BEHAVIOURAL INVESTIGATIVE ADVICE
IN DIFFICULT TO DETECT MURDERS;
A PRAGMATIC PSYCHOLOGICAL APPROACH

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Statement of originality

This thesis and the work to which it refers are the results of my own efforts. Any ideas, data, images or text resulting from the work of others (whether published or unpublished) are fully identified as such within the work and attributed to their originator in the text, bibliography or in footnotes. This thesis has not been submitted in whole or in part for any other academic degree or professional qualification. I agree that the University has the right to submit my work to the plagiarism detection service Turnitin UK for originality checks. Whether or not drafts have been so-assessed, the University reserves the right to require an electronic version of the final document (as submitted) for assessment as above.
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**Action** - “activity which, if pursued, is likely to establish significant facts, preserve material or lead to the resolution of the investigation” (ACPO, 2005, p77)

**BIA** - Behavioural Investigative Adviser

**Fast track actions** - actions utilised immediately – during the first 24 hours of an investigation

**Golden hour** - describes the importance of effective early action in the first hour of an investigation which can result in securing material that may otherwise be lost

**IO** - Investigating Officer

**Lines of enquiry** - series of actions with particular focus e.g. tracing a vehicle. A “main’ line of enquiry has the potential to lead to the suspect” (ACPO, 2006, p77)

**Policy file** - record of strategic, tactical and investigative policy decisions

**Review** - a constructive evaluation of the investigation re the standards used, thoroughness, integrity, objectivity, and to identify good practice. Some forces formally review after 7 days, though generally undertaken at 28 days. Reviews should be ongoing, preferably by the same reviewing team. It is good practice to review before the investigation is closed down, and undetected murders should be reviewed a minimum of every 2 years. If the case is high profile, complex and/or sensitive it is recommended that another force undertakes the review

**SIO** - Senior Investigating Officer

**TIE categories** - groups to ‘Trace, Interview, Eliminate’ as they may contain the offender

**Victim** - a person harmed by a crime

**Witness** - a person who sees, knows or vouches for something
Summary

This thesis examines the provision of behavioural investigative advice to difficult to detect murder investigations in the UK using a Pragmatic Psychological approach. Its aim is to assist practitioners - notably Senior Investigating Officers (SIOs) in solving cases, and Behavioural Investigative Advisers (BIAs) to provide the best possible advice.

A review is undertaken of the definitions and incidence of murder followed by a systematic evaluation of the origins of offender profiling and its development into Behavioural Investigative Advice.

The theoretical formulation, Pragmatic Psychology, is then described and explained and a justification for its use as the conceptual basis for the present research is given. The key principles of the approach are articulated which identifies the appropriateness of the mixed methods research design undertaken in the present research.

The first study involved semi-structured interviews with a purposive sample of 11 experienced SIOs. Utilising Pragmatic Psychology principles, their working knowledge of cases was tapped to elicit what information they as investigators want from BIAs; when they want it; and in what format. This was deemed to be vital as pragmatic enquiry recognises the importance of 'asking the clients', and there is a specific gap in the literature of research being grounded in practitioner needs (and then tailoring subsequent research to try and address them). The interviews were transcribed verbatim, and qualitative content analysis was undertaken following the 'concept book' approach using the NUDIST package. Individual comments were reported to retain the richness of the accounts, and overall themes were extracted and developed into a systemic summary, depicted as a model of the SIO's investigative process (pre charge) and how this relates to the products required from the BIA.

A key finding was that a multitude of information is drip fed into an investigation at different stages, but the type of information available at different times is somewhat predictable. This was important to identify in preparation for study two, in order to elicit realistic variables (offence data) which may be available to the investigation (and BIA) at
different stages. For example as soon as the body is discovered it is most likely that the sex of the victim, location, position and state of undress of the body will be known. Additionally in the first 24 hours information regarding the nature of injuries, the age and ethnicity of the victim and whether or not items have been left at the crime scene can usually be determined. As such, any predictions made upon such variables, can be given within the first day of the investigation. Thereafter additional information regarding the victim's lifestyle, further details of the offence, witnesses and suspects become available and can then be fed in to the analysis as appropriate.

Another key finding was that investigators wanted a variety of different types of information from BIAs including assistance with offence linkage; house to house enquiries and searches; interview and media strategies; risk assessment of further offending; prioritisation of actions, messages, lines of enquiry, persons of interest and search parameters; assistance with team welfare; crime scene assessment; hypotheses generation and testing; and consideration of motivation. It became apparent that it was important to consider investigator's needs holistically, and provide an itemised listing of all requirements as a basis for areas of future research and consideration by BIAs. Specifically offender profiling advice was sought by the investigators, but the interviewees articulated that whilst information regarding the age, sex, ethnicity, criminal history of the likely offender was of use, additional areas - including those not readily searchable on policing systems (such as education, living arrangements, employment, lifestyle, demeanour, family background, and medical conditions) may also be of assistance.

A further key finding was that the Senior Investigating Officers wanted assistance from the BIA throughout the course of the investigation, with initial advice being refined as necessary as more information becomes available. They also wanted reports submitted within the agreed timescales, and to include an executive summary, and the evidence base for the provided information, including database sources and practitioner experience. The team approach to profiling, utilising a variety of BIAs was also advocated. The interviewees stated they wanted BIA advice disseminated in a secure manner. The benefit of submitting written reports was discussed, however an additional verbal presentation to the investigation team was also considered beneficial.
The second study focussed specifically upon the provision of statistical offender profiling advice to investigations. A total of 312 detected murder cases from the Serious Crime Analysis Section (SCAS) database were explored to search for patterns regarding what is known about the offence at different stages of an investigation, i.e. the first hour (also known as the golden hour) within the first 24 hours and thereafter. The data were analysed to search for features which could reliably be predicted regarding the offender responsible at each of these stages. In compliance with the Pragmatic Psychology approach, the research was organic, in that the variables regarding the offence (including victim and crime scene), and the variables regarding the offender, were drawn out of the information available to the investigation and practical requirements of the SIO as articulated by the interviewees in study one.

Study two was split into two parts – the first undertaking univariate and bivariate quantitative analysis (base rate frequencies; chi square; odds ratios), and the second involving multivariate statistics (configural frequency analysis; logistic regression). The base rate frequencies confirmed some interesting findings, suggesting for example that most offenders are white males, aged between 18-40 years, who have some form of previous conviction at the time of the offence. The bivariate and multivariate techniques all resulted in some significant findings, suggesting there are associations between some variables known about a difficult to detect murder offence, and features known to be of use to SIOs regarding the type of offender responsible. For example bivariate analysis found that 93% of white victims were killed by white offenders; 86% of male victims were killed by someone with a previous conviction; and 84% of prostitute victims, and 83% of victims who are drug users or alcohol abusers, were killed by an offender who was known to them in some capacity. Multivariate analysis found all (N=32) of the offences involving a white adult female victim who was a prostitute and considered vulnerable were killed by an offender not known to have been familiar with the body recovery site, and the vast majority (29/32) were killed by a non white individual. Similarly, nearly all (20/21) of the offences involving an item of clothing and an item of value being taken and precautions to avoid detection at the crime scene involved white offenders with no previous convictions for any form of sexual offence.
As the research was pragmatic, consideration was given not only to statistically significant findings, but also to potential performance if applied to future (undetected) cases. The different statistical techniques were compared to one another, and some of the more complex analyses (e.g. logistic regression) did not significantly enhance predictions from those which could be made on the basis of more simplistic methods (e.g. base rate frequency). As such, pragmatic recommendation was made as to which findings regarding the offender should be reported in different offence situations.

Finally, building on previous practice advice, the thesis proposed future recommendations for SIOs, BIAs, the National Policing Improvement Agency (NPIA) and the wider police service. A programme of future research has been suggested that incorporates other aspects of behavioural investigative advice.
CHAPTER 1: INTRODUCTION

1.1 The current thesis

This thesis will focus upon profiling murder. It takes a Pragmatic Psychology stance, and is committed to ensuring that the research findings can be applied by Behavioural Investigative Advisers (BIAs) and ultimately are of practical use to investigators.

Whilst previous attempts have been made to articulate the process by which conclusions from BIAs are reached (see for example Copson, Badcock, Boon & Britton, 1997; Dietz, 1983; Pinizzotto, 1984) very little is published regarding,

- why particular crime scene variables are deemed significant;
- how inferences are drawn from these variables; and
- why it is thought these inferences will assist the investigation.

Yet the role of 'Behavioural Investigative Adviser' requires the BIAs to practically apply and integrate their suggestions into the investigation. Whilst much evaluation research has focussed upon user satisfaction, summarising the criticisms regarding the advice received, Senior Investigating Officers (SIOs) have stated they do not always know what information to expect from BIAs (Copson, 1995). There is a clear gap in the literature which the current research seeks to address namely ascertaining what police investigators actually want from BIAs. The needs of investigators have been somewhat assumed, learnt and developed by BIAs, but there is a paucity of systematic research in relation to specific consideration of SIO needs.

The ultimate goal for BIA advice is to assist the detectives investigating serious crime in the apprehension and arrest of the offender(s). In order to build upon the existing body of research, the present research is designed to ascertain the SIO’s requirements of BIAs in order to solve difficult to detect murders. Key variables will be pragmatically derived from the information that SIOs articulate is available to them at different stages during the enquiry. From this further analyses will evaluate the pragmatic utility of specific victim, offender and offence variables critical to the provision of useful and effective advice to the SIO. In particular rather than merely attempting to predict just one
offender characteristic as in much previous research, the current research will attempt to predict a variety of features.

1.2 Research Objectives

The research objectives to be addressed by the present research are summarised here:

1. To determine what information is available regarding the crime at different stages in a murder investigation (to identify key variables for the second study).
2. To identify what information SIOs want from BIAs (to clarify practically useful 'data out', in terms of the general nature of behavioural investigative advice and in relation to specific offender variables for study two).
3. To identify at what point in an investigation - i.e. when SIOs want assistance from BIAs in relation to providing a profile of the offender (to determine the optimum time of BIA involvement).
4. To identify the format in which behavioural investigative advice would be best received (to determine in what form behavioural investigative advice should be presented to the SIO).

These will be addressed in study one.

5. To determine the relationship between the variables available to the police about the offence and the known characteristics (available from police records) of the offender responsible (to provide systematic evidence for profiling advice).
6. To examine whether the reliability of profiling advice may be enhanced with the passage of time as more information becomes available to the police i.e. can prediction be refined as the quality and quantity of crime variables increase (to determine the optimum time of BIA involvement).

These will be addressed in study two.
1.3 Chapter summaries

1.3.1 Chapter 2: Murder Investigation

Chapter Two sets the scene for the present research by providing legal definitions of homicide and murder, and giving incidence information in relation to these crimes in England and Wales. Different types of murder investigation are then discussed, considering differences between more common, ‘self solvers’ and the more unusual, difficult to detect and ‘whodunnit’ murders. How the police service categorises murder investigations in terms of resource allocation is also considered.

The process of conducting an investigation is then summarised from initial response to preparation of the case for court, focussing upon the investigative stage. Gap analysis and the role of experts within the investigation are discussed, and the requirement for detailed record keeping, and the need for investigative ‘reviews’ are highlighted. The arduous role of, and skills required by the SIO in a difficult to detect murder enquiry are then outlined in order to contextualise the need for this research.

The chapter explores how BIAs provide one possible source of assistance to the SIO. The chapter ends by discussing why behavioural investigative advice has historically focussed upon serious sexual offences including murder.

1.3.2 Chapter 3: Behavioural Investigative Advice

Chapter Three defines, and provides a historical to present day overview of the nature of behavioural investigative advice. The origins of behavioural investigative advice is presented, stemming from practical application in court (forensic psychology) moving into the wider criminal justice system (criminal psychology) and finally into policing (police psychology). A historical summary is then provided specifically in relation to offender profiling, from ‘pen pictures’ of offenders, through to FBI profiling efforts and more currently the provision of such advice in the UK.

The chapter then goes on to outline recent changes in the provision of advice, including attempts at increased professionalism, and discusses the change in title from ‘offender profiler’ to ‘Behavioural Investigative Adviser’. The current advice provided by BIAs, and
their potential contribution to serious crime investigations within the UK are then detailed. Different techniques used in the provision of behavioural investigative advice are discussed, including reference to the FBI approach, systematic methods, clinical and statistical advice.

Importantly the considerations when giving or receiving such advice, limitations in the advice provided, and implicit principles underlying the provision of such advice, are highlighted. Issues relating to accuracy of advice provision are then discussed. Previous research evaluating advice provision, for example from investigator satisfaction surveys, is then examined. Finally previous research attempts at predictive profiling are explored and critiqued.

1.3.3 Chapter 4: Theoretical Considerations Underpinning the Provision of Behavioural Investigative Advice

Chapter Four begins by providing a historical overview of the origins of applied forensic psychology, and then goes on to outline the specific theoretical considerations relevant in this research. The criteria required of a theoretical formulation to underpin this research are given which must satisfy both scientific (to give empirical rationale and evidence base to SIO decision making), and practical (to provide accessible and meaningful directions to action) considerations.

Both Grounded Theory and Naturalistic Decision Making are evaluated for potential use, and each judged in relation to their ability to focus on practical problems and solutions; acknowledge SIOs working knowledge and experiences to ensure the applied by-product is of use; take wider contextual and policing systems into account; and demonstrate a systematic methodology to ensure the reliability of findings.

When these candidate approaches are compared to Pragmatic Psychology however, the latter has all of the necessary components to meet the research objectives and explore the practical service BIAs give in the specific context of difficult to detect murder investigations. A pragmatic approach ensures advice provided to SIOs by BIAs will be useful and timely.
The chapter then goes on to define and explain Pragmatic Psychology and its underlying principles and standards. These are then discussed with particular reference to their relevance to the current research. Finally the chapter highlights other applications of Pragmatic Psychology, and considers potential problems which may be encountered with this approach.

1.3.4 Chapter 5: Methodological Considerations

Chapter Five discusses the methodological considerations for the current thesis. It compares the similarities and differences between quantitative and qualitative research, and argues that the differences between the approaches have been somewhat exaggerated.

Contemporary research has highlighted the benefits of mixed method research designs and these are outlined. The chapter then explores the principles which are considered before undertaking, and then conducting, a mixed methods design and the need to articulate the rationale and purpose of mixing methods. Questions for consideration when utilising a mixed methods design are then detailed in light of this.

Finally, links between Pragmatic Psychology and the mixed method are discussed. For this thesis, the approach of Pragmatic Psychology is used with a mixed methodology involving both qualitative and quantitative studies, in order to holistically answer the research objectives. This approach, in combination with this method, allows for optimum data collection and analysis, whilst continuously focusing upon practical goals.

1.3.5 Chapter 6: Study One: The Role of the Client: A Qualitative Analysis

Part of the problem with previous research endeavours is that they have not taken practitioner views into account, or if they have this has been done via retrospective satisfaction surveys, as opposed to proactively asking SIOs what they want. This chapter details a study undertaken to understand the nature of the role of the SIO within a difficult to detect murder investigation, and what these practitioners think BIAs may be able to do to assist them.
First the research objectives are outlined. The chapter then details the study, outlining the choice of participants (SIOs) and choice of offence (difficult to detect murder). Research undertaken within the approach of Pragmatic Psychology is driven by an underlying roadmap or ‘guiding conception’ which is discussed with reference to this study.

The study is then presented detailing the sampling, semi-structured interview method, and how the qualitative content analysis follows the ‘concept book’ approach. The results are then presented in terms of composite themes, which are drawn out and compared between interviewees. Findings are described that relate to the investigative process – the skill requirements of SIOs; constraints faced by them; information available to the investigation; and actions undertaken to gain information of use to the enquiry. Then themes relating to the product available from the BIA are explored, namely – what SIOs want from BIAs, when they want it, and in what format. Whilst overall themes are extrapolated, verbatim accounts were also included to retain the richness of individual comments. The findings are then brought together and visually depicted in the form of a systemic summary. Finally potential answers to the research objectives are re-visited on the basis of the current findings, and an explanation of how these will be further developed in study two is provided.

1.3.6 Chapter 7: Study Two Part I: Pragmatic Offender Profile via Univariate and Bivariate Quantitative Analysis

This chapter outlines the first part of study two aimed to assist BIAs by providing statistical reasoning to support the provision of offender profiling advice to SIOs in charge of difficult to detect murder investigations. The study aimed to explore if there are any relationships between what is known regarding the offence (from the information likely to be available to the investigation) and what is known regarding the offender (which the SIOs in study one articulated would be of use to them).

The chapter explains the method and procedures used for data collection and analyses. Both univariate and bivariate statistical analysis of the database are undertaken, and the findings are presented. Basic descriptive statistics demonstrate interesting patterns in
relation to both the offence, and offender. The bivariate analyses are also described, allowing further inferences to be made about the offender, whilst taking information known about the offence into account. The chapter concludes by comparing findings from the different analytical methods to ensure the reliability of the results prior to application to future (undetected) cases. From those which concur, recommendations regarding the types of advice which would be most robust for BIAs to report to SIOs are provided. Finally a brief discussion reflects on the research objectives and the need for more complex multivariate analysis is identified.

1.3.7 Chapter 8: Study Two Part II: Pragmatic Offender Profile via Multivariate Quantitative Analysis

Chapter Eight considers the multivariate analyses of data generated by study two to determine if any patterns are apparent between what is known regarding the offence and what is known regarding the offender.

Due to the overall sample size, the grouping of data is necessary for this part of the analyses and this is undertaken by the pragmatic formation of striations. The study innovatively uses these, and analytical techniques (such as inputting the data in blocks) to consider the temporal elements of the research. In this study, configural frequency analysis (CFA) and logistic regression (LR) are used. Significant CFA types and some LR models (identifying the likely relationship between the offender and victim; ethnicity of the offender; and the likelihood of the offender having some form of previous conviction at the time of the murder), were identified.

However, pragmatist psychologists highlight the need to consider research findings in relation to performance, so although some results may appear statistically significant, performance measures are additionally used to examine pragmatic levels of effective application. For the CFA findings, a method akin to pattern matching is used to calculate the percentage ‘hit rate’ of success - indicating the number of times the predictions would have been correct based upon the current data. However sample sizes are also taken into account - whilst 1/1 is a 100% hit rate, such low incidence findings should obviously be interpreted with caution. For the LR analysis, the ‘cost effectiveness’ of the performance
is considered - whilst models may be significant, the actual percentage increase in prediction, compared to that obtained from 'best guessing' from base rate frequencies is calculated. Whilst some predictions increased, the amounts they increased by, are somewhat disappointing.

Finally the findings from the different methods are compared and discussed with reference to the original research objectives and in relation to their potential for future practical application.

1.3.8 Chapter 9: Discussion

This chapter begins by presenting an overview of the findings from this thesis. It then contextualises them in relation to what concurs within, and what is at odds with, previous research endeavours. The chapter then considers issues which are outside the scope of this thesis to emphasise where the current thesis has developed and made enhancements to previous research.

The utility of the Pragmatic Psychology approach is discussed at some length. Considerations include how well the framework assisted with the overall aims of the research, whether it was successful at addressing practical problems and proposing solutions; taking working knowledge and practitioner views into account; taking context and system issues into account; and if its enquiry managed to be both scientific, yet applicable in practice. The discussion then considers how anticipated problems with the pragmatic approach were overcome.

The chapter also explores the studies’ potential contribution to conceptual understanding. Reference is made to how some of the research findings can support previous theories, and how by answering the initial research objectives, a contribution is made to current knowledge and understanding regarding the provision of behavioural investigative advice. Moreover, gaps in present knowledge are highlighted and suggestions made for areas of future research which may lead to the enhancement and development of theories.
1.3.9 Chapter 10: Conclusion

Chapter Ten summarises the overall findings and draws conclusions in relation to the research objectives regarding ascertaining - what information is available to investigations at different times; the types of advice SIOs require from BIAs; when SIOs want advice; and how they want it presented to them. In relation to offender profiling, patterns between information known about the offence, and features known about the offender, are identified; and some potential predictions are able to be enhanced with the passage of time (and increase in information).

As such conclusions are elicited regarding the role of the BIA, what advice they may be able to provide, how advice should be presented, and when the findings of study two can be reliably used in difficult to detect murder investigations in the future. Recommendations and specific practice advice for SIOs, BIAs and the wider police service in relation to behavioural investigative advice in difficult to detect murder enquiries are also provided.

Finally, the limitations with the current data are outlined and a detailed agenda for future research is proposed. The thesis concludes highlighting how a pragmatic stance has proved a valuable tool by which to consider the applied research objectives, and using a mixed methodology has been vital in this endeavour.
CHAPTER 2: MURDER INVESTIGATION

2.1 Introduction
This chapter will outline legal definitions and incidence of homicide and murder occurring within England and Wales. It will then explain the different types of murder investigation and outline the investigative process. The role of the Senior Investigating Officer will then be explored. Issues encountered by investigators will be highlighted, and consideration given to how behavioural investigative advice may be able to assist investigations. The chapter will end by briefly considering why offender profiling has focused upon serious sexual offences and murder.

2.2 Homicide and Murder: Legal definitions and incidence
Homicide is defined as any killing of a human by another (Martin, 1990). Such an act will be viewed as unlawful unless it was undertaken

- In self defence (though the person may still be guilty of defensive homicide – Crimes Homicide Act 77, 2005);
- to prevent serious harm;
- by an officer of the law in execution of his/her duty;
- as an accident or misadventure; or
- as the lawful execution of a criminal (Martin, 1990).

Unlawful homicide includes crimes of infanticide, manslaughter and murder. Infanticide is the killing of a child under 12 months old. Manslaughter may be ‘voluntary’ and arise for example if there were mitigating circumstances such as diminished responsibility (due to depression or mental illness). It may also be ‘involuntary’, for example if a driver knocked some bricks onto a train line killing the train driver. Homicide that is neither accidental nor lawful (and is neither manslaughter nor infanticide) is classed as murder (Martin, 1990). Murder is therefore when a person of sound mind (i.e. sane or over 10 years of age) unlawfully kills (i.e. without legal justification or excuse such as self defence), with an intent to kill or cause grievous bodily harm (i.e. serious injury) (Archbold, 2009).

To secure a conviction for murder, actus reus and mens rea needs to be proven. The
actus reus is the essential element of the crime to be proved – i.e. that the actual act occurred within specified circumstances. The mens rea – also referred to as malice aforethought or having a ‘guilty mind’, considers the mental state of the accused. For example not only does it have to be proved that the act occurred, but also that it was intended, negligent or reckless.

Provisional data for the period 2008-2009 show the police have recorded 648 incidents of homicide in England and Wales (Walker, Flatley, Kershaw & Moon, 2009) - an average of 1.8 per day. This figure has remained somewhat constant over time with 13,140 people murdered in Britain between January 1981 and December 2000 – also an average of 1.8 per day (Dorling, 2006). Internationally, this rate is comparatively low (Dorling, 2006), and whilst under-reporting and under-recording in many crimes is believed to be high (see Maguire, 1997 for discussion), with the exception of unresolved missing persons, it appears likely the figures for homicide in the UK are relatively accurate (Lobb, 1999).

Analysis of murder in Britain by Dorling (2006) indicates patterns in relation to the likely victims and circumstances of the attack. Several groups of individuals are more at risk of becoming victims of murder than others. For example a quarter of all murders are of men aged between 17-32 years, and alcohol is thought to be a factor in the majority of murders of men by men. Fifty percent of female homicide victims however, are killed by their current or former partner. Dorling’s (2006) analysis has also demonstrated that rises in murder rates may be limited to particular groups – for example men of working age living in the poorest parts of Britain.

Statistics show that each year on average around 90% of homicide cases are cleared – i.e. a suspect is charged for the offence (Home Office, 2005; Innes 2003). However, although charged with homicide, suspects may be acquitted or convicted of a lesser charge. For the period 1996-2006 only 74% of suspects indicted for, were found guilty of, homicide (Coleman, 2008). Nevertheless, samples of convicted murderers are likely to be reasonably representative in this country as murder has comparatively high conviction rate (Langan & Farrington, 1998). Here, the vast majority of murderers are brought to justice, due primarily, to the investigations carried out by the police.
2.3 Murder Investigation

2.3.1 Types of murder investigation

Whilst murder is a relatively rare crime in the UK, its impact and consequences are severe (Soothill, Francis, Ackerley & Fligelstone, 2002). Most murder offences are unplanned acts of sudden violence - the result of a domestic situation, argument or the consequence of some other illegal activity (ACPO, 2006; Dorling, 2006; Innes 2003) and only an estimated 6% have an apparent or admitted sexual motivation (Beech, Fisher & Ward, 2005). Around 75% of murder investigations are solved relatively soon after the offence (Francis, Barry, Bowater, Miller, Soothill & Ackerley, 2004; Hakkanen & Laajasalo, 1996; Nicol, Innes, Gee & Feist, 2004). Most are what Innes (2003) labels 'self solvers' – i.e. those where the suspects are identified comparatively easily and police activity is focussed upon proving guilt.

A minority of offences however involve child victims, stranger, sexual or serial attacks. These are often the most difficult to detect, tend to use the most resources, and, due to media attention, are the most likely to increase public fear and adversely impact community perceptions of the police (Francis et al, 2004). These potentially harder to solve murders are termed 'whodunits' by Innes (2003) and may involve more challenging and problematic investigations which necessitate an extended search to establish the identity of the offender.

Murder investigations can also be categorised in relation to the initial policing resource implications (ACPO, 2006). For example a 'category A+' murder is one which may cause grave public concern, where there is media attention, and as such normal levels of staffing are not adequate. These offences will receive the greatest amount of personnel and resources. Similarly 'category A' murders are where the public may be at risk, where the identity of offender is not apparent, or where significant resources are required. 'Category B' murders are where the identity of the offender is not apparent, but there is a lower risk to the public, and it is perceived that the crime can be investigated with normal staffing levels. Finally 'category C' murders are where the identity of the offender is apparent from the outset and it is believed that evidence can be achieved more easily. In these
enquiries, the investigative process commands comparatively reduced resources (ACPO, 2006).

2.3.2 The investigative process

There are two overarching methods of criminal investigation - proactive and reactive (ACPO, 2005). Reactive investigations begin when a crime has been discovered, whereas proactive enquiries begin with intelligence or information regarding a particular individual or groups where a crime is believed to have been, or will be committed (ACPO, 2005).

As outlined by Innes (2003) a murder investigation is usually reactive, following the discovery of a body, a call to emergency services or when there are suspicious circumstances surrounding a missing person. An investigation is concluded at the end of criminal proceedings, or when all lines of enquiry have been exhausted (Adhami & Browne, 1996).

This investigative process has been divided into three distinct phases. ACPO (2006) describe these as;

- Instigation and Initial response - deployment, actions taken to preserve life, securing and assessing the scene to develop hypotheses regarding what may have happened, locating relevant material;
- Investigation - developing strategies and appropriate lines of enquiry to gather information, interpreting information, identifying and arresting suspects; and
- Case management - post-charge enquiries and preparing material for court.

Investigations begin when a crime is known (or is believed to have been) committed, or to ascertain whether a crime has been committed (ACPO, 2006). Practice advice to investigators acknowledges the fact that:
"The actions taken by the first officers attending the scene of a homicide or major incident are critical to the success of the investigation....If in doubt, investigate as homicide"

ACPO, 2006, p35.

It is common for uniformed officers to be involved initially and a Senior Investigating Officer or Investigating Officer (SIO/IO) will be appointed to assess the situation, begin lines of enquiry\(^1\) and set up a murder incident room (MIR) if a major incident is declared.

Early objectives of an investigation are likely to include ascertaining who the victim is, whether or not there are any witnesses, consideration of the type and number of crime scenes, whether or not a suspect can be identified, and what material can be gathered from relevant scenes, witnesses and suspects in order bring an offender to justice (ACPO, 2005).

During the development of a case, and in anticipation of court proceedings, a vast amount of information will be made available to the investigation. Organising the knowledge enables investigators to identify 'gaps' where additional lines of enquiry may be appropriate (ACPO, 2005).

This gap analysis can be used to determine what is known, what is not known and where there are conflicts or consistencies in information (ACPO, 2005). Primarily the '5WH' formula is advocated (ACPO, 2005) which involves consideration of how to source information in relation to:

- Who – are the victims, witnesses, suspects?
- Where – did the offence occur?
- What – actually happened?

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\(^1\) A series of actions with a particular focus – e.g. tracing a vehicle. A 'main' line of enquiry is one that appears to have the potential to lead to the suspect and which is, therefore, given a higher priority (ACPO, 2006).
• When – did everything occur?
• Why – did the offence occur?
• How – was the offence committed?

The investigation is continual, but advice to investigators in relation to best practice refers to temporal stages in the investigation (ACPO, 2006). Notably the 'Golden hour' is frequently used to describe the importance of effective early action which can result in securing material that may otherwise be lost. Also reference is made to 'Fast track actions' which are often utilised during the first 24 hours. 'Actions' are any activity which is likely to establish significant facts, preserve material or lead to the resolution of the investigation (ACPO, 2005). 'Fast track actions' therefore include any such actions which are undertaken immediately, such as commencing enquiries in relation to the victim, securing and forensically searching the scene, and conducting a post mortem (ACPO, 2006).

During the investigation, there are a range of experts and specialist advisors available for consultation. These can include both internal (e.g. crime scene managers, higher ranking police officers, analysts, specialists in family liaison, interviewing, search, community awareness, media, behavioural investigative advisers) and external personnel (e.g. pathologists, forensic scientists, psychologists, archaeologists) whose involvement may be brief or sustained throughout the whole criminal process. It is up to the investigators to decide who, why, when and how to engage such individuals, and what to do with the information they provide.

Throughout the investigation there is a requirement for detailed records to be kept. For example detail of the material gathered, any relevant information, and actions taken, are maintained on indexes - usually via the computerised Home Office Large Major Enquiry System (HOLMES) database. In addition auditable records of the reasons for taking particular investigative actions, are kept regarding decisions made (e.g. via crime reports, policy files or decision logs), to document the progress of an investigation.

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2 Further discussion about the nature of behavioural investigative advice, and the role of Behavioural Investigative Advisers will follow.
The investigation will also be periodically reviewed by others as a means of constructive evaluation to ensure the enquiry is conforming to appropriate standards, is thorough, being conducted with integrity and objectivity, that investigative opportunities have not been overlooked and to identify and disseminate good practice between investigators (ACPO, 2006).

2.4 The role of the Senior Investigating Officer (SIO)
The SIO is the lead investigator of a serious crime - the person who makes the principal decisions and has overall responsibility for the investigation (Smith & Flanagan, 2000). They are required to direct the investigation, develop and implement investigative strategy, manage the team and resources, ensure proper procedures are undertaken, are responsible for recording and retaining material, and ultimately have overall accountability for all investigative activity. As such they need to be both an investigator and a manager (ACPO, 2006).

It has been acknowledged that:

"The role of the SIO in a homicide investigation is potentially one of the most complex and challenging positions within the Police Service."


Research has indicated that in order to be effective, the investigative lead must acquire a ‘knowledge gathering’ habit in order to generate and store all of the material required (Torrington & Hall, 1995). They have to deal with a vast amount of information coming in to the investigation from various sources (Innes 2003).

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3 It is strongly recommended that all under murder investigations are reviewed formally. Some forces do this after 7 days; in general this is done after 28 days. Reviews should be ongoing, preferably by the same reviewing officer (with team). It is also good practice to review before the investigation is closed down, and undetected murders should then be reviewed a minimum of every 2 years, especially in relation to forensic evidence. If the case is high profile, complex and/or sensitive it is recommended that another force undertakes the review (ACPO, 2006).
Smith and Flanagan, (2000) have also indicated the importance of investigative ability for the assimilation and assessment of information coming in to an enquiry including handling expert advice, the need for relevant organisational, procedural and legal knowledge. However they also highlight the importance of managerial skills in relation to resources, people, risk, the quality of the investigation, actions and records, in order to oversee and direct the investigation effectively.

Decision making skills also appear critical as investigators deal with a wide variety of issues, and decisions have to be made in often "complex, uncertain and dynamic environments" (Crego & Alison, 2004, p208). Whilst the aim of the enquiry is ultimately to solve the offence, the way this is done, and sensitivity given to all involved is central to a ‘successful’ investigation (Crego & Alison, 2004).

The senior investigator therefore requires an array of knowledge and has to maintain a multitude of skills to undertake this role (ACPO, 2005). These can include their being a “detective, counsellor, accountant, scientist and an administrator” (Smith & Flanagan, 2000, p15).

2.5 Investigative issues
Clearly it may not be possible for any one individual to possess or optimally apply such a multitude of skills at all times during the investigative process. An SIO in charge of a murder investigation has unique challenges – there is the pressure due to the serious nature of the crime, it can involve a range of circumstances and undoubtedly a variety of information will be generated, there are financial accountabilities and often the investigation arouses considerable media attention (ACPO, 2006). There are many investigative issues, such as those discussed below.

2.5.1 Decision making
The most common type of error in crime investigation is the ability to make justifiable decisions (Irvine & Dunningham, 1993) yet investigators have little assistance in this (Stelfox, 2007). Many factors may limit objective decision making. Detectives may use short cuts or ‘heuristics’ developed from their own, or learnt from colleagues’ experiences
(Adhami & Brown, 1996; Smith & Flannigan, 2000). Whilst these assist officers in formulating hypotheses, personal perceptions may bias thoughts. One problem with this is that this can lead to searching for information that reinforces their opinions, and basing decisions on information which is most easily available or memorable to them (ACPO, 2005). In addition, routine decisions may become so automatic that investigators may be unable to explain the rationale behind them.

2.5.2 Limited experience

Linked to SIOs having potential difficulty in making appropriate decisions, are issues surrounding experience. Research has indicated detectives interpret a new crime by applying their indirect/direct knowledge of past similar crimes (Adhami & Browne, 1996). SIOs may have a general knowledge that murders arising from confrontation typically involve males, are often spontaneous, usually occur in public places with an audience, and often involve alcohol and hitting/kicking behaviours, for example (ACPO, 2006). As such, lines of enquiry may be generated surrounding the capture of witness and CCTV information. Yet when enquiries are not straightforward — witnesses are not forthcoming, there is no CCTV or forensic evidence, or there is some unusual element (such as it being a sexual murder), issues may be beyond their previous repertoire. Some officers now enter the role of SIO with no CID experience at all, and an estimated 80% of officers running major enquiries have less than 5 years experience (PSSO, 1992; Smith & Flanagan, 2000). Whilst some skills (e.g. dealing with the media) may be transferable from the investigation of other offences, others (e.g. drawing relevant suspect parameters) may not. It has been recognised,

“some types of homicide are extremely rare and even the most experienced SIO will not have first-hand experience of every type of case.”

ACPO, 2006, p27.

and,
"in dealing with rare crimes...the inferential expertise of detectives is deficient, in that it is often fragmented, anecdotal, case specific and lacking in structure"

Adhami & Browne, 1996, pv.

To assist them, detectives have expressed a "strong need" (Adhami & Browne, 1996, p.15) for central sources and databases of information on specific types of previous crimes and offenders.

2.5.3 Accountability

Difficulties can be enhanced due to the fact that SIOs now work in an environment of increasing scrutiny. The police are accountable for their actions, and decisions made have to be recorded for example in 'policy files' and 'logs' of decisions and actions. Decisions are under continual review both internally (see Sawers, 2008 for a summary) and externally for example from the media.

Specifically, research has highlighted the importance of good record keeping throughout an investigation. Although senior officers consider the maintenance of accurate records having a high impact on the outcome of the investigation (Crego & Alison, 2004), in an analysis of murder investigation reviews, Nicol et al. (2004) identified:

- record keeping was a frequent investigative weakness;
- decisions were not always recorded; and
- policies were often vague.

In addition, in recognition of the need for increasing professionalism within the service, and in order to ensure investigators are able to keep abreast of changes, there has been an increase in standardised procedures and formally accredited courses to ensure individuals are appropriately qualified for the role (Stelfox, 2007). Detectives now have extensive training and continual professional development on a range of topics. As such they are now expected to, and are continually monitored for their ability to, comprehend and deliver. Whilst guides such as the Murder Investigation Manual (ACPO, 2006) and...
Core Investigative Doctrine (ACPO, 2005) provide assistance highlighting good investigative practice, such resources bring their own additional pressures, in that dissent from the texts’ suggestions may be called into question.

2.5.4 Workload
Research has also shown an investigation can generate, and hence SIOs receive, a mass of information during an enquiry (Canter, 1989; Innes, 2003) and investigators have a number of activities to undertake during a serious crime investigation. For example Adhami and Browne (1996) identified weaknesses may exist as SIOs have to consider so many facets in an enquiry including:

- analysis of the crime scene;
- resourcing and financing;
- the media;
- potential offence linkage;
- how to manage the information coming in; and
- maintaining team motivation.

Highlighting the important elements as being able to;

- draw suspect parameters from information at the crime scene;
- determine lines of enquiry; and
- prioritise lines of enquiry.

Other difficulties encountered by enquiry teams include concerns regarding increasing budgetary constraints and inadequacy of resources. Indeed one manager of a critical incident commented “time and volume of work is not an excuse the family or media will accept” (Crego & Alison, 2004, p220). In addition, despite their being a link between resource allocation and thorough and timely investigations, SIOs have high workloads and staffing levels tend to be low. For example a relatively recent thematic inspection by the

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4 Whilst this research was focussed upon sexually oriented child homicide, they suggest their findings are likely to be applicable to other types of murder investigation.
HMIC found that every murder incident room in the Metropolitan Police Service had a backlog of outstanding actions (HMIC, 2000; Nicol et al, 2004).

In summary, investigators face increasing legal and financial constraints and are now under constant public scrutiny for their actions (Crego & Alison, 2004). As such, any tool which may assist investigations in systematic prioritisation should be a welcome aid (e.g. House, 1997; Leyton, 1983; Rossmo, 1997).

2.6 Potential assistance from behavioural investigative advice

It is argued that behavioural investigative advice can assist SIO decision making, prioritisation and workload, for example in relation to drawing suspect parameters or focussing lines of enquiry. Moreover, information from the behavioural investigative adviser (BIA) may enhance recording practices by providing an audit trail, enabling accountable justifications for decisions made by the SIO. Finally a BIA may also provide additional experience - either direct from their own working knowledge from similar cases, or indirect via data gleaned from databases or research into previous offenders. Such advice may be of particular relevance in relation to some of the rarer, more difficult to detect murder investigations where SIO experience may be limited.

2.7 Why focus upon profiling murder?

Only a limited number of offences are suggested as suitable for the provision of behavioural advice - those involving violence or ritual, with a sexual focus, unknown motive, those which are part of a series (Holmes & Holmes, 1996; Wilson & Soothill, 1996), or involve hostage negotiation or threat letters (Douglas & Burgess, 1986). Application has also been attempted in relation to higher volume crimes such as burglary and arson (Canter & Alison, 2000; Canter & Fritzon, 1998) and expansion to other areas such as contract killing and extremist terrorism has more recently been discussed (Dowden et al, 2007). In relation to offender profiling, it is recommended crimes are only considered if they are unsolved and all major leads have already been investigated (Sturidsson, Langstron, Grann, Sjostedt, Asgard, & Agnede, 2006).
Historically the focus of the provision of offender profiling advice has been overwhelmingly in relation to serious sexual crimes including murder (Holmes & Holmes, 1996). For these offences the spectrum of potential behaviours displayed is potentially broad (for example choice of weapon, whether and what to steal, which sexual acts to undertake) when compared to other offences. Arguably serious sexual offences are also more likely to reveal the underlying personality, traits, motives, characteristics or demographic information regarding the perpetrator (Ainsworth, 2001; Holmes & Holmes, 1996).

As outlined above, from a policing perspective murder offences involving child victims, stranger, sexual or serial attacks are often the hardest to detect, use the most resources, and are the most likely to increase fear in the community (Francis et al, 2004). Offender profiling advice is usually provided in relation to this type of difficult to detect offence where the suspect is not obvious (Innes, 2003). A recent review of published profiling literature has also demonstrated that whilst the majority of articles spoke generally in relation to profiling, homicide was the most popular crime discussed followed by rape and then serial homicide (Dowden et al, 2007).

2.8 Conclusion
Initially, this chapter outlined legal definitions, and provided incidence information regarding homicide and murder in England and Wales. It then went on to discuss different types of murder investigation, and outlined the investigative process and role of the Senior Investigating Officer. The chapter highlighted how murder investigation is complex and onerous. The SIO has many investigative issues to consider, and has overall responsibility for all actions taken. In cases involving consideration of ‘whodunit’, SIOs have a particularly arduous task. Specific difficulties and issues encountered were highlighted, and it was suggested that behavioural investigative advice may be able to assist. Finally the chapter considered why offender profiling has focussed upon serious sexual offences including murder.
The following chapter will detail behavioural investigative advice. It will outline the origins and development of the provision of such advice, provide definition and explanation of the role of the behavioural investigative adviser (BIA) and describe their potential contribution to investigations. It will detail the different techniques used in the provision of behavioural investigative advice, paying particular attention to methods of statistical profiling. Considerations when providing advice to investigations will be discussed, together with the limitations and principles underlying advice provision. Attempts at measuring the accuracy of advice provided will be considered, alongside more contemporary moves attempting to evaluate the rationale behind BIA suggestions. Previous research highlighting investigator views regarding behavioural investigative advice will be explored, and finally previous research attempts at predictive profiling will be critically reviewed.
CHAPTER 3: BEHAVIOURAL INVESTIGATIVE ADVICE

3.1 Introduction
The previous chapter provided an outline of homicide and murder in the UK. It explained the different types of murder investigation and detailed the investigative process and role of the SIO. Issues encountered by investigators were highlighted alongside considerations as to how behavioural investigative advice may be able to assist. Finally the chapter considered why offender profiling has historically focussed upon serious sexual offences and murder.

