adhere to these principles are likely to be severe. This is just another example of some of the issues on a broader geographical scale that can identify different forms of barriers to movement or influences on movement.

10.11 Conclusion

The results of this study highlight that there is a preference for offenders to offend on the side of the city in which they live; this is based on the division of the city by the River Liffey that runs through the centre of Dublin, dividing the north side from the south side. As

a result, it appears that there is a form of a psychological barrier to offender behaviour, and this is based on the river that divide the north of the city from the south of the city.

10.11.1 Distance Decay

It is possible that it could be argued that what is being observed is in fact a subtle distance decay features, relating to the distance that offenders are travelling within the Dublin region. However, this position can be countered by the distribution of the offences in and around the river which divides the city. As mentioned previously, it would be assumed that if the river was not positioned where it is then the offence would be distributed differently, as a result it can be put forward that the river is an influence on the distribution of offences, therefore supporting the current argument that a psychological barrier to movement within this location exists.

10.11.2 Distribution of Opportunities

The prevalence of crime within the city centre, in which there are a number of opportunities that offenders can avail of, draws attention to the backdrop of criminal opportunity. This needs consideration when looking at an individual offenders crime location choice. To argue that there is a uniform number of opportunities that an offender can avail of is flawed, the overall structure of an area must be considered first and then the opportunities that are likely to be present within that area as a result. This basically means that the structure and distribution of offences could be as a result of the opportunities for crime being only available in the location in which the crime occurs. This is not the case however for Dublin City Centre as it has a considerable number of opportunities throughout the city centre and not just in the areas that the offenders indicated that they committed there offences. Although it must be stated that establishing the true value and attractiveness of one location over another to offender is particularly difficult, there is, however, enough evidence within the

maps to indicate that the river does have an influence over where offenders are likely to offend.

There are a number of limitations to this study, notably relating to the small sample of maps collected. However, it must be stressed that these crime locations were generated by offenders themselves and not from published statistics of crime, which will always be biased towards solved or reported incidents of crime. Acquiring maps on which offenders have marked the location of their crimes provides a more valid representation of their offending behaviour. The rationale for this is that under the confidentiality agreement discussed and outlined to the offenders by the current researcher, the offenders were safe in the knowledge that any information provided would not reveal their identity in any way. They were therefore encouraged to be open and honest about the location in which they committed their offences. Therefore, this provides a much more accurate picture of the individual distribution of crime in Dublin based on the self-reported involvement of offenders themselves.

There are some factors, however, that are likely to account for the preference of offenders to offend on one side of the city over the other, such as the principle that crimes are committed close to where they live. However, the range of marked offence locations on the map indicate that although criminals will commit offences close to where they live, the range for some of the offences, all things being equal, are likely, in most instances, to cross over onto both sides of the city. The absence of this indicates that crossing this divide as regularly as an even distribution of offences would suggest, based on some of the observable ranges within which offenders had operated, would suggest that offenders choose generally to not cross over the other side of the city to offend.

In addition, other accounting factors for the spatial distribution of offences might be the influence of gang 'hotspots' that exist in Dublin. Gang-controlled territories might not be

open to offenders from one side of the city, or they may not consider offending in a particular area a viable option. However, as Chapter Seven has shown, these restrictions are not prevalent for certain types of crime, and they are likely to only hold for crimes that relate to the distribution of drugs in the city, for instance. Therefore, this is possible evidence for a psychological barrier to movement that was put forward as an interpretation of the locations in which offenders committed their crime based on their reported maps.

The implication of these findings are that they show subtle evidence that a psychological barrier to offending exists in Dublin, and is accounted for in the form of the River Liffey that naturally divides the city. There is also additional evidence found for a broader barrier to crime in relation to the border regions in Ireland based on interviews with offenders. Knowledge of this barrier can help advance the understanding into the nature and distribution of crime in Dublin and the importance of understanding the historical background and geographical features of a given location. Furthermore, there are also possible implications for how crime, in other cities that have a similar geographical landscape such as Dublin, can be explored.

11.1 Conclusion

This thesis investigated the impact of aspects of geographic location and offenders geographic background on criminal spatial behaviour. Furthermore, the thesis aimed to develop the concept of a locational characteristic paradigm, which puts the focus on where crime occurs, indicating the type of the individual who is likely to commit crime there. The research sought to examine specific aspects of geographic location and its influence on criminal spatial behaviour through different but related methods.

The studies described in this thesis focus of the following key issues, individuals' psychological, physical and cultural backgrounds as they relate to geography. The psychological, physical and cultural aspects relate to each other directly in that they all form a key part in our understanding of why crime occurs where it does. The manner in which an individual conceptualises the location in which they commit their crime is linked to the physical features of the location in question which is likely to influence the movement of offenders. Finally the cultural background to the offenders will provide a subtle insight into styles of offending behaviour. It was argued within this thesis that these features can either prohibit or inhibit forms of criminal movement and crime location choices.

Using the special qualities of TK which are, numerous locations contained within the offence, considerable advance planning, high levels of organisation and large numbers of offenders and resources as well as a willingness to interact with victims directly, it has been possible to explore many of the current assumptions about crime location selection. The work addressed this by looking at some key issues,

1. Offenders' representation of crime locations

2. The distribution of crime locations as influenced by barriers to movements

3. An offender's decision making when planning their location of their crimes

The studies set out to challenge some of the key concepts within the criminal spatial literature, such as Routine Activity theory, Rational Choice theory, the psychological importance of the home and the influence of familiarity on crime locations. For instance, the study in involving TK offences highlighted how the offence locations are not related directly to the home location of the offender but that that they are driven more by the robbery location and the victims home location.

In order to develop an effective way of exploring offenders mental representation of their crime locations and the influence of this on their location choice it was necessary to examine the well established mental mapping procedures. Therefore the work attempted to develop an understanding of what, in fact, is meant by a mental map and how efforts at trying to classify map styles through systematic classification schemes have proven to be difficult when applied to a criminal population.

Finally, one issue that was drawn from the literature while working through the previous studies was the role that barriers to crime have to play on offender movement. This issue was able to be tested through the unique map data that was collected from the offenders interviewed.

As a result of these studies, it was found that there were, in fact, some subtle differences within criminal movement, for example, differences within travel distances for offenders from certain locations, as was found in the study of TK offences. This could not be easily accounted for by Rational Choice and Routine Activities. As a result of this finding specifically, it was argued that a further understanding of the background to offenders, in

addition to the purely geometric models available in the literature, is central to advancing our understanding of criminal geography.

11.2 Summary of the Results

In Chapter Six the validity of the Crow Flight Distance measure was tested over the Route Distance measure. The result showed that there is a substantive significant difference of over one third between Crow Flight and Route distance for travel data generated on Irish roads. It was argued that these results call for the use of the route distance over the crow flight distance as the preferred method for analysing criminal distance data.

In Chapter Seven the variation in travel distance for TK offences in the North and South of Ireland was tested. Three stages were identified and explored: 1. The home to robbery location; 2. The abduction location to the hostage holding location; and 3. The robbery location to the money exchange location. Statistical significance was found for stage 1 and stage 2 of the robbery offence but not for stage 3. The core finding within this study was that travel distance relates to the specific contextual factors behind the location where the offence occurs. It was argued that a greater understanding to the background of both the location and the offender likely to reside there will provide a greater insight into understand the variations in travel patterns.

Chapter Nine tested a classification system for sketch maps in order to establish if this system was a reliable method to distinguish between sketch maps drawn by offenders. It also sought to examine the best way to approach the interpretation of mental maps that were developed by offenders for the purpose of this study. The results indicated that there was a poor reliability within the classification scheme that was developed to analyse sketch map. It

was argued that this was due to the difficulty of working with maps that have been developed by offenders, but also the subjective process of analysing maps. It was suggested that, the classification systems would be better served to be divided between maps that were simple and maps that were more complex, of which there was support for in the analysis. Furthermore, maps should be explored with the full background details of the drawer and the context behind the crime that has been represented.

Chapter Ten built on the unique concept of extracting information from maps that relate to crime. The study aimed to explore if the river dividing the city of Dublin formed a barrier to offenders movement. The results highlighted a preference for offenders to offend on the side of the city in which they live and that this was based on the division of the city by the River Liffey that runs through the centre of the city. It was argued that the river formed a sort of psychological boundary which influenced the movement of offenders and the locations in which they committed crimes.

11.3 The contributions of the work

Four central aspects to the work which make it unique are,

a) The type of crime being explored - TK

b) The intensive interviews with offenders using maps, and,

c) The specific geopolitical context on which the data was gathered.

d) The novel methodological study into distance measurements.

Initially, a study was developed into the methodological reliability of the Crow Flight distance measurement technique. This study was underpinned by a core argument on how

space and distance are conceptualised, which provided a rational basis for an alternative approach to measuring distance that relates to criminal movement. It was put forward that route distances, as opposed to the relative position of locations, are likely to be the manner in which individuals conceptualise the relatedness or closeness of these locations, and that organised criminals, based on the unique sample that was acquired, are more likely to lean on routes and associated temporal factors when planning their offences, as was observed within the interviews with offenders. One argument for this development, to the expansion of technology and also greater access to independent travel that is now widely accessible.

The individual differences across features of criminality were also examined. This was achieved through the analysis of real crime cases, which were explored in order to unearth the differences within the geographic profile of particular offences, specifically, TK, which is one of the fundamental contributions of the work. The results indicated distinctions within criminal movement between two defined locations, which suggests that criminal movement, for TK offences in Ireland, was heavily dependent on the location in which the offence occurs, which related to the background of the individuals operating within those areas.

Following on from this, a study was conducted to explore the manner in which offenders represent graphically their offending areas. The rationale for this study was twofold. Firstly, it was an attempt at establishing what these depictions actually represent; it has long been argued that mental maps, which are the internal structural layout an individual has of their environment, can be extracted through this process. Secondly, it was a test of the classification schemes presently available that purport to measure mapping styles effectively. The result indicated that an offender's map is best understood when taken together with details of the offence which they are representing and the role that they had to play in the offence. Furthermore, the classification process for analysing mapping styles was found to be

a deeply subjective process and that greater validity might be found through ascertaining whether a map is either complex or basic. These results provide auxiliary support to the literature on mental maps, which suggests that extracted mental maps represent how an offender views their crime, but challenges the literature which suggests that these methodological approaches can be classified in a systematic manner. It was found that the mental maps within the sample represented the part that an offender had to play in the offence, for example, the getaway driver who drew road networks and routes when asked to represent their offence graphically. Therefore, the role that an individual plays in the offence is likely to influence the style of map produced, which, naturally, will have an effect on the validity of assigning a specific style to a given map.

The final stage of the research explored, firstly, how psychological barriers to crime can be identified and, secondly, what inferences they are likely to have on the distribution of criminal offences. This was achieved through offenders' self-reported offence locations on a map. Results indicated a preference for offending on a particular side of the city; the identified barrier being a river intersecting this city. The rationale put forward by offenders for not crossing over this barrier was not identified directly within the interview undertaken, indicating a psychological boundary which the offenders were not necessarily consciously aware of obeying. This opens up a new area of focus, something which has only briefly been touched upon in the available literature and something which is certainly of primary importance to our understanding of criminal geography and how it is shaped. However, it must be stated that this study, and subsequent results were only possible because of the maps were in relation to a particular city that the current research knows well. It is important to highlight that an intrinsic knowledge of the location in which this study was based was vital in order to be able to interpret the results effectively. Furthermore, it would be difficult to

undertake a study of this nature without a solid structural understanding of the area being examined.

11.4 Uniqueness of the work

By using a dataset of TK offences from Ireland, it has been possible to examine for the first time the features and attributes of this rather unique and developing crime type in its particular geopolitical context. As a result, it is one of the key strengths to the research. At present, there exists no known academic comment on the offence of TK within the criminology literature. The present work therefore provides the first academic analysis of the crime of TK. However, irrespective of the findings that were generated and the theoretical implications of these findings on our understanding of criminal movement, as a first thorough analytical look at TK, this work retains a level of distinction directly removed from previous studies exploring criminal geography. Therefore, the first central contribution of the present work is the introduction to an extremely unique form of criminality that has previously lacked any solid analytical focus.

A number of distinct methods of data collections were employed to capture a broad understanding of the factors influencing behaviour. It was important to explore these issues of geography both quantitatively and qualitatively and through exploring unique approaches toward the analysis of criminal geography.

11.5 Rationale for Method Study

When working with the original case material and coding the geographic data that was available, it became clear early on in the process that it was vitally important to strip

back the methodological approach previously utilised by other studies and analyse the effectiveness of that directly. The rationale for this initial approach was twofold:

1. The make-up of Irish roads and the distances that were measured did not relate to the journey that offenders would have to travel to make it between one location and another.

2. On a broader, more theatrically relevant issue, a debate opened as to the form in which individuals mentally represent the distance between two locations.

It was put forward that the development in technology and greater access to independent travel options has resulted in a more holistic approach in how individuals conceptualise space and the distance between locations. It was felt that the previous measurements employed in the literature, such as the Crow Flight distance measure, was not applicable to Irish roads, but also, importantly, it was argued, for the manner in which individuals conceptualise distance.

11.6 Classifying Mental Maps

The classification schemes previously employed to measure offenders drawing of their crimes were tested. It was found that they were not a very valid and reliable form of classification due to the subjectivity of the sketch map process. Results suggested that there may be some utility in starting from the beginning, by dichotomising maps to either complex or basic, as the analysis found that there was some success with this approach. As a result, a number of questions related to validity and reliability have been raised, which question the utility of the sketch-mapping classification approach directly and another which challenges the notion of what, in fact, a sketch map is tapping into. This is likely to be directly affected by the manner in which the offender conceptualises their involvement in an offence that they

have been asked to represent visually. This therefore does not influence the quality of the output but, more importantly, the nature of the individual's role or how they see themselves within the spectrum of their involvement in a particular crime; some explore of this were provided within the work.

11.7 North vs. South

One of the core hypothesises of Investigative Psychology is that there will be differences between individuals who commit crime and that these differences will manifest themselves in the behaviour exhibited within their crimes. For the present research, this was no different. The research found a differentiation between the style of offences within the South of Ireland and the style of offences in the North of Ireland.

It was put forward that the cultural background of the offenders accounted for the differences in their geographic profile. In addition, there was also the influence of the physical location that the offences occurred in which prohibited movement. This was in reference to the border region dividing the North of Ireland from the South of Ireland, and was only prominent for offences from the north, as that was the arena that they were bound to.

It has been reported in the literature that levels of organisation are likely to reflect the mobility of offenders; this has been found in the higher the reward, reflecting the distance travelled by offenders (Capone & Nichols, 1975). Although the logical rationale for this is that targets of higher value must be sought out, which naturally means that they are likely to be further away. In the current work, all the offences were extremely well organised, but offenders in the north operated the same offence across a more refined geographic space; this

represented the cultural underpinning to not just the offender but also the location in which the crimes were occurring. These issues are discussed in depth within Chapter Seven. Therefore, it is put forward that although levels of planning can shed light on the geographic profile of certain types of offences, what is more fundamental is the background to the individuals in question, as this is more prominent in shaping the geographic style of an offence.

11.8 Influencing Factors on the Location of Crime

The core aspects that influence the location in which offenders choose to offend is put forward below (Figure 11.1). It incorporates three central themes that emerged as being an influence on where offenders choose to offend:

- The strictly physical influence of the environment on the location of crime

- The psychological manner in which location and space is conceptualised and the manner in which this mental cognition is representation graphically; and,

- The underlying influence of culture, which is the background of the individual and how that is likely to shape the location and nature of their geographic behaviour generally. Furthermore, culture also accounts for previous criminal experience and the influence that that can have on the decision-making process.