This chapter will introduce and detail the nature of behavioural investigative advice. It will outline its origins and development, noting the increased professionalism in the provision of such advice. It will define and explain the role of the BIA and their potential contribution to serious crime investigations. The different techniques used in the provision of behavioural investigative advice will be explained, and the considerations, limitations and principles underlying the provision of advice will be discussed. Issues surrounding the accuracy of advice will be considered, including evaluation of BIA rationale, and compilation of investigative views via satisfaction surveys. The chapter will end by reviewing previous research attempts at predictive profiling, highlighting potential areas for future improvement.

3.2 Origins
The origins of behavioural investigative advice can be traced from developments in the study of crime, and the emergence of forensic and criminal psychology. By the end of the nineteenth century increasing attention was being paid to the state of an offender’s mental health and a discernible shift towards consideration of the criminal alongside criminality (McGuire, Mason & O’Kane, 2000). Thought was being given to concepts such as free will, competence to stand trial, ‘madness’ and ‘insanity’ requiring a ‘will to harm’ and a need for the defendant to know what was done was wrong (Howitt, 2009). Medical expertise was increasingly being used to comment upon the mental state of defendants (Howitt, 2009), and it became apparent that psychologists’ knowledge of behaviour and mental illness, may be of use to the courts. However it took a while for ‘knowledge of the topic’ to be viewed as more important than ‘medical qualification’, and psychological
expertise in mental illness was not even recognised in American courts until 1962 (Howitt, 2009).

Moreover, there was a wide array of psychological data emerging of potential interest to the courts. An early example was in 1896 when Albert Von Schrenk-Nortzing gave psychological evidence in court regarding the likelihood of potential confusion when memory of an actual event could have unwittingly been merged with memory of pre-trial media publicity surrounding the case (Brown, 2000). Also, in 1908 Munsterberg wrote warning about interpretations of ‘factual’ witnesses and the use of expert evidence (Blackburn, 1997; Cox, 1999). It is interesting that many similar debates still continue today (Cox, 1999; http://www-all-about-forensic-psychology.com/history).

It was recognised that social science knowledge could be of benefit not only to the courts (i.e. strict definition of the ambit of ‘forensic’ psychology), but also provide information to the wider criminal justice system. Witmer’s 1896 lectures on criminal behaviour and Stanley Hall’s research on delinquents in 1904 were critical to in the shaping of clinical and eventually criminal psychology (Blackburn, 1997).

Despite early distance between practitioners and academics (Howitt, 2009), scepticism by the legal profession (Munsterberg, 1908, 1925) and subservience to the medical profession (e.g. by the National Health Service Act, 1946) psychologists today are increasingly working in applied forensic and criminal settings. Many undertake research in academic institutions, work in prisons, special hospitals or secure units, and there is an increasing knowledge and research base in relation to rehabilitation, assessment and management of risk. Psychologists assist in the provision of tests, in answering whether the accused could have committed the crime, whether they intended to, and if they understood what they were doing.

In relation to the use of psychology to assist the police, initially psychologist’s roles were somewhat more traditional, focussed upon areas such as recruitment and selection, stress and research (Brown, 2000; Howitt, 2009). More latterly, interest regarding crime and criminals were developed as areas which may directly assist the police in the investigative
process. There appears to have been initial scepticism and suspicion of academia and psychologists roles, but this has been allayed by an increase in the use of accredited ‘outside’ experts and ‘inside’ civilians in investigations more generally, and an increase in police officers gaining academic qualifications themselves (Brown, 2000).

With an increasing demand for accountability in the police service, the relative merits of social scientific endeavour appear to have been realised. In addition the inclusion of academic research in practitioner publications such as ‘Police Review’ and the ‘Journal of Homicide and Major Incident Investigation’ have disseminated findings to the wider policing audience, and explicated how new tools and ideas may be able to assist them in their everyday role.

In summary the work of psychologists who work with the police is now broad:

“The practical content of the work undertaken ranges from organizing and managing staff, training, health and welfare to providing operational support such as offender profiling and witness interviewing”

Brown, 2000, p71.

3.3 Profiling origins

Early attempts at profiling were the provisions of ‘pen pictures’ of individuals who may have committed crimes such as:

- Dr. Bond’s 1888 description of Jack the Ripper – for example that he may be middle aged, a loner and mentally unstable (described in Alison, McLean & Almond, 2007);
- Dr. Langer’s 1943 profile of Adolf Hitler – for example that he had difficulty establishing close relationships and had sadistic tendencies (Langer, 1972 - the secret psychological report remained unpublished for a number of years); and
- Dr. Brussel’s 1956 account of New York serial bomber George Metesky as being a disgruntled former employee of a targeted company, middle aged, unmarried and would wear a fully buttoned double breasted suit (Brussel, 1968).
Since then, formally recognised 'offender profiling' advice has been provided to predict the likely socio-demographic characteristics of an offender, based on the information available at the crime scene (Allison et al, 2007). Its use within the police service originated in the Behavioural Science Unit of the FBI (see for example Burgess, Hartman, Ressler, Douglas, & McCormack, 1986; Ressler, Burgess & Douglas, 1988). By applying psychological considerations regarding the likely background of the offender, attempts were made to develop new lines of enquiry and narrow down the searches for relevant suspects. Following interviews with 36 sexual murderers, their approach developed into classifying offences into different types. For example in relation to sexual homicide, crime scenes could be categorized as either organised (e.g. the offence was planned, restraints used, evidence absent etc.) or disorganised (e.g. the offence was spontaneous, scene is random, body was left etc.). Furthermore, organised scenes could predict an organised offender, who may for example have high intelligence, be socially adequate and geographically mobile.

In the UK whilst some detectives have become profilers, they are not a homogeneous group (Bekerian & Jackson, 1997; Gudjonsson & Copson, 1997). Individuals with backgrounds in research, clinical environments or with access to relevant statistical databases have been the prime contributors (Smith, Smith, Knight & Clarke, 1998). Initially, in the early 1980's requests came from the police for assistance on a case by case basis (e.g. Britton, 1997; Canter, 1994). This meant that profiling development in the UK was somewhat more ad hoc and multidisciplinary than it had been in America. In the UK, initially a combination of knowledge and experience used from psychologists’ professional practice of working in Universities or Psychiatric Hospitals was applied to criminal investigation.

By the early 1990's a central unit, then known as the National Crime Faculty (NCF), was set up to ensure the police received the appropriate advice for their specific investigation, and profiling became the remit of a selected few 'accredited' consultants. By the turn of the century, full-time offender profilers had been recruited centrally and a change in title from 'Offender Profilers' to 'Behavioural Investigative Advisers' (BIA), was made (West, 2001). Slowly regulation, by means of the NCF, Association of Chief Police Officers, and
more latterly the Strategic Board for Behavioural Investigative Advice followed, ensuring advice provision adhered to specific standards, and investigations received effective and reliable advice, by personnel best suited to assist them.

3.4 Increased professionalism

Regulation of BIAs in the UK has brought growing coherence and increased professional uniformity. Academically, this has come in the form of guidance regarding the professional responsibilities of BIAs and recommendations regarding the format in which reports could be presented (Alison et al., 2007; Alison, Goodwill & Alison, 2005; Alison, Smith, Eastman & Rainbow, 2003; Almond, Alison & Porter, 2007).

Similarly in the practical provision of behavioural investigative advice, significant procedural changes were introduced in an attempt to professionalise the advice provided (see Rainbow, 2008). For example BIAs were asked to conform to specific working practices (which include for example the provision of standardised written reports) and the appointment of a strategic board (consisting of both academic and investigative practitioners) to continually quality assess the content of reports and approve new BIA candidates. Such measures are particularly important as whilst the use of 'profiling' has been recommended to police officers for major enquiries in the UK since July 1992, it has received significant criticism, despite now being a routine part of many serious crime investigations (Copson, 1995).

Both the research literature, and the practical use of, offender profiling and behavioural investigative advice in crime investigation has increased over the last 30 years in Britain (Ainsworth, 2001; Dowden et al., 2007; Snook, Eastwood, Gendreau, Goggin & Cullen, 2007) and across the world (Homant & Kennedy, 1998). For example in the UK during the period 1981-1994, 29 profilers provided 242 pieces of advice (Snook et al., 2007). In the period June 1999-March 2009, 4 UK BIAs alone advised upon over 800 cases between them (NPIA BIA case management, 2009). Similarly the FBI received 600 requests for advice in 1986, which by 1996 had exceeded 1200 requests (Witkin, 1996, cited in Dowden et al., 2007). However, Kocsis, (2003a) and Snook et al, (2007) have suggested this growth is lacking robust scientific evidence of validation. Despite some attempts to
track professional enhancements within the UK (e.g. Almond et al, 2007; Rainbow, 2008; West, 2001) little is known regarding how the practice has developed (Dowden et al, 2007).

3.5 What is behavioural investigative advice?

Behavioural investigative advice is one source of expertise which may assist investigators' decision making. It involves drawing inferences about an offender or an offence from behavioural examination of the actions within a crime (ACPO, 2006).

Whilst 'offender profiling' aspects of serious crime is still a primary role for the BIA in order to make predictions regarding the type of person most likely to have committed the offence (Jackson & Bekerian, 1997), the change in title to behavioural investigative advice was prompted by the additional services which are also regularly supplied. For instance by looking at minute detail regarding the offender, victim and location, an attempt is made to identify what happened at the crime scene – or to conduct a behavioural 'crime scene assessment'. Advice in relation to offence linkage, media or interview strategies, and prioritisation of persons of interest are all additional areas in which assistance is now routinely provided to investigations by BIAs (West, 2001) and formally the role of 'offender profiler' no longer exists in this country.

3.6 The potential contribution to investigations

Discussions have highlighted the multifaceted nature of the potential contribution BIAs make to investigations. BIAs may assist in:

- Casting a 'critical eye' over the investigation (West, 2001) or bringing a new perspective to bear on investigative thinking (Kocsis, Irwin, Hayes & Nunn, 2000).
- Hypothesis generation or "building a scenario which best explains the available material" (ACPO, 2005, p70). Positing and encouraging SIOs to continually test alternative hypotheses can also encourage investigators to keep an open mind, highlight gaps in knowledge, test the reasonableness of their interpretations and anticipate potential court arguments (ACPO, 2005; ACPO, 2006; Ault & Reese, 1980).
• Bringing new skills (Kocsis et al, 2000), for instance highlighting the scientific importance of methodological considerations such as:
  o falsification and testing the null hypothesis as opposed to focussing upon looking for information to 'prove' hypotheses by building evidence in preparation for court. This difference in method may be beneficial, as whilst a great deal of material may be required to 'prove' hypothesis at levels satisfactory for court, potentially only one piece of evidence may 'disprove', knock, discount, or at least lower the priority of hypotheses;
  o interpretation of whether acts are statistically unusual (by comparison to base rate information); and
  o highlighting the differences between correlation and inferred causation.
• Confirming thoughts previously held by the investigation team (Copson, 1995) sometimes being used “simply used as an insurance policy” (Allison, West & Goodwill, 2004, p81).
• Providing a more scientific rationale and justification (for example based upon comparison to previous research and cases) for investigative decision making.
• Prioritisation of resources, in particular regarding persons of interest and/or lines of enquiry (Wilson & Soothill, 1996). Whereas detectives deal with facts, looking for example for CCTV evidence to depict what has occurred, BIAs can look additionally at probability, behaviour and overall classifications (Jackson, van den Eshof & de Kleuver, 1997).
• Bringing an understanding of behaviour to the investigation team for example via:
  o assessment of the crime scene in order to consider the potential 'why' (motivation of the offender), but also 'what' went on at the crime scene, and present a pen picture regarding the background of 'who' was likely to be responsible (Pinizzotto, 1984);
  o consideration of the frequency and likely co-occurrence of behaviours in terms of themes (for example Canter, 2000; Canter & Heritage, 1990) or typologies (see Holmes & Holmes, 1996; Kocsis, Irwin & Hayes, 1998); and
  o enhancing understanding of specific psychological issues such as paraphilias or aggression.
All of this potential assistance also needs to be cognisant of pragmatic issues such as providing information of practical use to the police. For example, predictions of global traits are unlikely to be of great use (Alison, Bennell, Mokros & Ormerod, 2002). Described as the 'bandwidth-fidelity' trade off or abstraction issue, Alison et al (2002) cite an example in that whilst prediction of a specific behaviour such as punctuality may be good, this is only predictive of a small range of behaviours. For current purposes therefore, whilst prediction that the offender is likely to be a male aged between 10-90 years is likely to be accurate, practically it would be of limited value to the investigation in the narrowing of their potential suspect pool. Predicting the offender is likely to be aged between 20-25 years would be far more useful, yet is far less likely to be accurate. However to be of practical assistance a balance must be sought, and prediction of the somewhat more specific traits are required if the advice is to be of assistance to investigations, yet this cannot be at the expense of the reliability of the claims.

3.7 Techniques involved in the provision of behavioural investigative advice

3.7.1 Federal Bureau of Investigation (FBI) Approach

In general the FBI profilers collect and classify data regarding the crime using one of their typologies (for example a murderer who appears to have planned the crime may be classified as ‘organised’), reconstruct the crime and then generate a profile. Advice is based primarily upon their experience as detectives and from interviews with offenders of previous similar crimes (e.g. Burgess et al, 1986; Ressler et al, 1988).

Whilst this contribution to the profiling endeavour has been recognised for practical application and active multidisciplinary research collaborations (Dowden et al, 2007), their approach has subsequently received much criticism. For example it is based on research undertaken 25 years ago upon a limited, non random sample, which was reliant upon truthful self report. In addition individuals rarely fall within distinct types; there are issues regarding the reliability and validity of the typology; statistical evidence to support the dichotomy is weak; scene interpretation may have been subjective; it fails to take into account progression over time; and the practical utility of some of the traits identified
(e.g. 'follows crime in the news media' or 'father's work unstable') has been questioned (e.g. Canter, Alison, Alison & Wentink, 2004; Dowden et al, 2007; Poythress, Otto, Darkes, & Starr 1993). Moreover, attempts at testing some of the murder classifications, have not been able to replicate some types, and provide only limited support for the original findings (Canter et al, 2004; Canter & Wentink, 2004). In fact in their discussion, Canter et al (2004) highlight, in relation to the disorganised/organised dichotomy, that it;

"does not garner even the weakest support from the data examined here...we do not have reliable evidence to support the validity of such categorization systems, let alone an indication of whether the hypothesized types are an appropriate basis on which to infer different background characteristics”


Furthermore, it is clear that many of their criticisms could also be directed at other proposed FBI typologies (Canter & Wentink, 2004).

3.7.2 Systematic Method

Alternatively, other BIAs with experience in utilising or conducting research may apply techniques and findings from the scientific method to provide behavioural investigative advice. Consideration of relevant theory and literature, with attention to data collection, hypothesis testing, reliability and validity feature in their methodology. However, research is somewhat limited in this field, due in part to the difficulties in gaining access to confidential police information. Using research from other domains may prove beneficial, though the validity of such application may be questioned as findings may not be generalisable.

Of the research that is available, most relies upon police data, with its inherent difficulties (Ainsworth, 2001; Farrington & Lambert, 1997; Horvath and Brown 2006). For example, such data

- were initially collected for evidence to be presented in court, rather than research purposes;
- does not include unreported or unrecorded crimes;
• is usually limited in both quantity and quality (for example it may rely upon witnesses memory or offender accounts);
• often includes omissions, (missing or incomplete entries) or inaccuracies;
• is often recorded by secondary sources (for example via statements); and
• in murder without witnesses, will predominantly consist of observation and interpretation of only the consequences of behaviour.

There is some research to indicate which data are likely to be more reliable – sex, ethnicity age and marital status of offenders appear more reliably recorded compared to features such as scars, height and hair colour for example (Farrington & Lambert, 1997). However difficulties remain. There may also be other methodological problems with the research, such as a lack of theoretical base or small sample sizes (see for example Bukhanovsky, Hempel, Ahmed, Meloy, Brantley, Cuneo, Gleyzer & Felthous, 1999). Additionally, with no control groups usually available, experimentation cannot assist in confirming or refuting hypotheses and much of the work is correlational or exploratory.

3.7.3 Clinical profiling
Another group of BIAs consist of psychologists or psychiatrists working in a clinical setting who may utilise their techniques and experience to provide advice to the police. They apply case study knowledge gleaned directly from their clinical experience in assessing and interviewing patients, often over an extended period of time, exploring criminal histories, background, personality and lifestyle which they use when formulating a diagnosis or risk assessment. Perhaps even more than other methods, reliance on 'clinical judgement', means precise specification of the method remains unclear (though see Copson et al, 1997) and findings may be somewhat idiosyncratic, being primarily case studies based upon subjective clinical experiences. It is also important to note that only an estimated 1% of offenders are considered to be mentally ill (Badcock, 1997) and therefore the sample from which many clinical observations are based may not be representative of the vast majority of the offending population. Additionally in profiling unknown individuals, there has obviously been no opportunity to assess the person directly (Gudjonsson & Copson, 1997) - a usual prerequisite to clinicians’ diagnostic assessment.
3.7.4 Statistical profiling

Finally, BIAs with access to relevant databases or computer packages are able to provide statistically based information regarding the likely background characteristics of offenders. Based upon features known about previous offenders who have been responsible for similar crimes, inferences can be made regarding offenders who are yet to be caught.

**Univariate/descriptive statistics:** Frequency of occurrence of previous offender characteristics has been used in offender profiling. For example, Marogna (2005) explored the offending history of those convicted of 117 stranger homicide offences against females on the SCAS database. Base rate statistics indicated for example 70% of all the offenders had a previous conviction of some kind, and that nearly 57% of these had previous convictions for theft related offences. As such, if profiling the murder of a female stranger, prioritising persons with previous convictions, particularly those with a theft related offending history, may be considered on the basis of such a finding.

Similarly, using the Homicide Index (which collects details of all offences initially recorded as homicide in England and Wales), and the Offender’s Index (which stores information in relation to offender’s previous convictions) Francis et al (2004) looked at 2145 solved cases of adult homicide from the period 1995-2000. They found 78% of convicted offenders held on the index were white. Frequencies could also be refined with victim details - for example if the victim was 30-39 years, 92% of previous offenders were found to be 18-49 years, with most being aged between 30-39 years at the time of the murder.

This type of simplistic analysis is one of the methods currently utilised by BIAs in assisting their compilation of murder profiles. However, as searches become more specific, then interpretation from the decreasing number of similar cases, becomes more subjective and problematic.

**Bivariate analyses:** In order to explore potential associations between crime scene behaviours and offender characteristics, some have conducted bivariate analysis. For example using chi-square analysis Lobb (1999) elicited relationships between the

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5 See page 136.
behaviours exhibited in 85 homicide offences against females, and the criminal career of the offender responsible. Data was taken from Operation Enigma where just under a third of offenders were strangers to the victim. Findings suggested for example that a significantly higher proportion of sexually motivated offences were committed by offenders who had previous convictions, and these convictions were most likely for violent offences.

Similarly Marogna (2005) conducted bivariate analysis involving chi-square and odds-ratios. Her findings also indicated certain crime scene behaviours were strongly associated to previous convictions. For example if the offence involved stabbing the victim, the offender was twice as likely to have a previous conviction for a violent offence.

Identification of risk factors: Others (e.g. Soothill et al, 2002) have focussed upon attempting to proactively identify risk factors in previous offending which may indicate a future propensity to commit murder. Using data from the UK Homicide and Offender Index, analysis was undertaken on 569 males under the age of 45 years, convicted of murder for the first time during the period 1995-1997. Echoing findings of Marogna (2005) and Lobb (1999) nearly 68% of the offenders were found to have had a previous conviction of some kind, and these were most commonly for theft and handling stolen goods (72%). However, unlike the findings of Marogna (2005) no difference was found in the methods of killing between those offenders with, and those without previous convictions.

Multivariate statistics: Some researchers have used complex statistics to explore potential models of homicide and make inferences regarding the offender on the basis of offence information (see Aitken, Connolly, Gammerman, Zhang & Oldfield, 1995; Davies, Wittebrood & Jackson, 1998; Grubin, Kelly & Ayis, 1997).

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6 This was a confidential police enquiry managed by the National Crime Faculty. The initial focus was upon female prostitute victims of homicide; however the remit was expanded to include homicides of female victims over the age of 9 years which had occurred in the period 1986-1996 where the proceedings had been discontinued or the suspect acquitted. No intrafamilial cases were included.

7 Defined as when the murder or events immediately preceding it involved an overt sexual element - as supported by medical or forensic evidence.
For example Salfati (2000) looked at 247 solved homicide offences from a thematic perspective using Smallest Space Analysis. Findings indicated where the victim fulfilled an instrumental role for the offender - the acts were focussed upon the benefits the behaviours had for the offender (the victim being used as an object by which to obtain the further aim of sex or money), behaviours such as using a weapon from the crime scene or stealing valuable property were prevalent. Moreover, these were associated more frequently with offenders possessing an extensive criminal record.

Santtila, Runtti and Mokros (2004) used Configural Frequency Analysis in their exploration of 502 Finnish homicides (occurring 1980-1994) and demonstrated it may be possible to predict the presence of an offender’s previous police record, on the basis of the victim’s lifestyle. For example if a female victim was an unemployed alcoholic who was intoxicated at the time of the offence, the offender was likely to have a criminal record.

Francis et al (2004) compared the univariate frequency approach outlined above to a statistical modelling approach (multinoml logistic model) to determine which victim and offence characteristics were important in predicting offender characteristics. The victim’s age, sex, circumstances in which the crime took place and the method of killing were found to be significantly associated with predicting the age of the offender. Overall the more complex statistical model was more accurate at prediction, and drew upon the combined power of relationships between variables already held on the database. However, they highlighted the frequency approach may be of use when the number of similar cases is small, and may out-perform the statistical model for some groups of homicide. As such, the researchers recommended using both methods in combination in the provision of profiling advice to investigations. Of interest however was the researchers’ choice of some variables. For example it is questionable as to whether prior to arrest they would be able to say the offender was ‘of imbalanced mind’ (Francis et al, 2004, p34) or would be sure of the precise circumstances of death - such as the murder involving a ‘rage or quarrel’ (Francis et al, 2004, p33). These would be more likely to appear as a result of, rather than assisting in building, an offender profile. Moreover, if such detail were known, then other investigative suggestions - such as who is the victim likely to have quarrelled with etc. may have more relevance to the investigation.
Aitken et al (1995) also explored the potential of analysing past cases for prediction of offender characteristics using 320 solved sexually-oriented child homicides from the ‘CATCHEM’ database. They highlighted the need for data to be consistently coded, the use of appropriate statistical tests, and some form of assessment of the performance of any predictions. They acknowledged variables were restricted and hinted different information may be available to investigations at different times, suggesting detail could be input as and when it became available, (although temporal analysis was not explored). Findings from logistic regression included increasing the correct prediction rate of the likely known/stranger relationship between the offender and victim from a ‘best guess’ base rate of 58%, to 73% on the basis of offence information.

3.8 Considerations in the provision of behavioural investigative advice

The use of statistics may be appealing in the investigators’ increasingly accountable world, where justifications for decisions and resources are routinely required. Additionally investigators have an awareness of statistical reporting, from consideration of forensic evidence and the like. However ‘probable’ estimates may mistakenly be perceived as ‘actual’, necessitating careful caveats as there can be no guarantee the offender under consideration falls within the suggested parameters. Moreover, recent research has begun to explore interpretations of behavioural advice and provided recommendations in relation to the precise wording of that advice. For example there appear to be individual differences in the way some words used to convey verbal probability estimates are interpreted. Villejoubert, Almond and Alison (2008) found that the use of a word such as ‘suggests’ was ambiguous and could be interpreted as denoting very low or very high probability of occurrence, whereas words such as ‘likely’ or ‘very likely’ were far less ambiguous. Further exploration found that probably due to the effects of matching biases, suspects with characteristics reported as having a low probability of occurrence may still be (erroneously) prioritised, presumably due to the mere presence of being mentioned in the profile (Villejoubert et al, 2008). However, reporting of both sides of arguments – the likelihood of the offender both having and not having a previous conviction for example – may reduce this phenomenon.

8 The CATCHEM database contains records of all child murders in England, Scotland and Wales since the 1 January 1960 (personal communication, Tony Osborne, 2008). It will be discussed further on page 135.
There are however further difficulties in presenting numerical estimates of advice. It often relies upon the user reducing the qualitative detail of the offence to quantitatively coded variables, and then subjectively selecting which variables are felt to be most significant to search and report. In addition the databases from which information is gleaned are limited in number, and coverage of crime types is sparse - limiting the availability of ‘hard’ data to quantitatively back claims and reducing the generalisability of results. Whilst some databases are national, individual forces differ in their compliance levels of data submission. Drawing inferences from a sub-sample of offenders reduces the statistical reliability and validity. Moreover, some databases have limited quality control procedures for the data contained, making inferences potentially unreliable.

In addition, the utilisation of all types of behavioural investigative advice should be treated with caution as all are exclusively based upon offenders who have been caught and with whom the BIA has had contact/access to data for, clearly skewing the data to a potentially unrepresentative sample. Furthermore, in cases of low incidence crimes, such as sexual homicide, the sample size is limited even further. Moreover, analysis based upon what previous perpetrators may have recalled may be problematic as it is reliant not only upon accurate memory, but also in part upon truthful self-report, in some instances from potentially very ill or misguided individuals.

### 3.9 Limitations and underlying principles surrounding behavioural investigative advice

#### 3.9.1 Lack of theory and scientific validation

Academic debate has highlighted the absence of theory, systematic procedure, and research in relation to the provision of offender profiling. In a review of profiling literature, Dowden et al (2007) emphasise only 5% of published articles have dealt with theoretical issues. Advice has also been criticised for “not [being] ethically or professionally acceptable” (Alison & Canter 1999b p.28) and it “is still very much a discipline that is yet to be proved” (Muller, 2000 p.260). For example Alison et al (2002) have cautioned over its use prior to demonstrations of predictive validity.
3.9.2 Reliance upon naïve trait theory

Alison et al (2003) have also highlighted how much profiling advice inadvertently relies on ‘naïve trait’ theory attributing behaviours to the underlying personality of the offender. But statements are:

- nomothetic – attempting to make general predictions;
- deterministic – assuming all offenders are affected in the same way;
- non-situationist – proposing that between situations, behaviour is likely to remain stable; and
- tautological – a violent offence may indicate a violent offender, but the very fact that the offender has committed an offence in this way, makes him such, i.e. “traits are both inferred from and explained by behaviour” (Alison et al, 2003, p117).

3.9.3 Assumptions regarding behavioural consistency

In relation to offence linkage consideration is given to whether offenders behave consistently between different crimes - or at least the variance in their crimes is smaller than those found in random comparisons. Acknowledging the likelihood for development and learning, there is some evidence of consistency in serial offending (Bennell & Jones, 2005; Clarke, 1999; Grubin et al, 1997; Santtila, Junkkila & Sandnabba, 2005; Santtila, Pakkanen, Zappala, Bosca, Valkama & Mokros, 2008). However the findings are mixed and reference the need to consider the role of situational factors – for example the victim, witnesses or dis-inhibitors, such as drugs or alcohol (Butterworth, 1997; Salfati & Bateman, 2005). Clearly more research in this area is required.

Behavioural consistency also however applies in relation to offender profiling, with an assumption that that there is a relationship between the actions at a crime scene (e.g. extreme violence), everyday interactions (e.g. violence in other, perhaps domestic or social situations) and the background characteristics of an offender (e.g. previous convictions for violence). Similarly such assertions have yet to be proved (Mokros & Alison, 2002).
3.9.4 The homology principle

The notion that offenders with similar backgrounds will commit similar offences and display similar actions and behaviours at the crime scene, has yet to be confirmed empirically (Mokros & Alison, 2002). There has been some success at finding correspondence between certain crime scene - e.g. forced entry into a property during a stranger rape - and offender characteristics - e.g. having a previous conviction for burglary (Davies et al, 1998). However as Mokros and Alison (2002) highlight, the results of further multivariate analysis on such data were disappointing, and concerns have been raised regarding the design, analysis and generalisability in similar studies for example those by House (1997) and Knight, Warren, Reboussin and Soley (1998). In addition, in their own study they simply did not find any links between offence behaviour in stranger rape and the offenders’ age, socio-demographic (employment situation, ethnicity and whether they lived alone), or previous convictions and imprisonment (Mokros & Alison, 2002). They did however find that there is lower variance in behaviours displayed by offenders within series than would be expected by chance, and acknowledge that some offence behaviours may be better predictors than others.

3.9.5 What is being predicted?

Alison et al (2003) have also asserted that much profiling, attempts to predict socio-demographic features rather than personality characteristics. They highlight that it seems unlikely such features can be reliably predicted on the basis of specific behaviours which occur within a short-term and traumatic situations.

A further conceptualisation is in relation to whether or not offenders are ‘specialists’ or ‘generalists’ – i.e. do criminals confine themselves to particular offence types, or are they merely more generally ‘criminal’. Some have argued that it may be that criminal backgrounds are unspecialised, with rapists having similar antecedents to bank robbers (Grubin & Gunn, 1990). In relation to those who commit stranger homicide, previous research has similarly indicated a cross section of previous conviction types (Marogna, 2005). As such profiling on the bases of individual or clusters of offence behaviours, or even regarding overall offence types, may be futile, and generic profiles of offenders in general may suffice.
3.9.6 Inadmissibility

Whilst potentially of use for intelligence purposes, profiling advice is not admissible evidentially in UK courts (Gudjonsson & Copson, 1997). The case against Colin Stagg confirmed there would be “formidable difficulties” in allowing such advice as expert evidence (Ormerod, 1996). Significant professional advances, such as acceptance by the scientific community and the provision of accurate, reliable, falsifiable and peer reviewed advice would be necessary pre-requisites before the inclusion of such advice would be considered in court (Alison et al, 2004). The source and reliability of any statistical information would come under scrutiny, and the evidence would have to form expertise outside of the jury’s common experience (Ormerod, 1996). However academic literature has indicated current prediction of offender characteristics may be no more accurate than that which could be made by the average person (Snook et al, 2007). In addition, consideration of legal arguments for example concerning whether the relevance of the advice would outweigh any potential prejudicial value, would also need to be overcome in order for behavioural investigative advice to be accepted (Alison et al, 2004). For a profile to be relevant it needs to demonstrate the commission of the crime by the defendant more probable, and currently such advice is only able to describe (at low levels of reliability) the likely type of person responsible rather than provide evidence toward the identity of the offender (Ormerod, 1996). It is currently recognised that a “profile which fits the accused is no more evidence of guilt that one which does not is evidence of innocence” (Copson, 1995, p30).

Yet psychologists may have a unique contribution to make in judicial proceedings, and their role is expanding (Gudjonsson & Drinkwater, 1987). In a landmark decision in the case of R v Turner (1975 60 Cr. App. R. 80, CA) the court ruled that for expert testimony to be admitted it must furnish the court with scientific information which is beyond the common knowledge and experience of the jury. Whilst some suggest this ruling still may preclude much psychological testimony, others argue information provided by psychologists is beyond ‘mere’ common sense (Coleman & Mackay, 1993). Certainly there have been encouraging signs of greater acceptance by legal advocates. For example information is being supplied by psychologists and accepted by courts surrounding compensation, childcare, treatment and sentencing, reliance of witnesses,
diminished responsibility, neuropsychological issues, mental abnormality, intelligence, learning disability and personality disorders, and psychologists have also advised on more specific areas such as post-traumatic stress disorder, learned helplessness, battered woman syndrome, phobias, reaction time, vision, validity of eye witness testimony, and disputed confessions considering traits such as suggestibility and compliance (Ainsworth 2002; Gudjonsson, 1986; Gudjonsson, 2003; Gudjonsson, & Haward 2000, Haward, 1987). Whilst initially such advice was usually incorporated into others' (e.g. medical practitioners, social workers, probation officers) reports (Haward, 1987), surveys of practitioners indicate increasingly psychologists are being asked to provide reports and testify themselves (see Gudjonsson & Haward, 2000). As such, whilst not currently accepted in UK courts, the role of the BIA in future as an ‘expert’ witness advising regarding offence behaviour, cannot fully be discounted.

3.10 Accuracy of profiles

Even when used for intelligence purposes only, the importance of accuracy within profiling cannot be underestimated:

“A profiler who gets it wrong may be responsible for many hours of wasted police time...it is essential that anything that is done in the name of profiling is subject to scrutiny and testing”


In relation to accuracy of profiles, evidence is varied. Certainly successes have been articulated by some profilers themselves (e.g. Britton, 1997; Douglas & Oleshaker 1995), with some profiles being cited as extremely accurate (e.g. the Mad Bomber of New York), whilst others (e.g. the Boston Strangler) are more wide of the mark (Holmes & Holmes, 1996). Due primarily to the confidential nature of the work, only limited (and mainly successful) evaluative case studies have been published, for example Canter was correct on 13 of his 17 suggestions to the police regarding John Duffy (Smith, 1993). Although even in this instance, some of these “hits” are attributable to eye witness testimony of surviving victims, physical forensic evidence and rather obvious predictions such that the offender was male.
Formally assessing the accuracy and usefulness of behavioural investigative advice has proved problematic for a variety of reasons (Gudjonsson & Copson, 1997). First, research can only be undertaken once the perpetrator is apprehended which may not always occur in the ‘difficult to detect’ cases in which BIAs are likely to become involved (Grubin, 1995; Homand & Kennedy, 1998; Smith et al, 1998). Also there are so many potential variables of interest that it would be difficult to assess whether the suspect was captured primarily due to new material derived solely from the suggestions of the BIA, or due to one of the many other ongoing aspects of the investigation. In addition there are no control groups (of similar offences where a profile was not used) from which to empirically compare cases, and even if someone is caught, there are likely to be many unknowable and therefore un-testable features, making analysis difficult (Copson & Holloway, unpublished but cited in Gudjonsson & Copson, 1997).

Fundamentally, there are initial considerations in relation to what is meant by accuracy. Ainsworth (2001) for example highlights how if 80% of the profile features are correct, is this considered accurate? Also the BIA is unlikely to talk in terms of certainty, yet more likely articulate features in terms of probability. Nothing therefore can be classed as ‘inaccurate’ if presented with appropriate caveats and explanation. Importantly, the inclusion of accurate information in BIA reports does not necessarily mean that it is useful. So whilst accurate assessments of the offender’s personality may have been outlined, these are not necessarily of use to the investigation in a proactive search for the perpetrator (Ainsworth, 2001; Kocsis, 2006).

Despite difficulties, attempts have been made to assess the utility of behavioural investigative advice. For example an evaluation of validity undertaken by Pinizzotto and Finkel (1990) found profilers wrote richer and more accurate sexual profiles when compared to detectives, but demonstrated far less success in relation to profiling murder offences. In relation to reliability, the FBI gave 64 murder scenes to 6 profilers and found 80% congruence in their findings. However with the same training provided to all participants, and with only dichotomous categorisation required, it is questionable if such levels of inter-rater reliability are sufficient (Oleson, 1996).
Other studies, for example those conducted by Kocsis and colleagues (Kocsis, 2004; Kocsis et al, 2000; Kocsis, Hayes, and Irwin, 2002) have explored this further. In a paper combining these results in addition to new findings Kocsis (2003a) utilised previous suggestions of the likely skill sets required by profilers (by Hazelwood, Ressler, Depue, & Douglas, 1995), and compared groups of psychologists; investigators (including new police recruits, generalist police officers, specialist murder and arson detectives and personnel from fire brigades); science students; and self declared psychics. Their ratings on a multiple choice questionnaire were compared to 11 expert psychological profilers and a control group of unskilled participants (who completed the questionnaires about likely characteristics without access to any case files). The findings indicated that whilst there were individual differences, the profilers were capable of outperforming the other groups in the total number of correct predictions. Other research has also shown that profilers write profiles that contain more information about the crime or offender behaviour (Kocsis, 2003b).

In summary:

“Although nowhere near enough, a small amount of empirically based data have emerged to support the validity of a psychological profiler’s capacity to accurately describe the characteristics of an unknown offender”

Kocsis, 2003a, p140.

However, Bennell, Jones, Taylor and Snook (2006) critically review the work of Kocsis (2003a), highlighting methodological and conceptual concerns. Yet Kocsis’ (2006) response is highly critical of Bennell et al’s (2006) interpretations and he reiterates that after years of research, his overall findings stand – i.e. It appears that his sample of profilers can predict characteristics of unknown offenders more proficiently than the other groups tested.

Snook et al (2007) additionally undertook a meta-analysis of 4 criminal profiling articles to assess the predictive validity of profiling advice. Overall they found the self-labelled profilers outperformed comparison groups (including students and detectives) in relation to predicting overall offender characteristics. The authors describe the profilers’ success
rate of 66.5% as only somewhat tentative support for profilers’ expertise as compared to 33.5% of the comparison group. Whilst their conclusions that this level of false alarm means the advice is “as likely to be hazardous as it is to be helpful” (Snook at al, 2007, p447) and that “profiling appears at this juncture to be an extraneous and redundant technique” (Snook et al, 2007, p448) appear somewhat overstated on the basis of such findings, they rightly highlight the need for further research in this field, particularly in relation to investigator decision making on the basis of the presumed ‘expertise’ of profilers.

An attempt at empirical analysis of the accuracy of profiles in the UK was made by Copson and Holloway (unpublished, cited in Gudjonsson & Copson, 1997). They examined 111 profiles testing the goodness of fit between the points provided by the profiler, against the known facts concerning the offence and/or the offender which could be verified through police records, such as the age of the offender at the time of the offence. They found that many of these features were accurate, although there were large individual differences between the accuracy rates of different profilers. However they conclude:

“If success in profiling were synonymous with accurate prediction, then profilers could claim much success.”

Gudjonsson & Copson, 1997, p73.

It appears that internationally at least, the jury is still out, and the precise effect profiling has on investigations is not known, however there is some evidence to support its use.

### 3.11 Evaluation rationale

Some of the problems with analysis of accuracy could be overcome by examining the evidential basis given by BIAs in their decision making. However in the Copson and Holloway (unpublished cited in Gudjonsson & Copson, 1997) study, the reasoning behind the different elements of advice offered was provided on only 16% of occasions. Moreover the presence of justifications for inferences does not mean they are necessarily adequate. For example a statement that the offence was sexually motivated because the
victim was stabbed in the neck provides justification, though the validity of this inference may be questioned (Smith et al, 1998).

Snook at al (2007) reviewed 130 published profiling articles and found that anecdotal arguments were the most frequently endorsed source of knowledge (60%) with intuition least commonly used (23%). Whilst replication of the research was advocated, and note should be taken of wide confidence intervals (limiting the conclusions), of scientific concern is that common sense (e.g. things that ‘everybody knows’, based on authority or anecdote) were used more than empirical (quantitative, based on evidence from literature, case histories or studies) arguments, 58% of the time. The use of common sense arguments were more frequent in clinical articles, those published before 1990, in those published by law enforcement (rather than academics), and those originating from the USA. Of interest is that such arguments were also more frequent in those articles expressing a positive opinion of, and in support of profiling.

Assessment of profilers’ articulated reasoning process within their written reports has been undertaken by a series of papers by Alison and colleagues (Alison et al, 2003, 2005; Almond et al, 2007). They tested the strength of an argument’s component parts by examining the claim or opinion proffered by the BIA (e.g. the murderer is under 30 years), and looking for justification, by examining the underlying grounds for the claim (e.g. because this is a murder of a 23 year old female), the specific warrant for the claim (e.g. the majority of murderers of females under 25 years are under 30 years old) and the backing or rational to give the claim credence (e.g. research by XXX, or data from XXX database). Where possible some form of modality or the strength of the claim (e.g. there is an 87% chance that...), with relevant rebuttals to explain the conditions when this may not be true (e.g. unless other indications...) should also be articulated. If any of the elements are missing, the claim is weakened.

Assessment of profiles using this method, suggests significant improvements in relation to the presentation of more transparent, coherent, and evidence based reports in recent years. Alison et al (2003) analysed 21 profile reports, 12 of which involved murder offences. They were comprised of 13 profiles from the United Kingdom, 5 from the United
States and 3 from other European countries primarily from the period 1997-2001. The research found that much of the information contained in the profiles was already known to the investigation, and out of nearly 4,000 claims made, 80% were unsubstantiated containing no grounds, warrant, or backing. In addition, 20% of the claims were ambiguous, 80% could not be falsified and nearly 50% were unverifiable – for example included comments such as “at the time of the offence the offender was feeling no remorse” (p9). This has obvious implications with a number of potential suspects easily being able to ‘fit’ the profile. However a comparison sample of 47 reports written in 2005, found that out of 805 claims made, 96% contained grounds, although only 34% had formal support or backing. In addition, 70% of the claims were verifiable, although only 43% were falsifiable post conviction. Nevertheless the analysis indicated a,

“very large positive difference between the contemporary behavioural investigative advice sample and previous non-NPIA expert advice in terms of the substantiveness of their arguments. Contemporary NPIA behavioural investigative advice has clearer boundaries around the claims made and presents material in a more coherent and evidence-based format”


3.12 Satisfaction surveys
Due in part to some of the difficulties encountered in evaluation, the focus of previous evaluative research has been via satisfaction surveys.