The figure represents how each of these facets are interlink with location and the decision-making process which occurs within individuals when planning a crime. These facets can often be unconscious influences on the behaviour of the offender, such as barriers to movement or cultural aspects which prohibit or inhibit movement, as was found. The

results suggest the decision to undertake or plan an offence is multifaceted and goes beyond the purely economic model of risk and reward.

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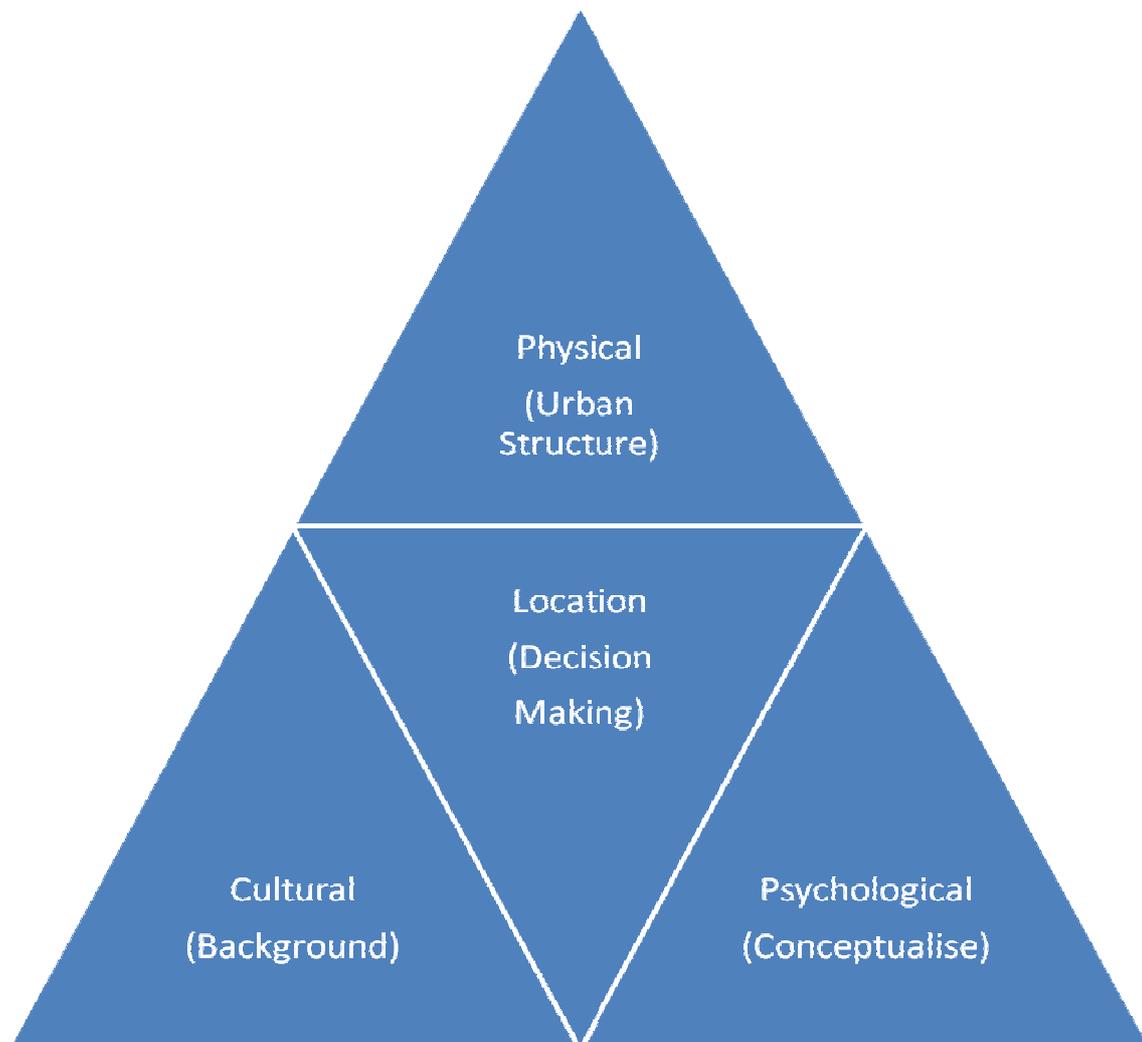
Figure 11.1: Paradigm of Influencing Factors on the Location of Crime

The results of this thesis indicate that offenders are bound by the geographic area which they are a part of, as was found in the study of TK offences in the North and South of Ireland, and that advanced planning removes some of the core features put forward to account for criminal movement such as familiarity, importance of the home and routine activities. These theories which have served so long as a core conceptual basis behind the location of

where to offend are challenged presently, as it appears the decision-making process is much more complex than, for instance, just offending in an area which an individual is familiar with. Each of these facets acts as conceptual modifier on the decisions on where to offend and they interact, often unconsciously, to influence various competing aspects of an offender's geographic behaviour. Therefore, it appears that offenders may, in fact, be bound by other restrictions that are manifested in what they know is possible where and their geographic behaviour is bound by these restrictions but also these opportunities. For instance, an offender might be aware of areas where crime is possible and these areas may be familiar to them; however, if another criminal group operates out of that location, they may make the decision that it is not safe for them to engage in certain acts of criminality in those areas. This example highlights how the concept of familiarity being a dominate force in geographic behaviours of criminals as being a simplistic interpretation of what appears to be a rather complex decision-making process.

Familiarity is a concept that has served our understanding of geographic behaviour well, but it is now important to explore some of these issues further, especially when dealing with offences that have high levels of planning and organisation to them. It is likely, as was found in these cases, that they adhere to a different template of geographic behaviour, something which has not yet been accounted for fully in the available literature, which incorporates active spatial learning on the part of the offender.

It is possible that the paradigm introduce above has the potential to be applicable to all forms of highly organised crime, where there is a removal away from the standard interpretations of offending behaviour. As with various other forms within offence classifications, there are also various forms of the decision-making process inherent to the level of professionalism ascribed to certain offences. As a result, it is only natural that there

are different, more in-depth and complex decision-making processes regarding where to commit a crime for these types of organised crimes.

11.9 Investigative Implications

One of the most important features of the present research is the prospective practical implications of the findings. Although the theoretical contributions of the work are of primary importance, the investigative element of the research invariably implies that there will be some form of applied implications to the work. The core philosophy of the discipline of Investigative Psychology, which this work is grounded in, is that it is bound to the ethos of empirical research while retaining an applied element to it that is useful beyond the contribution to theory. How an understanding in Psychology can help in the investigation of crimes is at the very heart of studies in Investigative Psychology. It is important for any work with an investigative component to have some form of solid contribution to the investigative process.

The central investigative contributions of this work emerge from the studies into the offence of TK. The findings have implications for the focus that the police should have on the investigation and also the way in which they can manage their resources. The most obvious piece of investigative advice that could be offered from the research is not, however, related to the findings into the geography of the offence.

The investigative advice discussed below is controversial, but it is supported by the findings into TK offences. It is important, initially, to briefly revisit how the offence of TK operates. TK is an effective form of criminality for three main reasons.

1. Firstly, the offenders do not have to enter into the premises that are being robbed, which reduces risk on their part.

2. Secondly, if, for instance, they are caught with the proceeds of the offence after it has taken place, it is very difficult to implicate them in the absence of forensic trace evidence, which makes it legally very difficult to establish an individual's involvement in the crime.

3. Finally, and most importantly, offenders exploit the 'human factor' through the threat to kill in order to coerce the victim into helping. It is this intimation element which enables the offence to be successful, as the victim is likely to lose all forms of rational consideration when presented with a life-or-death situation. It is the offender's role to make this threat as convincing as possible in order for it to hold some tangible merit. Without success at this stage, the offence of TK will dissolve, therefore efforts to tackle the offence are likely to be most effective at this stage.