Pinizzotto (1984) found 77% reports were described as being successful in focusing the investigation, and in the Netherlands advice was rated highly (Jackson et al, 1997). More recently, Halnes (2006) surveyed 51 Canadian Police Officers and found that 94% agreed profiling was a viable investigative tool. In the UK a small sample of detectives stated their support for profiling as part of research by Adhami and Browne (1996). In the largest published study of its kind in the UK to date, Copson (1995) surveyed detectives enquiring about the usefulness of 184 offender profiles, which were compiled mainly in relation to murder offences (61.4%). Whilst the majority found the profiles operationally useful (82.6%) this view was not dependent on either assistance in solving the case (14.1%), nor even in adding anything new to the investigation (53.8%). It was found
that the profiles rarely led directly to the identification of the offender (2.7%) but instead the reports furthered their understanding of the case or offender (60.9%) and/or reassured their own judgement regarding the case (51.6%). Nearly all stated they would probably or definitely use a profiler again (92.4%).

In general findings from satisfaction surveys indicate respondents have stated the reports may be of assistance in focussing the investigation, prioritising suspects, saving time, generating new ideas, furthering their understanding of the offender and in ensuring a complete investigation has been conducted (Britton, 1992; Copson, 1995; Douglas unpublished, cited in Pinizzotto, 1984; Haines, 2006; Jackson et al, 1997; Wilson & Soothill, 1996).

Whilst the findings of such surveys are of interest, the results should be interpreted with caution. Firstly it is problematic to determine to what degree the profile has assisted the investigation (Douglas unpublished, cited in Pinizzotto, 1984). Secondly satisfaction surveys are reliant upon the individual views of the investigators who may have their own biases which could lead them to over/under-exaggerate the contribution of the BIA’s predictions (Copson, 1995). Indeed, studies have indicated that Barnum Effect may be evident in interpretation of profiles (Alison, Smith & Morgan, 2003). This involves people accepting vague and general personality descriptions as being specific to them. In this context investigators could selectively and erroneously fit ambiguous information from a profile (which may ‘fit’ many individuals) to a suspect (Alison et al, 2003). Similarly, research has shown the more a police officer believes in profiling, the more likely they are to perceive the profile as being accurate, irrespective of content (Kocsis & Heller, 2004). Also perceptions regarding accuracy may be related to the perceived identity of the BIA (Kocsis & Hayes, 2004). Recent research has also shown that individuals may also be influenced dependent upon whether the advice supports or challenges their own beliefs (Marshall & Alison, 2007). Lastly, behavioural investigative advice is only one small aspect of an investigation and when considered in isolation is rarely sufficient to guide the investigation in a completely new direction (Jackson et al, 1997).
Additionally the satisfaction survey research is mainly based upon small samples of individual officers (Alison et al, 2002). Much of this research is not UK based, and those which are, are now somewhat dated. For example Copson (1995) questioned investigators who had used profiling during the period 1981-1994. Additionally two individuals contributed to 47.8% of the profiles discussed which may have unduly skewed findings. Also satisfaction was only sought retrospectively, after the investigations had ceased and hence opinions could have been influenced by the outcome of the investigation. Details such as at what stage of the investigation (i.e. how much was known, or was the investigation at a dead end) or what happened to the advice (was it followed, was it accurate) may also unduly influence satisfaction, yet are rarely recorded. For example in the Copson study, only 16.3% of advice was directly acted upon.

3.13 Previous attempts at predictive profiling
There is a limited amount of previous research, but an increasing attempt by the research community, to identify links between crime scene indicators and offender characteristics in murder.

3.13.1 The relationship between offence behaviour and the likely relationship between the offender and victim
From early examination of crime statistics by Wolfgang (1966) it has been demonstrated that females are more likely to be murdered by a close family member whereas males are more likely to be murdered by a close friend or acquaintance. In sexual homicide offences, research has highlighted offences involving an element of planning tends to be associated with stranger offenders (Brooker, 2003; Ressler et al, 1988). Other studies have found that stranger homicides are more likely to involve robbery (Silverman & Mukherjee, 1987), have a sexual element (Meloy, 2000), and are less likely to occur in a victim’s home (Silverman & Kennedy, 1987).

3.13.2 The relationship between offence behaviour and the likely previous convictions of an offender
In relation to homicide, Lobb (1999) and Marogna (2005) indicate a high proportion of murder offenders have previous convictions and there may be links to specific previous offending and crime scene behaviour. For example where property was taken in the
murder, offenders were more likely to have a previous conviction for burglary (Lobb, 1999) and if a bludgeoning weapon was used, the odds that the offender had previous convictions were over five and a half times greater than the odds that the offender did not (Marogna, 2005).

3.13.3 The relationship between offence behaviour and the likely mental status of an offender

Hakkanen and Laajasalo (2006) looked at 182 homicides in Finland\(^9\) and found for example schizophrenic offenders were more likely to use a sharp weapon and cause injury to the victims face. However there appear to be particular methodological considerations in this study - the sample was restricted to those offenders undergoing forensic psychiatric examination; groups were not mutually exclusive; the comparison ‘undiagnosed’ group included individuals with a ‘less serious disorder, such as mild depression’ (p38); and data was taken from psychiatric reports with a lot of missing offence information.

Recently, Quayle (2008) argued that if specific psychopathic behaviours outlined are present in a crime, it may be possible to infer the offender could be a psychopath. For example, given a psychopath’s likely persistent and pervasive anger, lack of empathy, poor behaviour controls and impulsivity, opportunistic offences involving overt sadism may suggest the offender could be a psychopath. This in turn may indicate a background involving a large number of disparate previous convictions which may have commenced at an early age for example. Research of this nature – linking crime scene behaviours to previous research and professional practice knowledge regarding what is known regarding types of individuals, is an invaluable step forward in profiling endeavours.

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\(^9\) In Finland, homicide includes the act of killing a human being by another. The difference between a murder and manslaughter is in terms of premeditation and brutality. This sample included 25% murder, 75% manslaughter offences.
3.14 Critique of previous attempts at predictive profiling

Whilst the research efforts outlined above in relation to profiling murder provide a good starting point, there are several issues of concern.

3.14.1 Sample

Much of the research is based upon homicide in general, with datasets heavily skewed towards cases involving someone known to them, and therefore arguably of less relevance in profiling efforts (Francis et al, 2004; Hakkanen & Laajasalo, 2006; Salfati 2000) or with specific subsets of murder (Aitken et al, 1995; Wherton, 2004).

3.14.2 Variables

As recognised by Francis et al (2004), in some previous research attempts variables of potential interest are missing in the datasets (e.g. where the victim’s body was found). In addition some research has confusingly combined variables into overarching categories (e.g. motive and circumstance) non mutually exclusive typologies (e.g. organised and disorganised) or themes (e.g. expressive and instrumental).

3.14.3 Method

A recent review of the profiling literature found that whilst the number of studies utilising inferential statistics has increased significantly in the last 10 years, methodological sophistication is still lacking, with half of all publications still not including any statistical analysis (Dowden et al, 2007). Of the research focussed upon difficult to detect murder offences in the UK, much of it is univariate or bivariate. Some do not take any account of the potential impact of offence variables in combination (e.g. Lobb, 1999; Marogna, 2005), and nearly all are only designed to predict one feature such as previous convictions (e.g. Lobb, 1999; Marogna, 2005), or the likely relationship between the offender and victim (e.g. Brooker, 2003; Wherton, 2004).

3.14.4 Application

The research also needs to take into account the pragmatic considerations of the investigation for it to be of practical benefit. Previous research has relied upon using variables that researchers perceive to be of use (e.g. Hakkanen & Laajasalo, 2006). For example the question of what information is available and useful to BIAs from the victim
and scene (Alison et al, 2005), and perhaps more importantly what information is useful to investigators to assist their decision making, currently remains unanswered.

3.15 Conclusion

This chapter has outlined the current provision of behavioural investigative advice by defining its origins and potential contribution to investigations. It has detailed some of the techniques used and summarised considerations, highlighting limitations and underlying principles in the provision of profiling advice. The chapter then highlighted current issues relating to the accuracy and evaluation of advice provision, with additional reference to investigators’ views from satisfaction surveys. Finally previous attempts at predictive profiling were explored and critiqued.

Some of the advice currently being provided by BIAs appears to be accurate, articulation of the rationale underlying the advice seems to be improving, and satisfaction surveys indicate overall investigators are pleased with the contribution. However individuals have looked at the provision of behavioural investigative advice, particularly in relation to offender profiling, from different perspectives. The rest of the thesis will attempt to move toward a potentially unifying theory, via pragmatic consideration of how best BIAs may be able to assist investigators in difficult to detect murder enquiries.

The next chapter will provide some background to the provision of behavioural investigative advice, by briefly outlining a historical review of applied forensic psychology. The chapter will identify considerations for the present research and set out the need for a framework which is both scientific, yet also focussed upon practical application. Candidate frameworks are suggested and Pragmatic Psychology will be introduced. The principles of Pragmatic Psychology will be outlined, and examples provided of previous research in which it has been applied. Finally potential problems in the practical application of Pragmatic Psychology will be considered.
CHAPTER 4: THEORETICAL CONSIDERATIONS UNDERPINNING THE PROVISION OF BEHAVIOURAL INVESTIGATIVE ADVICE

4.1 Introduction

The previous chapter provided an overview of behavioural investigative advice, defining its origins and highlighting its potential contribution to investigations. It detailed the techniques used by BIAs and looked at considerations, limitations and principles which need to be taken into account in the provision of such advice. The chapter also highlighted research findings which have considered the accuracy of advice, how advice can be evaluated, and satisfaction surveys from users. The chapter ended by critiquing previous research attempts at predictive profiling.

This chapter will begin by providing a background to applied forensic psychology, and then go on to outline the initial considerations for the present research, namely identifying a framework which is both scientific, yet also focussed upon practical application. Candidate frameworks will be explored and the benefits of Pragmatic Psychology considered. Pragmatic Psychology will then be explained with reference to this thesis. The principles of Pragmatic Psychology will be discussed, and previous applications of the paradigm briefly explained. Finally potential problems in applying Pragmatic Psychology will be considered.

As outlined in Chapter Three, much previous literature has focused upon retrospective assessment of behavioural investigative advice. The research found a lack of unified theory, and limited predictive value in the provision of such advice. It is currently unclear how and what psychological concepts would have greatest utility in providing an underlying theoretical foundation for behavioural investigative advice.

Furthermore, criminal investigators have indicated the advice they had received from profilers was of limited use in identifying the perpetrator (Copson, 1995). Practically, it is also unclear what information investigators would like to receive from BIAs and currently there is a paucity of academic mapping between the needs of the enquiry - the usefulness of the BIA advice - and the nature of the advice provided. There is an absence too in the literature of research that directly asks the investigator users what BIA information would
be of assistance to them, and limited articulation as to how theoretical appreciation may best be applied in the practical provision of behavioural investigative advice.

This chapter addresses these problems and identifies Pragmatic Psychology as a theoretical position, and the best candidate to provide a systematic basis to apply in order to underpin the provision of behavioural investigative advice. Pragmatic Psychology provides a unifying framework in which to explore the research objectives set by this thesis.

4.2 Origins of applied forensic psychology

At the end of the nineteenth century, not only was there increasing attention being paid to the potential contribution by psychologists’ to legal considerations surrounding the state of an offender’s mental capacity (Howitt, 2009; McGuire et al, 2000), but psychology was being further developed as a scientific endeavour.

Wilhelm Wundt set up the first psychological laboratory in Leipzig, Germany, advocating the experimental paradigm and methodological rigour. A student of his, Hugo Munsterberg moved to America in 1892 to set up a laboratory at Harvard, aiming to introduce applied psychology to the courtroom. He published a series of magazine articles (which he republished in his book ‘On the Witness Stand’ in 1908) highlighting scientific means of probing facts and improving recall from witnesses, by the application of experimental psychology (Whitman, 1922).

As outlined in a historical summary by Howitt (2009), at the beginning of the twentieth century, Lombroso (1911) compared the physical features of army personnel with offenders, concluding the latter were more likely to have ears which stick out or be left handed, and that murderers had bloodshot, cold or glassy eyes. At a similar time, Jung (circa 1905) conducted experiments which tested response delay of emotional words in word association with a criminal suspect, and Marbe (circa 1911) applied knowledge regarding latencies in reaction time to demonstrate an engine driver could not have stopped in time to prevent a train crash. It was also around this time that a student of
Munsterberg, William Marston (1915) developed the first lie detector test by measuring blood pressure.

As detailed by Howitt (2009), emergence of a formal sub-discipline of forensic psychology in the UK can be traced to discussions and publications of Lionel Haward and from the 1970’s interest, research and employment opportunity in the subject grew. Much research centred on memory – from how information may be encoded, what information is likely to be accurately (and not so accurately) recalled, and how it may be optimally retrieved. Subsequent focus of forensic psychology research and practice moved to application in prison settings where clinical or occupational practitioners looked at issues such as treatment, assessment of risk, occupational competence, and stress, of personnel (Brown, 2000).

With psychologists obtaining an increasing awareness of how investigations work, they have innovatively explored ways in which psychology may assist police endeavours. As such work has now expanded further in relation to an array of diverse areas including hostage negotiation, crises management, decision making (including group dynamics of jurors), extremism and offender profiling (Brown, 2000; Howitt, 2009).

In sum, forensic psychology has developed from utilisation of traditional psychological research (e.g. memory) into application for specific areas (e.g. eye witness testimony) and problems (e.g. known miscarriages of justice due to the fallibility of witness evidence). The topics chosen are therefore of specific interest to the particular police officers dealing with them (e.g. those police officers dealing with compliant witnesses) and many are now applied in practice.
4.3 Considerations for the this research

When reviewing previous academic work that has been applied to offender profiling, there has been some systematic inferences made at the investigative stage of an inquiry. For example research has identified that a witness may be more reliable at estimating an offender’s age if they have contact with that age group. This may be of use for an investigator setting suspect age parameters where the victim has described the offender as being ‘about the same age’ as her (Kebbell & Wagstaff, 1999). On the basis of such research evidence, an investigator may be more confident that the information is reliable, and thus tighten the age band of suspects prioritised in this instance.

However, the majority of research findings, and many traditional research methods are not always applicable to proactive profiling. One difficulty is that profiling does not have any coherent, reliable or valid theory from which to build relevant hypotheses (Dowden et al, 2007). Whilst some conceptual formulations have been suggested (e.g. disorganised/organised crime scenes may indicate disorganised/organised offenders), subsequent empirical support has been limited (Canter et al, 2004). This also makes hypothesis testing and matching samples problematic (match which variables?).

It is argued here that scientific principles should underpin behavioural advice. Yet additionally, practical profiling endeavours should be the end goal. As such slight adaptation to the traditional scientific method may be required. For the purposes of this study, an approach is required which is both scientific - obtaining reliable and valid evidence; and pragmatic - focussing on the end goal for practitioners.

4.3.1 The need for science

The requirement for scientific research and a systematic framework in relation to the provision of behavioural investigative advice has been strongly advocated. There has been recognition that the,

"discipline must draw upon established principles and the methods that have been the backbone of scientific research"

This would involve definition of a domain of interest, consideration of a systematic (theoretical) stance to explain it, and empirical observation and testing of hypotheses (Alison & Canter, 1999b).

However it has been acknowledged that in relation to scientific method,

"offender profiling has developed the tendency for these principles to be ignored in favour of quick answers based on experience rather than any systematic cumulative study."

Alison & Canter, 1999b, p27.

Findings from a review of profiling literature concur; highlighting processes have yet to be articulated and the lack of methodological sophistication in much of the research (Dowden et al, 2007). Alison and Canter (1999a) state, despite their wealth of experience, examination of profiles written by those considered the ‘old masters’ of profiling highlights a lack of systematic procedure or substantive theoretical models of behaviour.

4.3.2 The need for practical application

Whilst there has been some research regarding the underlying principles of profiling - for example finding correlation between crime scene behaviours and offender characteristics, these have been difficult to interpret and apply (Dowden et al, 2007). Therefore, in combination with scientific endeavour, the requirement of practical application - considering the needs of the investigation, is also necessary;

"profilers must understand better the requirements and needs of police investigation. This requires that scientific and investigative methodologies are concerned with issues of validity and reliability in the context of real investigations"


One gap in previous literature is in proactively ‘asking the clients’ their needs. Whilst some social scientists (e.g. Innes, 2003) have previously considered Investigative requirements in murder enquiries, there has been an apparent failure of psychological
research to tap into detectives’ working knowledge, or to seek information from practitioners about the processes involved in detection and the ways in which they would like psychologists and BIAs to help. The current research will therefore be exploratory, yet client-led. The first study will involve interviews with experienced investigators and rather than second guessing what they want, it will ask them. The second study will then be an attempt prediction, but with these considerations in mind - rather than identifying variables on the basis of what the researcher finds of interest, can access or via statistical means, it will utilise variables available in, and of use to, an investigation. As such the research will initially identify how investigators want BIAs to assist (study one), and tailor the subsequent research to deliver it (study two).

To summarise, there has been limited scientific thought underpinning offender profiling and the provision of behavioural investigative advice. For the purposes of this thesis, a practical, yet scientific approach is needed within a framework which can underpin the derivation of evidence and assist the provision of advice to investigators.

4.4 The search for an appropriate framework

Any theoretical formulation in this field therefore needs to be able to:

1. Focus on practical problems and solutions (guaranteeing the product is relevant and applicable to practitioners).
2. Acknowledge detectives and SIOs working knowledge and experiences (ensuring the product is of practical utility).
3. Take context (what information is available, when is it available) and systems (what information is needed, when is it needed, by whom, why) into account to ensure advice is deliverable, specifically tailored to the individual needs of an investigation and consideration is given to the wider policing system in which the provision of behavioural investigative advice, and the conduct of investigations are located.
4. Demonstrate a systematic methodology (to ensure the reliability of findings).

There are several approaches that might fit these criteria.
4.4.1 Grounded Theory

Grounded Theory (Glaser & Straus, 1967) has been utilised widely in the health arena, and by educational, occupational, social, clinical, feminist, organisational and environmental psychologists (Fassinger, 2005). Grounded Theory has the potential for broad application due to the flexibility of its approach. Grounded theorists interrogate meanings in social relationships to discover how groups of people define their realities (Fassinger, 2005). The aim is to produce theory that emerges from, or is 'grounded' in the data, to explain lived experiences in a social context (Fassinger, 2005).

Evaluation of Grounded Theory’s capacity: Concepts and methods used by grounded theorists are appropriate in the first study that forms part of the present research. The aim of study one is to ascertain what advice UK SIOs would like from BIAs to assist their difficult to detect murder enquiries – i.e. understand how behavioural investigative advice may assist them. In order to undertake this, a necessary pre-requisite is to elicit SIOs’ working knowledge, drawing on their experiences in the ‘real world’ context of being in that role, the difficulties faced, and where BIA assistance would be of greatest benefit. Use of in depth semi-structured interviews with participants where little is known about the phenomenon, to include open ended and non leading questioning would give insight into the SIO role and where BIAs may be able to assist. In addition, methodological suggestions such as simultaneous data collection and analysis, codification of responses, constantly comparing findings to that of other interviewees, memo-writing thoughts, procedures and analytical decisions throughout the process would be of use. The importance of keeping close to the data by using quotations of interviewees is also highlighted, as is using findings to guide the collection of additional data. Attempts are also made in Grounded Theory to bridge the qualitative/quantitative divide by collecting rich data, allowing for naturalistic interpretation and understanding, whilst also preserving logic, rigour and systematic analysis (Fassinger, 2005; Starks & Brown Trinidad, 2007; Walker & Myrick, 2006).

However, the overall aim of study one of this research is not to generate a contextualised, explanatory theory regarding the experiences of SIOs per se. Whilst an appreciation of their role is necessary, the main aim is to glean sufficient knowledge in order to inform
how, and in what way BIAs may assist – i.e. specifically to determine the variables required for study two and to ascertain what product would be of use to the end users (SIOs). As such, derivation of a ’central phenomenon’ or ’core category’ was not required (Fassinger, 2005; Starks & Brown Trinidad, 2007), but what was needed were consideration of multiple research objectives to ascertain what, when and how behavioural investigative advice could be optimally delivered.

In addition, the present focus was upon a specific subset of investigators – a purposive sample of those with experience in difficult to detect murder investigations. Sampling a diverse range of individuals to represent multiple dimensions of their experiences under different conditions (Starks & Brown Trinidad, 2007), or consideration of other ’outsider perspectives’ (Fassinger, 2005) was not necessary for this research. Furthermore, whilst initial participant involvement was seen as critical to ensure relevant procedure and a practical outcome to the research, their continual involvement as advocated by grounded theorists (Fassinger, 2005) seemed inappropriate and logistically would have proved difficult.

Finally, whilst debate ensues regarding the amount of prior familiarity with the research topic and the amount of existing literature which should be read and utilised prior to engagement of Grounded Theory, there appears a consensus toward minimal knowledge in the early stages (Fassinger, 2005). In addition, consideration of the reflexive role of the researcher is central, as pre-existing or implicit theories may ’bias’ the grounding of theories from the data alone (Fassinger, 2005). Due to being a BIA, the current researcher has over the preceding 10 years read about, analysed data in relation to, researched, and practically worked in the field. Recognising, articulating and attempting to set aside all of this pre-existing knowledge and assumption (Starks & Brown Trinidad, 2007) is unrealistic. Moreover, whilst the use of knowledge from SIOs was warranted, the aim of the research is to be practical, not only to their requirements, but also to the BIA practitioners and any other stakeholders. Rather than pre-existing knowledge and thoughts being set aside, they needed to be utilised and amalgamated to ensure the research is appropriately situated and would be of practical benefit to investigations. Thus
whilst helpful, the adoption of Grounded Theory in the present research would compromise its aims.

4.4.2 Naturalistic Decision Making

Naturalistic Decision Making (NDM) was also considered. NDM is focussed on practical (rather than theoretical) problem solving by looking at how decisions are made in applied situations – i.e. by practitioners in their ‘natural habitats’ (Lipshitz, Klein, Orasanu & Salas, 2001). It has been utilised in many contexts, including decisions made by critical incident managers, in health care and by military personnel (Lipshitz et al, 2001; Lipshitz, Klein, & Carroll, 2006). NDM research challenges normative models of rationality and choice between alternative options, to consider actual behaviour in applied settings. NDM research primarily observes and interviews practitioners, and advocates understanding and enhancing how people make real life decisions. NDM is therefore able to account for complexities such as the role of experience and expertise, the importance of time pressure, uncertainty and the involvement of high stakes into consideration (Lipshitz et al, 2001). The information obtained is then used to build theories and explore patterns in the data.

NDM aims to describe cognitive processes, giving due consideration for example to what information is sought by the decision maker, and how this is interpreted. It takes into account situation-action matching decision rules – i.e. where individuals do what is appropriate in the situation, evaluating and ‘matching’ sequential options one at a time, rather than choosing between the (relatively) best simultaneous alternatives. The recognition-primed decision model outlines how experienced decision makers usually size up situations and respond with an initial (usually successful) option (Klein, 1997). If the situation is unclear then a ‘story’ is built to mentally simulate the events. As alternatives are not considered, evaluation is carried out via mental simulation of the course of action to see if it will work (Lipshitz et al, 2001).

**Evaluation of NDMs capacity:** Certainly the observation and interview methods of NDM used on ‘proficient’ (experienced/knowledgeable) decision makers (Lipshitz et al, 2001) to explore NDM appear appropriate for considering data available to SIOs, and decisions
surrounding what information they want from BIAs. Similarly of interest is the ‘Critical Decision Method’ which involves retrospection of a specific incident in which the participant had personal experience (Hoffman, Crandell & Shadbolt, 1998). Probing questions are used to elicit further relevant detail, and timelines with decision points are used to structure the account into meaningful sections (Hoffman et al, 1998). This method would be of use in determining what information, and when specific information was available to SIOs in specific murder investigations they had conducted, and what type of, and the optimum time, advice from BIAs would have been of use to them.

However the focus of the current research is upon eliciting what is required from experienced SIO individuals, and then exploring potential ways in which such advice may be provided by BIAs, rather than upon investigating or improving the cognitive processes underlying the decisions individual SIOs make. Moreover, it has been indicated that some decision making strategies - for example recognition-primed decisions - are less likely to be used in situations where justifications are required or where the views of different stakeholders have to be taken into account (Lipshitz et al, 2001). Yet in modern policing, decisions made should be transparent and fully justifiable. In addition, investigators are potentially accountable to a variety of stakeholders including senior colleagues, politicians, relatives of the victim, suspect/s and the public at large. Furthermore, whilst applied to concrete situations, not all NDM research takes organisational goals and concerns into account as part of the context (Lipshitz et al, 2006). Clearly working within a policing environment, due consideration to organisational, political and legal requirements is an essential component and needs to be included in any framework for this thesis.
4.4.3 Comparison of candidate approaches.

The following table highlights the potential contribution each of the candidate approaches outlined above appears to be able to make in relation to the main theoretical requirements for this research. This suggests they are incomplete as frameworks and have limited capacity to take context and systems into account.

Table 4.1 Candidate approaches and requirements for this research.

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<thead>
<tr>
<th></th>
<th>Grounded Theory</th>
<th>Naturalistic Decision Making</th>
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<tbody>
<tr>
<td>Focuses on practical problems and solutions</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Takes knowledge and experience into account</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Takes context and systems into account</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Systematic, ensuring reliability of evidence</td>
<td>✓</td>
<td>X</td>
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Whilst Grounded Theory and NDM elicit working knowledge from practitioners, another approach Pragmatic Psychology, simultaneously takes broad context and systems into account as well as working knowledge.
4.5 Pragmatic Psychology

To re-iterate, the requirements for a theoretical framing of the present research problem are a need to:

- Focus on practical problems and solutions, so as it is relevant to investigations, and can provide practical solutions in relation to the provision of behavioural investigative advice.
- Take previous working knowledge and practitioner views into account to shape the research – in particular relevant SIO experience of how BIAs may assist officers running difficult and unusual murder investigations.
- Take context and system (including organisational) issues into account to enable findings to be appropriately situated within a policing environment.
- To be systematic - structured and disciplined yet flexible enough to incorporate relevant ideas and methods from other research frameworks such as Grounded Theory and Naturalistic Decision Making.

Practical problems in applied situations have been explored within the framework of 'Pragmatic Psychology' (Fishman, 1999). With its key inspiration as focussing on contextualized knowledge about particular individuals, this approach provides a practical means to address local problems in specific concrete situations (Fishman, 1999). The approach has roots in the work of William James, John Dewey, Richard Rorty, Richard Bernstein and Stephen Toulmin. Indeed the early writings of Munsterberg (1908, p8-9) also appear to echo pragmatic endeavours:

"If experimental psychology is to enter into its period of practical service, it cannot be a question of simply using the ready-made results for ends which were not in view during the experiments. What is needed is to adjust research to the practical problems themselves and thus, for instance, when education is in question, to start psychological experiments directly from educational problems."

In the forward to the seminal text by Fishman (1999), Peterson highlights the fact that enquiry need not begin with traditional science before useful practice can be achieved. A pragmatic framework advocates that enquiry should begin with the practitioners
themselves; highlighting the importance of professional experience, and scientists should bring their experience, knowledge and creativity to cooperate and solve practical problems together. Pragmatic Psychology has recognised the need to incorporate new ideas, method and theory, and advocates that systematic study of individual cases can be brought together creating a database of instances for future reference (Peterson, 1999). In doing this Peterson, (1999, p.xvii) argues a “scientifically credible, practically useful profession of psychology” will be progressively achieved.

4.5.1 Theory building

It has been argued that theory establishes an explanatory shell for the phenomena with which it deals (Kaplan, 1964). This allows an understanding of what is contained within the shell surrounding the phenomena and all the component parts that are necessary and sufficient for an explanation according to the theory. Kaplan (1964) proposes that theories put things into a known system which then allows the researcher to “make sense of what would otherwise be inscrutable or unmeaning empirical findings” (p.302) while simultaneously establishing the boundaries within which to work. Whilst a hypothesis can be confirmed by fitting it to facts, it can actually gain as much, if not more, confirmation by fitting into a theory because by doing so it gains the support provided by the evidence for all other hypotheses of that theory (Kaplan, 1964). As such, a good theory corresponds with data which has previously been observed, and accurately predicts future data patterns (Brown & Cullen, 2000).

Dubin (1976, p18) states that “observation and description of the real world are essential points of origin for theories in applied areas”. Others concur:

“...the first task of the theorist is to describe the phenomena of interest thoroughly and systematically. The next task is to categorise phenomena, showing how specific instances are characterised by common attributes which make them capable of being treated in some sense as equivalent to each other...the theorist’s next task entails stating how one category of phenomena is related to another.”

Breakwell & Rose, 2000, p7.
A theory then makes sense of the topic under investigation by ordering the relationships among the constituent parts that make up the topic (Dubin, 1976). Thus the starting point for this research was to observe and describe what information SIOs want from BIAs in difficult to detect murder investigations. The second stage was then to observe and describe potential patterns and relationships in a pre-existing dataset of murder cases, in order to illuminate the provision of such information to future enquiries.

Rather than being theory driven like much psychological research, the outcome of any undertaking in Pragmatic Psychology is specifically goal focussed and problem driven.

“We believe that researchers should stay much closer to the observed data and be less distracted by the search for entities that do not exist beyond the observations from which they were inferred.”

Brown & Cullen, 2000, p201.

Instead of attempting to identify theories and test hypotheses or to explore issues in general, which may then be applied, the pragmatists’ aim is to be scientifically functional – the application comes first.

“Pragmatism favours the use of directly accessible variables and defines theory as the description of functional relations between data.”


The differences between pragmatic and more traditional scientific stances regarding theory are outlined below;

“In the positivist paradigm, a research article begins by setting forth a general theory...then shows how the study investigates the validity of the theory by testing a series of operationalized hypotheses that are logically derived from it. In contrast, in the hermeneutic paradigm an article begins by setting forth a topic...but not initial theory or hypotheses. These emerge from the study itself...the pragmatic paradigm...begins with a particular problem as presented by a specific client”.

Fishman, 1999, p154-5.
In summary, any potential underlying theory is secondary to practical requirements, and research is conducted to directly and practically influence the solution of a specific problem. Fishman (1999, p145) states pragmatic study is “driven by its core need to be of practical relevance”, and others surmise,

“the functional utility of the research therefore takes precedent over the requirement to adopt a particular theory”.

Crego & Alison, 2004, p212.

4.5.2 Guiding conception

As such, rather than testing a general theory, pragmatic researchers use a ‘guiding conception’ which “includes practitioners’ assumptions about theory, epistemology, program goals, and ethics” (Fishman, 2000, p2). The guiding conception has to be adaptive, but is basically “a pragmatic road map for designing a particular program” (Fishman, 1999, p155). This underlying theoretical or philosophical conception can be used to assist the design of the research, and the practitioner should help shape its emanation from theory or experience (Slobogin, 2003).

The introduction to any pragmatic research should outline the client, the problem, a summary for improvement and the ‘guiding conception’ of the problem, all of which can be identified and informed by previous research and experiences of practitioners. The guiding conception should be;

- molecular – focussing on particular areas of interest, utilising relevant variables to test key relationships between them;
- multivariate – so that broader issues and ‘real world’ may be taken into account or subject to further research;
- holistic – so that the problem as a whole is considered;
- systems oriented – giving consideration to the differing and interconnecting system levels within the problem – for example individuals, groups or teams, and organisations; and
- organic - developing in light of the findings and analyses.
4.6 Defining Pragmatic Psychology

Pragmatic Psychology has been described as,

“a psychological framework developed to advance pragmatic principles and ideas in various domains of applied psychology”


Others have suggested,

“Fishman does not advance Pragmatic Psychology as a simple practice; he advances it as an epistemological paradigm”

Dowdle, 2003, p322.

and Fishman himself agrees that the,

“recently developed epistemological paradigm that integrates selected elements from each of the opposing sides in forensic psychology: a natural-scientific positivist model...and a clinical/hermeneutic model”


Pragmatic Psychology then is an approach, an ‘epistemological paradigm’ or a set of shared assumptions taking a psychological perspective, regarding how useful scientific knowledge should be obtained.
4.7 **Pragmatic Psychology's relevance to this research**

As highlighted above, this thesis requires a framework which focuses on practical problems and solutions; can take working knowledge and practitioner views into account; considers context and systems; yet is systematic and scientific. Pragmatic Psychology is able to do all of these.

4.7.1 **Focus on practical problems and solutions**

The premise of Pragmatic Psychology is that ultimately the aim for research should be to improve the lives of individuals within specific contexts (Fishman, 1999). Practical application is an essential component of any pragmatic research. Pragmatic Psychology does not require a pre-requisite theory from which testable hypotheses are generated rather enquiry begins with a problem to be solved. The purpose of a pragmatic enquiry is to consider, and assist in creating a solution for, a particular problem within a specific applied environment.

Pragmatic research should propose solutions, and moreover, if and when any recommended changes are put into place, evaluation of how the programme or developments have (or could have) worked in practice is an essential final stage of analysis. Use of performance indicators are advocated where appropriate. These are able to provide an ‘indication’ or estimation of how well a system is functioning in practice. Both the process – how well the internal process worked, and the outcome – how well it was at accomplishing its goals or its overall impact, should be reflected. One method involves ‘pattern matching’ whereby information measures are compared to a predicted pattern or desirable ideal. Practical consideration should also be given to the relative cost effectiveness of the suggested or implemented developments.

4.7.2 **Accounting for previous working knowledge and practitioner views**

The pragmatic approach also advocates utilising information and best practice from individual case based knowledge. Pragmatists propose research needs to begin with the clients, understanding practitioners and their problems in context with “all their natural complexity” (Peterson, 1999, pi). As such, practitioner “experiences are treated as central in developing and informing research” (Crego & Alison, 2004, p209). Consultation, or at least detailed consideration, of practitioner requirements and needs is a core concept.
The utilisation of experience is key throughout all stages of research, from development, actually undertaking, and subsequently feasibly applying the findings. As such, practitioner led research, part ownership of projects and 'insider' evaluation is advocated. However, the pragmatic model does not necessarily involve continual negotiation with the research participants or other stakeholders. For example it may be responsive to emergent data over the course of the research (Fishman, 1999).

4.7.3 Consideration of context and systems

Pragmatic Psychology advocates the inclusion of rich, multivariate and contextual variables. It is recognised that many aspects may influence research findings and therefore holistic consideration of cases is encouraged. Contextual issues are also of particular importance to ensure findings and recommendations can practically be of use, and applied within the arena for which they were intended. However, as some findings are specifically contextualised, it may not be appropriate to generalise beyond those specific types of case.

In a similar vein, pragmatic research should be systems oriented – in other words consideration should be given to all system levels which may impact upon the research and implementation of the findings. Whilst specific clients may be involved, all system levels are likely to be interconnected. So for example in a policing environment different ranks from constables to Chief Police Officers, roles, teams, related organisations, government, and the general public may all impact upon practical considerations of SIOs in difficult to detect murder investigations. If an impact to one system level is to be effective, other system levels’ perspectives require simultaneous consideration.

For the purposes of the present research the ‘client’ is the SIO, as such of primary concern is serving their needs. However consideration is also given to the BIA – what information they may require to undertake their work, and what information police systems hold regarding murder cases which may be of relevance for profiling endeavours. The principle of a systems model has however been further adapted in the present study to include a timeliness element in the investigative process. As such consideration of what information (relevant to the BIA) is likely to be available when (at what stage in the
enquiry), and when assistance is likely to be of most benefit to SIOs (when they would find it useful, when it is likely to add most value) has been included within the design of this study.

4.7.4 Systematic - scientific, yet flexible

Pragmatic Psychology advocates the use of scientific method to extrapolate general patterns and trends for wider practical application. Fishman (1999) positions pragmatic theory as bridging the gap between 'scientific' positivism and 'post-modern' hermeneutic paradigms. Whilst positivism searches for a general theory or truth which can then be applied, pragmatism begins with application, directing research based upon the end goal or problem at hand. Fishman (1999) demonstrates how pragmatism shares some ideology with a hermeneutic stance, advocating field research, taking context and 'real world' problems into account in order to guide practical solutions and action. However it is also mindful to heed scientific notions including more traditional methods and concepts, believing there are answers and 'truth', but that this consists of *usefulness* to practitioners. It appreciates the need for both qualitative, rich, descriptive, interpretation, and empirical, hypothesis testing with control and isolation of variables – utilising both where necessary for practical solutions to current problems. It is therefore argued that Pragmatic Psychology is a step towards resolving the dilemma between rigour and relevance, that this systematic merging of case based knowledge ensures psychology will develop into a discipline which is not only scientifically credible, but also of practical relevance (Peterson, 1999).

Yet although Pragmatic Psychology provides principles for conducting enquiries (outlined in the next section) it does not in itself provide a specific ‘cookbook’ method. It suggests tools to assist in consideration of the research objectives, and advises upon how to address and present different topics of research. It supports the use of *any* methodology which would be of assistance in addressing the problem at hand. It neither strongly promotes nor denounces any specific method be it qualitative or quantitative.

It is also flexible, adapting methods for practical utility. For example, whilst the use of the case study method is advocated, it is suggested that this should be enriched "from single
case to database” (Fishman, 2005) to enable greater applicability. Building a database of case studies is therefore proposed as good practice. It is suggested that such databases would be of assistance to practitioners – data could be categorised in ways which would allow searching and comparison of previously similar cases to help find concrete and useful solutions to present cases. Not only would such databases provide researchers with valuable sources of rich data, but practitioners would also benefit. With enhanced access to multiple sources, it would provide them with a greater awareness of cases from which to base judgements than they would have access to by reliance upon their own experiences alone:

“In short, the database would magnify the breadth, efficiency, and efficacy of the professional networking process.”

Fishman, 2000, p16.

4.8 The principles of Pragmatic Psychology

As an advocate of a scientific approach, to ensure studies are of a suitable quality, Pragmatic Psychology articulates a number of principles or 'pragmatic standards' which should be taken into account when conducting research.

4.8.1 Utility

The research needs to be useful and focus upon the needs of the intended users. It needs to be of practical benefit and assist the problem at hand or enhance the service currently provided. The current research has been shaped by expressed SIO needs, and is continually mindful of the requirements of the BIA users.

4.8.2 Feasibility

The research product needs to be realistic and practically capable of being implemented within the environment for which it is intended. As the present research is somewhat exploratory, the usefulness of the product is as yet unknown, however the researcher will ensure that any appropriate findings are disseminated and utilised appropriately. The researcher’s focus on explicit SIO requirements, coupled with her knowledge as an ‘active participant’ in BIA practice, should ensure that findings are capable of implementation where appropriate.
4.8.3 Proprietary
Consideration should be given to legal, ethical and moral requirements within the situation. Due consideration should also be given to participants and those effected by the results. In the present research, due consideration will be given to any legal and ethical requirements such as discussion of cases, confidentiality, access and ownership of data, and wellbeing of participants.

4.8.4 Accuracy
Related to this is the requirement for the research to be technically accurate. Consideration should be given to findings within the context in which they were found. Not only does the information itself have to be correct, but also any evaluation of the merit of any findings needs to be accurate. This research will strive to report accurate findings and outline where appropriate potential pitfalls in relation to sources and means of data collection.

4.9 Applications of Pragmatic Psychology
Pragmatic Psychology has previously been applied to a variety of practical problems (Fishman, 1999).

4.9.1 Educational reform
Fishman (1999) outlined how to test the impact of class size on academic performance, traditional research may compare the performance of pupils in two similar schools (matched on certain criteria), one with small, and the other with larger class sizes. However there is issue with this method in that it may not take into account the contextual issues of the individual schools under review.

A pragmatic approach would primarily focus upon the problem (poorly performing schools) rather than the variables (class size, academic performance). As such a pragmatist may look at both well and poor functioning schools and compare similarities and differences both qualitatively and quantitatively, including as many potential variables as possible.
4.9.2 Environmental psychology

Moore, Van Haitsma, Curyto and Saperstein (2004) highlight how there is an issue in environmental psychology in that it is often considered diverse, including various topics and research approaches. This in turn makes the subject appear to lack coherence, poorly fitting with academic frameworks, and resulting in an ‘outlier’ status.

Moore et al (2004) summarise the work of Powell Lawton, who advocated environmental research be designed to inform practice, “generating knowledge useful for practitioner decision-making” (Moore et al, 2004, p472) via a comprehensive case study method. His interest was “in ‘action-taking’; in improving the environmental quality for those less able” practically recognising that small environmental improvements could make a great deal of difference to those living within it (Moore et al, 2004, p473). As such, they argue Lawton’s work exemplifies Pragmatic Psychology.

4.9.3 Psychotherapy

Messer (2000) highlighted how previous research testing efficacy of treatment has been criticised for;

- being undertaken in the laboratory raising issues of ecological validity – unable to fully capture the complex context of therapy (Messer, 2000; Seligman, 2000);
- leaving practitioners confused as to how to apply findings (Seligman, 2000); and
- ignoring case studies (Messer, 2000).

Messer (2000) advocated the increased use of case studies to enhance research and Seligman (2000) highlighted the benefits of building a database of cases consisting of patient, outcome and treatment variables for use by practitioners in treatment and for teaching purposes. These suggestions are commensurate with suggestions from Pragmatic Psychology to build a database of cases (see section 4.7.4).
4.9.4 Forensic psychology

The precedent has also been set for considering Pragmatic Psychology within the forensic arena. These have focussed upon recommendations of Pragmatic Psychology including the publication of case studies; consideration of context; and ensuring research is problem focussed and applicable in practice. For example:

- Witt (2003) described a case study - 'H' (a 16 year old female charged with aggravated assault after stabbing a fellow student) in order to discuss the underlying legal context for transfers from juvenile to adult court, with reference to the competing approaches to justice – namely rehabilitation/treatment opposed to a more punitive, deterrent effect.
- Schlesinger (2003) explored another case study to highlight a mentally retarded individual's competency to stand trial and consider issues surrounding diagnosis, assessment and patient deception. It was found that examiner bias' such as formulating opinions based upon gender, age and social class, or attempting to confirm hypotheses suggested by the lawyers can potentially distort findings in such cases.
- Dyer (2004) used a combination of theory and empirical studies regarding attachment, clinical data, and considerations regarding the fitness of the birth parents, to highlight contextual issues. Dyer demonstrated how in some instances even if the birth parents have been rehabilitated, there are situations where they should permanently lose their full parental rights.
- Birgden and Ward (2003) have discussed how the assessment of individuals with mental retardation to stand trial, and the determination of parole for sex offenders based upon purely clinical or standardised actuarial methods; can be enhanced by the use of practical vignettes and consideration of the actual case at hand. These can be used to rate the particular defendant's abilities in specific situations, allowing for increased consideration of contextual issues.
- Kinsler, Saxman and Fishman (2004) provide a case example of how misunderstandings in probation conditions can lead to mislabelling of an individual as 'defiant' and result in greater penalties being (unjustly) administered. They
highlight how taking account of the context – the combination of difficulties an individual's life, may enhance understanding in such circumstances.

- Crego and Alison (2004) utilised the experiences of a group of critical incident managers of major incidents to explore practical problems faced by them. By logging their experiences and views regarding cases in an electronic focus group, it was consistently found that external parties’ views of cases were not only one of the most difficult aspects of the investigation for them to deal with, but also seemed to have the most significant impact on the enquiry. Crego and Alison (2004) argued that these key issues were likely to be due to a perceived lack of control by the managers regarding this matter, coupled with belief that any subsequent 'blame' would ultimately lie with them.

- In addressing problems regarding the construction of quality, scientific, professional reports. Practical guidelines have been produced in relation to suggested formats and principles for writing forensic (Heilbrun, DeMatteo & Marczyk, 2004) and behavioural investigative (Alison et al, 2004, 2007) reports.

### 4.10 Problems in applying Pragmatic Psychology

It is anticipated however that difficulties may arise when practically applying Pragmatic Psychology.

#### 4.10.1 Science and law may clash

As outlined by Fishman (2003), science's desire for group based, probabilistic findings, is ill-fitting with the law's requirement for specific application to individual cases. In addition, positivist science assumes determinism whereas the courts imply free will (except in special circumstances). Pragmatists aim to selectively integrate both scientific and practical aims and hence there may be challenges in implementation. For example whilst comparisons of previous case studies appears analogous to the use of stare decisis precedent in common law, the utilisation of such databases needs to consider issues such as representativeness, generalisability, confidentiality, and logistical issues such as the sheer number of cases for consideration or whether or not to include cases where no outcome is known (Fishman, 2004; Hellbrun et al, 2004; Slobogin, 2003).
4.10.2 Selectivity in write up
Seligman (2000) highlights issues in relation to selectivity, including;

- currently there is an apparent bias toward writing up only successful case histories; and
- there are difficulties inferring causation. For example it is difficult to infer aetiology due to the fact that patients only seek therapy if they have a problem. An example is provided that a therapist may never see victims of child sex abuse with no subsequent mental health problems.

4.10.3 Boundary problems
The ‘boundary problem’ considers how many cases, and how much detail within those cases, to look at. For example, whilst ‘thick’ description is advocated (Fishman, 2004), this could soon become overwhelming and could limit simple comparisons between cases. Seligman (2000) highlights the need to potentially reduce the data to make it manageable and searchable. However, reasons for such choices regarding the data should be overtly articulated in the research. In making such decisions, consideration should be given to feasibility and also what appears to be a ‘natural’ unit. Boundaries should also be justified in relation to what would be useful for potential practical application (Fishman, 2000).

4.10.4 Testimony
In addition there may be particular difficulties in practice, for example in relation to potential use in courtroom testimony. According to the Federal Rules of Evidence (1975, Rule 702) testimony will be admissible if it assists the trier of fact to understand the evidence. As Slobogin (2003) highlights, this requirement of usefulness is actually the “ultimate pragmatic test” (p285). However, there are other hurdles which may make pragmatic enquiry less likely to be admissible in a court of law. Dowdle (2003) has suggested that any hermeneutic aspect, i.e. anything relating to meaning or interpretive, would have difficulty being accepted due to courts demands of accountability – i.e. they need to visibly conform to the demands of the larger constitutional structure of which they are a part. As such, their views are commensurate with traditional positivist scientific notions regarding what constitutes truth. Probabilistic causal connections, together with transparency in method, reasoning and decision making are all required to satisfy
scientific notions of determining truth. Testimony based upon technical and specialized knowledge (for example from mental health professionals) must therefore be scientifically reliable and valid (Dowdle, 2003).

4.10.5 Acceptance of pragmatism
For utilisation as evidence in court, theoretical and methodological foundations must be sufficiently established to have gained general acceptance in the field (Frye v. United States, 1923, 1014 cited in Dowdle, 2003). Yet such a legacy exists beyond the courtroom. General acceptance of any framework is required before practical use is encouraged in any domain. As such, until it becomes more widely used and incorporated into mainstream psychological thought, findings from Pragmatic Psychology may face some difficulties in currently being accepted in some environments.

4.10.6 Requirement of scientific rigour
As outlined above, research conducted under the label of Pragmatic Psychology needs to be undertaken with scientific rigour. Indeed as Dowdle (2003) articulates, Pragmatic Psychology’s encouragement of new applied theories and technologies may benefit forensic psychology by increasing the scientific rigour and reliability of findings. This in turn should enhance the utility of such expertise in the future. However, with applied problems there is often an immediate requirement for ‘quick fix’ answers that cannot be scientifically backed. As such, there is a potential conflict in that practitioners may want answers, which research is currently unable to provide (Alison & Canter, 1999b).

4.11 Conclusion
This chapter began by briefly presenting a historical summary of applied forensic psychology, before outlining the considerations for this research. A scientific, yet applied framework was required, and both Grounded Theory and Naturalistic Decision Making were considered to be potentially of use for the current thesis. However, Pragmatic Psychology stood out as having all of the necessary components with which to answer the research objectives. Pragmatic Psychology has been described as being ‘supremely’ suited to data and questions which are still in the experimental stage (Dowdle, 2003, p331), and for ideas which require further exploration and are yet to be demonstrated. As such, Pragmatic Psychology was considered to be of central relevance to this thesis,
the overall aim of which is to explore and if possible enhance the practical service BIAs give, in the specific context of difficult to detect murder investigations. It is considered that a pragmatic focus of this research will ensure any subsequent advice provided to SIOs by BIAs is useful, timely, reliable and valid. The chapter then defined and explained Pragmatic Psychology, outlined its relevance to this thesis and then discussed its underlying principles. Finally the chapter highlighted previous applications of Pragmatic Psychology, and considered potential problems in application.

The next chapter will focus upon methodological considerations of the thesis. It will highlight the similarities and differences between traditional positivist, primarily quantitative analysis, and qualitative research, highlighting the benefits of mixed method research designs. The main questions for consideration in any design involving a mixed methodology will be outlined in consideration of the current research, and finally the method's potential links to Pragmatic Psychology will be discussed.
CHAPTER 5: METHODOLOGICAL CONSIDERATIONS

5.1 Introduction

Chapter Four provided some background to applied psychology and contextualised forensic psychology. The choice of Pragmatic Psychology as the conceptual frame to underpin the research presented in this thesis was justified. This approach endorses the need for research to be scientific, but highlights that it also needs to be problem based, and findings should be useful and usable. This chapter will focus upon methodological considerations of the current research. It will compare traditional positivist, primarily quantitative analysis, and qualitative research, and then go on to argue that differences between these approaches have been exaggerated. The benefits of mixed method research designs will be outlined, and the principles underpinning conducting a mixed methods design will be detailed with reference to this thesis. Finally links between the mixed method and Pragmatic Psychology will be discussed.

5.2 The traditional methodological dichotomy

Quantitative methods have somewhat dominated and prevailed in psychological research (Powell, Mihalas, Onwuegbuzie, Suldo & Daley, 2008). Whilst there is increasing recognition that qualitative paradigms may be more appropriate for understanding human behaviour (Powell et al, 2008), as summarized by Haverkamp, Morrow and Ponterotto (2005, p124), “psychology has been slow to adopt a balanced methodological pluralism in its research agenda”. Although qualitative and quantitative research has coexisted, they have been separate - somewhat ‘competing’ with one another, not only in the practice of undertaking research (Powell et al, 2008), but also in how the individual research methods are taught as a subject (Tashakkori & Teddlie, 2003).

Hanson, Clark, Petska, Creswell and Creswell (2005) and Tashakkori and Teddlie (2003) summarise how some have argued an amalgam of both quantitative and qualitative research methods within one study – i.e. using a ‘mixed method’, is inappropriate, due to the incompatibility of their different theoretical perspectives and the opposing paradigms which underlie them. Indeed the quantitative, scientific, objective, positivist approach of rational observation and analysis, precise measurement and manipulation in controlled environments, appears at odds with qualitative research which highlights complete
control, objectivity or truth as unobtainable, where everything people do is underpinned by underlying shared assumptions, which are constructed and contextualised within their own subjective socio-cultural experience and practice.

The position taken by this thesis is that the differences between qualitative and quantitative approaches have been exaggerated. Tashakkori and Teddlie (2003) and Yardley and Bishop (2007) note the similarities between the two orientations. Tashakkori and Teddlie (2003) argue the idea that qualitative researchers operate from a blank ‘tabula rasa’ is naïve, as is the assertion that their research never implies causal relationships. They also acknowledge how quantitative researchers may have problems with theoretical explanation due to the lack of formal theories in the behavioural sciences, and highlight that prediction is possible only at an aggregate (rather than an individual) level, and only ever in probabilistic terms. More tangibly as they state;

"It is easily forgotten that the similarity-contrast principle that guides the constant-comparative analysis of narrative data...is highly similar to the discriminant (divergent)-convergent principle in exploratory factor analysis...It is a process of creating groups of variables (e.g. items) that have high correlations with each other, and at the same time have low correlations with other groups of variables"

Tashakkori & Teddlie, 2003, p71.

Also pertinent for consideration of study two in the present research which is considered exploratory, yet is clearly quantitative, is their discussion regarding confirmatory (traditionally quantitative) and exploratory (traditionally qualitative) research:

"In practice confirmatory qualitative research is not an impossibility...neither is exploratory quantitative research"

Tashakkori & Teddlie, 2003, p71.

Yardley and Bishop (2007) similarly explain how pragmatism recognises that the acquisition of all types of knowledge involves both imagination and interpretation (primarily qualitative), but that this may be grounded in empirical (primarily quantitative)
experience. In addition, science is historically characterised by uncertainty, attempts to falsify current working models, and consideration of various tests of reliability and validity in appreciation that complete control, proof or verification of absolute truth is unrealistic. Moreover, all research shares common aims of linking theory and observation, the need for rigor, searching for patterns, consideration of appropriate methods, and the requirement for peer critique and appropriate dissemination of results.

As such, as long as underlying assumptions of different paradigms are not disregarded, and research decisions are transparently articulated, a mix of both quantitative and qualitative approaches may not only be possible, but some have argued may be beneficial and necessary for complete understanding of the underlying phenomena and pragmatic enquiry (Powell et al, 2008; Tashakkori & Teddlie, 2003; Yardley & Bishop, 2007). The only real disadvantage appears to be the length of time and resources required to collect and analyse both types of data (Ivankova, Creswell & Stick, 2006).

5.3 Mixed method

Mixed method research designs

“involve the collection, analysis and integration of quantitative and qualitative data in a single or multiphase study”

Hanson et al, 2005, p224.

Researchers began to recognise multiple research methods, and multiple forms of data collection may enhance findings - for example via Campbell and Fiske’s (1959) introduction of triangulation in research. More recently there has been a realisation that in practice, research does not always neatly fit the quantitative-qualitative dichotomy and broader thought may be required in order to answer research questions or test hypotheses (Tashakkori & Teddlie, 2003).

It has been articulated that different methods of study may actually complement one another (Tashakkori & Teddlie, 2003). Quantitative research is of use to identify prevalence and cause-effect relationships, whereas qualitative research is useful to obtain
insights, experiences and meanings (Powell et al, 2008). Haverkamp et al (2005) make an interesting analogy stating quantitative research is like a photograph of a person, excelling at producing a reflection of a precise image at that moment in time. Qualitative research however is more like an artist’s portrait, creating an overall impression of the person, and offering a glimpse of what lies beneath.

Moreover, it has been found that inferences based on multiple perspectives may actually be more trustworthy (Tashakkori & Teddlie, 2003). Powell et al (2008) use the concrete example of school bullying research to exemplify how the use of mixed methodology can enhance findings over and above those provided by either quantitative or qualitative research in isolation – either of which may have led to inaccurate conclusions. As such, “mixed methods techniques can greatly improve the quality of inferences...compared to monomethod studies” (Powell et al, 2008, p305).

The use of both methods together can serve not only to utilise the respective strengths, but also compensate for the weaknesses of each method (Creswell, Clark, Gutmann & Hanson, 2003), in order to maximise their respective contributions:

“Combining the internal validity of quantitative methods with the external validity of qualitative research can thus be a very productive way of mixing methods...to arrive at a richer and more complete description of a phenomenon than by using a single approach”


As such, discussions have ensued regarding mixed methods as a separate research design (Creswell et al, 2003), or a ‘third research community’ and interest in the area has grown rapidly within the last 20 years (Teddle & Tashakkori, 2009).
5.4 Conducting mixed method research

There are principles underpinning a mixed methods design when considering the formulation, planning and actual implementation of such research (Collilins, Onwuegbuzie & Sutton, 2006; Powell et al, 2008). These align with many of those taken in either qualitative or quantitative research – for example;

- determining the goal of the study (adding to the knowledge base, prediction, organisational impact or examination of the past for instance);
- formulating the research objective (including exploration, description or prediction);
- collecting the data;
- analysing the data; and
- writing the report.

However decisions are also required in relation to the rationale and purpose of mixing the research, and how the quantitative and qualitative components relate to one another (Powell et al, 2008).

Specifically, Yardley and Bishop (2007), summarise the main questions for consideration in any design involving a mixed methodology. Where required, these will be expanded upon in the following chapters, however in relation to the utilisation of an overall mixed method, they are summarised here for clarity:

a) Be clear about the reasons for mixing methods.

A Pragmatic Psychology stance is taken throughout this thesis, and Fishman is clear in advocating utilisation of whichever research method best suits the research question/s under enquiry (Fishman, 1999). It is widely recognised that qualitative methods may be appropriate for exploratory research and theory building. It can be of value with small sample sizes, can simultaneously examine many potential factors of interest, and has the ability to include environmental complexities and contextual detail (Lyons, 2000). As such, qualitative methods may be best suited to initially examine exploratory research objectives as a precursor to a more detailed exploration of issues.
In this instance, it was decided that consideration of the themes regarding what information is required from BIAs by a specific subset of experienced SIOs, and what information is available at different points in time during a difficult to detect murder investigation, may be best explored using such techniques.

Once relevant variables have been identified, reliable extrapolation of base rates of variables from pertinent datasets, potential correlations and creation of generalisable models in order to assist practitioners, may be best produced from subsequent quantitative investigation.

As such, in order to optimally examine the respective research objectives, different methodologies are required for each of the component studies. Greene, Caracelli and Graham (1989) outlined 5 potential rationales for using a mixed method study. In line with their framework, the mixed method was used in this instance for what they label ‘development’ – i.e. the results from one method (the qualitative study one) helped to inform the other method (the quantitative study two); and ‘expansion’ – the breadth and range of the study is expanded by using different methods for different research components. These rationales have recently been expanded by others (e.g. Mertens, 2003; Punch, 1998) to include the identification of variables (from study one in this instance) that may be measured subsequently (in study two).

b) The aims to be achieved by each component.

The following research objectives will be addressed through a qualitative methodology in study one:

1. To determine what information is available regarding the crime at different stages in a murder investigation (to identify key variables for the second study).
2. To identify what information SIOs want from BIAs (to clarify practically useful 'data out', in terms of the general nature of behavioural investigative advice and in relation to specific offender variables for study two).
3. To identify at what point in an investigation - i.e. when SIOs want assistance from BIAs in relation to providing a profile of the offender (to determine the optimum time of BIA involvement).

4. To identify the format in which behavioural investigative advice would be best received (to determine in what form behavioural investigative advice should be presented to the SIO).

Using the Pragmatic Psychology stance of ‘asking the clients’, it is those select individuals who have had experience in being in charge of difficult to detect murder investigations who will be aware of the complexities involved and how BIAs may be able to assist them. Moreover they will have the knowledge regarding what variables will be available from the investigation at what time in the enquiry, which may be of benefit for any subsequent quantitative analysis. The research’s aim is to be utilised in the naturalistic setting of a difficult to detect murder investigation, and as such it seemed critical to understand the SIOs perspectives to help determine what information from BIAs was needed, and when it would be of most benefit to them.

The following research objectives will be addressed through a quantitative component in study two:

5. To determine the relationship between the variables available to the police about the offence and the known characteristics (available from police records) of the offender responsible (to provide systematic evidence for profiling advice).

6. To examine whether the reliability of profiling advice may be enhanced with the passage of time as more information becomes available to the police i.e. can prediction be refined as the quality and quantity of crime variables increase (to determine the optimum time of BIA involvement).

Once the SIOs have articulated what information is available to the investigation at different stages, and what information they would find useful to receive from BIAs in study one, quantitative analysis enables exploration of whether this can be reliably provided which is the purpose of study two. Using appropriate categories from a pre-
existing dataset of previously detected cases, any patterns and potential relationships in the data can be explored using appropriate statistical tests.

However, practical aims must also be considered during the different components of the research. For example, as the population of SIOs experienced in the type of murder investigations which utilise the services of BIAs is small, in depth, exploratory interviews with a small purposive sample will be useful and appropriate as the aim is to get an insightful perspective from this group. Additionally, if the information available to investigators differs at different stages of an investigation, the research should also aim to take this into account.

In relation to study two, it is recognised that a large volume of information is generated throughout a murder investigation (e.g. Innes, 2003). As such, it would be neither practical, nor desirable to analyse the entire 'population' of data collected for the purpose of this research. Looking forward to future application, BIAs cannot practically read every single piece of information coming into an investigation, and it is likely that only certain pieces of information regarding the offender can practically assist investigators. As such, a practical aim of reducing both the appropriate information to be used as 'data in' (i.e. predictor variables about the offence to be used by BIAs in analysis), as well as consideration to the usefulness of any 'data out' (i.e. results, or outcome variables regarding the offender to be given to SIOs to assist their investigative efforts regarding prioritisation of suspects) was required. Utilisation of the likely types of information which may be of use was extrapolated from relevant research, policing databases, good practice policing guides and from what the SIOs articulated in study one. In addition, Pragmatic Psychology considerations such as the experience of the researcher as a BIA practitioner and the availability and likely reliability of variables, collectively shaped the reduction and use of data.

This approach was phased, as outlined in Table 5.1.
Table 5.1 Pragmatic Psychology - data generation and reduction.

<table>
<thead>
<tr>
<th>Stage</th>
<th>How derived</th>
<th>Where derived</th>
<th>What derived</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Theoretically driven</td>
<td>Academic research, Relevant police databases, Police good practice guides</td>
<td>Variables and considerations relating to the victim, scene, offence and offender</td>
</tr>
<tr>
<td>2</td>
<td>Empirically driven</td>
<td>SIO interviews, SIO questionnaires</td>
<td>Information relating to what, when and how information is available, and what would be useful to investigators</td>
</tr>
<tr>
<td>3</td>
<td>Statistically driven</td>
<td>Merged variables, Chi-square, Odds ratios, Grouped variables</td>
<td>Refined variables appropriate for further quantitative analysis and potential development of predictive models</td>
</tr>
</tbody>
</table>

As such the different components are aimed directly at exploring the different research objectives in the most appropriate and pragmatic way.

c) How the paradigms are being integrated and whether or not priority is being given to qualitative and/or quantitative components.

Whilst as yet there is no consensus regarding the types of mixed method designs which exist (Creswell et al, 2003), in the present study the models suggested by Powell et al (2008) have been utilised to integrate the research studies, and to enhance the development of a common language for future researchers using a mixed method.

The phasing of the qualitative and quantitative component parts of this research in the present thesis occur sequentially (as opposed to concurrently), and the ‘relationship of the samples’ are multilevel in that two different sets of samples are extracted from different populations (Onwuegbuzie & Collins, 2007).

In relation to the design, Leech and Onwuegbuzie (in press, cited in Powell et al, 2008) would classify this research as ‘fully mixed’ in that study one - the qualitative study, was essential for the remainder of the research to be carried out - it was used to
develop the variables used in study two. The research should also consider the emphases put on each of the component parts. In line with recommendations from Powell et al (2008) that full information from the qualitative component of studies, including the method by which any themes are identified, is emphasised as much as any subsequent quantitative component, in this instance both qualitative and quantitative studies were considered equally dominant.

However, due to the underlying pragmatic theoretical stance of the thesis, which has been focal to guiding the study (over and above the use of method), the current research is more likely to be labelled as 'sequential transformative'.

As recommended by Hanson et al (2005), a notation system has been employed to visualise the mixed method design. Such shorthand visuals have been commended as a useful way for readers to understand the basic procedures of any mixed method study (Creswell et al, 2003). The suggested 'rules' for drawing up visual models for mixed method designs have been used (see Appendix 5i, Ivankova et al, 2006) and building on work by Morse (1991), and Tashakkori and Teddlie (1998). The final model used here has been adapted from that recommended by Creswell et al, (2003). As seen in Figure 5.1, this provides a visual depiction of the integration and prioritisation of the research design for this research. As per protocol, the methods given priority are cited in capital letters (both are given equal priority in this instance) and arrows indicate the sequential (rather than concurrent which is indicated by '+' signs) nature of the studies.
Figure 5.1: Visualisation of Mixed Method Research Design

Previous Literature

Study one - QUALITATIVE Research

- Qualitative Data Collection
- Semi-structured interviews
- 11 participants

- Qualitative Data Analysis
- Qualitative content analysis

- Qualitative Findings
- Consideration of research objectives 1-4
- Variables for study two

Study two - QUANTITATIVE Research

- Quantitative Data Collection
- Selection of cases/variables from SCAS database

- Quantitative Secondary Data Analysis
- Frequencies
- Chi-square/Odds ratios
- Configural Frequency Analysis
- Logistic Regression

- Quantitative Results
- Consideration of research objectives 5-6
d) How the data will be related and the research put into practice.

Each component of the current research addresses individual research objectives which are both qualitative and quantitative, and as such the use of mixed method has been present from the initial design stage. However the research overall is ‘composite’ and is additionally re-connected in the intermediate stage, where the results of the qualitative analysis are used to inform and guide the data collection and analysis in the second, quantitative study (Ivankova et al, 2006). As such the research is additive, with each piece building upon and utilising the results of previous findings, informing later parts of the study. So for example, the findings from the literature review inform the process of, and the development of the protocol for, the SIO interviews in study one. Then subsequently, the findings from study one assist in consideration of both the predictor and outcome variables subsequently used in the statistical analysis in study two. Study one will identify predictor variables – i.e. those available from the crime scene which may be used in order to make predictions about the offender. These are not under the control of the investigation and are therefore akin to what Wells (1978) labelled estimator variables. Study one will also identify outcome variables – i.e. variables of use to the SIO regarding the type of offender likely to have committed the offence. These are akin to what Wells (1978) described as system variables or those that potentially can be under the control of the criminal justice system – if certain variables are of greater (or less) interest to SIOs, these can be appropriately provided (or disregarded).

Finally the results from both stages will be integrated again during the overall interpretation of the research in its entirety. It is anticipated that individual and overall findings can therefore be practically used and appropriately disseminated to the relevant practitioners. Researchers may be interested in the underlying Pragmatic Psychology approach and use of mixed methods, investigators may wish to develop the predictor and outcome variables, and BIA practitioners may wish to utilise the results (with appropriate caveats) in future assessments of murder enquiries in which they are invited to assist.
5.5 Links to pragmatism

Hanson et al (2005) highlight how some authors view mixed methods as just that, a 'method' which allows researchers to utilise any underlying paradigm. Creswell et al (2003) also explain how when using mixed methods the 'theoretical lens' may be explicit or implicit, however note that the ideological viewpoint of the researcher often informs the purpose of the research.

As described previously, Pragmatic Psychology fully appreciates that the research methods adopted should be those best suited to answer the research questions or objectives. Others have also highlighted this need, for example Sigmund Koch believed that methods should be devised with "intelligent flexibility to fit the problems being pursued" (Smith, 2001, p443). For pragmatic psychologists, qualitative, quantitative, or a mixture of both methods, are embraced and utilised as necessary (Howe, 1988).

Conversely, many prominent mixed method researchers and scholars view pragmatism as the 'best' paradigm when undertaking mixed methods research. Indeed Tashakkori and Teddlie (2003, p74) state;

"There is a responsibility to make it clear to our students that finding answers to research questions is the most important aspect of their research. Paradigm issues are secondary to this quest for answers, and research design always follows the research question...A pragmatist approach is needed and the research question needs to be addressed accordingly."
5.6 Conclusion

This chapter has discussed the methodological considerations of the current thesis. It briefly compared quantitative and qualitative research, arguing that the reputed differences between approaches have been exaggerated. The benefits of mixed method research designs were outlined, together with the principles for consideration when conducting a mixed methods design. These were detailed with reference to this thesis, and finally links to Pragmatic Psychology were discussed.

The approach of Pragmatic Psychology will permeate this research and a mixed methodology involving both qualitative and quantitative studies will be used as appropriate to explore the research objectives. The Pragmatic Psychology approach will enable optimum data collection and analysis, and allow for holistic exploration of the research objectives with continual consideration of practical goals.

The next chapter will detail study one which considered the role of the SIO and the provision of behavioural investigative advice to investigations. The study involved semi-structured interviews with experienced SIOs who have been in charge of difficult to detect murder investigations. Qualitative content analysis was undertaken in order to answer research objectives 1-4, and elicit appropriate, relevant variables for subsequent research (study two).
CHAPTER 6: STUDY ONE: THE ROLE OF THE CLIENT: A QUALITATIVE ANALYSIS

6.1 Introduction

The previous chapters have outlined details of the conduct of murder investigation, behavioural investigative advice, and the theoretical and methodological considerations for this thesis. This chapter will detail the first study, which elicited views on behavioural investigative advice from the main client of Behavioural Investigative Advisers (BIAs) in difficult to detect murder investigations – Senior Investigating Officers (SIOs).

The chapter will begin by outlining the research objectives to be addressed by this study, and will then go on to describe the method used, including the choice of participants and offence. It will then set out the guiding conception behind the research, outlining how the study will be multivariate; holistic; molecular; systems oriented and organic. It will detail the interview structure, procedure undertaken, and how the analysis was conducted. The results will then be presented – first giving consideration to features relating to the investigative process, and then detailing features relating to the products available from the BIA. Finally, the findings will be visually depicted in the form of a systemic summary and discussed with reference to the research objectives.

As highlighted in Chapter Three, retrospective satisfaction surveys of police officers have articulated an uncomfortable combination of confusion, praise and scepticism regarding the provision of behavioural investigative advice to serious crime investigations in the UK. Criticisms include the type of advice provided – for example being either of limited use in solving the case or opening new lines of enquiry, and in the timing and format of information provided – being received too late as the advisers were too busy with competing cases or other tasks, or that it was received only in verbal form which may be misinterpreted (Copson, 1995). The main purpose of study one is therefore to proactively ascertain what advice investigators want from BIAs, when they want it, and in what format.
This data, once analysed will then inform study two, which will attempt to deliver advice and evaluate the products against a timeline.

The research objectives for study one are:

1. To determine what information is available regarding the crime at different stages in a murder investigation (to identify key variables for the second study).
2. To identify what information SIOs want from BIAs (to clarify practically useful 'data out', in terms of the general nature of behavioural investigative advice and in relation to specific offender variables for study two).
3. To identify at what point in an investigation – i.e. when SIOs want assistance from BIAs in relation to providing a profile of the offender (to determine the optimum time of BIA involvement).
4. To identify the format in which behavioural investigative advice would be best received (to determine in what form behavioural investigative advice should be presented to the SIO).

These objectives are pragmatic, in that addressing them will;

- directly influence the choice of offence variables in study two;
- shape the nature of subsequent offender variables and findings from study two; and
- ultimately inform future recommendations regarding the nature and content of the provision of behavioural investigative advice.
6.2 Method

6.2.1 Choice of participants

The participants, SIOs, are the main clients of BIAs. Such individuals are the lead decision makers throughout the course of the investigation, and it is they who decide whether or not to engage and utilise behavioural investigative advice.

Pragmatic Psychology researchers argue that key issues emerge from consideration of particularly difficult and/or unusual cases. As such, research participants were identified from a purposive sample of serving or recently retired SIOs having specific experience in relation to difficult to detect murder investigations. It quickly became apparent the population of SIOs experienced in serious crime investigation who have utilised the services of BIAs was small, and these SIOs are repeatedly called upon to investigate such offences. A total of 36 such individuals, all male, were initially identified by asking the Operational Support staff and consulting records held at the National Policing Improvements Agency (or National Crime Faculty as it was known at the time).

The 36 SIOs were filtered by means of the following criteria;

- having specific experience in difficult to detect murder investigations;
- the cases for discussion were detected;
- their current availability for interview; and
- in order to provide an appropriate representation of forces from the UK, including both metropolitan and provincial areas.

The reasons for these criteria were to gain as much information regarding the offence and offender (who would be known in detected cases), to overcome potential disclosure issues regarding discussions about undetected cases, and to undertake interviews within a realistic time frame.

This process resulted in 12 SIOs being identified. They were all the SIO in charge of the cases being discussed. All participants were or had been until recently, serving SIOs with
considerable experience in serious crime investigation – all had served at least 20 years as a police officer at the time of interview and all were extremely experienced in working on this type of enquiry within the Criminal Investigations Department (CID). All had used behavioural investigative advice in their investigations. In the event, one SIO having initially agreed to be interviewed withdrew due to operational contingencies.

Table 6.1 provides basic demographic information for the research participants.

Table 6.1 Participant demographic information.

<table>
<thead>
<tr>
<th>INTERVIEWEE</th>
<th>HIGHEST RANK HELD</th>
<th>METROPOLITAN(^{10})/ PROVINCIAL FORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Detective Chief Inspector</td>
<td>Metropolitan</td>
</tr>
<tr>
<td>B</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>C</td>
<td>Detective Chief Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>D</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>E</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>F</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>G</td>
<td>Detective Chief Superintendent</td>
<td>Provincial</td>
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<tr>
<td>H</td>
<td>Detective Superintendent</td>
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<tr>
<td>I</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
<tr>
<td>J</td>
<td>Detective Chief Superintendent</td>
<td>Metropolitan</td>
</tr>
<tr>
<td>K</td>
<td>Detective Superintendent</td>
<td>Provincial</td>
</tr>
</tbody>
</table>

When conducting pragmatic research decisions made in relation to the ‘boundary problem’ of how many cases to look at (or interviews to conduct) alongside how much detail to go into must be specified. For the current study the sample of 11 participants – which included one pilot interview, was considered adequate. Morse (2000) highlighted sample size estimation for qualitative research should be based upon the scope of the study, nature of the topic, quality of the data, the design and the use of shadowed data (when participants speak of others’ experiences).

\(^{10}\) For the purposes of this study, ‘metropolitan’ forces have been defined as including the Metropolitan Police (London) and Greater Manchester Police. All other UK police forces have been included as ‘provincial’.
6.2.2 Choice of offence

As outlined in Chapter Two, historically BIAs have advised on difficult to detect, stranger or serial murder investigations and serious sexual offences. In part this is due to the belief that these types of offence may be ones in which the ‘personality’ of the perpetrator may be revealed at the crime scene (Holmes & Holmes, 1996). There is a variety of potential behaviours from which the offender may ‘choose’ (e.g. what sex acts to undertake, whether or not to use a weapon, where to leave the victim etc.) and an implicit assumption in profiling is that such choices may give ‘clues’ as to the personality and identity of the perpetrator. It could be argued that profiling serious sexual offences with a living victim may be somewhat easier as usually there is a corpus of victim and/or witness statements from which vital information and more direct ‘clues’ can be gleaned. Victim testimony is obviously unavailable in cases of murder, making profiling all the more difficult and often reliant upon inferences drawn from the deceased’s body and crime scene.

In addition, by their very nature difficult to detect murder investigations are problematic, often being time consuming, resource intensive, attracting a great deal of media attention, and causing a great deal of concern to the general public. As such, any additional advice to investigations may be even more welcomed and warrant the time and expertise of a BIA. The focus of the current research is therefore upon difficult to detect murder offences.

6.2.3 Guiding conception

As highlighted in Chapter Four, pragmatic researchers use a guiding conception as a road map to assist the design of their research (Fishman, 1999). As recommended, the guiding conception has considered the following points in relation to this study:

*Multivariate:* In order to consider as many potential variables as possible, open ended questions and probes were used in the interview schedules for study one. This enabled a variety of information to be elicited in relation to what information investigators want from BIAs, and specifically identified which offender information would be of interest to them for the purposes of offender profiling.
Holistic: Study one initially aimed to identify all of the potential areas in which behavioural investigative advice is required including interview strategy, psychological offender profiling, offence linkage, or media strategy. This enabled broader issues and 'real world' to be taken into account, and consideration could be given to how such advice would fit into their overall investigation. The study also sought to identify areas, not currently supported by BIAs and so provide an exhaustive itemising of all the domains of potential interest to SIOs. This represented the holistic requirement of Pragmatic Psychology.

An important standard in pragmatic psychological research relates to accuracy - not only of the research itself, but also to ensure that findings are considered in context. Asking the interviewees to discuss in detail then timeline plot a case study and check their case files, allowed for verification of the information. This also contextualised the process rather than simply considering the provision of behavioural investigative advice in isolation.

Molecular: Yet in addition, study one also aimed to identify molecular areas of advice required. Thus one domain area - profiling advice, was explored in greater depth, and de-constructed to determine precisely what SIOs wanted to know about the offender. Likely profiling domain items included the perpetrator's age, ethnicity, and criminal history. The SIOs were then asked to provide an indication of the information yield expected from this type of information. This section will inform study two, ensuring the large number of variables available from the victim and the crime scene are reduced, in order to explore only the relationships between key situational and offence variables and the likely (and relevant) background of the offender.

Systems oriented: This was interpreted in a more limited way in the present study. Usually this is taken to mean the organisational systems within which the individual works. Whilst systems have been considered in relation to the practical availability of data and appropriate utilisation of research findings, here it will be interpreted primarily to construct a system of relevant and timely interactions between the SIO and BIA.
Finally the research was designed to be organic, in that study two will develop in light of the findings and interpretations of study one.

The design was also organic in that the overall experience of the SIO was considered (in other words the aggregation of their collective experiences of multiple cases) as well as charting individual cases they were involved with.

6.2.4 Interview

Pragmatic Psychology indicates that useful information may be obtained from careful examination of individual cases. As such semi-structured interviews were designed to elicit the individual's experiences, thoughts and perspectives in relation to a specific difficult to detect murder case the investigator (interviewee) had been in charge of. There were a set of introductory questions asking about the general role of an SIO. These were progressively refined to discuss behavioural investigative advice. Whilst the full interview schedule can be found in Appendix 6i, the main questions are outlined below:

1. What is your role as an SIO?
2. Can you talk me through a difficult to detect murder investigation in which you were SIO?
3. Did you use a profiler\textsuperscript{11}?  
   \begin{itemize}
   \item At what stage were they brought into the investigation? Why then?
   \item From your perspective what type of behavioural advice was of assistance?
   \item What else do you think may have benefited the investigation to have known regarding the likely suspect?
   \end{itemize}
4. From your perspective, how would such advice link into potential lines of enquiry?
5. In your view, when would this type of information be useful?
6. In what format would you find the information useful?
7. In your force how much suspect information is gathered for court preparation or post conviction?
8. Is there any information you feel I may benefit in knowing to assist my research?

\textsuperscript{11} Offender profilers are now known as Behavioural Investigative Advisors (BIAs) however the term BIA and profiler were referred to ensure the interviewees understood the types of individuals the researcher was referring to. Some of the SIOs had only used 'profilers' when they were called such and may not have been aware of the change in title.
Within questions 2-4, interviewees were initially requested to draw a ‘timeline’ highlighting at which stages information came into the investigation, the resultant actions and investigative decisions, and the actual/potential role of a BIA within this. The pilot interviewee did not like this process and so in future interviews the researcher drew the timeline as the participant was talking, and asked them to review it at the end of the interview. An example of a plotted timeline is provided in Appendix 6ii. Participants were invited to utilise verification data (for example their policy files) for external corroboration and aid of recall. This method enabled the results to be more reliable and not solely reliant on recall. This provided insight into the investigators’ actual behaviour rather than purely their account of intended or ideal action.

Introductions and closure ensured full ethical coverage, and consideration of pragmatic proprietary standards. The content of the written research agreement was verbally reiterated and information provided regarding the researcher, research, confidentiality, permissions regarding recording, withdrawal of participation, and feedback of results.

6.2.5 Procedure
Having identified and selected participants fulfilling the research requirements, they were initially telephoned, and then follow up confirmation letters were sent with the ‘research agreement’ for signature prior to interview. Copies of these can be found in Appendix 6iii-6vi. 12 interviewees were contacted and all agreed to be interviewed though one subsequently cancelled and despite several attempts could not be re-scheduled, resulting in a final sample of 11 interviewees.

All of the interviews took place between 5th August 2002 - 7th January 2003 at times and locations requested by the interviewees. During the interviews, attempts were made to keep interruptions to a minimum.

One pilot interview was conducted to trial the interview questions, length of interaction and general technique. This was externally observed by an experienced researcher who, with the participant, provided subsequent verbal and written feedback. Several points of interest were raised which led to only minor amendments, as such this interview was
Included in the current study. ‘Contact summary sheets’ were prepared after each interview with learning and points of interest for future consideration in other interviews. An example of a ‘contact summary sheet’ is given in Appendix 6vii.

The relationship between researcher and participant is considered when conducting qualitative research. In addition, Pragmatic Psychology advocates that all stakeholder values and goals should be considered, and further recognises the professional as a participant observer within the research. It was therefore of note that all participants were older male, highly ranked and highly experienced within the police service. The researcher is a relatively young female civilian employee working as a BIA. She had considerable experience interacting with SIOs in murder investigations; however the interviews may have been influenced by these respective roles. Research suggests accounts may combine with self-presentation or motivational factors (Denzin, 1970) hence negative information regarding behavioural investigative advice may have been withheld in respect of the researchers work role as a BIA. In an attempt to overcome this, the role of researcher was emphasised, as was the need to take the BIA profession forward, and the importance of the SIO’s expertise and opinions in doing so. Alternatively, it could also be anticipated that interviewees may have provided greater technical detail if they perceived the researcher to be knowledgeable of murder investigations. This in turn may have led interviewees to be more forthcoming with suggestions.

Pragmatic standards of utility and feasibility require that the results of the research will be useful and capable of being implemented. Ownership of the research within the community from which it emerges is also promoted. The researchers’ position as an ‘insider’ in the BIA and policing community brings knowledge and practical ability to ensure the findings are utilised in future research and practice in her day to day employment. Additionally, the whole focus of the research is practitioner led, enquiring as to what advice practitioners need and attempting to understand how and when this would assist them.
Pragmatic procedure should also consider measures - namely how the impact of the research can be evaluated. In relation to study one this was contemplated with regard to both the practicalities of conducting more interviews tempered with a reaching of saturation point in data collection. Once all initial SIO contacts were interviewed and their interview data analysed, the number of interviewees and information gleaned was reviewed. At this stage it was felt that the main topics and themes were being repeated by subsequent participants, and hence increasing the number of interviews was unlikely to yield many additional insights. In addition validation of the findings was to be sought via other means (questionnaires) as a measure of evaluation of the results found (Wenman, Gozna & Cole, in preparation).

The research was conducted within the principles of the ethical guidelines of the British Psychological Society. The research was explained to potential respondents, that their participation was entirely voluntary, and that they could withdraw at any time from the research. It was further stressed that no individual would be named in the research and that the information provided would be held in strictest confidence. The interviewees were also made aware that the interviews would (with their agreement) be taped in order for an accurate account to be recorded, however no mention of the individuals’ names was made on tape and the typed transcripts were immediately anonymised - participants were only referred to as ‘respondents A-K’. Once analysis is complete this material will be destroyed.

6.2.6 Analysis

Content analysis (Krippendorf, 1980) methodology was deemed most appropriate to extract common comparative themes. Whilst this method has primarily been utilised from a quantitative stance, it can encompass more qualitative, open ended material; including consideration of intent and meaning of concepts from the perspective of the interviewee (see Mostyn, 1985). As such, commensurate with the principles of pragmatism the richness of the verbatim case study account is retained, yet general themes are also abstracted.
The study looked at multiple rather than single cases. Interviewees focused upon discussing their role as SIO on one particular case pertinent to them. However throughout the discussions they were encouraged to compare and contrast experiences in other investigations. In addition to these ‘within participant’ considerations, analysis involved interpretation of the similarities and differences ‘between’ the investigators’ experiences.

The methodology outlined in the ‘concept book’ approach to thematic content analysis (Mostyn, 1985) was followed. This involved initial consideration and contextualisation of the research problem (‘briefing’); consideration of sampling issues (‘sampling’); reflection of personal associated experiences and previous research (‘associating’) and the ‘development’ and ‘testing’ of hypotheses/research objectives moving from general open-ended questions to the more specific during the interview process.