There have been no fatal outcomes for any of the victims of the offence of TK in Ireland, regardless of whether they were successful with the offences or not. Furthermore, in the offences that were not successful, it was found that the offenders abandoned the crime if they became suspicious at any of the stages that the police might have been aware of the offence taking place. In one instance, after the victim, who had been fitted with a hidden microphone, had already secured the money, the offenders misheard the word 'regards' for 'the guards' (Irish police) and abandoned the operation as a result.

Therefore, taking these factors into account, the results suggest that the best method to reduce this type of offence would be for the banks to instruct staff not to comply with the requests of a colleague who presents themselves as the victim of a TK. This goes against the current position in operation, of complying with the requests of the offenders while

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contacting the police at the same time; however, this approach has often not been acted on properly. The reason why this appears to be the most rational form of advice is that it is entirely unlikely that a group of offenders will escalate an offence of kidnap and robbery, which they will be able to distance themselves from immediately, to murder, when they know that they are unlikely to be successful with the offence.

Although this is logical advice based on what occurs during a TK, it would be ignorant of the present researcher not to acknowledge that this is not just a controversial measure but an impractical one at that. It is very difficult to manage or instill training in individuals who are faced with this type of situation; in fact, it is this situation, the human factor, that TK exploits quite effectively.

Although it is thought that this approach would eventually dramatically decrease incidents of the offence, it is one which is likely to be met by resistance from all sectors, for the obvious potential risk that exists, even if they are envisaged to be minimal at best. However, research can only provide advice in the direction in which it appears to be placed. However, there are additional practical implications of the work relating to the study of the geographic profile of the offences.

The potential of spatial information to help the investigation of crime has been widely acknowledged in the literature (Canter & Larkin, 1993; Canter & Gregory, 1994; Rossmo, 2000; Snook, 2004; Canter, 2005; Sarangi & Youngs, 2006; Paulsen, 2006; 2007; Canter & Hammond, 2006; 2007). These studies relate to the potential of the practical applications of Geographic Profiling.

The results of the present study provide practical advice for the police in the form of search parameter guidance. In general, when the alarm is raised during a robbery, the response by the police is to immediately go to the location under attack. However, with TK,

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this is the last location where the offenders are likely to be. In fact, they will have never been there during the course of the robbery; therefore, it is of little investigative benefit to secure that location at this time. The most practical benefit is found in the location of the money exchange, and the research confirms this. The research found the least amount of variance between the North and the South for the money exchange stage of the offence. Furthermore, the vast majority of these locations were all less than 1km from the robbery location.

It is therefore suggested that the police should be dispatched to areas around the location being robbed and not a speedy response to the robbery location in question. It is therefore likely that there will be a greater probability of intercepting the offenders at this stage of the offence. Moreover, this has obvious benefits towards legally securing a conviction for their involvement later on, something that has retrospectively been difficult, as there are temporal factors which make an individual's involvement irrefutable at this stage of the offence.

In addition to the implications of the work for the investigation of TK, the research also provides some new developments in regard to the geographic arena of offenders, although the best manner in which to utilise these findings in an applied context is rather tricky to interpret. The finding that there are geographic barriers to offending behaviour sheds light on the parameters in which offenders operate and also how they conceptualise what is possible where. The most logical investigative implication for this is through suspect identification, in that attention should be given to suspects who reside in one geographic area over another which is defined by an identifiable barrier. This is likely to have greater predictive accuracy than crimes that are not as highly organised as TK.

The finding that there were notable differences in the spatial profiles of offenders, which related to their backgrounds and culture, is also of importance in terms of police

investigations. Therefore, it could be possible to make inferences about the characteristics of certain offenders based on the manner in which they use the environment during their crimes. However, this would require more in-depth research into the offenders in question to establish the potential of this approach; however, the absence of any convictions for TK offences makes getting access to information on these offenders difficult.

Although the present work has not set out to test the decision support systems which are in operation (see Canter, 2005, for details), or, in fact, contribute to them directly, there are aspects of the current research which have implications for the development of these support systems. This comes in the form of the methodological contributions of the work, outlined in detail in Chapter Six, towards the analysis of distance data and the reliability of these measurements. Although this is a purely methodological issue, it is one that is likely to contribute to more accurate measurements, which will ultimately produce more accurate outputs.

11.10 Limitations of the Work

Although there are some key developments within this work relating to theory and practice, it is natural that, as with all forms of research on real world data, there are likely to be a number of limitations to the work.

The first obvious limitation is the small sample size for both offences and offenders. The nature of the data sources, archival police records, is fraught with completions, from incomplete to missing information. However, this is the material that researchers have to work with in this field, and through cross-referencing information and discarding information which is incomplete, it is possible to build datasets which are of some benefit.

The analysis would obviously have benefited from detailed information on offenders' background characteristics, but due to the nature of the offences under study, this information was not available; some of these issues have been addressed in Chapter Three. However, as mentioned previously, this work does contain all known offences of TK in Ireland, which is a considerable strength to the work and does not adhere to some of the difficulties that other studies have in only having access to cases in which there have been convictions. Finally, gaining access to any offenders in a prison setting is extremely difficult, so the limitations of the small sample size must be viewed in this context.

The manner in which the offenders where recruited in the prison is another limitation. Relying on the guards relationship with the prisoners meant that some of the offenders might not have taken part if it were not for the relationship that they had with the prison guards. However, all offenders were briefed as to their right to withdraw from the study, so, if they had any objections after meeting with the researcher they were free to refuse to engage with the study.

It is possible that they offenders that were interviewed in prison fabricated their stories for the benefit of the researcher. This is something that always needs to be mentioned when working with offenders. However, due to the nature of the details provided, the ability to cross references cases in places and the unlikely possibility of being deceptive through sketch maps in addition to the good rapport that was generated with inmates, it is the position of the current research that the vast majority of those interview where being truthful. However, it cannot be possible to determine this with absolute certainty.

The timing restrictions in relation to the breaks that the offenders had during the day put pressure on the researcher and as a result were another limitation to the study. This resulted is some of the spatial aspects of the interview being cut short. Furthermore, this

temporal pressure related to the need to establish a good level of rapport with the participant while also being mindful of collecting all of the information needed during this time. However, when conducting interviews in prison you are bound to the timing schedules of the prison staff and prisoners so there was no way to overcome this difficulty.

As mentioned in Chapter 3, some of the interviews were recorded with a Dictaphone but the majority were recorded by taking notes. There are some obvious limitations in regards to this approach. Firstly, it is not possible to directly record everything that was discussed using this method. Secondly, note taking can have an influence of the development of themes as the need to record what is being discussed can have a restrictions on the flow of the discussion. However, it was not possible to electronically record all participants as some of them where not comfortable with the idea of being recorded, therefore, there was no better way in this situation, than to manually take notes during the interview.

The findings of this research, specifically in relation to the work on TK, are unlikely to be applicable outside of Ireland. This relates specifically to the unique nature of Ireland, its geopolitical culture and is specific geographical make up. One of the general themes to emerge within this research was for the appreciation of contextual factors, that are likely to influence movement. Although the results are difficult to translate outside of Ireland they do raise some important questions for the nature of all findings involved the study of geography and for a greater understanding of the underlying context of the environment under investigation.

11.11 Further Research

The current study aimed to explore aspects of geographic location on criminal spatial behaviour through a variety of techniques and methods. This led to the development of the paradigm presented above, which provides a early framework for features that influence the decisions of an offender on where to commit crime. A number of questions have arisen out of this work that have implications for future research. Some of these issues could not be explored within this work as the data did not allow for this, and some of the topics did not necessarily fit in with the direction of the work. These issues are discussed below.

11.12 Mental Maps

Although the research worked with a small number of offender-generated maps and it found that there was little reliability within the classification schemes available, there were some avenues identified for future research. What was found in the present work was that offenders' maps reflected the role that they had to play in the offence, which caused problems for classifying the maps through rigid systems such as Appleyard's (1970) classification scheme. What would be of potential benefit would be to collect, initially, a larger database of offenders' maps and see how the narrative of their offending behaviour manifests itself in the development of a graphic representation of their offence. Therefore, it may be fruitful to try to link in the narrative role that an offender sees themselves as playing and how they represent this graphically in the form of a mental map.