Analysis involved the researcher undertaking full verbatim transcriptions of all interviews (‘immersion’). During transcription, ‘memos’ of thoughts and/or suggestions were written where appropriate. An example of a memo is given in Appendix 6viii. The transcripts were then read fully to digest the overall content of the interview. Next, line-by-line ‘categorizing’ of actions/events, in-vivo responses and research topics, was undertaken using the NUDIST (Non-numerical Unstructured Data Index Searching and Theorising) package. This was carried out by looking at the words, lines, paragraphs and or sections of the interviews and coding them in relation to their salient point/s. These codes were then validated by other researchers in an attempt to increase the reliability of the categorisation. The project was then set aside in order for the researcher to collect her thoughts (‘incubation’). The codes were then revisited in light of other findings and merged as necessary into more overarching themes reflecting further exploration of the relationships between the categories (‘synthesis’). Data were edited (‘culling’); ‘interpreted’ to explore subtle, new and underlying meanings behind those overtly articulated; and finally the findings were repeatedly ‘written, rethought about and re-written’.
6.3 Results

6.3.1 Overview

SIOs articulated the Investigative process as comprising stages, from being initially made aware of a discovered body or bodies, practically becoming in charge of, and then conducting the investigation. They gave details and descriptions of the skills required and constraints encountered. Timelines were plotted to provide an insight into the different stages information came into an investigation, and the investigative decisions made on the basis of these inputs.

SIOs detailed the practical application and requirements of behavioural investigative advice, and provided details regarding when and what type of information ideally would be sought from BIAs.

In order to make sense of the data and identify salient information of relevance to answer the research objectives, the ‘concept book’ approach outlined above was undertaken. As such the information was systematically coded - the codes being derived directly from the raw interview data. As codes emerged these were reconsidered, and merged as necessary, to form overall themes. These themes are specified in table 6.2.
Table 6.2 Themes with summary descriptions and example quotations.

<table>
<thead>
<tr>
<th>THEMES</th>
<th>BRIEF DESCRIPTION</th>
<th>EXAMPLE QUOTATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic skills</td>
<td>Managerial, leadership and investigative skills plus procedural knowledge necessary to perform the role of SIO in a difficult to detect murder investigation</td>
<td>SIO role defined as: &quot;co-ordinate, team approach, leadership, motivate, general knowledge, laws, rules of evidence, investigative skills, provide investigative focus, accountable for every facet of the enquiry, knowledge of specialist resources, now that is my definition&quot; [K : 651 – 656]</td>
</tr>
<tr>
<td>Constraints</td>
<td>Adherence to force protocols, PACE clock, other legal requirements, resource limitations, reliance upon witnesses</td>
<td>Difficulties include: &quot;compliance with PACE, your compliance with PEACE, your compliance with Human Rights, RIPA...the Murder Investigation Manual and then you have got MIRSA and well...there is all the legislative and policy and procedures to follow, it's a bloody complex job now&quot; [K : 699 – 707]</td>
</tr>
<tr>
<td>Information available</td>
<td>Information available (or unavailable) to the investigation such as victim sex, location of body, cause of death</td>
<td>Particularly limited as: &quot;the problem with murders of course is the victim can't tell you anything which is the big difference between that and other offences&quot; [A : 396 – 398]</td>
</tr>
<tr>
<td>Actions</td>
<td>Activities undertaken to gain information which may be of use to the investigation e.g. Setting up HOLMES, conducting house to house enquiries</td>
<td>Assist in determining: &quot;what do we know, what can we prove, what do we think we know&quot; [H : 336 – 337]</td>
</tr>
<tr>
<td>When information required</td>
<td>When advice from a BIA would ideally assist the investigation</td>
<td>Timeliness of advice: &quot;if we had a murder today and you came tomorrow, we sat down, these are my initial thoughts, I would find that useful, and they maybe refined as more information comes in&quot; [E : 863 – 867]</td>
</tr>
<tr>
<td>What information required</td>
<td>The type (e.g. offender profile) and specific nature (e.g. age, ethnicity, previous convictions, lifestyle information) of advice ideally sought from a BIA</td>
<td>Preference for accountable inferences: &quot;I want someone to say to me, look this is likely to be a kid between 14 and 18 with this sort of background and it's based on the fact that we've dealt with 500 murders in the last 10 years in the database, 100 of which fit this MO and on 86 occasions it was someone who fitted this profile&quot; [K : 923 – 929]</td>
</tr>
<tr>
<td>Format</td>
<td>The preferred format (e.g. written reports) in which behavioural investigative advice would be received</td>
<td>Regarding a verbal presentation of findings by the BIAs: &quot;they were spellbound because it's not a case of, we're here with the answers, but we're here with some thoughts, and it was a really electric meeting I thought and they suddenly got the respect of the team&quot; [D : 875 – 880]</td>
</tr>
</tbody>
</table>

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13 Acronym used for interview model: Preparation and Planning; Engage and Explain; Account Clarification and Challenge; Closure; Evaluation.
15 Major Incident Room Standardised Administrative Procedures.
The themes themselves are linked, in that they related to either the process of conducting the investigation (taken primarily from the introductory questions relating to the role of the investigator and timeline data), or the resultant product from the BIA (taken primarily from the latter questions which were more directed towards ascertaining the requirements of the investigator). In accordance with this, the themes will be discussed in more detail below, and a model outlining the relational nature of the findings will be presented at the end.

6.3.2 Investigative process used by the SIO

Generic skills: There was general agreement about the many investigative and managerial skills required as an SIO when considering the crime scene and conducting the subsequent investigation. Investigative skills included having knowledge about general legal matters, specific legislation, policing manuals, and specialist resources.

"it's become a lot more scientific, a lot more procedure based, a lot more relying on peoples' knowledge and expertise" [K: 710 – 714].

More generic managerial skills included having an ability to co-ordinate, creating "order out of chaos" [H: 524], giving instructions about appropriate actions, and leadership – one SIO stated;

"I will set the direction having taken account of the expertise of all the people there" [K: 174 – 176].

In essence,

"the role of the SIO is to reduce a lot of the words experts use down to, this is what we are going to do" [I: 692 – 695].

Other management skills include considering the welfare of, and motivating the team to "keep people motivated and keep going" [I: 871], prioritisation of work, and having an ability to make and revise significant decisions when appropriate.

Some behavioural skills of inference were also being utilised in some of the SIO decision
making. For example one experienced detective considered;

"initially I thought the offender hadn't been there for very long, but then when you looked at the degree of the injuries and the mutilation...it was careful" [F: 895 – 898].

Another described when at the scene, consideration of likely exit routes may impact upon their decisions about where to search for evidence;

"my opinion is you need to go to the scene...get a better understanding on what has gone on...it gives me an idea of the surroundings...what type of premises it is...the family photographs...the neighbours...the type of vehicles parked...the layout of the road...how would this person (the offender) have got there, how would he have got away...the local pub...what made him come to this location, you know this was an open fronted garden...he would have seen her...his escape route out the back was limited...there was a six foot fence...So again when I am starting to look at my initial house to house...my search parameters for discarded weapons, your immediate focus is on the front" [K: 202 - 301].

However another interviewee inadvertently highlighted how sometimes evidence from the crime scene may be interpreted differently by the SIO or the BIA. Whilst a BIA may find the presence or absence of clothing of interest for what such clothing could indicate about the type of victim, or what missing items may suggest regarding the likely criminal background and motivation of the offender, one SIO highlighted how it would assist him in relation to identification of the victim, and gaining forensic evidence;

"...if clothing is missing it informs your thinking in terms of finding that clothing...and linking that to...who she is...her clothing once you have recovered it if it is missing is actually going to assist you to identify her, because, you know black blouse, whatever it is that type of thing, will be the thing that jogs somebody’s memory. But if on the other hand there is not clothing missing then that particular aspect goes out of the window so you don’t need it for those purposes but you might start wanting it for the purposes, like...to recover the clothing then to see what you can get from it forensically so um, contact fibres and um blood from him, fluids from him, on the uh clothing...what they may have left behind.” [J: 447-479].

In addition to the multitude of skills the SIO required to assist them conduct the investigation, they were all also required to work within certain constraints.
**Constraints:** SIOs have to work within their own force protocols. There was much standardisation between forces regarding the types of cases the SIOs generally worked on, and the categorisation of murders as A+ to C dependent primarily upon the initial need for and deployment of resources. However some force differences existed in relation to how offences were allocated for investigation, with seven interviewees referring to the fact that officers who make initial decisions were not necessarily the SIO subsequently given investigative responsibility. This was viewed as constraining the SIOs in that they did not have overall control of the investigation from the outset. This could be problematic, as sometimes initial actions by others appeared to hinder the SIOs subsequent investigations. One SIO recalls how he was disappointed by original searches conducted at a scene prior to his taking charge, and how when he did take charge, additional vital information was secured (which potentially could have been found earlier).

"Police Officer did a search and found only spectacles...and several more in depth searches made though still nothing found. Two weeks later a PoLSA\(^{16}\) team went in and did a complete search and found the wrapped up body of the victim...that weekend I was...off duty and so other detectives took decisions re what should and not be done at the scene.” [A: 277-298].

Another example of this involved the initial treatment of a murder crime scene as a suicide which potentially could have compromised the evidence obtained.

"I got home...phone call from the head of CID to say [a lady] has been found in their home address, with multiple wounds. A DS\(^{17}\) went to it with some uniformed staff...and found [her] in her kitchen....There was considerable blood around...and...serious wound to her wrist. First thoughts...she'd...probably accidentally cut her wrist...then they thought well actually it's not an accident, it could well be suicide. By two or three hours down the road they'd decided it wasn't...I get to know about it and attend the scene about...six hours in, probably lost a little bit of time...it effects me in several ways, firstly your initial actions at the scene can be somewhat effected...I'll just give you an example, I would have asked immediately, I did anyway, you know surrounding roads all vehicle registration numbers to be taken, I also asked for recovery of videos from local shops and garages” [K: 050-115].

\(^{16}\) Police Search Adviser.

\(^{17}\) Detective Sergeant.
Other hindrances involved problems specific to the investigations, for example regarding the location, time of day, or bad weather causing problems in relation to scene security and searching;

"late at night hours of darkness, it affected house to house effected how we surveyed the scene and all the rest of it" [K: 120-122].

There were some constraints and hindrances with which BIAs may be able to assist. Four interviewees referred to the "information overload" and related difficulties in prioritisation of suspects and data. Six referred to their reliance upon, yet the perceived inaccuracy of, witness accounts. Six mentioned problems regarding either the 'media frenzy' or disinterest, in certain cases. As such, behavioural investigative advice in relation to prioritisation of suspects, knowledge regarding eye-witness testimony, and suggestions of how best to utilise the media, may be of assistance.

Five interviewees talked about the constraints involved in obtaining information from experts (including BIAs). In some instances the answers to the SIOs’ questions may simply be unavailable – however other instances involved issues of professionalism such as a lack of communication, high costs and long waits for results. Clearly such areas highlight the need for BIAs and any experts to set clear terms of reference with SIOs.

Investigators also acknowledged their accountability, particularly in relation to legal issues. For example interviewees explained it was the duty of the SIO to ensure all discussions were recorded, preserved, and revealed to the prosecution for potential disclosure to the defence. The SIOs therefore recognised the need for prior consideration of the possibility of receiving inaccurate advice from the BIA and the potential impact this may have.

Therefore SIOs not only require many skills when taking charge of a murder investigation, they also have to work within certain constraints, and with the information available to them at different stages.

*Information:* The amount and nature of information coming in to the enquiry depended
upon the particular investigation. Whilst information was ‘drip fed’ in at different stages, the timeline data revealed some interesting patterns regarding when information generally became available. This is of use not only for an awareness of how decisions need to be made on the basis of sometimes limited information, but also assists in identifying what information BIAs may have available to them at different stages - hence when the provision of behavioural investigative advice may become more valid.

There was consensus in that interviewees detailed how the location of where the body was found; the sex of the victim; the position; and state of undress were generally known upon or very soon after, discovery of the body. Within the first 24 hours the post mortem had usually taken place, and could typically provide clarity regarding the nature and possible sequence of injuries, and the probable cause of death. In addition, items believed to have been left at the scene; and the approximate age and ethnicity of the victim; were all usually apparent fairly early on. Whilst the initial information received may not always be accurate and could subsequently change, quite a lot of information was available initially regarding both the physical attributes of the body and scene and the personal attributes of the victim which would be of use to the BIA.

Over the next few days more detailed information emerged. Statements and photographs/video records of the precise position of the body when found and information from intelligence trawls, witnesses, house to house enquiries, friends and relatives, and the media also began to accumulate.

Over an indeterminate period a vast amount of additional information came in to the investigations regarding for example forensic findings, suspects, financial dealings, and telephone activities - providing additional behavioural data. Innes (2003) similarly highlighted the vast array of information which comes into the investigation at different stages and in different quantities, highlighting the various ‘bursts’ during different times during the enquiry.

From this information coming in, the SIOs had then to decide which specific ‘actions’ or lines of enquiry they wished to undertake. The BIA may be able to assist in consideration
or prioritisation of such actions if required.

**Actions:** Initial actions appeared somewhat standard including identification of the victim, organisation of the post mortem, securing, recording and gathering evidence from the scene, and initiating house to house enquiries and searches. Actions undertaken following these included notifying the victim’s family, consideration of the potential impact to the community, and setting up the incident room.

Throughout the investigative process, prioritisation of appropriate lines of enquiry and delegation of relevant 'actions' to the investigation team, to obtain further information regarding the victim, witness, scene and/or suspect were continual. One SIO described:

"We went to the school, people who may have known her..., CCTV was quite important. Intelligence...those who lived very close to her or if we got specific information regarding them. We did telephone usage both in and outgoing which proved quite helpful...we plotted the internet usage and phone use" [B: 450-478].

Nine interviewees stated behavioural advice had assisted in either adding more scientific confidence to their decision making, or in prioritisation of some activity. For example after advice from the BIA to consider of interest persons in the vicinity persistently visiting sex shops, subsequent actions were raised:

"We concentrated on people who visited sex shops and...checking against associations - if we got a match they would be high priority actions” [B: 234].

Other examples were given of actions raised as a direct consequence from behavioural advice, some of which assisted in identifying the offender.

After a suspect had been charged, actions related more to preparation for court presentation, liaison with the victim’s family, retaining and returning items recovered during the course of the investigation.
The investigative process is complex. Whilst SIOs may bring skills and experience to assist them in leading such enquiries, they also have to work within certain constraints. In addition, a multitude of information of interest may be 'drip fed' to the investigation at different times and from different sources of varying reliability. Yet the analysis of such information is crucial, as it is likely to focus subsequent investigative endeavour and actions.

6.3.3 Product from the BIA

In relation to the specific products required from the BIA, interviewees had similar views. Early provision of advice would be beneficial, and most agreed upon the general type of information from BIAs which would be of greatest assistance to them.

When information required: There was general agreement that the quicker advice could be received from BIAs the better, and the need for setting explicit terms of reference regarding time scales was advocated. The difficulties in relation to interview advice were also discussed as it appeared the requirement for ‘fast time’ responses sometimes made it difficult for the BIA to attend, or conduct full and detailed analysis in advance.

Participants were asked at what stage they would prefer BIA involvement. Most interviewees stated that the level of information required by the BIA may not be available to the investigation within the first hours, although one commented it should be up to the experience of the BIA to assess and communicate this. Some stated they would not consider a BIA within the first 24 hours as they are too busy and two suggested waiting 72 hours.

However, others had a different view. One interviewee stated that to assist in prioritisation of resources, interpretation of the scene and development of initial hypothesis, it was crucial to get BIA assistance as soon as possible. Others concurred, stating
"when you start at that early stage there are things that you would be looking at that would ring bells, whereas I'm talking about how am I going to exploit forensic on her, I've got a hell of a lot going on in my mind" [C: 400-411]

"at the outset with cases like this I think that an SIO needs whatever help he can get to rationalise what we are dealing with" [D: 110-115]

Others agreed that if it appeared unlikely the enquiry would be resolved quickly, a BIA should be involved. Three articulated that an early indication of motive or analytical comparison to historical cases would be useful. A repeated suggestion was for advice to be supplied throughout the course of the enquiry, with the BIAs recurrently 'touching base' with the investigation so as initial findings could be continually refined as necessary as more information becomes available.

What information required: The SIOs articulated the need for BIAs to be accountable by providing written reports, with statistical, research or experientially backed recommendations. This gave the SIOs a better foundation on which to base their decisions. Such thoughts from SIO practitioners echo academic discussions by Alison and colleagues (Alison et al, 2003, 2005; Almond et al, 2007) in relation to the need for BIAs to provide explicit rationale and backing for the behavioural advice they provide.

Interviewees were clear in what they did not want. Many stated they sometimes have difficulty in knowing whether or which type of BIA would be of benefit, and what information to ask for, that information provided by the BIA was not definite, nothing could be done with it, it took too long to arrive, was merely a 're-hash' of what was already known, or stated the obvious. Such findings are in concordance with previous research regarding the provision of offender profiling advice in the UK (Copson, 1995) and appear rectifiable by proficient communication between the BIA and the SIO throughout the course of their involvement in the case.

There were also many positive comments, and interviewees stated they would, or have used BIAs repeatedly. BIA reports were especially praised if they were succinct, neither too broad, nor too narrow in terms of the characteristics provided - reflective of the
'bandwidth-fidelity' trade off issue discussed in Chapter Three section 3.6.

The SIOs wanted reports which added value, and were tailored to the specific offence and type of victim.

When asked about the specific content of information, several articulated they preferred more statistically based inferences regarding the likely characteristics of the offender, however clinical knowledge directly from exposure to offenders was also viewed as important, and the team approach to profiling - involving BIAs with different backgrounds, was strongly advocated.

SIOs stated they would like to receive detailed inferences regarding the likely relationship between the offender and victim, the likely sex, previous convictions, ethnicity and age group of the offender. Such information is reflective of that already routinely provided by BIAs in the UK (Rainbow & Gregory, 2009).

Yet whilst these factors were deemed useful as investigators hold information on such data (making initial suspect generation and prioritisation easier), there were other factors they also felt would be of assistance. Detail about the nature of employment, regarding access to potential weapons or specialist knowledge, were also mentioned as being of use and are potential areas of further exploration.

Six interviewees discussed the importance of getting as much information as possible regarding the general lifestyle or hobbies of offender. Information requested included inferences regarding the suspects’ education, sociability, way they conduct themselves, medical conditions, family background, demeanour, whether they abuse their wife or children, their aspirations.

When probed about the usefulness of this type of information, one interviewee responded;

"what I need is for when my detectives go to the door, that they use their intuition, something clicks about this individual and uh, if that individual fits the kind of profile you have come up with, and there is something about him
that they are not happy with, I would expect those individual officers to pursue that to their satisfaction and ultimately to my satisfaction...it’s not just about previous convictions” [I: 889 – 945]

Four interviewees discussed the usefulness of knowing the likely relationships and living arrangements of offenders, one discussing how he would have utilised information to find out which individuals lived alone. Others however highlighted the difficulties involved in researching such information, limiting its value.

Whilst information regarding a likely ‘profile’ of an offender was felt to be of use, other areas in which BIAs could assist were also articulated. These included assistance with geographic considerations in attempting to locate offenders, in crime scene interpretation, consideration of motivation, what and how to release details to the media, assistance with interview strategies for witnesses and suspects, generation, testing and revision of hypotheses, offence linkage, risk assessment of re-offending, and overall prioritisation of lines of enquiry and search parameters, and suspects. Again, many of these services are reflective of those already offered by BIAs in the UK (Rainbow & Gregory, 2009; West, 2001). However other suggestions included assistance with questionnaires and schedules for the purpose of conducting house to house enquiries, assistance with house searches, management of team welfare and morale, and prioritisation of actions and messages coming into the incident room.

It appears therefore that advice regarding the likely background of an offender would be of use to investigations and this advice should not be merely restricted to providing profile features that are immediately searchable on police systems. The interviewees articulated that any background and lifestyle information could assist them in attempting to trace the offender. Additionally it appears there are many areas other than profiling in which advice from BIAs may be of use to SIOs.

Format: In relation to the preferred format in which they would like to receive behavioural investigative advice, in some situations - such as the provision of brief interview advice, the SIOs would not expect this to be followed up in writing for their purposes. However, eight interviewees generally advocated the need for written advice
from BIAs. This is in accordance with ACPO guidelines for adherence by UK BIAs which necessitates a commitment to producing written reports (Rainbow, 2008). The interviewees in the present study indicated that it did not matter in what format this arrived, as long as the information was received in a secure manner.

Six of the interviewees highlighted written advice in combination with initial verbal thoughts would be the ideal, provided the verbal advice was the same as what would later be reflected in the writing. Dialogue with, and presentation to the management or investigation teams was also advocated as beneficial.

Mention was made that SIOs may not have time to read lengthy reports. Suggestion was made that a full report was written with justifications for inferences made - for example inferences and recommendations should be backed by relevant research, databases or experience. However, a front bullet pointed page acting as an executive summary outlining the main issues in an easily understood format would also assist. Consideration of the provision of an executive summary has similarly been advocated by Alison et al (2007).

6.3.4 A systemic summary

As highlighted above, the interviewees indicated a number of issues in relation to the investigative process of conducting a difficult to detect murder investigation from their perspective. They utilise generic skills primarily in relation to investigative knowledge and management skills, however are still faced with a difficult and multifaceted task as a SIO in charge of a difficult to detect murder. The task is made somewhat more difficult by various constraints which are placed upon them, be they force protocols, legal constraints or practical hindrances. They receive a vast amount of information throughout the course of the investigation. The SIO continually raises actions, or “units of activity...directions to perform a specific task” (Innes, 2003, p97) for their investigation team to undertake in order to attempt to determine and prove what happened - who killed the victim, where, why and how.
Behavioural investigative advice clearly has a role in such enquiries, and recommendations in relation to the nature of the content of the advice required were articulated by the interviewees. The majority of comments were reflective of current services provided by BIAs in the UK; however some additional services such as assistance with house to house enquiries and prioritisation of messages coming into the incident room could be explored further in future. Information was also elicited specifically in relation to offender profiling - the type of information regarding the likely background of the likely perpetrator which would be of most use to them. Perhaps surprisingly, this included a vast array of information, some of which would not readily be searchable in current police systems but may merely give officers some clue as to the type of person they were likely to be looking for. The timing of when advice would be best received was discussed, and there was considerable agreement that repeated contact throughout the course of the investigation was the ideal, particularly in relation to offender profiling. It seems however that other areas of advice, although could be considered throughout the enquiry, were most likely to have been requested at different stages. Finally the format in which advice was best presented, the quality, and timescales for advice was discussed. A model considering the relational nature of these findings is outlined in Figure 6.1.
Figure 6.1: Model of the SIO’s investigative process (pre-charge) and how this relates to the product from the BIA.

**SIO GENERIC SKILLS**
- Managerial
- Investigative

**CONSTRAINTS**
- Force set up
- Initial response
- Hindrances
- Accountability
- Legal Issues

**INVESTIGATIVE PROCESS USED BY SIO**

**VISIBLE CUES IN FIRST HOUR:**
- Victim sex
- Location of body
- Position of body
- State of undress

**SIO/‘FAST TRACK’ ACTIONS**
- e.g.
  - Identity victim
  - Secure scene
  - Organise post mortem
  - Incident room
  - Initiate house to house

**USUALLY WITHIN 24 HRS:**
- Victim age
- Victim ethnicity
- Cause of death
- Items left at scene

**SIO ACTIONS**
- e.g.
  - Notify victim’s family
  - Community impact
  - Set up incident room

**MORE LIKELY AFTER 24 HRS:**
- Intelligence (friends etc.)
- Witnesses
- Finances
- Forensics /Specialists
- Telephones
- Suspects

**PRODUCT FROM BIA**

**WHEN REQUIRED**

**WHAT REQUIRED**

**CONTENT: PROFILE**
- Profile - sex; relationship; living arrangements; previous convictions; ethnicity; age; employment; weapon access; specialist knowledge; lifestyle; hobbies; education; sociability; way conducts self; medical conditions; family background; demeanour; aspirations

**OTHER SERVICES**
- Crime scene assessment
- Hypotheses generation and development
- Motive
- Risk assessment

**QUALITY**
- Succinct; written report; adds value; rationale (e.g. statistics); tailored to offence/victim; points neither too narrow/broad; pragmatic; not contradictory; submission within agreed timescales; involves a team of BIAs
6.4 Discussion
The findings will be considered in relation to each of the research objectives.

6.4.1 Determination of available information regarding the crime at different stages in a murder investigation
Information is 'drip fed' into the investigation at different stages; however the timing of when certain information is likely to be received in the early stages of this type of investigation is generally predictable. Information available in the first hour is usually in relation to the sex of the victim, location, position and state of undress of the body. Usually within 24 hours further detail regarding the likely age and ethnicity of the victim, likely cause of death and whether or not items have been left at the crime scene become available. Thereafter even more detailed information regarding the victim, offence and suspects becomes known at various stages.

Such information will be used in consideration of potential offence variables for study two.

6.4.2 Identification of what information SIOs want from BIAs
Features such as the likely relationship to the victim, age, ethnicity, previous criminal history, living arrangements and likely employment were all deemed of use to the investigation. Of interest was the suggestion that the content of this advice should not be restricted to providing profile features that are immediately searchable on police systems. The interviewees articulated that any background and lifestyle information could assist them in attempting to trace the offender. The difficulty may be however, in collecting reliable information regarding offenders' 'sociability', 'demeanour' and 'aspirations' for example.

Additionally it appears there are many areas other than profiling (including offence linkage, interview strategy and risk assessment of future offending) in which advice from BIAs may be of use. In general, these findings are commensurate with the writings of West (2001). Of interest, areas such as assistance with house to house enquiries, prioritisation of actions and messages, and aid with the management of the team's welfare and morale were also discussed as being of potential assistance. Such advice is not currently routinely offered by BIAs and therefore may be worthy of further research. However, a follow up questionnaire study (Wenman et al, in preparation) did
not subsequently highlight these areas to be of great significance when tested upon a wider SIO audience.

Importantly, to assist SIO decision making, the interviewees wanted recommendations from the BIA which fulfilled certain qualities – for example advice which was explicitly supported by statistical or research findings, or by previous experience of similar cases. This is in line with suggestions from recent research advocating transparency in the reasoning and rationale for claims made within BIA reports (Alison et al., 2003, 2005; Almond et al., 2007).

The ‘team’ approach to profiling was also advocated. Of interest is that ‘profiling’ efforts in other countries appear primarily to utilise more of a ‘group’ approach, with teams of BIA’s dispatched to and brainstorming cases collectively and profiling jointly, before feeding back the results to the investigation team. Personal experience of the present researcher indicates such practices are common in both Germany and the FBI (USA) for example. Certainly this team approach may be best practice, although is obviously dependant upon resources and the nature of the case – for example the FBI would not deal with a single stranger rape case (they would only usually deal with a series) as undertaken in the UK. As such the validity of dispatching a ‘team’ to such a case must be considered.

The UK initiative has been to utilise more multidisciplinary teams – involving differing ranks of detective (experienced in serious crime investigation), a crime analyst, a geographic profiler, a forensic scientist (and other experts as appropriate) in Regional teams who dispatch when necessary to cases in conjunction with the BIA. Whilst this approach is beneficial in ensuring other investigative suggestions and considerations are captured and are incorporated, relevant and usable by investigative teams, it means that usually only one ‘lone’ BIA is involved in a case, limiting additional BIA involvement to peer review of any final report or the occasional BIA case conference at the request of one of the BIAs.

There may be scope therefore to include a greater number of BIAs on cases, and to incorporate both statistical and clinical considerations (currently the NPIA has limited clinical resilience ‘in-house’). For example initial statistical findings could be later refined as richer qualitative and idiosyncratic information emerges, or a ‘team’
including a combination of a clinical BIA working in conjunction with a more statistical BIA may be of benefit. Reports could then be produced which are automatically agreed by more than one person; with suggestions supported by additional experiences (e.g. direct contact with clients); and with additional investigative suggestions (for example regarding media or interview strategy). It could also be that some of the anxiety experienced by BIAs in working on difficult cases alone, may be alleviated by an increase in 'shared' or diluted responsibility. Suggestion of using 'multiple profilers' has been made by others previously with recognition that when “different approaches are adopted, the quality and quantity of information is likely to be superior” (Bekerian & Jackson, 1997, p211). However the resource implications and possibility that BIAs may disagree with one another has also been recognised (Bekerian & Jackson, 1997). Certainly however, anecdotally when such individuals have worked together, it is felt the input to the investigation has been enhanced (personal experience and personal communication, Adrian West, 2008). As advocated by Alison et al (2004) it is believed separation between the different factions of profiling is unnecessarily divisive, undermining the potential contribution of behavioural investigative advice, and utilisation of both approaches in combination in these ways may be appropriate.

Such information requested by investigators will be used to shape the nature of study two, in particular in consideration of potential offender (outcome) variables. In addition, it will also inform recommendations regarding the nature of the provision of future behavioural investigative advice.
6.4.3 Identification of points in an investigation when SIOs want assistance from BIAs in relation to providing a profile of the offender

It seems the quicker advice can be received from the BIA the better, although this is dependent upon the nature of the enquiry. A repeated suggestion was for advice to be supplied throughout the course of the investigation, with initial findings being continually refined as more information becomes available.

Such information will be used in consideration of potential temporal analysis in study two. In addition, it will also inform recommendations regarding the timeliness of the provision of future behavioural investigative advice.

6.4.4 Identification of the format in which behavioural investigative advice is best received

SIOs would like to receive behavioural investigative advice in the form of written reports submitted in accordance with ACPO guidelines and as is now formally adopted by the BIA strategic board who review written BIA reports on behalf of the police annually. It did not seem to matter how this information arrived, as long as the information was disseminated in a secure manner and within the agreed timescales. Additional verbal presentation of findings back to the investigation teams was also advocated by the interviewees, being seen as beneficial and a welcome addition to the written results. This too is being initiated as BIA good practice where feasible (Alison, 2007) as it decreases the likelihood of misunderstandings and ensures questions regarding the report can be asked and addressed directly.

Such information will be used to inform recommendations regarding the ideal format for the dissemination of future behavioural investigative advice.
6.5 Conclusion

This chapter has detailed a study which has been undertaken to understand the nature of the role of the SIO within a difficult to detect murder investigation, and what BIAs may be able to do to assist them. It began by outlining the research objectives and then summarised the choice of participants and choice of offence. It then outlined the guiding conception underpinning the pragmatic research, and detailed the interview method, process and analysis. The results were presented under two headings - features relating to the investigative process, and then relating to the product available from the BIA. Verbatim accounts were included in order to retain the richness of the comments made. Composite themes were drawn out via qualitative content analysis using the concept book approach, and these findings were visually depicted in the form of a systemic summary. Finally the research objectives were re-considered, in light of the findings, and explanation given to how they will be developed further for study two.

The next two chapters will detail study two, which in light of the findings above, will attempt to use data regarding detected cases of difficult murder from a pre-existing database, to enhance the provision and provide backing and rationale for behavioural investigative advice to such enquiries.
7.1 Introduction

The previous chapter detailed a study which was undertaken to understand the role of the SIO within a difficult to detect murder investigation, and what BIAs may be able to do to assist them. More particularly it was designed to extract key variables and the timings upon which to base BIA involvement.

This chapter will detail the first part of the second study which involved retrospective statistical analysis of the Serious Crime Analysis Section (SCAS) database, to determine if any patterns were apparent between what is known regarding the offence (from the crime scene) and what is of use to investigators regarding the type of offender who was responsible (as determined from the findings of the SIO interviews in study one). The chapter will begin by exploring the current issues of concern in relation to the provision of behavioural investigative advice, and outlining the guiding conception underlying the research. It will go on to describe the database, sample and variable selection, and outline the method and procedure used. The statistical analysis will then be presented, and the chapter will conclude with a description and comparison of the main findings.

The research objectives for study two are:

5. To determine the relationship between the variables available to the police about the offence and the known characteristics (available from police records) of the offender responsible (to provide systematic evidence for profiling advice).

6. To examine whether the reliability of profiling advice may be enhanced with the passage of time as more information becomes available to the police i.e. can prediction be refined as the quality and quantity of crime variables increase (to determine the optimum time of BIA involvement).
The research objectives outlined are pragmatic in that answers to them will:

- inform future investigations regarding the content of profiling advice to difficult to detect murder investigations in the UK; and
- provide the basis for recommendations about BIA practice regarding the optimum timing and the provision of profiling advice to difficult to detect murder investigations in the UK.

7.2 Method

7.2.1 Guiding conception

As highlighted in Chapter Four, and exemplified in Chapter Six, pragmatic researchers use a guiding conception to assist the design of their research (Fishman, 1999).

The experience of the researcher and other BIAs acknowledges advice involving analysis of past murder offences on the SCAS database is primarily based upon a 'best guess' methodology utilising base rate information and descriptive statistics. So for example if a female prostitute is found dead in the street, stabbed and strangled and has been subjected to sexual assault, the BIA may use their experience to choose these as the salient features of the offence, and search the SCAS database for the characteristics of all offenders previously convicted of similar crimes involving these variables. If 85% of previous offenders who have committed these crimes were aged between 20-35 years, the BIA may suggest to the enquiry that persons between this age range should be prioritised as persons of interest for the current enquiry.

Whilst this method may be appropriate, it is an approximation and has not been formally tested or compared against other methods. There are several issues of concern, including reliance upon:

- individual experience of the BIA as central to the choice of 'relevant' variables for inclusion;
- descriptive statistics; and
- implicit (unproven) assumptions in relation to
o homology principle - i.e. offenders who commit offences in similar ways are likely to have similar characteristics or share demographic information, and
o behavioural consistency between individuals - i.e. those offenders whom we have already caught are likely to commit offences and share characteristics in the same way as the person whom we are currently attempting to capture.

In addition, the research literature has criticised UK profiling endeavours for involving common sense rather than theoretically grounded, quantitative, evidence based, empirical argument and formal support from case histories or prior studies (Almond et al, 2007; Snook et al, 2007).

As highlighted in Chapter Three, previous research attempts have used databases with limited behavioural information (e.g. Francis et al, 2004) or looked only at very specific subsets of murder (e.g. Aitken et al, 1995; Wherton, 2004). Much analysis has been bivariate (e.g. Lobb, 1999; Marogna, 2005), or designed to predict only one feature such as the likely relationship between the offender and victim (e.g. Brooker, 2003; Wherton, 2004);

It seems therefore that research which uses relevant offences from an appropriate database, explores multivariate relationships, looks at cases holistically, and takes into account practical experience and pragmatic investigative considerations, is required.

Such issues have been taken into account in the design of the current study, in conjunction with following points:

Multivariate: Rather than being the sole choice of the researcher the variables of interest will be those which are pragmatically 'relevant' - i.e. available (from the crime scene) and useful (to the SIO), taken from the findings of study one. Moreover, in study two (part II) more complex, inferential multivariate statistical analysis will explore patterns in existing data, to determine whether or not such analysis would add value to advice provided by base rate frequency information.
Holistic: The eventual aim of study two is to provide a holistic ‘offender profile’ based upon a combination of offender characteristics. As described previously, in an investigation for which a BIA has been invited to give advice, empirical comparison of what is known about patterns between previously convicted offenders responsible for similar offences held on the database, can be used to extrapolate likely features of the offender in the current (undetected) offence under consideration. Whilst this is done already in a somewhat ad hoc manner from base rate comparisons, this research will aim to identify statistically reliable, combinations of variables which may assist in the prediction of the most likely offender features. These will be consolidated in the form of an overall profile by the practitioner on individual case by case basis.

An important standard in pragmatic psychological research relates to accuracy - the research itself should be accurate and findings should be considered in context. Using appropriate statistical analysis, this study aims to provide, statistically robust behavioural investigative advice. In addition using variables available to investigators, and attempting to provide information regarding the offender which will be of use to them, allowed for contextualisation and the provision of practically useful advice.

Molecular: Molecular areas of specific categories of information available (regarding the offence), and advice required (regarding the offender) were identified from the SIO interviews in study one. Study two is responsive to these findings as it will utilise the specific individual variables identified to explore any patterns which may be able to give an indication of offender characteristics or demographic features which will be of practical use to the investigation.

Systems oriented: Pragmatic Psychology advocates taking account of all aspects of an organisation. The advice emanating from study two is purely statistical and aimed to provide a rational for the difficult decisions SIOs have to make in relation to the timely prioritisation of suspects and resources. However, whilst statistically based upon behaviour, the resultant product is not intended as a ‘push button’ tool. The application of findings requires interpretation and amalgamation within the enquiry – the role of both the BIA and SIO. For example whilst findings may strongly suggest an unknown perpetrator has a previous conviction for a specific type of offence, this information then requires the BIA to turn this into potential ‘actions’ for the investigation – such as ‘research all police databases for persons with previous
convictions and intelligence markers in relation to X'. The SIO then needs to assess the reliability of this information, its resource implications, and decide upon whether or not, and the priority with which, these suggestions are used.

Organic: The findings from the SIO interviews in study one have informed the focus of and variables used in study two; and study two will inform future research endeavours and practice. No one theory or method (other than pragmatism) is being adhered to, but the research will utilise the theories and methods most appropriate to consider the practical research goals. In addition, multiple research tools (qualitative and different types of quantitative) have been used as appropriate to compliment each other and assist in solving the practical problems considered in this thesis.

7.2.2 Sampling issues

Selection of database: To determine the relationship between the offence variables available to an investigation and useful characteristics in relation to the offender, a dataset comprising of both offence and the corresponding offender data was required.

There are only three currently operating, national police databases collecting this type of information regarding murder offences in the UK – the Central Analytical Team Collating Homicide Expertise and Management (CATCH EM) database, the Homicide Index (HI) and the Serious Crime Analysis Section (SCAS) database.

The CATCH EM database contains records of all child murders in England, Scotland and Wales since the 1 January 1960. 'Child' is defined as a female victim under the age of 22 years and a male victim under the age of 17 years at the time of death (personal communication, Tony Osborne, 2008). As such, whilst an unprecedented dataset for analysis of murder of children and young adults, it may be of less relevance to more general profiling efforts in relation to what is primarily adult murder.

The Homicide Index records information on every death initially recorded as a homicide in England and Wales (Home Office, 2001). However it lacks some potentially essential behavioural detail – for example it does not code whether the body was found indoors or outdoors. In addition, due to the nature of the majority of the murder offences occurring in the UK, whilst representative of murder per se, it may be of less relevance in relation to the type of 'difficult to detect' offences in which BIASs are more likely to
become involved in, in relation to proactive profiling. This is due to the fact that it is heavily skewed towards offences where the offence is detected quickly and where the offender and victim have some form of previous relationship, for example as a result of arguments between males (Francis et al, 2004).

Pragmatists recognise key issues can emerge from particularly difficult and/or unusual cases. In addition, the types of murder investigation BIAs generally become involved in to provide profiling advice in the UK are those difficult to detect or sexually motivated offences. As such, the Serious Crime Analysis Section (SCAS) database was chosen for the purposes of this research.

"Behavioural investigative advice and analysis are predominantly requested for serious sexual offences and homicide where the offender is unknown... one source of data that is increasingly drawn upon... is the SCAS database... (whilst) not, however, representative of all homicides that occur within the UK - it is much more geared towards hard-to-solve or sexually motivated homicides"


The SCAS database consists of a sample of questions adapted from the Canadian Violent Crime Analysis System database (ViCLAS). This database was identified and chosen by the UK police service as being the most appropriate for behavioural comparative case analysis in relation to murder, rape and abduction, after consideration of other potential databases worldwide (personal communication, Sean Sutton, 2008).

Set up in 1998, the database consists of murder, rape and abduction offences within the UK, providing data has been received from the individual police forces. Codes of Practice were issued to all forces in January 2006 that made it mandatory for forces to comply with the notification and submission of cases and case material that fulfil the SCAS criteria within 56 days of the murder being reported to the force. Compliance is tracked on a quarterly basis and reported back to each force and the HMIC.

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18 Some ad hoc cases which occurred before this date have also been included. Some cases have been requested to be included by forces, if they were part of the confidential ‘Operation Enigma’, or if they have been subject to review by NPIA, they will have been input onto the SCAS database.
19 Since January 2007 this has been reduced to 28 days.
As such, the SCAS database is a pre-prepared archive containing serious crime offence information within the UK. It holds detailed (including behavioural) data on a specific sample of both detected and undetected serious crime offences, and includes both information about the offence, and information regarding the suspect/s or offender/s.

Due to its confidential nature, access to the SCAS data is considered on a case by case basis. Research proposals have to be agreed by an internal panel, confidentiality agreements signed, and all data are completely anonymised prior to dissemination to the researcher.

**Case boundaries:** The ‘boundary problem’ considers decisions regarding which cases, and how much detail within those cases should be included within the research. Pragmatists recommend that choices are made on the basis of feasibility, what appears to be ‘natural units’ and what can be justified in terms of practical application. Consideration of cases will be discussed further in relation to the sampling criteria and selection of variables in sections 7.2.3-4 below. Pragmatists also consider whether or not the research will involve single or multiple cases and if the design is holistic or embedded:

**Multicase study:** This study will look at multiple cases (offences) which involve the same types of unit (variables). Though the individual variables may differ (e.g. the body being discovered indoors or outdoors) the context and variable categories (location of body discovery) are the same. The choice of case will be detailed below, however involves cases of difficult to detect murder.