Further research should also be concerned with what these mental map representations actually signify. If it is a matter of how well the individual understands the

task that they have been set, then it may be better to develop a core structure to obtaining this type of information, possibly through educating the individual about what this task is attempting to tap into. However, this approach is likely to influence the way the individual understands the task and effect of the map that is produced. Therefore, future research should be concerned with what, in fact, a mental map is representing, as this will bridge the gap between the cognitive representation of an activity space and the behaviour that has occurred in this activity space, therefore providing a more rigid understanding of cognitive maps and what they represent. There are possible benefits for treatment and rehabilitation that may grow out of this work based on an offender thinking about and understanding how he sees himself and his crimes within his environment.

Finally, one novel contribution would be through the use of the sketch-mapping process as an investigative interview tool to help promote recall. This may not be suitable for offenders but may have some benefit when used with the victims of crime, as it actively taps into a cognitive recall process, which may aid an individual to remember details of an offence.

11.13 Reclassification of The Journey to Crime Concept

The Journey to Crime that an offender makes proposes that they travel out from a base to offend and then return to this base. What the studies within this work suggest, and something that shined through within the interviews, was the importance of travel to offenders and how much importance they ascribe to it. One thing is clear: the concept of a Journey to Crime is one that is very misleading, as travel patterns within crime is a much broader and more complex issue than the term suggests. There are competing factors based on the offenders' backgrounds, the manner in which they conceptualise their environment

and the space they find themselves in. Moreover, there are also the barriers that they face and restrictions that they encounter when planning crime.

Future research should concern itself with a broader approach to studying criminal spatial behaviour, with an emphasis being placed more on the area in question and the underlining contextual factors that are likely to be prevalent there and how they may or may not influence the spatial behaviour of offenders. An example of this within the current work is found in the border between the North and South of Ireland in which it was found to influence the travel patterns of offenders. Therefore, a reclassification of the term Journey to Crime would be appropriate, with preference for criminal spatial behaviour as it does not imply a rigid system for movement.

The current research exposed slight flaws of applicability to certainly crimes in some of the fundamental theories within criminal movement, such as the importance of familiarity being overcome by the active learning of locations. It is not to say that the previous work has not been beneficial in helping to shape how we understand spatial behaviour, it is just that now it is important to refine what it is these conceptual frameworks actually represent. Therefore, future research should be concerned with additional influencing factors on movement, such as barriers to crime and how the Journey to Crime is a much more complex and dynamic approach than the term suggests.

Finally, a detailed study into the distances offenders operate over during the getaway stage of all offences would be of particular interest as an applied piece of research. This emerged as an important focus in the present work, which found consistency across the exchange stage of the TK offences, while also finding that this stage reflected the shortest travel distances. Developing this work further would have benefits for the way in which police resources are effectively distributed, which would possibly lead to the interception and

identification of getaway vehicles. Therefore, future research should be concerned with developing the operational range of criminals for all offence types at the getaway stage of an offence. Establishing if there is any consistency within range for large cities over small rural towns would be of particular interest.

11.14 The Influence of Group Geography

The present work has studied cases in which there have been large teams of offenders. Something which is currently lacking in the literature on criminal geography is the effect of group geography on the location of crimes. As most of the literature in the area of crime and geography has predominantly been concerned with where the offender lives, it makes the influence of a team of offenders' home locations something that would appear to be of additional interest.

A number of questions therefore develop, such as: what are the factors that govern group geography in relation to crime, and how are the distribution of offence locations influenced by one individual in the group over another? Is it that there is one dominant member of the group and their personal geography reflects the distribution of crime locations in which the other members of the crime fix themselves to over the course of the offence? Therefore, it is proposed that the nature and influence of group geography on the location of crime is one area where future research would be beneficial.

11.15 To Conclude

The present research aimed to provide a collection of studies outlining different influencing factors on criminal spatial behaviour. It aimed to offer up a more in-depth look at

features of geography, distanced from the purely geometric and mathematical models that exist, and how they can influence the location in which crime occurs. Through exploring the nature of the influence of the physical, the psychological and the cultural elements of offenders' spatial behaviour, a number of central psychological processes emerged that help account for the observed developments found within the results of this thesis. What this thesis found was that criminal geography, although previously distilled to numbers and figures, has more potential to open up understanding when the individual is where the focus is applied. The contextual aspects underpinning an individual's involvement in crime and the location of that crime has a dominant role in the development of their spatial behaviour and, thus, how it can be modeled and understood. How they interact, conceptualise and are bound within and away from the location that they find themselves in can be understood by stripping back the criminal geography to exploring directly where it occurs and what is special about where crime occurs.

There are likely to be some significantly revealing features to be found with this shift in focus, meaning that knowledge of the location, and the type of individual who is likely to commit crime in that location, can be more rewarding than restricting research to the generic measurement of distance. This will lead to a more refined geographic appreciation which incorporates the knowledge of what a particular location represents as much as it does the measurements and figures that can be extracted from these locations. Therefore, the story of how a crime ended up where it did can provide a fruitful avenue for the future of research into criminal spatial behaviour.

The importance of this work lies in fact that it explores the unique crime of TK in a unique geopolitical context. There are a number of important developments that grow out of this purely introductory focus on TK, by bringing it to the attention of practitioners and academics alike. It is likely that the key implication of this introduction to TK will be in the

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manner in which crimes of this nature are classified by police and researchers alike. TK is a unique form of criminality which encompasses a number of the salient aspects of other crime types, including, but not limited to, robbery, kidnap and extortion. Bringing attention to this new form of criminality will help grow and develop our understanding of how crime evolves generally, but also how geography can play a central role in the commission of certain types of crimes. TK illustrates this perfectly in the vast number of locations actively incorporated within a singular offence.

Finally, the central message of this Thesis is that we can only get so far in understanding criminals crime location choices by the sorts of abstract dots on the map that most studies have used so far. To get any further than this studies need to have detailed information about the offenders and their geopolitical contexts. Unpacking the influence of these factors on criminal spatial behaviour will help to develop a more in-depth understanding of why crime occurs where it does.

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Information Sheet for Participation in Research
International Research Centre for Investigative Psychology

Dear Potential Participant,

Geographical Aspects to the planning of a Robbery

Thank-you for taking the time to read about this research which is being carried out by John Synnott from the International Research Centre for Investigative Psychology, at University of Huddersfield, as part of my PhD degree.

Before you make a decision about whether or not to take part, we hope you will take the time to read the information below.

What is the purpose of this research?

The purpose of this study is to help understand the extent to which the physical environment has an effect on the planning of a crime.

Who can take part?

Adult males aged 18 years or older

Hold a conviction for Armed Robbery/TK

No current legal charges or appeals pending

Willing to discuss how you plan a crime.

What happens if I decide to take part?

If you wish to engage in this research, you will be invited to attend a meeting with the man researcher who will provide you with a consent form and demographic sheet (information about your background and forensic history). In addition, you will then be given some questionnaires to fill out these will look into your criminal history, the role that you see yourself having played in crime. You will then by interviewed about aspects that you can relate to in planning a robbery offence, you can draw on the experience you may have of planning a robbery offence. During the interview you will also be asked to draw on one of your signature offences to

highlight some of the aspects how you carried out the offence. The central purpose of this is to explore the extent in which the built environment plays a role in the planning of an offence.

Will I be debriefed?

If you find that thinking about your offence brings up some difficult memories or emotions, the researchers will be willing to discuss these with you after each session. During this time, they will also assist you in identifying other supports you can access within the prison setting to help you cope with any distress the research may have caused.

What happens if I change my mind?

If you agree to take part in the study, but then change your mind, or have started and then wish to stop, please inform the researcher or a member of staff at the prison. Participation in this study is completely voluntary and consent to participate or choosing not to participate will not affect your care, life in prison or parole in anyway.