**Embedded design:** This study will use an embedded design to systematically examine subunits of cases (e.g. frequency of individual variables), explore how the subunits relate to the larger case (e.g. looking at combinations of variables into offence themes – such as pathology - to predict likely offender characteristics), and the case as a whole (how the predictive profiling findings emanating from different offence themes and different stages of an enquiry may fit together overall in the provision of practical advice to future investigations on individual cases).

**Selection of cases:** As outlined in Appendix 7i, in relation to murder offences the SCAS database only collects offences where there is a known sexual element or motivation,
or offences where the relationship between the offender and victim is unknown or stranger, where the motive is unknown. As such it seems the most feasible database in terms of utility for the provision of behavioural investigative advice.

7.2.3 Sampling criteria

All murder offences held on the SCAS database were selected. These were further refined to:

- include only detected offences – where the offender has been convicted of murder, and has not subsequently been acquitted. This was to ensure as far as possible the offender data was reliable and not merely in relation to suspected individuals;
- include only offences involving one offender and one victim. This limited the potential effects of group dynamics upon offence behaviour and the difficulties in reliably determining which offender or victim did what. In addition only 23 cases involved multiple offenders and 10 cases involved multiple victims so excluding them should not have significantly altered any findings;
- exclude any anomalies – three cases were excluded due to data considerations. One case involving a dismembered victim was excluded because only remains were found and these were scattered both indoors and outdoors; another case the location of the body could not be ascertained; and another actually involved multiple offenders.

The final sample consisted of 312 detected (and convicted) offences of murder with the offence dates ranging from 1968-2006. This sample was feasible in that it was considered a reasonable size for meaningful analysis of a specific type of offence (difficult to detect murder) for a specific purpose (the provision of practical profiling advice). It was also a ‘natural unit’ in that it constituted all detected cases (where the offender had been convicted) of this type of offence within the UK held on the SCAS database at the time of data collection (27/12/06) involving one offender and one victim. It was also practical in that the variables are behaviourally focused, yet could also be refined in terms of the usefulness to the investigation. In addition, the researcher had vast experience in operating the SCAS system and therefore it was felt she could validly interrogate the data and interpret the findings.
7.2.4 **Selection of variables**

Variables held on the SCAS database were a sample of those originally chosen by investigative agencies elsewhere (ViCLAS Canada; VICAP FBI) and selected for use in UK policing and adapted for the purposes of behavioural offence linkage and analysis at the inception of the database in 1998. For the purposes of this study, these variables were then filtered further on the basis of reliability and relevance;

- how they were coded - whether they were the potentially harder to quantify and involved 'free text' searches or whether they involved ‘ticking boxes’ of appropriate responses (the latter were preferred for ease of subsequent quantitative categorisation);
- from previous research – what variables had been used previously; and fundamentally
- from the findings articulated by the SIOs in study one - those variables known to be available in an investigation regarding the offence and those of practical use to SIOs regarding the offender.

Variables were split into those relating to the 'offence' and crime scene - ‘predictor’ or ‘independent’ variables, and those relating to the ‘offender’ - ‘outcome’, ‘criterion’ or ‘dependent’ variables.

The final ‘offence’ variables were chosen on the basis that they involved information likely to;

- be available from a murder crime scene (as highlighted from the findings of study one and where possible to include factors relating to both the person/victim and the situation - as advocated by Alison et al, 2002);
- have been (relatively) reliably reported and recorded in police files - e.g. information about the victim is likely to be robust (as recommended by Alison et al, 2004); and
- be less subjective and therefore easier to interpret and code onto the SCAS database.
The final 'offender' variables were chosen on the basis that they involved information likely to;

- be of practical use to investigators when searching for persons of potential interest to the investigation (as highlighted from the findings of the SIO interviews in study one);
- have been available from and (relatively) reliably recorded in police files – e.g. the gender of the offender is likely to have been more reliably coded than the accent of the offender (as recommended by Alison et al, 2004; Alison, Snook & Stein, 2001); and
- be less subjective and therefore easier to interpret and code onto the SCAS database.

The only features requested by interviewees in study one which could not be explored fully in the present research were in relation to 'employment' and 'lifestyle' of the offender. Whilst the SCAS database does record previous employment details of convicted offenders, the data is somewhat limited with frequent gaps. In addition, due to the way in which the data is coded, it was difficult to ascertain the nature of the offender’s employment at the time of the offence.

In relation to 'lifestyle' despite attempts at prompting, what investigators wanted and meant by general 'lifestyle' information was difficult for them to specifically define as it appeared to be very idiosyncratic, seemingly referring to anything about the offender’s life which (with hindsight) may have helped them. Consistently recorded lifestyle variables such as - who the offender was living with at the time of the offence, were included and therefore these were felt to be sufficient for this research.

Finally age was coded dichotomously as the sample size was too small to allow for analysis involving more detailed categorisation (see section 8.2.1 for calculations in relation to sample size and number of variables). Whilst use of precise (ratio) offender age was considered, it seemed overly complex, impractical and unnecessary for the present purposes. Future research to enable further exploration specifically in relation to offender age may be worthwhile dependant upon the initial findings from this study.
7.3 Procedure

7.3.1 Data collection

In accordance with NPIA Specialist Operational Support research protocols (see Appendix 7ii), relevant data were requested and obtained (see Appendix 7iii) in an anonymised state from the data integrity officer within SCAS. It was received in the format of an excel spreadsheet.

Data are coded direct from police case files and input onto the SCAS database by fully trained Assistant Analysts. The coding is then quality controlled by a separate Crime Analyst, and finally checked by the SIO in the case. The quality control procedures are rigorous and include documented guidance with operational definitions to ensure the standardisation of input and reliability of data.

The data for this study are however secondary data. The crime scenes of individual offences were not attended, and offenders were not directly assessed. The data were therefore practically constrained to analysis of information available from police files read and input by others. Also whilst updates regarding offence and offender information are requested by SCAS, the compliance in relation to this is unknown and as such there may be information missing.

7.3.2 Merging categories

Merging of categories was undertaken prior to analysis. For example whilst there was detail regarding the precise nature of injury or type of previous conviction an offender held on the SCAS database, many of these were merged into overall categories by the researcher. For example in relation to previous convictions, overall categories of 'violence', 'sex', 'dishonesty' or 'other' were felt to be sufficient rather than detailing the specific charge for which the offender was convicted. This was for pragmatic purposes in order that meaningful patterns of previous convictions could be explored and reported to SIOs.

In part, some merging was due to the fact that some categories included more missing, than present data. For example nearly a quarter of the data for the category regarding whether or not the offender was 'married' at the time of the offence, was missing (24.7%). This is greater than the number of offenders recorded as actually
married at the time of the offence (23.7%). In addition, those offenders which are married are less likely to be living alone. Chi-square analysis also showed a significant association between the two variables ‘marital status’ and ‘living arrangements’. As such, a decision was made to condense these variables to look only at who the offender was living with at the time of the offence. The missing data was thus reduced (although only slightly) to 66/312 cases (21%).

However, merging of other variables was considered, and then discounted. For example, if an offender has been in prison then they would also have a previous conviction. Chi-square analysis also showed a significant association between these two variables. However, these are outcome variables and so for the purposes of this study were not being used simultaneously. Also, pragmatically, it was considered that whilst knowledge regarding the offender’s living arrangements/marital status would provide similar potential lines of enquiry (house to house etc.), knowledge regarding a previous prison record would add something in addition to mere knowledge regarding their likely previous convictions. As such it was decided to retain both ‘prison’ and ‘previous conviction’ variables and if the findings were similar the practitioner could always reassess or choose to utilise just one of them in practice if necessary.

Similarly, both whether or not a weapon was left at the scene was coded in addition to whether or not a weapon had been physically used during the offence. Whilst a weapon was only likely to have been left, if one had been used, it may merely have been threatened and not actually used in the attack. In addition previous research literature has indicated (e.g. Ressler, Burgess, Depue, Douglas & Hazelwood, 1985) important differences between offender backgrounds based upon information such as whether or not a weapon was left at the crime scene. As such, the variables ‘weapon used’ and ‘weapon left at the scene’ were both retained.

A full list of all of the final variables used together with operational definitions can be found in Appendix 7iv.
7.4 Analysis and results

7.4.1 Univariate statistics
Pragmatic researchers recognise the value of quantitative analysis to solve certain practical problems and as a way of ensuring fairness and rationality throughout the research process (Fishman, 1999). The importance of base rates is also highlighted in order to initially contextualise the variables within the topic of research. As such, in order to determine the frequency with which offence and offender features generally occur, initial descriptive statistics were sought from the dataset.

*Descriptive statistics regarding features of the offence:* The final predictor variables included for analysis, together with information regarding their frequency of occurrence, are detailed in Tables 7.1 and 7.2.
Table 7.1 Information regarding victim and body for final sample of offences – N=312.

<table>
<thead>
<tr>
<th>OFFENCE VARIABLE</th>
<th>NUMBER OF OFFENCES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>246</td>
<td>78.85</td>
</tr>
<tr>
<td>Male</td>
<td>66</td>
<td>21.15</td>
</tr>
<tr>
<td>Victim ethnic appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White European</td>
<td>271</td>
<td>86.86</td>
</tr>
<tr>
<td>Non white</td>
<td>24</td>
<td>7.69</td>
</tr>
<tr>
<td>Missing data</td>
<td>17</td>
<td>5.45</td>
</tr>
<tr>
<td>Victim age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 18 years</td>
<td>54</td>
<td>17.31</td>
</tr>
<tr>
<td>18 and above</td>
<td>257</td>
<td>82.37</td>
</tr>
<tr>
<td>Missing data</td>
<td>1</td>
<td>0.32</td>
</tr>
<tr>
<td>Prostitution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim known prostitute</td>
<td>57</td>
<td>18.27</td>
</tr>
<tr>
<td>No evidence of prostitution</td>
<td>255</td>
<td>81.73</td>
</tr>
<tr>
<td>Other vulnerability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim known drug/alcohol abuser or mental/physical disability</td>
<td>94</td>
<td>30.10</td>
</tr>
<tr>
<td>No known drug/alcohol abuse or mental/physical disability</td>
<td>218</td>
<td>69.90</td>
</tr>
<tr>
<td>Body recovery(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoors</td>
<td>149</td>
<td>47.76</td>
</tr>
<tr>
<td>Outdoors</td>
<td>163</td>
<td>52.24</td>
</tr>
<tr>
<td>Body discovered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothed</td>
<td>233</td>
<td>74.68</td>
</tr>
<tr>
<td>Naked</td>
<td>79</td>
<td>25.32</td>
</tr>
<tr>
<td>Body concealment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concealed</td>
<td>80</td>
<td>25.64</td>
</tr>
<tr>
<td>Not concealed</td>
<td>232</td>
<td>74.36</td>
</tr>
<tr>
<td>Body dismemberment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dismembered</td>
<td>25</td>
<td>8.01</td>
</tr>
<tr>
<td>Not dismembered</td>
<td>287</td>
<td>91.99</td>
</tr>
</tbody>
</table>

\(^2\) Body recovery/recovery site was used as it was not always possible to ascertain where the murder took place, although often this was at the same location as body recovery. In addition, the choice of where to leave the body is under the control of the offender, and previous research suggests that “the final location chosen for the victim’s body is important” – Ressler et al, 1988, p60.
Table 7.2 Information regarding offence for final sample of offences -N=312.

<table>
<thead>
<tr>
<th>OFFENCE VARIABLE</th>
<th>NUMBER OF OFFENCES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sexual activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known sexual activity</td>
<td>121</td>
<td>38.78</td>
</tr>
<tr>
<td>No known sexual activity</td>
<td>191</td>
<td>61.22</td>
</tr>
<tr>
<td><strong>Foreign object</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known foreign object insertion</td>
<td>30</td>
<td>9.62</td>
</tr>
<tr>
<td>No known foreign object insertion</td>
<td>282</td>
<td>90.38</td>
</tr>
<tr>
<td><strong>Overkill injuries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known overkill</td>
<td>37</td>
<td>11.86</td>
</tr>
<tr>
<td>No known overkill</td>
<td>265</td>
<td>84.94</td>
</tr>
<tr>
<td>Missing data</td>
<td>10</td>
<td>3.21</td>
</tr>
<tr>
<td><strong>Head injury</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known injury to head, face or neck</td>
<td>280</td>
<td>89.74</td>
</tr>
<tr>
<td>No known injury to head, face or neck</td>
<td>31</td>
<td>9.94</td>
</tr>
<tr>
<td>Missing data</td>
<td>1</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Injury to sexual area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known injury to genitalia, breast or anus</td>
<td>47</td>
<td>15.06</td>
</tr>
<tr>
<td>No known injury to genitalia, breast or anus</td>
<td>265</td>
<td>84.94</td>
</tr>
<tr>
<td><strong>Binding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known binding</td>
<td>38</td>
<td>12.18</td>
</tr>
<tr>
<td>No known binding</td>
<td>274</td>
<td>87.82</td>
</tr>
<tr>
<td><strong>Weapon</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weapon known to have been used</td>
<td>225</td>
<td>72.12</td>
</tr>
<tr>
<td>No weapon believed to have been used</td>
<td>87</td>
<td>27.88</td>
</tr>
<tr>
<td><strong>Weapon left</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weapon left at offence scene</td>
<td>114</td>
<td>36.54</td>
</tr>
<tr>
<td>No weapon left at offence scene</td>
<td>198</td>
<td>63.46</td>
</tr>
<tr>
<td><strong>Clothing taken</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing known to have been taken from the victim</td>
<td>56</td>
<td>17.95</td>
</tr>
<tr>
<td>No known clothing taken from the victim</td>
<td>256</td>
<td>82.05</td>
</tr>
<tr>
<td><strong>Item of value taken</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item of value known to have been taken from the victim</td>
<td>116</td>
<td>37.18</td>
</tr>
<tr>
<td>No known item of value taken from the victim</td>
<td>196</td>
<td>62.82</td>
</tr>
<tr>
<td><strong>Precaution/s</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precaution/s known to have been taken by the offender</td>
<td>136</td>
<td>43.59</td>
</tr>
<tr>
<td>No known precaution/s taken by the offender</td>
<td>176</td>
<td>56.41</td>
</tr>
<tr>
<td><strong>Vehicle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle known to have been used during offence</td>
<td>88</td>
<td>28.21</td>
</tr>
<tr>
<td>No known vehicle use</td>
<td>224</td>
<td>71.79</td>
</tr>
</tbody>
</table>
The majority of victims in this sample were white females over the age of 18 years. Whilst murder in the UK is associated with a predominance of male victims (Francis et al., 2004) it is apparent that the majority of advice provided by BIAs is for murder offences involving female victims\textsuperscript{21}. Most bodies were not concealed, not dismembered, and wore some clothing when discovered. Whilst just over 60\% of this sample had been subject to some form of sexual activity, only 15\% received injury to sexual areas of the body, and less than 10\% involved foreign object insertion.

The majority of victims had received some form of head, face or neck injury, and a weapon was known to have been used in most offences. In most offences a vehicle was not known to have been used. Whilst it is most likely that no items were taken from the victim, if things were taken, these were most frequently items of monetary value.

\textit{Descriptive statistics regarding demographic features of the offender:} The final outcome variables included for analysis, together with information regarding their frequency of occurrence, are detailed in Table 7.3.

\textsuperscript{21} For the period June 1999-March 2009, of the 272 murder investigations the NPIA BIAs provided advice for, 68\% (185) involved female victims - NPIA BIA case management, 2009.
Table 7.3 Demographic information regarding final sample of convicted offenders.

<table>
<thead>
<tr>
<th>OFFENDER DEMOGRAPHIC</th>
<th>NUMBER OF OFFENCES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Familiarity with body recovery site</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiar</td>
<td>168</td>
<td>53.85</td>
</tr>
<tr>
<td>Not known to have been familiar</td>
<td>144</td>
<td>46.15</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-40 years (inclusive)</td>
<td>255</td>
<td>81.73</td>
</tr>
<tr>
<td>Under 18 or over 40 years</td>
<td>55</td>
<td>17.63</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>303</td>
<td>97.12</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>2.88</td>
</tr>
<tr>
<td><strong>Ethnic appearance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White European</td>
<td>275</td>
<td>88.14</td>
</tr>
<tr>
<td>Non-white European</td>
<td>32</td>
<td>10.26</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>1.60</td>
</tr>
<tr>
<td><strong>Living arrangements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>64</td>
<td>20.51</td>
</tr>
<tr>
<td>Not alone</td>
<td>182</td>
<td>58.33</td>
</tr>
<tr>
<td>Missing</td>
<td>66</td>
<td>21.15</td>
</tr>
<tr>
<td><strong>Relationship to victim</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>172</td>
<td>55.13</td>
</tr>
<tr>
<td>Stranger</td>
<td>109</td>
<td>34.94</td>
</tr>
<tr>
<td>Missing</td>
<td>31</td>
<td>9.94</td>
</tr>
<tr>
<td><strong>Previous conviction/s of any kind</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction</td>
<td>221</td>
<td>70.83</td>
</tr>
<tr>
<td>No known previous conviction(^{22})</td>
<td>91</td>
<td>29.17</td>
</tr>
<tr>
<td><strong>Previous prison term/s</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prison</td>
<td>127</td>
<td>40.71</td>
</tr>
<tr>
<td>No prison</td>
<td>175</td>
<td>56.09</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>3.21</td>
</tr>
<tr>
<td><strong>Previous conviction/s - sexual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction</td>
<td>47</td>
<td>15.06</td>
</tr>
<tr>
<td>No known previous conviction(^{23})</td>
<td>265</td>
<td>84.94</td>
</tr>
<tr>
<td><strong>Previous conviction/s - violence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction</td>
<td>123</td>
<td>39.42</td>
</tr>
<tr>
<td>No known previous conviction</td>
<td>189</td>
<td>60.58</td>
</tr>
<tr>
<td><strong>Previous conviction/s - dishonesty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction</td>
<td>172</td>
<td>55.13</td>
</tr>
<tr>
<td>No known previous conviction</td>
<td>140</td>
<td>44.87</td>
</tr>
<tr>
<td><strong>Previous conviction/s - any other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction</td>
<td>177</td>
<td>56.73</td>
</tr>
<tr>
<td>No known previous conviction</td>
<td>135</td>
<td>43.27</td>
</tr>
</tbody>
</table>

\(^{22}\) All previous conviction data was taken from the Police National Computer. It is therefore possible that this is an underestimation – it is possible that offenders may have previous convictions from abroad, or on old microfiche records which have not been transferred onto PNC.

\(^{23}\) These figures are not just the offenders with no previous sexual convictions; they also include offenders without convictions of any kind (i.e. includes those in the ‘no previous convictions’ category above).
Several interesting features appear from these descriptive statistics. For example, the overwhelming majority of the offenders are male and between 18-40 years of age. Such statistics could be used to make generic 'best guess' predictions regarding the likely characteristics of similar homicide offenders (see Aitken et al, 1995). For example if we knew no other details regarding the murder offence, as a 'best guess' on the basis of the data above, it appears sensible to predict the offender is likely to be a white male who has a previous conviction for some form of past offence. However, if further offence information is available, it is possible that consideration of additional features may refine such simplistic predictions. This will be the focus of the rest of the study.

7.4.2 Bivariate analyses

For the purposes of this study Chi-square calculations were initially conducted on all of the offence variables (independent variables, or 'IVs') in combination with one another. This was to test that none were too highly associated with one another (multicollinearity), before inclusion into any further multivariate analysis in part II. If any had showed perfect association, a decision would have been made as to whether to merge the categories or exclude one of the pair from further analyses. If this had not been undertaken and two variables were highly associated, it may have been unclear as to which would have been responsible for predicting the outcome variable (dependent variable, or 'DV') in subsequent analysis. Whilst those variables outlined in Appendix 7v were significantly associated with one another, none were perfect correlates and there was no apparent reason as to why this should be the case, therefore it was deemed necessary to retain all of the offence variables in subsequent analysis.

For example the variable 'body naked or clothed' was significantly associated with the variable 'body concealed or not concealed'. However there is no apparent reason as to why this should be the case, and scenarios of bodies found either naked or clothed being either concealed or left out in the open are evident. As such, both variables were retained for subsequent analysis.

For the purposes of subsequent multivariate analysis in part II, it is suggested beneficial if some IVs are associated substantially with the DVs, however due to risks of
over-fitting\textsuperscript{24} it is important to check that the IV does not predict 100\% of the DV (Tabachnick & Fidell, 2001). In addition, bivariate information from Chi-square may assist in contextualising the findings. As such Chi-square analysis was also undertaken to check for associations between the IV and DVs.

No perfect correlations were identified, suggesting inclusion of all variables for future multivariate analysis would be appropriate.

As the tests have been repeated on the same sample, it cannot be guaranteed that they are not dependent on each other and there is a risk that the researcher “capitalises on chance” due to multiple testing (von Eye, Spiel & Wood, 1996, p311). To guarantee that 0.05 is the error rate for each single test, Bonferroni adjustments\textsuperscript{25} were applied to reduce the likelihood of such Type I errors and prevent over-enthusiastic interpretation of the results (i.e. thinking there were associations between variables when there were not). Although this vastly reduced the number of significant findings (in relation to the Chi-square and Fishers results 26 'significant' findings were reduced to 4), it was deemed necessary to ensure reliable results and limit the potential for such Type I errors.

All significant Chi-square (or Fishers Exact if the expected frequency was less than 5 in any cell) associations which were still significant after Bonferroni adjustments, are outlined in Appendix 7vi. These are discussed in more detail in conjunction with odds ratio findings in the next section.

\textsuperscript{24} This may occur if there are too many variables relative to the sample size and may result in an excellent fit to the sample which may not generalise to the population (Tabachnick & Fidell, 2001).

\textsuperscript{25} Findings were also analysed using the less stringent Holm correction. This resulted in the same findings.
7.4.3 Odds ratios

In an attempt to measure the effect size in categorical data, odds ratios are used. As an example the calculation of the odds of an offender being male, if the victim was female, is accomplished as follows:

Number of female victims where the offender was male

Number of female victims where the offender was female

= a

So a= observed frequency 242/ observed frequency 4 = 60.5

Next the odds of an offender being male if the victim was male are:

Number of male victims where the offender was male

Number of male victims where the offender was female

= b

So b= observed frequency 61/ observed frequency 5 = 12.2

The odds ratio is the ratio of these odds.

Odds ratio = a/b

So 60.5/12.2 = 4.959

This figure is reported in red in table 7.5 as the odds ratio for an offender being male, if the victim was female. This indicates that of the cases on the SCAS database, a female victim was nearly 5 times more likely to have been murdered by a male offender. If the odds ratio is positive, it indicates something is more likely, if the ratio is less than 1, it indicates something is less likely.
However, this should be interpreted in light of the base rate information. For example, suggesting something is 5 times as likely is of interest, but without knowing the base rate likelihood, it is not clear what '5 times as likely' actually means. As such, the odds ratios have been considered in conjunction with the base rate likelihoods of the offender variables from Table 7.3. In this instance, of the overall sample of 312 cases, the base rate frequency demonstrated overall 97% (303/312) of the offenders are male. However, when looking only at the female victims, this proportion increases slightly to 98%, as 242/246 women were killed by men. When looking only at the male victims, this proportion decreases slightly to 92% (61/66). As such, whilst it is 5 times more likely a female victim was killed by a male offender, in proportionate terms, comparison to the base rate likelihood, only provides an increase of 1% (from 97% to 98%). Further comparison, and how it is recommended that such findings should be applied, will be discussed below.

Tables 7.4 and 7.5 below detail all of the odds ratios of interest for the present study. There were 24 odds ratios where there was some effect (i.e. the 95% confidence intervals did not straddle 1). However, as outlined in relation to Chi-square above, as multiple tests were conducted, there was a need for adjustment to the p value to limit the potential of Type I errors. As such, the odds ratios highlighted in bold are significant after Bonferroni adjustments have been made (i.e. the 99.6% confidence intervals do not straddle 1, reducing the significant odds ratio findings from 24 to 18). These will be discussed with reference to their base rate likelihoods below.

---

26 A confidence interval of 95% indicates p=0.05. Bonferroni adjustment requires 0.05/(number of dependent variables), so 0.005/12=0.004. A confidence interval of 99.6% indicates p=0.004. This calculation assumes symmetry.
Table 7.4 Odds ratios for offence behaviours and offenders’ previous convictions.

<table>
<thead>
<tr>
<th>IV</th>
<th>DV</th>
<th>Any Previous conviction</th>
<th>Precon Sexual offence</th>
<th>Precon Violent offence</th>
<th>Precon Dishonesty offence</th>
<th>Precon Other type of offence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female victim</td>
<td></td>
<td>0.316*</td>
<td>0.991</td>
<td>0.624</td>
<td>0.590</td>
<td>0.495</td>
</tr>
<tr>
<td>Outdoor body recovery</td>
<td></td>
<td>0.711</td>
<td>1.419</td>
<td>0.839</td>
<td>0.862</td>
<td>0.879</td>
</tr>
<tr>
<td>Naked</td>
<td></td>
<td>1.869</td>
<td>1.655</td>
<td>1.311</td>
<td>1.105</td>
<td>1.340</td>
</tr>
<tr>
<td>Concealed body</td>
<td></td>
<td>0.808</td>
<td>0.868</td>
<td>0.670</td>
<td>0.662</td>
<td>0.565</td>
</tr>
<tr>
<td>Body dismembered</td>
<td></td>
<td>1.711</td>
<td>1.081</td>
<td>2.078</td>
<td>0.872</td>
<td>1.157</td>
</tr>
<tr>
<td>White victim</td>
<td></td>
<td>1.382</td>
<td>2.132</td>
<td>1.388</td>
<td>1.114</td>
<td>1.183</td>
</tr>
<tr>
<td>Sexual activity</td>
<td></td>
<td>0.955</td>
<td>1.633</td>
<td>0.643</td>
<td>0.657</td>
<td>0.775</td>
</tr>
<tr>
<td>Foreign Object insertion</td>
<td></td>
<td>1.147</td>
<td>1.470</td>
<td>1.389</td>
<td>0.687</td>
<td>0.741</td>
</tr>
<tr>
<td>Victim aged 18 / over</td>
<td></td>
<td>1.395</td>
<td>0.481</td>
<td>1.382</td>
<td>1.394</td>
<td>1.534</td>
</tr>
<tr>
<td>Overkill</td>
<td></td>
<td>1.321</td>
<td>1.156</td>
<td>0.825</td>
<td>1.070</td>
<td>1.142</td>
</tr>
<tr>
<td>Injury to head/face/neck</td>
<td></td>
<td>0.633</td>
<td>0.607</td>
<td>0.863</td>
<td>0.525</td>
<td>0.915</td>
</tr>
<tr>
<td>Injury to sexual area</td>
<td></td>
<td>0.771</td>
<td>1.278</td>
<td>1.191</td>
<td>0.856</td>
<td>1.189</td>
</tr>
<tr>
<td>Binding present</td>
<td></td>
<td>0.765</td>
<td>0.134</td>
<td>0.436</td>
<td>0.791</td>
<td>0.828</td>
</tr>
<tr>
<td>Weapon used</td>
<td></td>
<td>0.830</td>
<td>0.896</td>
<td>1.020</td>
<td>0.674</td>
<td>0.488</td>
</tr>
<tr>
<td>Weapon left</td>
<td></td>
<td>0.780</td>
<td>0.981</td>
<td>1.338</td>
<td>0.763</td>
<td>0.650</td>
</tr>
<tr>
<td>Victim prostitute</td>
<td></td>
<td>0.869</td>
<td>2.190**</td>
<td>1.491</td>
<td>0.964</td>
<td>0.971</td>
</tr>
<tr>
<td>Drug/alcohol</td>
<td></td>
<td>1.311</td>
<td>1.171</td>
<td>2.195</td>
<td>1.375</td>
<td>1.864</td>
</tr>
<tr>
<td>Mental/Physical disability</td>
<td></td>
<td>0.895</td>
<td>0.555</td>
<td>0.914</td>
<td>0.691</td>
<td>1.517</td>
</tr>
<tr>
<td>Clothing taken</td>
<td></td>
<td>1.291</td>
<td>2.561</td>
<td>1.087</td>
<td>0.926</td>
<td>1.021</td>
</tr>
<tr>
<td>Item of value taken</td>
<td></td>
<td>1.210</td>
<td>0.531</td>
<td>1.514</td>
<td>1.253</td>
<td>1.266</td>
</tr>
<tr>
<td>Precautions taken</td>
<td></td>
<td>0.864</td>
<td>0.497</td>
<td>0.776</td>
<td>0.901</td>
<td>0.992</td>
</tr>
<tr>
<td>Vehicle used</td>
<td></td>
<td>0.904</td>
<td>1.548</td>
<td>0.634</td>
<td>0.799</td>
<td>0.829</td>
</tr>
</tbody>
</table>
*As this is a negative number, this odds ratio suggests it is 0.316 times less likely a female victim would have been murdered by someone with any kind of previous conviction.

**As it is a positive number, this odds ratio suggests it is twice as (2.190 times more) likely a victim who is a prostitute would have been murdered be someone with a previous conviction for a sexual offence.
Table 7.5 Odds ratios for offence behaviours and other offender features of interest.

<table>
<thead>
<tr>
<th>IV</th>
<th>DV F Familiarity with body recovery site</th>
<th>Male offender</th>
<th>Offender white</th>
<th>Not living alone</th>
<th>Stranger to victim</th>
<th>Offender aged 18-40 years</th>
<th>Prison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female victim</td>
<td>1.314</td>
<td>4.959</td>
<td>1.247</td>
<td>0.999</td>
<td>1.640</td>
<td>0.695</td>
<td>0.875</td>
</tr>
<tr>
<td>Outdoor body recovery</td>
<td>0.867</td>
<td>1.380</td>
<td>1.678</td>
<td>1.793</td>
<td><strong>1.999</strong></td>
<td>0.759</td>
<td>1.007</td>
</tr>
<tr>
<td>Naked</td>
<td>0.641</td>
<td>1.192</td>
<td>1.566</td>
<td>0.609</td>
<td>1.403</td>
<td>1.002</td>
<td>1.205</td>
</tr>
<tr>
<td>Concealed body</td>
<td>0.930</td>
<td>***</td>
<td>1.064</td>
<td>0.788</td>
<td>0.582</td>
<td>1.023</td>
<td>0.793</td>
</tr>
<tr>
<td>Dismembered</td>
<td>0.775</td>
<td>***</td>
<td>2.964</td>
<td>0.524</td>
<td>0.411</td>
<td>0.521</td>
<td>1.300</td>
</tr>
<tr>
<td>White victim</td>
<td>0.680</td>
<td>1.429</td>
<td><strong>13.105</strong></td>
<td>1.737</td>
<td>0.802</td>
<td>0.389</td>
<td>1.779</td>
</tr>
<tr>
<td>Sexual activity</td>
<td>1.233</td>
<td>5.246</td>
<td>1.678</td>
<td>1.435</td>
<td>1.641</td>
<td>1.867</td>
<td>1.003</td>
</tr>
<tr>
<td>Foreign Object insertion</td>
<td>0.977</td>
<td>0.847</td>
<td>0.700</td>
<td>1.127</td>
<td>1.206</td>
<td>1.448</td>
<td>1.322</td>
</tr>
<tr>
<td>Victim 18 / over</td>
<td>1.718</td>
<td>1.218</td>
<td>1.087</td>
<td>0.579</td>
<td>1.049</td>
<td>1.061</td>
<td>1.141</td>
</tr>
<tr>
<td>Overkill</td>
<td>0.847</td>
<td>0.834</td>
<td>0.839</td>
<td>1.159</td>
<td>0.727</td>
<td>1.413</td>
<td>0.985</td>
</tr>
<tr>
<td>Injury to head/face/neck</td>
<td>1.053</td>
<td>2.537</td>
<td>1.703</td>
<td>0.906</td>
<td>0.888</td>
<td>3.020</td>
<td>0.715</td>
</tr>
<tr>
<td>Injury to sexual area</td>
<td>1.180</td>
<td>1.117</td>
<td>1.837</td>
<td>1.112</td>
<td>1.399</td>
<td>0.765</td>
<td>1.320</td>
</tr>
<tr>
<td>Binding present</td>
<td>0.946</td>
<td>0.472</td>
<td>2.259</td>
<td>0.797</td>
<td>0.623</td>
<td>1.172</td>
<td>0.626</td>
</tr>
<tr>
<td>Weapon used</td>
<td>0.816</td>
<td>1.304</td>
<td>0.573</td>
<td>0.835</td>
<td>0.917</td>
<td>1.206</td>
<td>0.781</td>
</tr>
<tr>
<td>Weapon left</td>
<td>1.035</td>
<td>1.156</td>
<td>0.536</td>
<td>0.846</td>
<td>0.798</td>
<td>1.521</td>
<td>0.855</td>
</tr>
<tr>
<td>Victim prostitute</td>
<td>1.222</td>
<td>***</td>
<td>0.794</td>
<td><strong>0.467</strong></td>
<td><strong>0.245</strong></td>
<td><strong>0.416</strong></td>
<td>1.425</td>
</tr>
<tr>
<td>Drug/alcohol</td>
<td>1.177</td>
<td>0.362</td>
<td>1.705</td>
<td><strong>0.411</strong></td>
<td><strong>0.252</strong></td>
<td>0.670</td>
<td>1.175</td>
</tr>
<tr>
<td>Mental/Physical disability</td>
<td>1.114</td>
<td>***</td>
<td>1.127</td>
<td>1.295</td>
<td>1.417</td>
<td>1.135</td>
<td>0.809</td>
</tr>
<tr>
<td>Clothing taken</td>
<td>0.904</td>
<td>***</td>
<td>2.308</td>
<td>0.744</td>
<td>1.598</td>
<td>1.590</td>
<td>1.418</td>
</tr>
<tr>
<td>Item of value taken</td>
<td>0.782</td>
<td>0.463</td>
<td>1.911</td>
<td>1.282</td>
<td><strong>1.941</strong></td>
<td>1.921</td>
<td>1.145</td>
</tr>
<tr>
<td>Precautions taken</td>
<td>0.801</td>
<td>0.376</td>
<td>1.349</td>
<td>0.746</td>
<td>0.683</td>
<td>1.107</td>
<td>0.805</td>
</tr>
<tr>
<td>Vehicle used</td>
<td>0.757</td>
<td>1.387</td>
<td>1.440</td>
<td>1.368</td>
<td>1.122</td>
<td>0.624</td>
<td>0.865</td>
</tr>
</tbody>
</table>
***It should be noted that the odds ratios for these variables could not be calculated. This was due to the fact that there were no entries in some of the cells. As it is not possible to divide by zero (x/0 = infinity), no odds ratio calculation can be made. In all of these instances this reflected the fact that no female offenders in this sample concealed the bodies of their victims, dismembered their victims, took clothing from their victims, or murdered prostitutes or victims with some form of mental or physical disability. Whilst therefore this demonstrates a very strong predictive relationship, caution should be given when interpreting these findings as only 9 of the sample were female offenders.

For practical purposes, the following crime scene indicators may provide suggestions to the likely background features of the offenders responsible.

**Female victim:**

Table 7.6 Significant odds ratios - victim gender.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim gender</th>
<th>Total (Base Rate(^{27}))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Any previous conviction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>82</td>
</tr>
<tr>
<td>Yes</td>
<td>57</td>
<td>164</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>66</td>
<td>246</td>
</tr>
<tr>
<td>Previous conviction - other(^{28})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>115</td>
</tr>
<tr>
<td>Yes</td>
<td>46</td>
<td>131</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>66</td>
<td>246</td>
</tr>
</tbody>
</table>

There was a statistically significant association between the victim's gender and whether or not the offender had a previous conviction of any kind - \(x^2\) (1) = 9.772, \(p<.01\). This seems to represent the fact that based on the odds ratio in table 7.4, the offender was less likely (0.316) to have a previous conviction at the time of the murder if the victim was female.

Whilst 71\% (221/312) of the offenders in this dataset had some form of previous conviction at the time of the murder offence, when including only those offenders who murdered female victims, this figure reduced slightly to 67\% (164/246), and when

\(^{27}\) Taken from table 7.3.

\(^{28}\) I.e. has a previous conviction but this is for neither a dishonesty, violent, or sexually related offence.
looking only at those offenders who murdered male victims it increased to 86% (57/66). However it is still the case that the majority of offenders had some form of previous conviction at the time of the offence.

The odds ratio also indicates the offender was less likely (0.495) to have a previous conviction for an 'other' offence (i.e. a previous conviction for an offence that was not a sexual offence, a violent offence, or an offence involving dishonesty) at the time of the murder, if the victim was female. 57% (177/312) of the offenders in this dataset had a previous conviction for an 'other' offence at the time of the offence. Looking only at those killing female victims, this figure decreased slightly to 53% (131/246), and looking at the offenders killing male victims, it increased to 70% (46/66).

**White victim:**

Table 7.7 Significant odds ratios - victim ethnic appearance.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim ethnic appearance</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non white</td>
<td>White</td>
</tr>
<tr>
<td>Ethnic appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non white</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>White</td>
<td>12</td>
<td>263</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>24</td>
<td>283</td>
</tr>
</tbody>
</table>

The victim's and offender's ethnicity also demonstrated an association - $x^2 (1) = 42.742, p < .0001$. However, 1 cell (25%) had an expected frequency of less than 5 and therefore Fisher's Exact Test = 0.000, p < .0001. If the victim was white, the odds were 13 times higher that offender was also white. Yet consideration should be given to the fact the majority of the dataset consists of both white offenders and victims - overall nearly 90% (275/307) of the offenders in this dataset were white. Looking only at white victims, 93% (263/283) of offenders were white, but looking at only non white victims only 50% (12/24) of the offenders were white.
Victim found outdoors:
Table 7.8 Significant odds ratios - body recovery.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Body recovered</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indoors</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>94</td>
<td>78</td>
</tr>
<tr>
<td>Stranger</td>
<td>41</td>
<td>68</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>135</td>
<td>146</td>
</tr>
</tbody>
</table>

If the victim’s body was discovered outdoors, the odds were nearly twice as high that the offender was a stranger. Whilst overall 39% (109/281) of the offenders were strangers to the victim, where the victim’s body was found outdoors, 47% (68/146) offenders were strangers, but when the body was found indoors, only 30% (41/135) were strangers to the murder victim, i.e. 70% (94/135) of the offenders were known to the victim.

Victim bound:
Table 7.9 Significant odds ratios - binding.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Binding</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction - violence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>160</td>
<td>29</td>
</tr>
<tr>
<td>Yes</td>
<td>114</td>
<td>9</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>274</td>
<td>38</td>
</tr>
</tbody>
</table>

The odds ratio suggests the offender was less likely (0.436) to have had a conviction for a violent offence at the time of the murder if the victim had been bound. In this sample only 9 offenders with a previous conviction for violence, bound their victims. As such, whilst 39% (123/312) of offenders had a previous conviction for a violent offence, this reduced to 24% (9/38) for the offences where the victim was bound and increased to 42% (114/274) where they were not. Therefore in offences where the victim was bound, 76% (29/38) of the offenders did not have a previous conviction for a violent offence at the time of the murder.
Body concealed:

Table 7.10 Significant odds ratios – body concealment.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Body concealment</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction – other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>92</td>
<td>43</td>
</tr>
<tr>
<td>Yes</td>
<td>140</td>
<td>37</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>232</td>
<td>80</td>
</tr>
</tbody>
</table>

Based on the odds ratio the offender was less likely (0.565) to have a previous conviction for an 'other' offence at the time of the murder, if the body had been concealed. Although overall 57% (177/312) of offenders had a previous conviction for an 'other' offence, this reduced to 46% (37/80) for the offences where the victim’s body had been concealed and increased to 60% (140/232) where it had not.

Weapon used:

Table 7.11 Significant odds ratios – weapon use.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Weapon use</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction – other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>108</td>
</tr>
<tr>
<td>Yes</td>
<td>60</td>
<td>117</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>87</td>
<td>225</td>
</tr>
</tbody>
</table>

It seems the offender is less likely (0.488) to have had a previous conviction for an 'other' offence if a weapon had been used in the attack. As stated above, 57% (177/312) of offenders had a previous conviction for an 'other' offence, which when only offences involving the use of a weapon were considered, reduced to 52% (117/225). When the offence did not involve a weapon 69% (60/87) of the offenders had a previous conviction for an 'other' offence.
Victim prostitute:

Table 7.12 Significant odds ratios - victim prostitute.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim prostitute</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>45</td>
<td>19</td>
</tr>
<tr>
<td>Not alone</td>
<td>152</td>
<td>30</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>197</td>
<td>49</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18, &gt;40</td>
<td>38</td>
<td>17</td>
</tr>
<tr>
<td>18-40 inclusive</td>
<td>215</td>
<td>40</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>253</td>
<td>57</td>
</tr>
<tr>
<td>Previous conviction – sexual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>222</td>
<td>43</td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>14</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>255</td>
<td>57</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>130</td>
<td>42</td>
</tr>
<tr>
<td>Stranger</td>
<td>101</td>
<td>8</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>231</td>
<td>50</td>
</tr>
</tbody>
</table>

The odds ratio indicates it is less likely (0.467) the offender was living with someone at the time of the offence if the victim was a prostitute. Whilst nearly 74% (182/246) of the offenders in this dataset are known to have lived with someone at the time of the offence, when looking at prostitute victims, slightly less - 61% (30/49) were murdered by such individuals. 77% (152/197) of non prostitute victims were murdered by someone living with someone else at the time of the offence.