What will happen to the information I give?

All information collected about you in this study will be kept confidential and stored in anonymous form. Do not put your name on any forms except the consent form; this will be kept separate from the information collected during the interview to ensure anonymity. After signing the consent form you will be allocated a participant reference number.   All information will be password protected; your name will not be associated with any of your interview responses. All information will be kept in a locked filing cabinet, in a locked office, at the International Research Centre of Investigative Psychology which only research staff and their supervisors at the IRCIP will have access to. Results of the research will be made available to you if requested. The data from this study will be used to write a research report that will be used in John Synnott's Thesis and may be written up for publication, however no individuals will be identifiable within any published reports, as only general themes will be indicated. This research report will be accessible upon completion at the University of Huddersfield Library.

As this data will be collected for completion of a PhD, all raw data will be retained for the development of the thesis and future statistical analysis until passed. On completion of the dissertation, all identifiable information will be destroyed to - however anonymity data will be retained indefinitely for future statistical analysis by the IRCIP if required. Due to requirements regarding data protection from data fraud, raw data (questionnaires, interview recordings etc) will be kept securely for five years beyond the end of a study.

Who is doing this research?

Researcher Names: John Synnott

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University Address: International Centre for Investigative Psychology, School of Human and Health Sciences, University of Huddersfield, Queensgate, Huddersfield, HD1 3DH.

 at the University of Huddersfield.

Researcher Supervisors: Professor David Canter and Dr Donna Youngs.

If you have any concerns about the ethical conduct of this study, you are asked to contact either the researcher or a member of staff at the prison. Alternatively, you can also contact the researcher's supervisors at the address above.

Consent Form for Participation in Research

International Research Centre for Investigative Psychology University of Huddersfield

Project Title: Geography and Crime: How Planned Crime interacts with the Environment

I have read the "Information Sheet for Participation in Research" and have been fully informed of the nature and aims of this research. I understand that participation in this study will not affect my care, life in prison or parole in anyway.

 I understand that I have the right to withdraw from the research at any time without giving any reason and that there will be no repercussions following my withdrawal.

If I choose to withdraw from the project, I am aware that my research data will continue to be used unless I explicitly request that this data be withdrawn from the study.

I understand that by agreeing to partake in the study, I am also giving my consent for the researches to access collateral file information held by the prison service regarding my offence history and details of my identified offence.

I understand that my identity will be protected by use of a participant number in the research report and collected information will be held in anonymity. Furthermore, no information which could lead to me being identified will be included in any report or publication resulting from this research.

I understand that on completion of the dissertations, all identifiable information will be destroyed - however anonymity data will be retained indefinitely under secure conditions for future statistical analysis if required.

I understand that due to requirements regarding data protection questionnaires, interview recordings and drawings will be kept securely for five years beyond the end of a study.

I am aware of the limits of confidentiality and acknowledge that if I express any intention to harm myself or others during the course of the research, the researchers are under obligation to report this information to the appropriate individuals.

I am aware that if I experience distress or personal difficulties at any point during the interview, the researchers, with my consent, will refer me to the psychology support team at the prison.

I am aware that by signing this document I am giving my consent to take part in the study.

Name of Participant: _____ Signature of Participant: _____

Name of Researcher: _____ Signature of Researcher: _____

Date: _____

DEMOGRAPHIC SHEET AND QUESTIONNAIRE ON CRIME

Participant Number:_____

The purpose of the demographic sheet is to obtain background information regarding your offending history and details of one specific offence you have committed and been convicted of.

When completing Section 3. Offence Details use this offence to answer the remaining sections. We would suggest that you answer this form in relation to your index offence, however if you choose to answer these questions in relation to a past offence, please indicate this.

1. DEMOGRAPHIC INFORMATION (please circle where appropriate)		
Current Age:	**Marital Status:** Single / Married / Divorced / Widowed / Separated	**Ethnicity:**
Nationality:	**Completed High School:** Yes / No **If no, what age did you leave?**	**Completed Higher Education:** Yes / No **If yes, what are your qualifications?**
2. OFFENDING HISTORY (please circle the convictions you have previously received).		
Age at first conviction:	**Number of Prior Convictions:**	**Number of times in prison (including now):**
Violent: Murder / Manslaughter / Grievous Bodily Harm /Assault / Common	**Sexual:** Rape / Attempted Rape / Indecent	**Other:** Burglary / Theft /Arson / Driving Offences / Drug Related Offences /

Assault /	Assault / Exposure	Criminal Damage
Other: *please specify*		**Other:** p*lease specify*
	Other: *please specify*	

<table>
<tr><td colspan="3" align="center">3. OFFENCE DETAILS</td></tr>
<tr><td>Date of offence:</td><td>Number of Convictions:</td><td>Age at offence:</td></tr>
<tr><td>Is the identified offence your index offence?

Yes / No</td><td>Sentence Length:</td><td>Did you plea:

Guilty / Not Guilty</td></tr>
<tr><td colspan="3" align="center">3a. What convictions did you received for the above offence? Please refer to the lists below.</td></tr>
<tr>
<td>Violent:

Murder / Manslaughter / Grievous Bodily Harm /Assault / Common Assault

Other: <i>please specify:</i></td>
<td>Sexual:

Rape / Attempted Rape / Indecent Assault / Exposure

Other: <i>please specify:</i></td>
<td>Other:

Burglary / Theft /Arson / Driving Offences / Drug Related Offences / Criminal Damage

Other: p<i>lease specify</i>:</td>
</tr>
<tr>
<td>Was anyone else involved in the commission of the offence: Yes / No</td>
<td>If yes, how many others were involved?</td>
<td>What was your relationship to them?

Family Member / Friend / Stranger / Partner / Acquaintance.

Other: <i>please specify</i></td>
</tr>
</table>

Where did the offence occur? Victims home / Your home / Public area / pub **Other:** *please specify*	**What day did the offence occur?** Monday / Tuesday / Wednesday / Thursday / Friday / Saturday / Sunday	**What time did the offence occur (approx):** 5am-9am / 9am-1pm / 1pm-5pm / 5pm-9pm / 9pm-1am / 1am-5am
Did you threaten the victim with use of a weapon? Yes / No	**If yes, did you actually have a weapon?** Yes /No	**Did you use a weapon against the victim?** Yes / No
If yes, did you: a) Take the weapon with you b) Find the weapon at the location of the offence.	**What weapon(s) did you use?** Knife /Gun/ Bottle/ Hammer / Rock **Other:** *please specify*	**What was the purpose of the weapon:** To control the victim / to inflict harm on the victim / to frighten the victim / to get the victim to comply / for protection **Other:** *please specify*
5. PERONAL CIRCUMSTANCES AT THE TIME OF THE OFFENCE		
Were you employed / studying at the time of the offence? Yes / No	**If yes, was this:** Full-Time / Part-Time / Casual **What type of work/study was this?**	**If no, how did you support yourself financially?** Job seekers allowance / disability benefits / crime / family **Other:** *please specify*
Where were you living at the time of the offence? Alone in own accommodation / Parents home / Homeless / With partner / With friends / Probation Hostel **Other:** *please specify*	**Were you in a relationship at the time of the offence?** Yes / No	**Were you on licence/probation at the time of the offence?** Yes / No

Were you using substances at the time of the offence? Yes / No	**If yes, what substance(s) were you using:** Alcohol / Heroin / Cocaine / Amphetamines / Marijuana / Ecstasy. **Other:** *please specify:*	**Were you experiencing mental illness at the time of the offence?** Yes / No **If yes, what was this?**

6. VICTIM DETAILS

Number of victim(s):	Gender of victim(s): Male / Female / Male and Female	Age of Victim (s): **If unsure, please circle each age bracket you think they were in:** Under 10 years old / 10-15 years old / 15-18 years old / 18-25 years old / 25-30 years old / 30-40 years old / 40-55 years old 55+ years old
Your relationship to the victim(s): Family Member / Partner / Ex-Partner / Friend /Acquaintance / Stranger - (known less than 24 hours) **Other:** *please specify:*	**How long did the offence against the victim(s) last for?** 5-30 minutes / 30 minutes to 1 hour / 1 to 2 hours / 2 to 5 hours / 5-12 hours/ 12-24 hours / 1+ days	**Injury to victim(s):** Death / Broken Bones / Mutilation / Sexual Assault / Beaten / Bruises / lacerations **Other:** *please specify:*
Did you blindfold or attempt to blindfold the victim?	**Did you attempt to silence the victim by gagging them?**	**Did you restrain or attempt to restrain the victim(s)?**

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Yes / No	Yes / No	Yes / No
If yes, what did you use?	**If yes, what how did you do this?**	**If yes, what type of restraint did you use / attempt to use?**
What type of <u>verbal</u> communication did you have with the victim(s) during the offence: None / friendly conversation / compliments / made jokes / talked calmly / belittled / criticized / threatened / yelled abuse **Other:** *please specify:*	**Did you steal from the victim(s)?** Yes / No **If yes, what did you steal?**	**Did you attempt to conceal your identity?** Yes / No **If yes, how did you try to do this?**

Now please tell me about yourself….