The odds ratios suggest it was less likely the offender was aged between 18-40 years (0.416) at the time of the offence if the victim was a prostitute. Whilst 82% (255/310) of the offenders in this dataset were aged 18-40 at the time of the offence, when looking at prostitute victims, slightly less - 70% (40/57) were murdered by someone in this age range. Of the non prostitute victims, 85% (217/255) were killed by someone aged 18-40 years.

It also seems from the odds ratio that it is twice as likely the offender had a previous conviction for a sexual offence if the victim was a prostitute. 15% (47/312) of the
offenders in this dataset had a previous conviction for a sexual offence at the time of the offence. However, of the prostitute victims, nearly 25% (14/57) were murdered by offenders with this type of previous conviction, with the non prostitute victims this reduced further to 13% (33/255). However this still means that 75% (43/57) of prostitute, and 87% (222/255) of non prostitute victims were murdered by someone with no previous convictions for any type of sexual offence at the time of the murder.

In addition, there was a significant association between whether or not the victim was a prostitute and whether or not the offender was a stranger - \( x^2 (1) = 13.305, p < .0001 \). This seems to represent the fact that based on the odds ratio it was less likely (0.245) that the offender was a stranger - i.e. more likely that the victim was known to the offender, if the victim was known to have been a prostitute\(^{29}\). There were only 8 cases where a prostitute victim was murdered by a stranger in this dataset. As such, although from this sample overall nearly 39% (109/281) of offenders were a stranger to the victim, of the prostitute victims, only 16% (8/50) were killed by strangers - i.e. 84% (42/50) were killed by offenders who knew them. Of the non prostitute victims, 44% (101/231) were killed by strangers.

\(^{29}\) According to the SCAS quality control guide, a 'client' of a prostitute can be coded as either a 'stranger' - if there was no known previous contact between the offender and victim, or 'known' if it is believed they had had some form of previous acquaintance. As such, 'known' could include previous clients of the victim.
Victim illicit drug use/alcohol abuse:

Table 7.13 Significant odds ratios - victim drug user/alcohol abuser.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim drug use or alcohol abuse</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>Not alone</td>
<td>146</td>
<td>36</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>186</td>
<td>60</td>
</tr>
<tr>
<td>Previous conviction – violence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>156</td>
<td>33</td>
</tr>
<tr>
<td>Yes</td>
<td>84</td>
<td>39</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>240</td>
<td>72</td>
</tr>
<tr>
<td>Previous conviction – other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>112</td>
<td>23</td>
</tr>
<tr>
<td>Yes</td>
<td>128</td>
<td>49</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>240</td>
<td>72</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>119</td>
<td>53</td>
</tr>
<tr>
<td>Stranger</td>
<td>98</td>
<td>11</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>217</td>
<td>64</td>
</tr>
</tbody>
</table>

The odds ratios indicate the offender was less likely (0.411) to be living with someone at the time of the offence if the victim was known to use drugs and/or abuse alcohol. Nearly 74% (182/246) of the offenders in this dataset are known to have been living with someone at the time of the offence. However when looking specifically at victims who are known to have been drug users or alcohol abusers, only 60% (36/60) were murdered by offenders living with someone. Looking at non abusers, this increased to 78% (146/186).

The odds were more than twice as great (2.195) that the offender has a previous conviction for a violent offence, and nearly twice as great (1.864) that the offender has a previous conviction for an ‘other’ offence, if the victim was known to use illicit drugs and/or abuse alcohol. Over 39% (123/312) of offenders had a previous conviction for a violent offence, yet looking only at the offenders who attacked known drug users or alcohol abusers, this increases to 54% (39/72). It reduces to 35% (84/240) for victims who were not abusing these substances. As such 65% (156/240) of victims who are not known abusers or drugs or alcohol were killed by someone who did not
have a previous conviction for a violent offence. Similarly nearly 57% (177/312) of offenders had a previous conviction for an ‘other’ type of offence, yet offenders who attacked victims known to have been drug users or alcohol abusers, increases this proportion to 68% (49/72). 53% (128/240) of victims not abusing substances were attacked by offenders with a previous conviction for an ‘other’ offence.

Furthermore, there was a strong association between whether or not the victim was known to have been a drug user/alcohol abuser and whether or not the offender was a stranger \( x^2 (1) = 16.289, p<=.0001 \). This seems to represent the fact that based on the odds ratio, the offender was less likely (0.252) to have been a stranger attacker if the victim was known to use drugs and/or abuse alcohol. Whilst almost 39% (109/281) of the offenders in the whole of this sample were strangers to the victim, of the victims who are known to have been drug users or alcohol abusers, only 17% (11/64) were murdered by strangers – i.e. 83% (53/64) were murdered by someone known to them. This is compared to 45% (98/217) of non abusers of drugs or alcohol who were murdered by strangers.

*Items of value taken:*

Table 7.14 Significant odds ratios – item of value taken.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Item of value taken from scene</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Relationship</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>117</td>
<td>55</td>
</tr>
<tr>
<td>Stranger</td>
<td>57</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total (Base Rate)</strong></td>
<td>174</td>
<td>107</td>
</tr>
</tbody>
</table>

The odds were nearly twice as great that the offender was a stranger if items of value were taken from the crime scene. Overall, nearly 39% (109/281) of offenders were strangers to the victim, yet for the offenders who stole from their victims, this was enhanced to nearly 49% (52/107). Of those who didn’t steal, 33% (57/174) were strangers, so 67% (117/174) knew the victim.
Clothing taken:

Table 7.15 Significant odds ratios – item of clothing taken.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Item of clothing taken from scene</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction – sexual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>224</td>
<td>41</td>
</tr>
<tr>
<td>Yes</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>256</td>
<td>56</td>
</tr>
</tbody>
</table>

The odds ratio indicates it was more than twice as likely the offender had a previous conviction for a sexual offence if the victim’s clothing had been taken from the crime scene. Whilst 15% (47/312) of offenders had previous convictions for sexual offences, looking solely at offenders who took items of clothing from victims, increased this proportion to nearly 27% (15/56). However this means the majority of offenders still did not have such a conviction. Of who did not take clothing, 87% (224/256) did not have a previous conviction for a sexual offence, so only 13% (32/256) had some form of sexual previous conviction at the time of the murder.

Precautions taken:

Table 7.16 Significant odds ratios – precautions taken.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Precaution taken to avoid detection</th>
<th>Total (Base Rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction – sexual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>143</td>
<td>122</td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>14</td>
</tr>
<tr>
<td>Total (Base Rate)</td>
<td>176</td>
<td>136</td>
</tr>
</tbody>
</table>

Based on the odds ratio if precautions were known to have been taken the offender was less likely (0.497) to have a previous conviction for a sexual offence at the time of the murder. 15% (47/312) of offenders overall had a previous conviction for a sexual offence at the time of the murder. However, of those offenders who took precautions at the crime scene to avoid detection, this proportion reduced to just over 10% (14/136) – i.e. 90% (122/136) of offenders who took precautions, did not have a previous conviction for a sexual offence. Of those offenders who didn’t take precautions, still only 19% (33/176) had such a conviction.
7.4.4 Comparison of results in combination and application of findings

It seems apparent that patterns can be found, and associations are present between some offence and offender variables in this dataset. Univariate and bivariate analysis can give some basic inferences regarding the background of an offender.

Yet, care needs to be taken when such results are interpreted. Some findings may appear contradictory. For example 'best guessing' on the basis of univariate base rate information might lead a practitioner to suggest any offender responsible for a murder falling with the SCAS criteria is likely to have a previous conviction of some kind as is noted in over 70% of the sample. However the odds ratio would suggest that if the victim was female, this likelihood is reduced (0.316). As such, when confronted with a female victim, it is difficult to determine which finding the BIA should report.

There is a danger too that practitioners may 'cherry pick' the main findings, reporting only the results which confirm their personal views regarding the type of person likely to be responsible. As such further consideration has been given to the potential pragmatic utility of the combined findings.

This has been done by analysing whether (and where) the base rate predictions are contradictory, or consistent with the odds ratio associations. For practical application, it may be pertinent for a BIA to primarily offer suggestions to an SIO, where the base rate and odds ratio findings are consistent with one another. In this way, the statistics or 'backing' for suggestions made are more rigorous. An example in relation to prediction of the likelihood of the offender having a previous conviction, given the gender of the victim, will be used to clarify this.
Table 7.17 Comparison of base rate for significant odds ratios - victim gender.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim gender - odds ratio</th>
<th>Base Rate&lt;sup&gt;30&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Any previous conviction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.165</td>
<td>0.316</td>
</tr>
<tr>
<td>Base rate /odds ratio</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>predictions consistent?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous conviction - other&lt;sup&gt;31&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.020</td>
<td>0.495</td>
</tr>
<tr>
<td>Base rate /odds ratio</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>predictions consistent?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the base rate, most offenders in this sample (221/312 - nearly 71%) have a previous conviction. As such, regardless of whether the victim was male or female, prediction from the base rate would indicate the person responsible is likely to already have a previous conviction for some kind of offence at the time of the murder.

The odds ratio would similarly indicate that if the victim was male, the offender is three times as likely to have a previous conviction (odds ratio 3.165<sup>32</sup>). However, conversely if the victim is female, an offender with such a conviction is less likely to have been responsible (odds ratio 0.316<sup>33</sup>).

As such, the base rate information in relation to male victims is consistent with what the odds ratio suggests – i.e. the offender is likely to have a previous conviction. The 'consistent' findings are reported in bold type. However, if dealing with a female victim, the prediction is less substantive.

In summary, as overall 71% of offenders have a previous conviction, the police would be well advised to look for such an offender. Yet the effect of adding another variable (e.g. the gender of the victim) should alert the police not to entirely rely upon this base rate information in all circumstances (e.g. where the victim is female). However where

<sup>30</sup> Taken from table 7.3.
<sup>31</sup> I.e. has a previous conviction but this is for neither a dishonesty, violent, or sexually related offence.
<sup>32</sup> Inverse ratio – i.e. 1/ 0.316 = 3.165.
<sup>33</sup> Figure '*' from table 7.4.
the odds ratio and base rate info are consistent with one another (e.g. where the victim is male), the findings are more robust.

Similarly the base rate information would indicate an offender is likely to have a previous conviction for an offence other than those related to dishonesty, sex offending or violent crime. The odds ratio would also indicate this, in the case of male victims, however would not concur when it comes to female victims.

As such it could be argued from the analysis undertaken above, that predictions regarding previous convictions should be restricted to only those offences involving male victims.

The same method has been used in relation to all of the other odds ratios with significant findings, detailed in the tables 7.18-7.27. The findings highlighted in bold indicate those where the odds ratio and base rate frequencies are consistent with one another:

Table 7.18 Comparison of base rate for significant odds ratios - victim ethnic appearance.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim ethnic appearance - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non white</td>
<td>White</td>
</tr>
<tr>
<td>Ethnic appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non white</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.076</td>
<td>13.105</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 7.19 Comparison of base rate for significant odds ratios - body recovery.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Body recovered - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indoors</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>1.999</td>
<td>0.500</td>
</tr>
<tr>
<td>Stranger</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>
Table 7.20 Comparison of base rate for significant odds ratios – binding.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Binding- odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>violence</td>
<td>No</td>
<td>0.436</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>123</td>
</tr>
<tr>
<td>Base rate /odds ratio</td>
<td>predictions consistent?</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 7.21 Comparison of base rate for significant odds ratios – body concealment.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Body concealment</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- odds ratio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>No</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>1.770</td>
</tr>
<tr>
<td>Base rate /odds ratio</td>
<td>predictions consistent?</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 7.22 Comparison of base rate for significant odds ratios – weapon use.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Weapon use - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Previous conviction –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>No</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2.049</td>
</tr>
<tr>
<td>Base rate /odds ratio</td>
<td>predictions consistent?</td>
<td>✓</td>
</tr>
</tbody>
</table>
Table 7.23 Comparison of base rate for significant odds ratios – victim prostitute.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim prostitute</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- odds ratio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Lives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not alone</td>
<td>2.141</td>
<td>0.467</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio</strong></td>
<td><strong>predictions consistent?</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td><strong>Relationship</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>0.245</td>
<td>4.082</td>
</tr>
<tr>
<td>Stranger</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base rate /odds ratio</strong></td>
<td><strong>predictions consistent?</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18,&gt;40</td>
<td>2.404</td>
<td>0.416</td>
</tr>
<tr>
<td>18-40 inclusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base rate /odds ratio</strong></td>
<td><strong>predictions consistent?</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td><strong>Previous conviction – sexual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2.190</td>
<td>0.457</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base rate /odds ratio</strong></td>
<td><strong>predictions consistent?</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>
Table 7.24 Comparison of base rate for significant odds ratios - victim drug user or alcohol abuser.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Victim drug use or alcohol abuse - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>Not alone</td>
<td>2.433</td>
<td>0.411</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>0.252</td>
<td>3.968</td>
</tr>
<tr>
<td>Stranger</td>
<td></td>
<td>109</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Previous conviction – violence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2.195</td>
<td>0.456</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>123</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>Previous conviction – other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>135</td>
</tr>
<tr>
<td>Yes</td>
<td>0.536</td>
<td>1.864</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 7.25 Comparison of base rate for significant odds ratios - item of value taken from scene.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Item of value taken from scene - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>1.941</td>
<td>0.515</td>
</tr>
<tr>
<td>Stranger</td>
<td></td>
<td>109</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>×</td>
</tr>
</tbody>
</table>
Table 7.26 Comparison of base rate for significant odds ratios – item of clothing taken from scene.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Item of clothing taken from scene - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Previous conviction – sexual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2.561</td>
<td>0.390</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>265</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>✓</td>
<td>x</td>
</tr>
</tbody>
</table>

Table 7.27 Comparison of base rate for significant odds ratios – precaution taken to avoid detection.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Precaution taken to avoid detection - odds ratio</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Previous conviction – sexual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.497</td>
<td>2.012</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>265</td>
</tr>
<tr>
<td><strong>Base rate /odds ratio predictions consistent?</strong></td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

As highlighted above, in some circumstances, comparison of predictions from the base rate and odds ratio data, are complementary. It is argued that more weight should be put upon such findings as they are more rigorous. As such the pragmatic recommendations for the use of the findings are summarised below:

**Offender’s previous convictions**
- 86% of offenders killing males had some form of previous conviction at the time of the offence
- 70% of offenders who killed male victims had a previous conviction for an ‘other’ type of offence
- 90% of offenders who took precautions to avoid detection had no previous conviction for a sexual offence
- Only 13% of offenders who attacked non prostitute victims had a previous conviction for a sexual offence i.e. 87% were murdered by someone with no previous conviction for a sexual offence
• Only 13% of offenders who did not take items of clothing from the victim had a previous conviction for a sexual offence i.e. 87% were murdered by someone with no previous conviction for a sexual offence
• 76% of offenders who bound their victims, and 65% of offenders who attacked victims who were not alcohol abusers or drug users, did not have a previous conviction for a violent offence
• 69% of offenders who did not use a weapon during the murder had a previous conviction for an ‘other’ type of offence
• 68% of offenders who attacked victims who were alcohol abusers or drug users had a previous conviction for an ‘other’ type of offence
• 60% of offenders who had not concealed the victim’s body had a previous conviction for an ‘other’ type of offence

Ethnicity of offender
• 93% of white victims were killed by white offenders

Living arrangements
• 78% of victims who were not known to have been drug users or alcohol abusers, where murdered by offenders who were living with someone at the time of the offence
• 77% of victims who were not known to have been prostitutes, where murdered by offenders who were living with someone at the time of the offence

Relationship to victim
• Only 16% of prostitutes in this dataset were killed by strangers – i.e. 84% were murdered by someone known to them
• Only 17% of victims who were known drug users or alcohol abusers were killed by strangers i.e. 83% were murdered by someone known to them
• 70% of offenders who left bodies to be recovered indoors, knew their victims
• Where there was no evidence of any items of value being taken from the scene, 67% of offenders knew their victim
**Age of offender**

- 85% of the *non* prostitute victims were killed by an offender aged 18-40 years

However, it is potentially possible that one offence variable may indicate one thing about an offender, whereas findings from another offence variable give rise to an alternative (or less conclusive) suggestion despite the fact that both offence variables are present in the same offence. In addition, variables may have different (e.g. additive) effects when presented in combination. For example victims who are both prostitutes *and* drug users may be even more likely to have been killed by an offender known to them. In order to take investigate such possibilities, multivariate statistics will be explored in study two, part II.

### 7.5 Discussion

The findings will be considered in relation to each of the research objectives turn.

7.5.1 *To determine the relationship between the variables available to the police about the offence and the known characteristics (available from police records) of the offender responsible*

Based upon even basic bivariate analysis of the data, there appear to be some associations between specific offence and offender variables that occur more often than would be anticipated by chance.

7.5.2 *To examine whether the reliability of profiling advice may be enhanced with the passage of time as more information becomes available to the police i.e. can prediction be refined as the quality and quantity of crime variables increase*

Even with the limited analysis conducted here, it seems, more associations are apparent as more offence information becomes available which may lead to additional suggestions from the BIA. For example information that the victim was male is usually available within the first hour and on the basis of this analysis could lead to a suggestion the offender is more likely to have some form of previous conviction. However other offence information received subsequently may lead to additional suggestions. For example if after some time it is discovered the victim was a prostitute, other suggestions regarding the offender’s likely relationship to the victim may additionally be considered at this time.
7.6 Conclusion

This chapter has outlined a study which involved univariate and bivariate statistical analysis of the SCAS database, to determine if any patterns were apparent between what is known regarding the crime scene and what is known regarding the offender. The chapter outlined the guiding conceptions underlying the research with reference to the principles of Pragmatic Psychology. It then described sampling issues, considering the selection of an appropriate database, cases and variables. The method and procedure were also explained.

The findings from the univariate exploration were then presented which were able to provide descriptive statistics regarding the data. For example the majority of victims in this sample were white females over the age of 18 years. Most had been subject to some sexual activity and had received some form of head, face or neck injury, with a weapon known to have been used. If items were taken from the body, these were most frequently items of monetary value. Some data regarding the offender could be used as 'best guess' information to inform investigators. For example most were white males aged 18-40 years who had some form of previous conviction at the time of the offence.

To further enhance this analysis, bivariate analysis was also undertaken to take additional offence information into account. Again some interesting patterns exist between what is known about the offence, and information of use to investigators regarding the offender. For example findings demonstrated a significant association between a victim being white and the offender being white. Subsequent odds ratios indicated the likelihood the offender was white were 13 times greater if the victim was white.

However whilst such findings are of interest, they needed to be considered in combination, so that whilst the odds of having a certain feature may be greater, what this meant in actual base rate and percentage terms should be compared. Moreover, whether or not the findings from the base rate and odds ratio information were consistent, led to recommendations regarding the types of advice which would be most robust for BIAs to report to SIOs.
It should be noted that these findings are based upon extremely limited crime scene information – considering only one variable at a time. When taken in combination, findings from the different methods and from different variables may give rise to different results and levels of confidence. In addition, the analysis is restrictive in that offence variables are not considered in combination. As such, multivariate analysis will be undertaken in study two (part II) and discussed in the following chapter.

To enable exploration of potential relationships between combinations of variables available to the police about the offence, in an attempt to predict likely features regarding the offender, the following chapter will focus upon multivariate quantitative analysis. First, configural frequency analysis will be used to investigate patterns between configurations of cases – indicating whether or not certain cases are more ‘typical’, or occur more often than would be expected. Then logistic regression analysis will look at the combinations of the variables within those cases and calculate the likelihood an offender has (compared to doesn’t have) certain characteristics given what is known about the offence. This method also assesses the importance of the information from the crime scene, indicating which variables assist in prediction when compared to ‘best guess’ information alone.
CHAPTER 8: STUDY TWO PART II: PRAGMATIC OFFENDER PROFILE VIA MULTIVARIATE QUANTITATIVE ANALYSIS

8.1 Introduction
The previous chapter looked at patterns that were discernible between information available from the crime scene and information regarding the offender. These patterns indicated the need for further statistical exploration. As such this chapter will expand upon the first part of the study by undertaking more complex multivariate analysis to determine if any combinations of variables from what is known about the victim, offence and crime scene are associated with offender variables. This research is of potential practical use in that it may ultimately provide pragmatic advice to investigators and BIAs in relation to prioritisation of appropriate suspects in future (as yet undetected) cases.

8.2 Analysis and results
In order to identify potential relationships between combinations of variables available to the police about the offence, and the known features of the offender, multivariate quantitative analysis was undertaken.

8.2.1 Multivariate statistics – Configural Frequency Analysis
The first statistical method utilised was Configural Frequency Analysis (CFA, von Eye, 1990). This is a technique used to look at associations among variables which then can determine group membership. By looking at the observed and expected frequencies CFA can detect profiles or patterns (known as ‘configurations’) within the data and reports when what is observed occurs more (‘types’) or less (‘antitypes’) often than expected by chance. It is therefore of use when answering questions in relation to what groupings are most atypical/typical (von Eye et al, 1996).

It has been described as a “versatile, multivariate, non-parametric and robust statistical method” (von Eye et al, 1996, p302) and is typically used in exploratory research such as the present study. Whilst it tends to be a somewhat underused method, it has the benefit of accommodating a range of research designs, allowing for multivariate analysis of non-parametric data, yet it is not particularly difficult to calculate and does not put greater demands on sample size than other methods (von Eye et al, 1996).
The potential value of CFA in this study is to identify configurations which will highlight if any combinations of offence variables are associated with offender variables more or less often than would be anticipated by chance. This multivariate method was deemed most suitable to explore and identify any pre-existing patterns from the sample of murder cases extracted from the SCAS database.

Consideration of validity: Having a relevant sample size and ensuring an appropriate number of variables were used during analysis was crucial. Having an expected frequency of 5 or more is recommended (Glass & Hopkins, 1984; Krauth & Lienert, 1973, and Weber, 1967 both cited in von Eye, Spiel, & Wood, 1996) however others have suggested expected cell frequencies as low as 0.8 are sufficient, as long as the expected frequency is the same for each cell (Larntz, 1978). The minimum sample size recommended is therefore 0.8 x number of cells (see von Eye et al, 1996, p322 for calculations as outlined below).

The number of cells using 6 dichotomous variables at any one time suggests:

\[ 2^6 = 64 \]

Using an expected frequency of 0.8:

\[ 0.8 \times 64 = 51.2 \text{ minimum sample size} \]

Using an expected frequency of 5:

\[ 5 \times 64 = 320 \text{ recommended sample size.} \]

As such, with the current sample of 312 cases, the use of a maximum of 6 dichotomous variables in any one CFA was deemed valid for current purposes. This could comprise of 5 predictor variables and 1 outcome variable.

The 'first order' CFA approach was chosen as it is able to take the baselines of variables into account. So for example if it is common that offenders are male, this is taken into consideration and balanced into the analysis so that all cases involving male offenders do not automatically present as common 'types'.

In addition, as the tests have been repeated on the same sample, there is again the risk of a Type 1 error (thinking there were associations when there are in fact none)
due to multiple testing. To guarantee that 0.05 is the error rate for each single test, Bonferroni adjustments were incorporated into the analysis to reduce this likelihood and prevent over-enthusiastic interpretation of the results.

The von Eye programme was used to conduct analysis and results significant at the $p <= 0.05$ level are reported.

**Temporal considerations:** To assist in consideration of whether the reliability of profiling advice may be enhanced as more offence information becomes available, and when behavioural investigative advice would be optimally received by investigation, in study one the SIO interviews considered the timeliness of information received.

The interviewees outlined the various offence information usually available to police, and described at what stages of the enquiry this information was likely to be known. Firstly the 'Golden hour' is referred to, due to the importance of effective early action to secure evidential material that may otherwise be lost. Also 'Fast track actions' are often undertaken during the first 24 hours (ACPO, 2006). As such, the findings in relation to the usual information available to investigations within the first hour, first 24 hours, and thereafter and correspondent data extrapolated from the SCAS database, are summarized in Table 8.1.
Table 8.1 Offence information usually known at different stages of an enquiry.

<table>
<thead>
<tr>
<th>STAGE OF THE ENQUIRY</th>
<th>OFFENCE INFORMATION AVAILABLE</th>
</tr>
</thead>
</table>
| First ‘Golden’ hour    | Sex of victim - M /F  
|                        | Dismemberment /not  
|                        | Victim naked /not  
|                        | Indoors /outdoors  
|                        | Concealed /not  |
| Within 24 hours        | Age of victim under 18 /not  
|                        | Ethnicity of victim -White /not  
|                        | Weapon use /no weapon use  
|                        | Injury to head/face/neck/no such injury  
|                        | Overkill /none  
|                        | Binding /none  
|                        | Evidence of sexual assault /no evidence of sexual assault  
|                        | Foreign object insertion /no insertion  
|                        | Injury to genitals/anus/breast / no such injury  
|                        | Weapon left at scene /no weapon left at scene  |
| After 24 hours         | Lifestyle prostitute /not  
|                        | Vulnerability (mental/physical disability/drug user/alcoholic) /no such vulnerability  
|                        | Clothing taken from scene /no clothing taken  
|                        | Item of value taken from scene /not taken  
|                        | Precautions taken /not taken  
|                        | Vehicle used /not used  |

The comparisons between this data, and the information available in figure 6.1, should be clear, however there are some discrepancies which are discussed for clarification.

Firstly in relation to the ‘Golden hour’ data, whether or not the victim had been dismembered was added in as information which would be immediately apparent from the scene on the basis of the researcher’s own experience and as information easily retrievable, and less subjective and therefore easier to interpret and code onto the SCAS database.

In relation to data received within 24 hours, cause of death was not used. This could not be coded dichotomously and even if reduced to 5 categories, due to the sample size would have meant that no other additional predictor variables could have been used in combination with it. However information reflective of potential cause of death and injury - regarding the nature and level of injuries, including from bindings, foreign objects and weapons, and evidence of sexual activity would usually be available.

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34 See calculations in section 8.2.1 above - if only 6 variables are recommended to be used with a sample of this size, 5 predictor variables + 1 outcome variable means there would be no other room for additional predictors.
from the post mortem within 24 hours and as such these variables were included instead.

Finally, due to the sample size and number of variables which can reliably be added into the CFA at any one time as explained above, the categories of drug abuser/alcoholic and victim mental/physical disability were merged into an overriding 'victim vulnerability' category which included any individuals with any recorded vulnerability of this type.

As ascertained from the interviewees in study one, information received after the first day would come from intelligence, witnesses, investigations into phones and finances and from experts such as forensic personnel. The amount of information received would be vast and variable dependant upon the enquiry, however in relation to the victim, initial intelligence would usually be able to ascertain any vulnerability (such as working as a prostitute, drug, alcohol abuse or mental illness) and where possible, whether or not items were believed to have been taken from the victim or crime scene. Experts and witnesses may also be able to advise in relation to any precautions taken by the offender and whether or not a vehicle was known or believed to have been used. Obviously some of this information is likely to be unknown or missing, however it was included in analysis as when it is known, their presence (for example precautions being taken by the offender to reduce the chance of identity) may be significant in the provision of any behavioural profile and investigative strategy.

*Analytical considerations:* The configural frequency analysis undertaken reflected this practical 'tiered' approach. The offence variables available at each stage of the investigation were fed in, and where present, correlations between these and the individual offender variables were identified at each stage. As will be seen, some correlations only became apparent as more information became available (e.g. it appears BIAs can only provide information regarding having a previous conviction for a sexual offence from variables available after the first hour of the investigation), yet conversely in some circumstances very little information is required to make tentative suggestions early on in an investigation (e.g. when the victim has been dismembered).
Initially attention was given to the offender (i.e. the ‘dependent’, ‘criterion’ or ‘outcome’) variables. It was considered that if there was little correlation between these variables, then use of each of these variables individually - with combinations of the offence, ‘independent’ or ‘predictor’ variables - could be justified. However if antitypes/types were apparent within these DVs, this may suggest that some of the offender variables should be looked at more multivariately as they may have interacted with one another. Yet CFA on all of the offender variables in combination did not highlight any types or antitypes. As such it was deemed valid to analyse only the offence variables multivariately with each offender variable in turn.

CFA Stage One Analysis - Golden hour.
An initial question of interest to an investigator is whether the case they are dealing with is particularly unusual. Descriptive statistics indicated only 8% (25/312) of offences involved a victim who had been dismembered suggesting individually this feature is particularly rare. As such, the presence of this feature alone makes a case unusual. Initial multivariate analysis just looking at the 5 offence variables usually available within the first hour of an investigation (sex of victim, whether or not the body was dismembered, naked, found in/outdoors or concealed) was also undertaken. However, (first order) CFA analysis did not identify ‘antitypes’ or combinations of offence variables which are particularly unusual or occur less commonly than would expect. Therefore from this sample, there do not appear to be any combinations of variables available within the first hour that would immediately indicate to an SIO that they are dealing with an unusual type of offence.

To ascertain if there were any correlations between any offender and offence characteristics available in the first hour, CFA between the 5 offence variables: sex of victim, whether or not the body was dismembered, naked, found in/outdoors or concealed, was undertaken with each of the offender variables in turn. All significant (p<=0.05) types are outlined in Appendix 8i.

The importance of evaluating performance: Rather than fully reporting all findings, for pragmatic research, the focus of the results is in relation to how the successful or impactive the research program has been. This is assessed both internally by looking at the process of the study and in relation to the outcome of the study – or how well the study has accomplished its goals. Often in Pragmatic Psychology ‘performance
indicators’ are used to provide an estimation of effectiveness. The need to assess performance of predictions in such models has also been advocated by Aitken et al (1995).

In this part of the study a method of rating performance akin to pattern matching (as advocated by Fishman, 1999) has been used as a means of evaluating the success of the configural frequency analysis. For pragmatic purposes, pattern matching refers to matching the outcome of an enquiry (i.e. the findings in this instance) to an ideal pattern (i.e. 100% accurate prediction regarding the offender – as outlined from previous cases held on the SCAS database). This has been undertaken in terms of calculating the ‘hit rate’ of success.

All significant CFA profile types (i.e. those reported in Appendix 8i) were analysed to ascertain the ‘hit rate’ or accuracy of their predictions. So for example the combination of offence variables female victim, whose body was discovered outdoors, naked, concealed and dismembered, were found to occur significantly more frequently in combination with the offender variable of the offender living alone at the time of the offence. It may therefore be appropriate to suggest or ‘predict’ in future cases where these features are present; the offender may be living alone. The number of times such a prediction would have been accurate out of the overall sample of cases (involving these offence features), was divided by the overall number of occurrences of this actual profile (involving these offence features in combination with this offender feature). This essentially provided a percentage indicating the number of times the prediction would have been correct.

For example on 3 occasions the combination of offence variables female victim, whose body was discovered outdoors, naked, concealed and dismembered occurred together, and in 2 of these instances the offender was living alone. In one case the offender was living with someone. The hit rate for this profile was therefore 2/3 – or 66.66% prediction accuracy\(^{35}\) in this instance, as outlined below.

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\(^{35}\) It should be highlighted that this does not indicate 66.66% prediction accuracy in the future; it merely demonstrates that on the basis of past cases, the retrospective prediction rate was 66.66% from this configuration.
<table>
<thead>
<tr>
<th>Offence variable</th>
<th>Offender variable</th>
<th>Frequency of profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female victim + body found outdoors + naked + concealed + dismembered</td>
<td></td>
<td>= 3 occurrences</td>
</tr>
<tr>
<td>Female victim + body found outdoors + naked + concealed + dismembered + Lived alone</td>
<td></td>
<td>= 2 occurrences</td>
</tr>
</tbody>
</table>

2/3 = 66.66% 'hit rate'

As such, whilst some combinations or 'profiles' may have been significant types, they also were required to have an appropriate hit rate for prediction (set at least 90% or $p \leq 0.10^{36}$) before they were reported here.

Table 8.2 therefore reflects the significant (at the $p \leq 0.05$ level) correlations between offence variables available within the first hour and offender variables, where the prediction accuracy rate was 90% or above.

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36 Whilst significance levels of 0.05 are usually used in psychological research, as this research is pragmatic, the significance level of 0.10 (i.e. 90% hit rate) was used to include all potentially relevant findings. In addition, it should be remembered that all of the findings were significant at 0.05, but only those with additional appropriate 'hit rates' of 90% are being selected and reported here.
Table 8.2 Significant profiles – ‘types’ (p<=0.05) with prediction level (p<=0.10) – first hour.

<table>
<thead>
<tr>
<th>OFFENCE</th>
<th>OFFENDER</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Indoors Naked Concealed Not dismembered</td>
<td>No known familiarity with body recovery site</td>
<td>1/1</td>
<td>100%</td>
</tr>
<tr>
<td>Male Indoors Naked Not concealed Dismembered</td>
<td>White</td>
<td>1/1</td>
<td>100%</td>
</tr>
<tr>
<td>Male Outdoors Clothed Concealed Dismembered</td>
<td>White</td>
<td>3/3</td>
<td>100%</td>
</tr>
<tr>
<td>Male Outdoors Naked Concealed Dismembered</td>
<td>Stranger</td>
<td>1/1</td>
<td>100%</td>
</tr>
<tr>
<td>Female Outdoors Naked Concealed Dismembered</td>
<td>Known to victim</td>
<td>3/3</td>
<td>100%</td>
</tr>
<tr>
<td>Male Outdoors Clothed Concealed Dismembered</td>
<td>Previous conviction</td>
<td>3/3</td>
<td>100%</td>
</tr>
<tr>
<td>Male Indoors Naked Concealed Dismembered</td>
<td>Previous prison</td>
<td>1/1</td>
<td>100%</td>
</tr>
<tr>
<td>Female Outdoors Naked Concealed Dismembered</td>
<td>Previous prison</td>
<td>3/3</td>
<td>100%</td>
</tr>
</tbody>
</table>

Firstly it should be noted that only a small number of cases represent the profiles outlined above. As such, whilst some findings are both significant and are above the specified prediction level, conclusions are limited and should be interpreted with caution. For example in the instance of a male victim being found indoors, naked, concealed and not dismembered, although it suggests an offender with no known familiarity to the recovery site was responsible, any subsequent prediction would be on the basis of only one case. A single counter example would reduce the prediction level from 100%, to only 50%. With this important caveat in mind, the following results are reported, but will be discussed further in relation to potential practical application in the final section.

As can be seen, if the body has not been dismembered, the only prediction which can be hypothesised is that when a male victim is found concealed indoors and naked, the offender may be less likely to be familiar with the body recovery site.

However if the victim is dismembered, it appears some initial hypotheses can be considered at this early stage:
If the victim is female, found outdoors, naked yet concealed, it is more likely the offender responsible is known to the victim and has previously served a term of imprisonment.

If the dismembered victim is male and found:

- Indoors, naked and not concealed, or outdoors, clothed and concealed, then the offender is more likely to be white.
- Outdoors, concealed and clothed they are more likely to have been killed by someone with a previous conviction.
- Outdoors, concealed and naked, they are more likely to have been killed by a stranger.
- Indoors, concealed and naked it is more likely the offender has served a previous term in prison.

Of interest is that the profile of ‘male; outdoors; clothed; concealed; dismembered’ is repeated, leading to hypotheses regarding both the offender being white and having some from of previous conviction. Whilst first order CFA takes base rates of variables into account, such repetition of this profile presenting as a type is of interest for future exploration.

Similarly the profile of ‘female; outdoors; naked; concealed; dismembered’ is repeated, leading to hypotheses regarding both the offender having known the victim and having previously served a term of imprisonment. Such repetition is also of interest.

**CFA Stage Two Analysis – Within 24 hours**

*Grouping of variables for Stages 2 and 3:* Before adding in any further variables, consideration had to be given to the fact that the sample size restricted the number of variables which could be ‘fed in’ to the CFA at any one time. Due to the number of variables it would neither be practical, nor methodologically desirable (as it may further increase the likelihood of making Type 1 errors) to undertake analysis of every possible combination of every single variable with one another. There were only 5 predictor variables available within the first hour of an investigation, but as outlined in table 8.1, a further 10 variables become available within 24 hours. The sample size of 312 is too
small (see calculations in section 8.2.1) to reliably accommodate this number of variables in analysis (5 IV’s from first hour+10 IV’s from within 24 hours=15 predictor variables, whereas only 5 predictor variables – in combination with one outcome variable, is recommended), and so some form of grouping of variables was deemed necessary. As such practical consideration was given to how the variables could be grouped.

Grouping is suggested in the CFA literature, however there is no published best practice regarding how this should be done, although it is recommended that groupings are undertaken a priori (von Eye, 1990). The main risks in such groupings appear to be that the groupings may be wrong or that the findings may reflect nothing new. However, variable reduction by grouping is required in this instance in order to reduce the number of variables. This was undertaken pragmatically by reference to policing guidance (ACPO, 2005; ACPO, 2006). In relation to murder, policing manuals and good practice identifies themes within an investigation for consideration by the SIO (e.g. ‘pathology’). These identified themes in conjunction with the experience of the researcher, information reliably available from the dataset, and the investigators’ experiences from study one, have been used in consideration of categorising the independent, predictor variables in terms of themes/striations. Hence the offence variables were subsequently grouped as outlined in Table 8.3.
Table 8.3 Grouping of variables for stage 2 and 3 analysis.

<table>
<thead>
<tr>
<th>STRIATION</th>
<th>OFFENCE VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victimology</td>
<td>Sex of victim</td>
</tr>
<tr>
<td></td>
<td>Age of victim</td>
</tr>
<tr>
<td></td>
<td>Ethnicity of victim</td>
</tr>
<tr>
<td></td>
<td>Lifestyle prostitute</td>
</tr>
<tr>
<td></td>
<td>Vulnerability (mental/physical disability; drug user/alcoholic)</td>
</tr>
<tr>
<td>Pathology</td>
<td>Dismemberment</td>
</tr>
<tr>
<td></td>
<td>Weapon use</td>
</tr>
<tr>
<td></td>
<td>Injury to head/face/neck</td>
</tr>
<tr>
<td></td>
<td>Overkill</td>
</tr>
<tr>
<td></td>
<td>Binding</td>
</tr>
<tr>
<td>Sexual elements</td>
<td>Victim naked</td>
</tr>
<tr>
<td></td>
<td>Evidence of sex</td>
</tr>
<tr>
<td></td>
<td>Foreign object insertion</td>
</tr>
<tr>
<td></td>
<td>Injury to genitals/anus/breast</td>
</tr>
<tr>
<td>Scene/location</td>
<td>In/outdoors</td>
</tr>
<tr>
<td></td>
<td>Concealed/not</td>
</tr>
<tr>
<td></td>
<td>Weapon left at scene</td>
</tr>
<tr>
<td></td>
<td>Vehicle used</td>
</tr>
<tr>
<td>Criminal element</td>
<td>Clothing taken from scene</td>
</tr>
<tr>
<td></td>
<td>Item of value taken from scene</td>
</tr>
<tr>
<td></td>
<td>Precautions taken</td>
</tr>
</tbody>
</table>

Available within first 'Golden' hour
Available within 24 hours
Available after 24 hours
As such, for the offence variables available within 24 hours, the analysis of the striations outlined in table 8.4 below was undertaken for stage 2. Each offence striation was looked at with each offender variable in turn. So for example the CFA profile for victimology and offender ethnicity was comprised of sex of victim, age of victim, ethnicity of victim and ethnicity of offender. If any patterns (e.g. white, female victim over 18 years with white offender) occurred more frequently than would be anticipated from chance, then this would be reported as a 'type'.

Table 8.4 Grouping of variables for stage 2 analyses.

<table>
<thead>
<tr>
<th>STRIATION</th>
<th>OFFENCE VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victimology</td>
<td>Sex of victim</td>
</tr>
<tr>
<td></td>
<td>Age of victim</td>
</tr>
<tr>
<td></td>
<td>Ethnicity of victim</td>
</tr>
<tr>
<td>Pathology</td>
<td>Dismemberment</td>
</tr>
<tr>
<td></td>
<td>Weapon use</td>
</tr>
<tr>
<td></td>
<td>Injury to head/face/neck</td>
</tr>
<tr>
<td></td>
<td>Overkill</td>
</tr>
<tr>
<td></td>
<td>Binding</td>
</tr>
<tr>
<td>Sexual elements</td>
<td>Victim naked</td>
</tr>
<tr>
<td></td>
<td>Evidence of sex</td>
</tr>
<tr>
<td></td>
<td>Foreign object insertion</td>
</tr>
<tr>
<td></td>
<td>Injury to genitals/anus/breast</td>
</tr>
<tr>
<td>Scene/location</td>
<td>In/outdoors</td>
</tr>
<tr>
<td></td>
<td>Concealed/not</td>
</tr>
<tr>
<td></td>
<td>Weapon left at scene</td>
</tr>
</tbody>
</table>

Details of all of the resultant types are outlined in Appendix 8ii.

Again the 'hit rates' of likely predictions were calculated, and the findings reported in table 8.5 below are only those with a subsequent prediction hit rate of greater than 90%.
Table 8.5 Significant profiles – ‘types’ (p<=0.05) with prediction level (p<=0.10) – in 24 hours.