Male_____ or Female_____

How old are you? _____

What ethnicity are you?   Please tick below.

White	Black-Caribbean	Black-African	Indian	Chinese	Pakistani	Bangladeshi	Other Please say what

What qualifications did you get at school? (GCSEs/ O levels/ CSEs)

Do you have any A-Levels? Yes_____ No_____

Write down any other qualifications or training that you have? (Things like NVQs or military training or sports skills)

What courses/ sessions have you attended in prison if any?

How old were you when you were first given an official warning by the police?

How old were you when you were first found guilty of a crime in court?

What was this for? _____

About how many convictions have you got in total (include everything)?_____

About how many times have you been up in court?_____

What do you have convictions for? Please write **all the different types** of convictions that you have.

What are **most** of your convictions for?

What was your **first** conviction?

Do either of your parents or step-parents have convictions? Yes_____ No_____

If yes, what for?_____

Have you been to a prison or a Young Offender's Institution before? Yes_____No_____

If yes, how long were you away for before? _____months

How long was the sentence you were given (this time)? _____months

How much of this have you served so far? _____months

Have you been on probation before? Yes_____ No_____

As a child did you live? (If you lived in different places please tick all those that apply) :-

with my Mum and Dad   -_____

with just one of my parents   -_____

with my Mum and step-Dad   -_____

with my Dad and step-Mum   -_____

with other relatives   -_____

with foster parents   -_____

in a Children's or Community Home   -_____

Other (please say)   -_____

Did any brothers or sisters (or step brothers or step sisters) live with you?

Yes _____ No_____

If yes, how many lived with you?   -_____

What ages are they now?

Do they have any criminal convictions? Yes_____ No_____

If so, what are these for?

If you know, please tell me what job your parents (or step-parents) do.

If they are unemployed tell me about their most recent job:-

Father/ Step-father: What is the job called? _____

What do they do? _____

Full time or Part time? _____

Are they unemployed now? Yes_____ No_____

Mother/ Step mother: What is the job called? _____

What do they do? _____

Full time or Part time? _____

Are they unemployed now? Yes_____ No_____

<div align="center">

OFFENCE ANALYSIS – SEMI-STRUCTURED INTERVIEW

Participant Number: _____

</div>

The purpose of this semi-structured interview is to explore with you how you plan to interact with the physical environment during the planning stage of an offence. I would like to explore the issues around location choice before during and after an abstract crime, however you may draw on a pervious offence in order to guide your responses. It might also be worthwhile to provide a visual representation of what you are talking about. This interview should last between 1 and 1 ½ hours.

1. Planning the crime.

Im going to ask you to describe some of the things that you would need to consider in the planning stage of the offence. For instance what do you need and how you go about getting this etc. You can use to the following as a guide.

- Locating a target – how is this done ?
- What tools to you need
- How much planning goes into the crime (temporally)
- How many individuals are needed and how do you recruit them?
- How many vehicles do you need

2. Location

When planning a crime what do you think about in relation to where the target is located, do you consider this as important? What do you do to either take advantage of a location or to control for where a target is?

- Does vehicle choice play a role in the location of a target?
- How do you go about sourcing suitable getaway locations.
- Do you have a pre-arranged location to go to if something goes wrong?
- How many disposal locations do you plan in advance of a crime and how much preparation goes into these locations?
- Do you visit the locations that you will use during the crime
- Have you yourself ever timed the time it takes to travel to one location to another for the purpose of advance planning?
- Have you ever chosen a location further away due to the security that that location offers?

3. Lead Up to the Offence

Offending tends to be preceded by a variety of personal stressors and difficulties. It would be interesting to consider the way in which you dealt with the possible stress for committing an offence.

- How did you deal with the stress? Did the plan you had develop put you at ease?
- Did you think you had a watertight get away that would reduce the stress of committing an offence?
- Where you comfortable with the roles that everyone had in the group.
- Did you raise any concerns about the locations that you would use?
- Do you think there was anything that could have stopped you from offending right up to the time you committed the offence?

4. Post Offence

Once an offence has been committed it will be helpful to explore what you did after the offence.

- What were your movements immediately after the offence? Where did you go?
- Did you burn the vehicle? Was this somebodies specific job?
- How did you clean yourself up from forensic trace evidence after the crime?
- Did you meet up with other members of the group after you committed the crime?
- Did you have a safe house? And was the crime locations based on the proximity to this safe house?
- Did you celebrate that night or in the subsequent days, or did you keep a low profile?

5. Map

Sometimes it is easier to understand how you would move before, during and after a crime by putting it down on paper. Can you draw me a simple diagram of how you would move from one location to another?

- Take into consideration the distance and travelling time for one location to another
- The direction in which you would travel away from the city towards the city

Barriers to Access

Initial contact was made with the Prison Based Research Ethics Committee (PBREC) in regard to the feasibility of conducting interviews within the various prisons in Ireland. Application forms were obtained and the researcher was then required to apply for Ethical clearance from the University of Huddersfield ethics panel. An ethics form was completed and submitted to the Deputy Chair of the Huddersfield School Research Ethics Panel, where it was swiftly processed and approval was thus granted as per some minor adjustments. When the ethics clearance from the University was granted, it was possible to formally apply for clearance from the PBREC of the Irish Prison Service (IPS).

The application document and all relevant supporting material relating to the study were submitted. Subsequently, a period of review began which was undertaken by the various members of the PBREC. Having received no correspondence regarding my application for a number of months, follow-up contact was made. This involved sending a number of emails and also making a number of phone calls. It took in the region of two months to make contact with the Deputy Secretary, who informed the current researcher that there was still no feedback regarding the application. Due to the delay in waiting for a response, abandoning the project and developing a new avenue to acquire relevant data was considered. This position was explained to the Deputy Secretary, who said that they would fast-track the application and that unless there were any major concerns raised by the PBREC, approval would be granted for the project. Official approval was finally received on the 6th of July 2012 (See Appendix D).

Although the project received official approval from the PBREC and subsequently the Director General of the IPS, a number of further barriers to access the required sample

immediately became apparent. In order to physically access the prisons, contact needed to be made with the Governors of the various institutions that the current researcher wished to visit. In some instances, this was not a major problem, as the Governors of the prisons hold full restricted authority to access for any individual, regardless of those who have received approval for access elsewhere or not. Therefore, on making contact with the various Governors, some requested that the proposals that had been previously approved by the PBREC and the Director General of the IPS be submitted to them for review. It became apparent that, on being granted approval by the PBREC, they were required to update this information onto a centralised database system. This was necessary for the Governors as they would have been able to log into it to see that access had been granted to commence the interviews. Unfortunately, this had not been done and the current researcher was therefore required to make contact again with the Acting Secretary of the PBREC, a very difficult process.

During this time, a number of the various Governors assisted in trying to make contact with the Acting Secretary. Three weeks later, email contact was made by the Acting Secretary requesting the researcher's Personal Public Service Number (PPS). The Acting Secretary should have requested this at the initial stage of the application as part of the security check. This was what delayed being placed on the prison database, so the Governors weren't aware of the nature of the project, let alone that it had been granted approval. However, it must be stated that two of the most senior Governors in Ireland, on speaking to them and explaining the situation, personally supported the project and, as a result, granted access even though the PPS check was still being processed.

This was a massive admission of support, as it allowed the current researcher to inform the other Governors that they had already been and visited other prisons. They all then followed suit and granted me access, which enabled the interviews with participants to take place.

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There was one institute that would not comply until official authorisation on the computer system came; this was because they had recently had a successful break-out and were on high levels of alert following this embarrassing situation. It is therefore no surprise that they followed every appropriate and required check procedure.

Therefore, with the positive help and assistance from the various Governors who seemed to be, and conveyed as such, well versed in the administrative minefield that was the IPS, the interviews were able to commence. However, a week into the interviewing the clearance came officially on the computer system, although the contact and access had already been established and granted by the Governors at that stage, apart from the one prison highlighted earlier.

On Site Issues

At this stage, having gone through the above process and having finally received official clearance to enter the prisons, further problems arose when arriving on site. As per the application to the PBREC of the IPS, official approval was obtained within this application, which would allow for a Dictaphone to be carried on site in order to record the interviews. The purpose of the Dictaphone was to make the process of writing up the transcripts of the interviews a more manageable process; it also enables greater rapport to be developed as written notes do not have to be continuously taken. On arriving at the main gates of the prison, all mobile phones and electrical equipment needed to be passed over to the Prison Guards at the security check-in. Issues arose once the Dictaphone was presented at the security check-in; the Security Guards were informed that permission had been granted from the Director General of the IPS to carry a Dictaphone on site to record interviews, with the permission of the participants, of course. Regardless of this, doubts arose at all prisons as to the safety of carrying a Dictaphone into the prison. This was due to the appearance and

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nature of the Dictaphone in that it resembled a mobile phone. Mobile phones are an extremely valuable piece of property inside a prison; as such, the only person authorised to carry a mobile phone inside a prison is the Governor.

However, clearance was eventually established by the prison authorities to carry the Dictaphone on site. However, each time the researcher arrived back at the security check-in, during lunch break or on subsequent days attended, they were required to go through a lengthy process where the Dictaphone had to be formally assessed on site by the security officer present at the time. One institution, the same that was mentioned previously in relation to their reluctance to grant me access, categorically refused me permission to carry the Dictaphone on site.

Appendix D

Seirbhís Phríosúin na hÉireann
Ceanncheathrú
Lárionad Gnó an IDA
Bóthar Bhéal Átha na Lao
An Longfort
Co. an Longfoirt

IRISH PRISON SERVICE

Irish Prison Service HQ
IDA Business Park
Ballinalee Road
Longford
Co. Longford

Láithreán gréasáin/Website: www.irishprisons.ie
Ríomhphoist/Email: info@irishprisons.ie

Teileafón/Telephone: 043 333 5100
Facs/Fax: 043 333 5371

Mr John Synnott
Apt 1
Baltic Square Apartments
Shaws Alley
Liverpool
L1 8DG
UK

6 July 2012

Re.   Research Proposal 'A Geographical exploration of Tiger Kidnap
Style Robbery Offenses in Ireland'

Dear Mr Synnott,

Your application to carry out the above research project was considered by
the Prisoner Based Research Ethics Committee and by the Director General
of the Irish Prison Service.

I am pleased to advise you that the research application is approved.

A condition is that Irish Prison Service requires a copy of the research when it
is completed and certainly prior to any publication.

Please provide a copy of this letter to the Governor of the institution/s that you
wish to visit as entry to the prison/institution for the purpose of the study is
contingent on the agreement of individual governors and appropriate security
clearance.

* Please note that the Governor must be contacted in advance of your
proposed attendance at the prison/institution.

Yours sincerely,

Séamus Beirne
Acting Secretary
Prisoner Based Research Ethics Committee

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The following section is a collection of the N=24 sketch maps were collected for analysis. The maps were collected from convicted offenders in a number of prisons around Ireland. These maps consist of graphic representations of locations where offenders committed their signature offence. As can be seen below, the majority of these were drawings of locations in which robberies occurred.

Appendix F
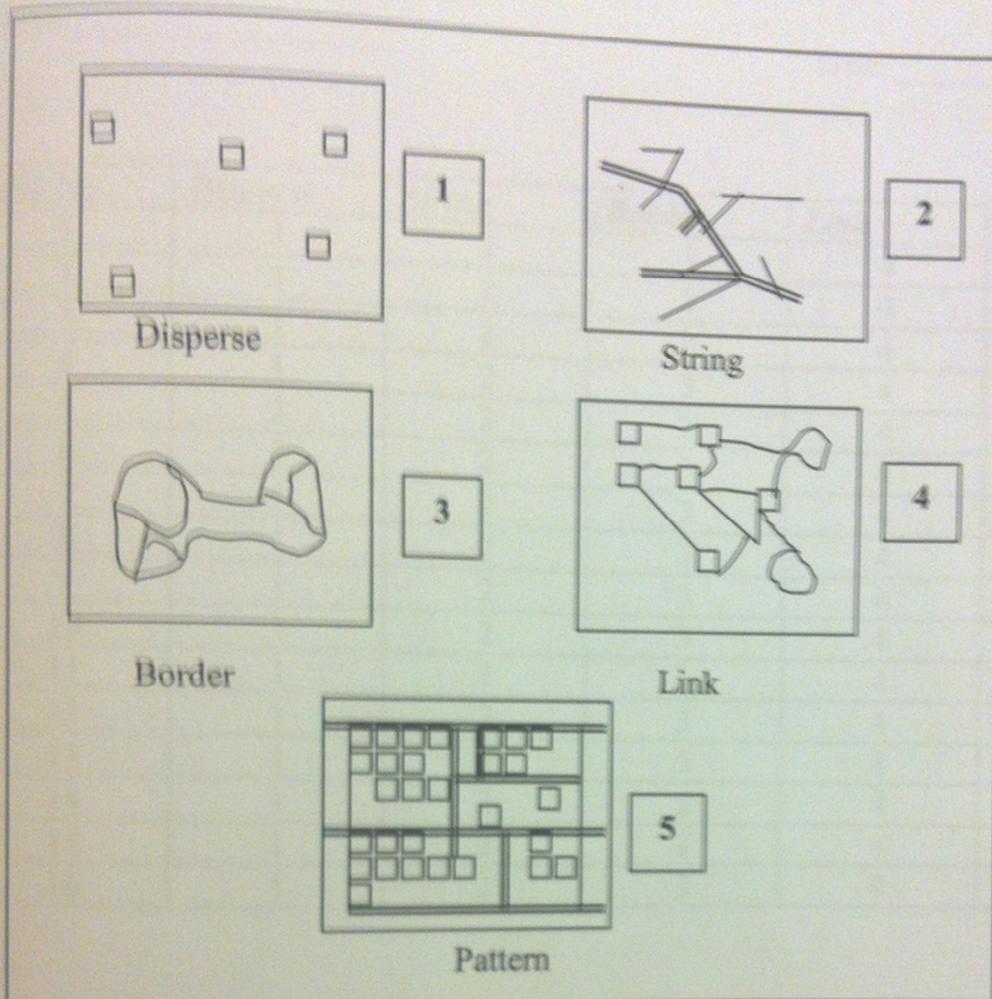
1. *Disperse:* The most primitive map style. It contains fragments of sequences or elements unconnected to each other and out of serial order.
2. *String:* A schematic type of maps, which contains curves and bends.
3. *Border:* The map distinctly contains districts and borders.
4. *Link:* Places or districts are clearly connected by a road system.
5. *Pattern:* The most complete type of map, which resembles a cartographic map.

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Appendix G