<table>
<thead>
<tr>
<th>PATHOLOGY</th>
<th>Injury</th>
<th>Overkill</th>
<th>Binding</th>
<th>OFFENDER</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismembered</td>
<td>Weapon used</td>
<td>head/face/neck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dismembered</td>
<td>Weapon used</td>
<td>head/face/neck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dismembered</td>
<td>Weapon used</td>
<td>head/face/neck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEXUAL ELEMENTS</td>
<td>No sex</td>
<td>No sex</td>
<td>No sex injury</td>
<td>Male</td>
<td>128/132</td>
<td>96.97%</td>
</tr>
<tr>
<td>Naked</td>
<td>Sex</td>
<td>Foreign object</td>
<td>Sex injury</td>
<td>Male</td>
<td>9/9</td>
<td>100%</td>
</tr>
<tr>
<td>Not naked</td>
<td>Sex</td>
<td>Foreign object</td>
<td>Sex injury</td>
<td>Not living alone</td>
<td>7/7</td>
<td>100%</td>
</tr>
<tr>
<td>Not naked</td>
<td>Sex</td>
<td>Foreign object</td>
<td>Sex injury</td>
<td>No sexual previous conviction</td>
<td>8/8</td>
<td>100%</td>
</tr>
</tbody>
</table>

No patterns occurred more frequently than expected in relation to the criminal element striations when looked at in combination with offender demographics. In relation to both victimology and scene/location, whilst some combinations of variables occurred more often than would have been anticipated, none of these were able to reliably predict the likely offender demographics at a level of 90% accuracy.

However several patterns, with significant predictions available regarding the offender, were apparent from the pathological and sexual elements of the offence.

- If a victim is found dismembered (weapon used and injury to head/face/neck) and binding is believed to have been used in the offence it is likely the offender is a stranger and lives alone.
- If a victim is found dismembered and a weapon had been used but there was no other injury to head/face/neck, no overkill nor binding it is likely the offender was aged under 18 or over 40 years at the time of the offence.
- If the victim is found naked, a sexual assault has taken place and a foreign object has been inserted (and a sexual injury is present) the offender is likely to be male.
• If the victim is not found naked and no further sexual elements are present, the offender is also likely to be male.

• If the victim is not found naked but sexual assault has taken place and a foreign object has been inserted (and a sexual injury is present) the offender is less likely to have any known previous conviction for a sex offence or to live alone.

Of interest is that the pathology profile of – ‘dismembered; weapon used; injury to head/face/neck; overkill; binding’ is repeated, leading to hypotheses regarding both the offender living alone and being a stranger. Whilst first order CFA takes base rates of variables into account, such repetition of this profile presenting as a type is again of interest for future research.

Similarly the sexual elements profile consisting of a victim who was ‘not found naked; where there was sexual assault; foreign object insertion; and injury to the genitals, anus or breasts’ was also repeated, leading to hypotheses regarding the offender living alone and not having a previous conviction for a sexual offence. Whilst first order CFA takes base rate frequencies into account, consistency in this profile is also of note.

**CFA Stage Three Analysis – After 24 hours**

For the offence variables available after 24 hours, the analysis of the striations outlined in table 8.6 was undertaken as stage 3. Each offence striation was looked at with each offender variable in turn.
Table 8.6 Grouping of variables for stage 3 analyses.

<table>
<thead>
<tr>
<th>STRIATION</th>
<th>OFFENCE VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victimology</td>
<td>Sex of victim</td>
</tr>
<tr>
<td></td>
<td>Age of victim</td>
</tr>
<tr>
<td></td>
<td>Ethnicity of victim</td>
</tr>
<tr>
<td></td>
<td>Lifestyle prostitute</td>
</tr>
<tr>
<td></td>
<td>Vulnerability (mental/physical disability; drug user/alcoholic)</td>
</tr>
<tr>
<td>Scene/location</td>
<td>In/outdoors</td>
</tr>
<tr>
<td></td>
<td>Concealed/not</td>
</tr>
<tr>
<td></td>
<td>Weapon left at scene</td>
</tr>
<tr>
<td></td>
<td>Vehicle used</td>
</tr>
<tr>
<td>Criminal element</td>
<td>Clothing taken from scene</td>
</tr>
<tr>
<td></td>
<td>Item of value taken from scene</td>
</tr>
<tr>
<td></td>
<td>Precautions taken</td>
</tr>
</tbody>
</table>

Details of all of the resultant types are outlined in Appendix 8iii.

The findings reported in table 8.7 below are only those with a subsequent prediction hit rate of greater than 90%.
Several patterns, with significant suggestions available regarding the offender, were apparent from the offence variables available at this stage.

- If a male victim who is under 18, non white and neither a prostitute nor vulnerable in relation to having a mental/physical disability or a known drug/alcohol problem, then it is likely the offender is familiar with the body recovery scene. It is also unlikely the offender lives alone, and unlikely the offender has previously served a term in prison. If a similar victim is white, it is likely the offender has some form of previous conviction.
• If there is a female victim over 18 years of age, white, a prostitute and further vulnerable in relation to having a mental/physical disability or a known drug/alcohol problem, then it is less likely the offender is known to have been familiar with the body recovery site. This offender is also more likely to be non white.

• If a victim is found outdoors but concealed, where a vehicle is thought to have been used, but no weapon has been left at the scene then it is more likely the offender responsible is male.

• If items of clothing and items of value have been taken from the victim, and precautions have been taken by the offender to protect their own identity, it is likely the offender is a white male. It is also unlikely this person has any previous convictions for a sexual offence.

As was noted in relation to some of the stage 1 and 2 profiles, some configurations have been repeated in stage 3. For example:

• Regarding the victimology profile
  o female; over 18 years of age; white; prostitute; vulnerable is repeated, leading to hypotheses regarding the offender not being familiar with the body recovery site and not being white; and
  o male; under 18 years; non white; not a prostitute; not vulnerable is repeated, leading to hypotheses regarding the offender being familiar with the body recovery site, not living alone or having served any time in prison previously.

• Regarding the criminal profile
  o Clothing taken; item of value taken; and precautions taken suggests white male offenders with no previous convictions for a sexual offence.

As indicated previously, first order CFA takes base rate frequencies into account, however such repetition in these profiles are of note and worthy of future research.

Summary of CFA findings: For clarity, the significant CFA findings presented in tables 8.2, 8.5 and 8.7 have been grouped (in tables 8.8-8.16) into each offender variable to which they relate.
Table 8.8 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding familiarity with body recovery site.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male victim Indoors Naked Concealed Not dismembered</td>
<td>Not familiar</td>
</tr>
<tr>
<td>Male victim Under 18 Non white Not prostitute Not vulnerable</td>
<td>Familiar</td>
</tr>
<tr>
<td>Female victim Over 18 White Prostitute Vulnerable</td>
<td>Not familiar</td>
</tr>
</tbody>
</table>

Table 8.9 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding offender age.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismembered Weapon used No injury to head/face/neck No overkill No bindings</td>
<td>Under 18 or over 40 years</td>
</tr>
</tbody>
</table>

Table 8.10 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding offender gender.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoors Concealed Vehicle used No weapon</td>
<td>Male</td>
</tr>
<tr>
<td>Naked Evidence of sex Foreign object insertion Sexual injury</td>
<td>Male</td>
</tr>
<tr>
<td>Not naked No evidence of sex No foreign object insertion No sexual injury</td>
<td>Male</td>
</tr>
<tr>
<td>Clothing taken Value taken Precautions</td>
<td>Male</td>
</tr>
</tbody>
</table>

Table 8.11 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding offender ethnicity.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim male Indoors Naked Not concealed Dismembered</td>
<td>White</td>
</tr>
<tr>
<td>Victim male Outdoors Clothed Concealed Dismembered</td>
<td>White</td>
</tr>
<tr>
<td>Victim female Over 18 White Prostitute Vulnerable</td>
<td>Non white</td>
</tr>
<tr>
<td>Clothing taken Value taken Precautions</td>
<td>White</td>
</tr>
</tbody>
</table>
Table 8.12 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding the offender living alone.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim male</td>
<td>Under 18</td>
</tr>
<tr>
<td>Dismembered</td>
<td>Binding</td>
</tr>
<tr>
<td>Not naked</td>
<td>Evidence of sex</td>
</tr>
<tr>
<td>Not white</td>
<td>Foreign object insertion</td>
</tr>
<tr>
<td>Not prostitute</td>
<td>Injury to head/face/neck</td>
</tr>
<tr>
<td>Not vulnerable</td>
<td>Overkill</td>
</tr>
<tr>
<td>Not live alone</td>
<td>Lives alone</td>
</tr>
</tbody>
</table>

Table 8.13 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding the offender/victim relationship.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim female</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Victim male</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Dismembered</td>
<td>Weapon used</td>
</tr>
<tr>
<td>Naked</td>
<td>Injury to head/face/neck</td>
</tr>
<tr>
<td>Concealed</td>
<td>Overkill</td>
</tr>
<tr>
<td>Dismembered</td>
<td>Binding</td>
</tr>
<tr>
<td>Known</td>
<td>Stranger</td>
</tr>
<tr>
<td>Stranger</td>
<td>Stranger</td>
</tr>
</tbody>
</table>

Table 8.14 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding the offender's previous prison experience.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim female</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Victim male</td>
<td>Indoors</td>
</tr>
<tr>
<td>Victim male</td>
<td>Under 18</td>
</tr>
<tr>
<td>Naked</td>
<td>Not white</td>
</tr>
<tr>
<td>Concealed</td>
<td>Not prostitute</td>
</tr>
<tr>
<td>Dismembered</td>
<td>Not vulnerable</td>
</tr>
<tr>
<td>Prison</td>
<td>No prison</td>
</tr>
</tbody>
</table>

Table 8.15 Significant types ($p \leq 0.05$) with prediction ($p \leq 0.10$) regarding the offender having a previous conviction (of any kind).

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim male</td>
<td>Outdoors</td>
</tr>
<tr>
<td>Victim male</td>
<td>Under 18</td>
</tr>
<tr>
<td>Clothed</td>
<td>Concealed</td>
</tr>
<tr>
<td>Concealed</td>
<td>Dismembered</td>
</tr>
<tr>
<td>Not prostitute</td>
<td>Precon</td>
</tr>
<tr>
<td>Not vulnerable</td>
<td>Precon</td>
</tr>
</tbody>
</table>
Table 8.16 Significant types (p<=0.05) with prediction (p<=0.10) regarding the offender having a previous conviction for a sexual offence.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not naked</td>
<td>Evidence of sex</td>
</tr>
<tr>
<td>Clothing taken</td>
<td>Value taken</td>
</tr>
<tr>
<td>Sexual injury</td>
<td>Precautions</td>
</tr>
</tbody>
</table>

|                     | No sex offence         |

It should be noted however that if the offence combinations of variables (predictors) are different to those listed above, then no valid predictions can be made on the basis of this method. However it should also be reiterated that some ‘predictions’ are tentative being based upon the findings of single cases, and others show profiles which repeatedly demonstrate the same variable combinations and therefore should not be over-interpreted at this stage.

Conclusion regarding research objectives from CFA analysis: Research objective 5 was to consider whether there was any relationship between the variables available to the police about the offence and the known characteristics of the offender responsible. Clearly, based upon this dataset and analysis, there appears some specific offence and offender configurations that occur more often in combination than would be anticipated by chance.

In relation to research objective 6, examining whether the reliability of profiling advice may be enhanced as more information becomes available to the police, it seems an increase in information available does allow for enhanced suggestions and more detailed predictions regarding the offender. For instance, during the first hour of an investigation, it appears very little can be advised, unless the victim has been dismembered. As dismemberment appears to occur very rarely in murder offences within the UK, on the basis of this analysis, the usefulness of profiling advice at this early stage, in the majority of instances appears limited. In addition, the interviews from the SIOs in study one suggest they are may be busy with other considerations such as arranging the post mortem, setting up an incident room, identifying and notifying the victim’s family, than considering initial profiling advice at this time. This may be especially pertinent if the advice provided is to be of limited value.
However, within the first 24 hours of an investigation, a wealth of potentially relevant behavioural information has already been gathered. Information from the post mortem in particular, may be of use in initially prioritising the type of person who may have been responsible for the offence. Whilst some findings may be no better than those obtained from ‘best guesses’ based upon frequency of offender characteristics and ‘common sense/detective experience’ (e.g. that the offender is likely to be male and have some form of previous conviction), some appear more interesting and contrary to what may have been anticipated. For example, offences where victims had been subject to a sexual assault, a foreign object had been inserted (and there was injury to the breast, anus or genitalia) but the victim was not found naked, occurred more commonly in combination with offenders with no previous conviction for sexual offences and by offenders who were living with someone at the time of the offence. As such actions prioritising suspects who are loners or sex offenders may not be as relevant in such instances.

As even more information comes into the investigation, in particular in relation to the victim’s lifestyle and vulnerability, then more indicators become available regarding the likely perpetrator of the offence. But the data suggests this only in relation to particular victim types. For example male, non white victims who are under 18 and are neither a prostitute nor have any known drug/alcohol problems or mental/physical disabilities are associated with offenders being familiar with the body recovery sites, not living alone, and unlikely to have served a previous term of imprisonment. It is possible that this combination of ‘offence’ variables occur more frequently together and hence appear more frequently as ‘types’ when put in combination with several different ‘offender’ variables. Whilst first order CFAs were conducted to take underlying base rates into account, it seems somewhat coincidental that these are repeatedly identified as common configurations. Further analysis is beyond the scope of this study, but conducting zero-order CFA or other analysis to investigate this further (ideally with an enhanced sample size) may be worthwhile in future research.

In summary, this exploratory study has thus far indicated that it may be possible to suggest general offender characteristics in the first hour if the victim has been dismembered. Otherwise, as more information becomes available predictions may be enhanced. However, predictions from configural frequency analysis are only possible in relation to certain types of offence with certain types of victim – i.e. involving certain
combinations of offence variables. If these are not present in the specific combinations outlined above, on the basis of this analysis no predictions can be made.

8.2.2 **Multivariate statistics – Logistic Regression**

The second multivariate statistical analysis undertaken was by means of logistic regression (LR). CFA investigated patterns of configurations, interactions of whole cases, and considers whether there are combinations of levels of the independent and dependent variables that occur more or less often than expected. LR was used as an alternative as it considers the linear additive combination of the independent variables to predict the (log of the) odds of being in one group versus another.

Regression indicates whether one distribution is related to another and can be used for future prediction (Pagano, 1994). LR is a method used when examining categorical variables. It can predict the probability of an outcome or group membership from predictor (independent) variables by dividing the probability of one outcome (being in one group) by the probability of another outcome (being in the other group). It uses maximum likelihood estimation to maximize the probability of correct prediction, finding the odds of being in one category of outcome (DV), given the combination of predictors (IVs). It also can assess the importance of the predictors by providing the strength of association between the individual predictors and outcome. Thus it can indicate which predictors assist in predicting the outcome better than the constant (block 0 or 'best guess') model alone. However although it may indicate variables are related, it does not provide information in relation to causation (Tabachnick & Fidell, 2001).

"The purpose of logistic regression is to improve upon this [best guess] success rate by exploiting association between the dependent and independent variables to predict category membership (the dependent variable) with the greatest possible accuracy."

Kinnear & Gray, 2001 p332.

It is of use for this study as a regressive technique, with pre-existing (rather than manipulated experimental) data, and is of specific value when predicting dichotomous category memberships such as whether the offender is likely (or not) to have a certain feature.
*Prediction of offender characteristics:* The use of LR in the prediction of offender characteristics has previously been advocated:

> "Essentially, logistic regression can be used to estimate the likelihood of an offender possessing a particular type of conviction\(^{37}\) based on the presence or absence of certain behaviours during his\(^{38}\) offence"


Aitken et al, (1995) explored several methods for the use of potential statistical modelling in predicting an offender’s characteristics. They firstly used logistic regression with binary variables and found that this method could enhance prediction in relation to some offender characteristics, and recommend its use on other datasets. However it should be noted that in their dataset, prediction of some offender characteristics was not greatly enhanced from that achieved by ‘best guessing’ from base rates alone. They then enhanced this analysis to include not two, but three ordinal levels of prediction (offender) variables, yet found that although this method was more discriminatory, it did not perform better than the simpler logistic regression and the number of predictor variables used was limited to three. They also discussed the use of more complex statistical methods but found one selection and matching method (Gammerman & Thatcher, 1990, cited in Aitken et al, 1995) would require several thousand cases before reliable results could be obtained and another (involving Bayesian Belief Networks) involved subjective judgments of which variables were required and which were influential in prediction (e.g. that there is a connection between the marital status of the offender and the sex of the victim). They stated a third method (categorical data modelling) would have involved a:

> "very computationally intensive task and require the comparison of a large number of statistical models. It was concluded that it was not feasible to progress further with this technique during this study. Further, it would not be practical to base any operational tool on this method unless the start up and maintenance costs could be dramatically reduced through further automation of the analysis technique."


\(^{37}\) The only DV used in the Davies et al (1998) research was in relation to previous convictions.  
\(^{38}\) All of the sample were male in the Davies et al (1998) research.
In addition, it was acknowledged that problems existed in assessment of the performance of the models. As such from this research, basic LR appeared the most appropriate method.

In summary therefore LR was chosen for use in this part of the study as:

- previous researchers of similar phenomena have noted its value (e.g. Aitken et al, 1995; Davies et al, 1998);
- it can consider categorical variables;
- it does not impose further parametric assumptions (such as normal distribution of the variables);
- it can be relatively easily conducted in SPSS; and
- it can allow for temporal considerations by allowing the researcher to explore potential utility at different stages of an investigation by adding the information available at different stages into the analysis in subsequent ‘blocks’.

The method of entry chosen for the predictor variables was ‘enter’ (direct, simultaneous) whereby all variables were entered simultaneously as none were deemed to be more important than others (hierarchal, sequential) and the research wanted to investigate all of the variables rather adding them in or taking them out based upon statistical rational (statistical, stepwise, forward, backward). In addition, such methods not only make decisions on behalf of the researcher, but also may be influenced by random sampling variation in the data, so inclusions of variables could be based on only slight differences between them and therefore seldom give replicable results (Field, 2005). They may also intensify any problems when there are correlations between the IVs (Kinnear & Gray, 2001). When regression is exploratory with no underlying theoretical model to test and with relatively low numbers of cases, the use of this method ‘enter’ is advocated (Brace, Kemp & Snelgar, 2000).

**LR Stage One Analysis – Golden hour**

In accordance with the CFA undertaken above, the LR analysis similarly gave appropriate consideration to the timing of when information was available regarding an offence. As such the first stage of LR involved analysis of the 5 predictor (offence) variables likely to be available within the first hour, in combination with each outcome (offender) variable in turn.
The LR models considered whether adding crime scene information available in the first hour significantly improved the accuracy of the prediction of offender characteristics. In addition, consideration of whether the overall prediction rate was improved was also taken into account. Any significant models, that also increased the levels of prediction, were subsequently reported.

As with previous analyses, due to multiple testing on the same dataset, there is an increased risk of making Type I errors and so to guarantee a 0.05 error rate for each test, Holm corrections were incorporated. This test is slightly less stringent than Bonferroni adjustments, which would have further reduced the number of significant findings. Although Holm corrections still reduced the number of significant findings, it was deemed necessary to ensure reliable results. After Holm corrections, one logistic regression model remained significant and the overall percentage prediction was improved. This finding is reported in Appendix Siv.

**LR Stage Two and Three Analysis – Within 24 hours and 24 hours plus**

In accordance with the method undertaken in relation to the CFA described above, due to the size of the sample, it would have been invalid to enter all of the variables into the LR at once. As such the ‘striations’ used for the CFA were replicated here, where each LR theme was looked at with each offender feature in turn. In addition, data was entered in ‘blocks’ corresponding to the likely time information would be available to investigations. For example for consideration of the ‘victimology’ striation in relation to offender ethnicity for stage one, the predictor (independent) variable comprised only of sex of victim, and the ethnicity of the offender was entered as the outcome variable under ‘block 1’. For stage or ‘block 2’ the predictor variables comprised of sex of victim, with age and ethnicity of victim also added. For stage or ‘block 3’ the predictor variables comprised of sex, age, ethnicity of victim plus the lifestyle and vulnerability variables.

As above, any significant LR models, that also increased the percentage levels of prediction, were subsequently reported. After Holm corrections, 3 logistic regression models remained significant and overall percentage predictions were improved. These findings are reported in Appendix 8v.
The importance of evaluating performance: All significant logistic regression models together with the overall percentage improvements in predictions are summarised in table 8.17 below.

Table 8.17 Percentage improvements in predictions from logistic regression analysis.

<table>
<thead>
<tr>
<th>% correct predictions from base rate - Block 0</th>
<th>Stranger relationship</th>
<th>White offender</th>
<th>Previous conviction - any</th>
</tr>
</thead>
<tbody>
<tr>
<td>% correct predictions from model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1 - Golden hour</td>
<td>64.4</td>
<td>-</td>
<td>72.9</td>
</tr>
<tr>
<td>Block 2 - Victimology predictors</td>
<td>-</td>
<td>89.7</td>
<td>73.2</td>
</tr>
<tr>
<td>Block 3 - Criminal predictors</td>
<td>62.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Block 3 - Victimology predictors</td>
<td>-</td>
<td>90.1</td>
<td>-</td>
</tr>
<tr>
<td>% increase in correct predictions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1 - Golden hour</td>
<td>3.2</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Block 2 - Victimology predictors</td>
<td>-</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Block 3 - Criminal predictors</td>
<td>1.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Block 3 - Victimology predictors</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
</tr>
</tbody>
</table>

In relation to prediction of whether or not the offender was likely to have known the victim, as the majority of cases involved offenders who did (61.2%), 'best guessing' the offender is likely to have known the victim therefore seems appropriate and is likely to be correct on 61% of occasions. This is obviously very quick and easy to calculate, and is one of the methods utilised currently by practicing BIAs. This can be done with combinations of variables, and gives rise to the 'block 0' calculations in the logistic regression. Subsequently adding in other variables at different stages (or 'blocks') can enhance prediction. For example when detail (available immediately from the crime scene) regarding the gender of the victim, whether or not they had been dismembered, were naked, found indoors/outdoors and whether or not the body was concealed was included, the prediction rate increased (to 64.4%) assuming that future offenders will have similar features to the previous offenders looked at in this sample.

---

39 This assumes that future offenders will have similar features to the previous offenders looked at in this sample.
However in some cases, waiting for, and including additional variables can decrease the percentage prediction rate provided by the LR models:

Attempting to predict the victim/offender relationship:

Base rate (block 0) - 172/281 offenders knew the victim 61.2%
Adding the Golden hour predictors (block 1) increases prediction rate to 64.4%
Including the criminal predictors (block 3), reduces prediction back to 62.3%.

As such practically it is recommended that in this instance we do not wait for the ‘criminal’ predictors to become available, and just use the model which enhances prediction the most – in this instance the ‘block 1’ model. It is recommended therefore that in all instances the models increasing prediction the most – those highlighted in bold in the final row of table 8.17, are the ones used.

The importance of outcome performance in pragmatic study has been outlined throughout this thesis. For the purposes of the LR calculations, evaluation considering the ‘cost effectiveness’ (as advocated by Fishman, 1999) of the enhancement to the prediction rate was also considered. Although waiting for additional variables (or offence information) may in some instances enhance percentage prediction over and above that offered by ‘best guessing’ (block 0), the significance of the increase in prediction was also considered. If the increase in prediction was less than 5%, it could be argued, that continuing the simpler ‘best guess’ analysis, from what is known from base rate information of past offenders on the SCAS database and giving this information to investigations as early as possible, may be virtually as effective.

Whilst the models outlined in Appendices 8iv and 8v made improvements which were significantly better than those which could have been made by best guess alone, none appeared ‘cost effective’ by this definition - i.e. none improved category prediction by 5% or more as can be seen in the final row in table 8.17.

Summary of LR findings: Some of the models obtained from the logistic regression analyses appear to be able to improve predictions regarding the offender when information regarding the offence is added, than when best guessing from base rate information alone. Practically, in relation to: the likely victim/offender relationship; ethnicity; and having a previous conviction of any kind - calculations can be made to
provide investigators with estimated percentage predictions of the likelihood of an offender having these features, given information known about the offence. All models achieved a correct prediction rate of above 60%. Some of this information could be provided within the first hour of the investigation if required, and waiting several hours or days for additional information, may not significantly influence these predictions.

However, when the actual increase in prediction is considered, no models appeared 'cost effective' in that none improved category prediction more than 3% from that available from 'best guessing' alone. As such, the practical utility of undertaking such analysis may be called into question - it may be that general base rate information, given at the earliest opportunity is sufficient initially, and then more detailed analyses can take place if required when more information becomes available. However, it should be noted, that compared to the 'cost' in time waiting for information, and in calculations being made, predictability may not be greatly enhanced.

**Conclusion regarding research objectives from LR analysis:** Research objective 5 was to consider whether there was any relationship between the variables available to the police about the offence and the known characteristics of the offender responsible. Based upon this analysis, the utilisation of some variables may be able to increase prediction regarding some background offender characteristics. However the overall percentage increase in predictions, from those available from the simpler 'best guess' technique, appears minimal and may therefore not be 'cost effective' to practically perform.

In relation to research objective 6, examining whether the reliability of profiling advice may be enhanced as more information becomes available to the police, it seems an increase in information available does in some instances increase overall percentage predictions. However the enhancements appear minimal and so practically waiting for additional information may not be worthwhile.

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8.2.3 Comparison of results in combination and application of findings

The combined findings from all of the statistical tests are summarised in tables 8.18 and 8.19 below. The table details for example that on the basis of the current dataset, the base rate prediction of an offender being male, would be correct 97% of the time (i.e. in 303 out of 312 cases). The configural frequency analysis would correctly predict the offender was male on 97% of occasions (128/132 cases) where the victim was not found naked, where there was no sexual assault, no foreign object insertion and no injury to the genital, anus or breasts. The odds ratio makes no predictions regarding the sex of the offender, but in relation to ethnic appearance, suggests that white victims are murdered by white offenders 93% of the time (263/283 instances in this sample). The logistic regression would also not make any predictions in relation to offender gender, but with detail available to the investigation within the first 24 hours, could correctly predict whether or not the offender was white or non white in 90% of cases. This prediction is no better than that obtained from the base rate, but findings may be of interest if the information is available. Information regarding predicted probabilities and predicted group membership for individual cases are available in SPSS.

The findings highlighted in red are those which it is suggested on the basis of this research may be presented to investigators as of use in future investigations of this kind where a suspect is as yet unknown, given appropriate caveat and caution. They all give a (retrospective) level of prediction of 65% or above. Those highlighted in pink are of interest, but the sample sizes involved make the results somewhat more tentative and in need of further verification and research. Those in black, whilst statistically significant findings, are considered of less interest for the reasons highlighted in the relevant sections above – for example they do not yield much more information than base rate findings, or are based upon very small sample sizes.
Table 8.18 Comparison of statistical profiling methods - offender characteristics.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Base rate</th>
<th>Odds ratio</th>
<th>Configural Frequency Analysis</th>
<th>Logistic Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97% (*</td>
<td>*</td>
<td>97% (128/132) not naked, no</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(303/312)</td>
<td></td>
<td>sexual assault, no foreign</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>object, no sexual injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100% (9/9) naked, sexual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>assault, foreign object</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>insertion, sexual injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100% (18/18) body recovered</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>outdoors, concealed, no</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>weapon used, vehicle used</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100% (21/21) clothing taken,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>item of value taken,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>precautions taken</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9/312)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnic appearance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>90% (*</td>
<td>93% (263/283) - white victims</td>
<td>100% (1/1) male victim,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(275/307)</td>
<td></td>
<td>indoor body recovery, naked,</td>
<td>indoor body recovery,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not concealed, dismembered</td>
<td>naked, not concealed,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100% (3/3) male victim, outdoor</td>
<td>dismembered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>body recovery, not naked,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>concealed, dismembered</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>95% (20/21) clothing taken,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>item of value taken, precautions taken</td>
<td></td>
</tr>
<tr>
<td>Non white</td>
<td>10% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(32/307)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-40 years</td>
<td>82% (*</td>
<td>85% (217/255) - non prostitute</td>
<td>100% (2/2) dismembered,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(255/310)</td>
<td></td>
<td>victims</td>
<td>weapon used, no</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>injury to head/face/neck, no overkill,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>no binding</td>
</tr>
<tr>
<td>Under 18 or over 40</td>
<td>18% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(55/310)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Body recovery site</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiar</td>
<td>54% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(168/312)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not familiar</td>
<td>46% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(144/312)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Living arrangements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with someone</td>
<td>74% (*</td>
<td>78% (146/186) - non drug/alcohol victims</td>
<td>100% (7/7) not naked, sexual assault,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(182/246)</td>
<td></td>
<td></td>
<td>foreign object</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>insertion, sexual injury</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100% (2/2) male victim, under 18, non</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>white, not prostitute,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>not vulnerable</td>
</tr>
<tr>
<td>Living alone</td>
<td>26% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(64/246)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relationship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>61% (*</td>
<td>84% (42/50) - prostitute victims</td>
<td>100% (3/3) female, outdoors,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(172/281)</td>
<td></td>
<td></td>
<td>naked, concealed, dismembered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>83% (53/64) - drug users/alcohol abusers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>70% (94/135) - body indoors 67% (117/174) - no evidence of any item of value being taken</td>
<td></td>
</tr>
<tr>
<td>Stranger</td>
<td>39% (*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(109/281)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*No findings of interest for these variables
**Weighted average
Table 8.19 Comparison of statistical profiling methods – previous criminality.

<table>
<thead>
<tr>
<th>Previous conviction</th>
<th>Base rate</th>
<th>Odds ratio</th>
<th>Configural Frequency Analysis</th>
<th>Logistic Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>(any)</td>
<td>of cases correctly classified</td>
<td>of cases correctly classified</td>
<td>of cases correctly classified</td>
<td>of cases correctly classified</td>
</tr>
<tr>
<td>Yes</td>
<td>71% (221/312)</td>
<td>86% (57/66) - male victims</td>
<td>- 100% (3/3) male victim, outdoors, clothed, concealed, dismembered &amp; 100% (12/12) male, under 18, white, not prostitute, not vulnerable</td>
<td>Using predictors available in Golden hour 100%</td>
</tr>
<tr>
<td>No</td>
<td>29% (91/312)</td>
<td>*</td>
<td>Golden hour 72.9%**</td>
<td>In 24 hours 73%</td>
</tr>
<tr>
<td>Previous prison term</td>
<td>Yes</td>
<td>58% (175/302)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>No</td>
<td>42% (127/302)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Previous conviction (sexual)</td>
<td>Yes</td>
<td>15% (47/312)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>No</td>
<td>85% (265/312)</td>
<td>90% (122/136) - where precautions taken 87% (222/255) - non prostitute victims 88% (224/256) - where no items of clothing taken</td>
<td>100% (8/8) not naked, sexual assault, foreign object insertion, sexual injury &amp; 95% (20/21) clothing taken, item of value taken, precautions taken</td>
<td>*</td>
</tr>
<tr>
<td>Previous conviction (violence)</td>
<td>Yes</td>
<td>39% (123/312)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>No</td>
<td>61% (189/312)</td>
<td>76% (29/38) - bound victims 65% (156/240) - non drug/alcohol victims</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Previous conviction (dishonesty)</td>
<td>Yes</td>
<td>55% (172/312)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>No</td>
<td>45% (140/312)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Previous conviction (any other)</td>
<td>Yes</td>
<td>57% (177/312)</td>
<td>70% (46/66) - male victims 69% (60/87) - where no weapon used 68% (49/72) - drug/alcohol victims 60% (140/232) - where bodies not concealed</td>
<td>*</td>
</tr>
<tr>
<td>No</td>
<td>43% (135/312)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
As can be seen, when just looking at the base rate information regarding the offender, some interesting predictions can be made. For example 97% of offenders in this sample are male, as such it could validly be suggested to future investigations of this kind that any unknown offender they are looking for is also likely to be male. Supporting evidence comes from findings from CFA, particularly in relation to offences where the victim was not found naked, where there was no evidence of sexual assault, sexual injury or foreign object insertion. In such instances the validity of reporting that the offender is likely to be male is somewhat enhanced by these correspondent findings.

When looking at the likely ethnicity of the offender, in the majority of cases the offender was white, particularly if the victim was also white. Whilst the odds ratio information indicates this, the logistic regression findings also suggested the best predictor of the offender being white was the ethnicity of the victim. However, of interest the CFA indicates that if the victim is a white, adult, female who is a prostitute and in some other way vulnerable, the majority of previous offenders are actually non white in this specific instance.

In relation to the likely age of the offender, the majority were aged between 18-40 years at the time of the offence and therefore prioritisation of this age group may be worthwhile, particularly if the victim is not a prostitute. Whilst the CFA findings suggested a certain offence type which may indicate an offender under 18 or over 40, this was on the basis of only two cases and therefore would not be reliable to report to investigators at this stage without further exploration.

Although obviously reliant upon the police having such knowledge, around half of offenders are known to have been familiar with the body recovery site. The CFA findings suggest however a predominance of offenders with no known familiarity to the body recovery site in offences where the victim was a white, adult, female victim known to have been a prostitute, and otherwise vulnerable.

Perhaps surprisingly around three quarters of offenders in this sample were living with someone else at the time of the offence, particularly if the victim is not known to have
been an alcohol abuser, drug user or prostitute. Whilst conclusions are tentative at this stage, the CFA findings indicate all 7 previous victims who were not found naked, but had been subject to sexual assault, foreign object insertion and sexual injury, were killed by an offender living with someone.

Although this dataset is focused upon difficult to detect murder, 61% of offenders were still known to the victims in some capacity. According to findings from the odds ratios however, this proportion increases to over 80% where the victims were known prostitutes, drug users or alcohol abusers. Similarly the odds ratios suggest the offender is more likely to have known the victim if the body was recovered indoors and if no items of value had been taken from the victim. Support comes from the findings of the logistic regression which also found the variables regarding the location of where the body was found and whether or not an item of value had been taken, were significant in predicting the likely relationship between the offender and victim.

71% of offenders in this sample had a previous conviction for some kind of offence at the time of the murder. In relation to male victims, the odds ratio suggests this figure increases to 86%. Again support comes from the findings of the logistic regression analysis which indicate the gender of the victim as being the only significant predictive variable in determining the likelihood of the offender having a previous conviction of any kind. The configural frequency analysis also highlights young, white, male victims (with no known prostitution or defined vulnerabilities) are more frequently killed by offenders with some kind of previous conviction.

Most offenders in the sample had previous convictions of some sort. However on the basis of the analysis conducted above, it is not possible at this stage to reliably predict the likelihood of the offender having previously served a period of imprisonment, on the basis of information available regarding the offence.

The majority of the offenders (85%) did not have previous convictions for sexual offences. In addition, there was no evidence that features such as taking precautions to avoid detection (which would include destroying of semen), taking clothing, undertaking sexual
assault or injury, or foreign object insertion were associated with having such a conviction, in fact as outlined from the odds ratio and CFA results, these features in some circumstances may further decrease the likelihood of previous convictions for sexual crimes.

Similarly the majority of offenders (61%) did not have a previous conviction for a violent type of crime at the time of the murder. According to the odds ratios, 76% of offenders who bound their victims did not have a previous conviction for a violent type of offence.

From the current dataset and analysis, no reliable conclusions can be drawn in relation to predicting the likelihood of an offender having a previous conviction for a dishonesty type of offence.

The majority of offenders (57%) did have a previous conviction for an 'other' type of offence. The odds ratios indicated this was particularly likely in offences involving male victims, where no weapon was used, or where the victim was a drug user or alcohol abuser.
8.3 Discussion
All of the statistical findings from study two will be considered in relation to each of the research objectives in turn.

8.3.1 To determine the relationship between the variables available to the police about the offence and the known characteristics (available from police records) of the offender responsible
Based upon the findings from this dataset, basic Chi-square analysis indicates there are some associations between offence and offender variables and the likely odds of the offender having certain features can be calculated. When looking at combinations of offence features from the CFA, there appear associations between some combinations of specific offence and offender variables that occur more often than would be anticipated by chance. In addition, from the LR analyses it is clear that some variables may be able to increase prediction of some offender characteristics more than would have been achieved by mere 'best guessing' from base rate information alone. However when considering the performance of the analysis, the overall increases in predictions are disappointing.

8.3.2 To examine whether the reliability of profiling advice may be enhanced with the passage of time as more information becomes available to the police i.e. can prediction be refined as the quality and quantity of crime variables increase
From the analysis undertaken above, it seems an increase in information available to the police over time, does allow for increased associations, enhanced suggestions and more detailed predictions regarding the offender. For instance, from the results of the CFA, it appears that during the first hour of an investigation very little can be advised, unless the victim has been dismembered, however as more offence information becomes available, in certain circumstances more suggestions in relation to the likely offender can be made. Looking at the findings from the LR, whilst it seems an increase in information can in some instances increase predictions, consideration needs to be given to performance, and it may be that waiting for additional information to be received, may not significantly enhance predictions which could have been made on the basis of limited information and using far more basic statistical methods.
8.4 Conclusion

This chapter has outlined the second part of a study which involved multivariate statistical analysis of cases from the SCAS database, to determine if any patterns were apparent between what is known regarding the crime scene and what is known regarding the type of offender likely to be responsible.

The chapter firstly outlined the grouping of data by the pragmatic formation of striations. The study innovatively used the striations and analytical techniques (such as inputting the data in blocks) to consider the temporal requirements necessary to explore the research objectives. It detailed the techniques of configural frequency analysis and logistic regression, and highlighted the main findings from these analyses. For example, the CFA demonstrated that the combination of variables white, male victim, under 18 years of age, not known to have been a prostitute, not known to have been otherwise vulnerable, occurred more often than would be anticipated by chance with offenders who had previous convictions. As such, if these features were displayed in an offence it could be suggested to the investigation team (with appropriate caveats) that based on previous cases, the offender responsible is likely to have a previous conviction at the time of the offence. The CFA may therefore be of benefit in highlighting previous patterns to investigators, but only in instances which directly replicate the specific offence scenarios presented.

In relation to LR, some significant models were found, and the probability of the offender displaying a particular characteristic can practically be calculated in SPSS, akin to the previous work in relation to prediction of previous convictions in stranger rape (Davies et al, 1998).

However, importantly in light of the pragmatic focus of this thesis, the findings were considered in relation to performance outcome – i.e. whilst some findings were found to be significant, performance measures were additionally implemented in order to examine just how effective they were. In relation to the configural frequency analysis a method of rating performance akin to pattern matching (as advocated by Fishman, 1999) was used. Here the ‘hit rate’ of success was calculated providing a percentage value which indicated the number of times the predictions would have been correct. Whilst in some instances
the 'hit rates' were 100%, consideration needed to be given to the fact that some involved 'hits' of 1/1, and as such there were fewer actual results of interest when the numbers of cases involved were explored. In addition for a large proportion of cases the CFA would not have provided any assistance – it is only of use for cases that precisely match the 'typed' profiles reported.

In relation to the logistic regression, the 'cost effectiveness' of the performance was considered. So whilst models may have been significant, the actual percentage increase in prediction, compared to that which could have been gained from 'best guessing' from base rate frequencies alone was calculated. It was determined that whilst predictions in some instances increased, as the increases were less than 5%, consideration should be given as to whether such analysis is 'cost effective' or worth doing (or at least waiting for additional information).

Finally the findings from the different methods were compared and discussed in relation to their potential for practical application.

The following chapter will further consider the findings in the light of previous research and evaluate how well the research objectives were addressed by the principles of Pragmatic Psychology. Finally the concluding chapter will bring the thesis together by picking up on the overall findings and in recommending what, how and when they can be reliably used in the provision of behavioural investigative advice to difficult to detect murder investigations in the future.
CHAPTER 9: DISCUSSION

9.1 Introduction

The previous chapter outlined the second part of a study aimed at attempting to explore patterns between what is known regarding the offence, and information regarding the offender, which would be of use to investigators of difficult to detect murder. Multivariate analysis was undertaken and patterns were found via different statistical methods, which were then compared and assessed in terms of performance and their potential for practical application.

The purpose of this research is to assist and enhance the advice provided by Behavioural Investigative Advisers (BIAs) to Senior Investigating Officers (SIOs) in charge of difficult to detect murder investigations. SIOs have traditionally

"frequently identified [offenders] during the initial response stage. Where this is not the case, it is usually possible to infer some characteristics of the offender from the material that is available in the early stages of an investigation. This basic type of offender profiling has always been practised by experienced SIOs”

ACPO, 1996, p52.

However, it is also recognised that

"SIOs should supplement their team with those who are able to provide authoritative advice in relation to the strategic area they are developing."

ACPO, 1996, p56.

Research has acknowledged that in particular the ‘inference layer’ of detective expertise is weak and recommends therefore that efforts should be focused upon assisting detectives in drawing valid inferences (Adhami & Browne, 1996).

The chapter presents an overview of the findings and discusses in the light of these, how SIOs may be better assisted in their investigations by timely and reliable BIA advice. The findings will also be contextualised in relation to previous research. The chapter assesses the utility of the Pragmatic Psychology approach as applied to the present topic under
investigation. Finally it will explore the potential contribution the research has made to conceptual understanding.

9.2 Overall summary of findings
Study one consisted of in depth interviews with experienced SIOs. The study initially considered the investigative process involved in a difficult to detect murder investigation and the role of the SIO. The views of the SIOs were then elicited with regard to the types of products they would like to receive from BIAs in order to assist them.

It was identified that a vast array of information is received into an investigation and that this is ‘drip fed’ in at different stages. However the information usually available to the investigation at different times is predictable. For example information regarding the sex of the victim, location, position and state of undress, are likely to be available as soon as a body has been discovered. In addition information regarding the specific nature of injuries and cause of death from the post mortem is likely to be available within the first 24 hours. Other information regarding the victim, witnesses, the offence and potential suspects continues to accumulate throughout the course of the investigation.

The interviewees provided many suggestions of assistance they felt the BIAs could give in relation to their enquiries, including;

- offender profiling advice;
- advice regarding offence linkage;
- interview advice;
- assistance with the media; and
- information regarding risk assessment.

These are commensurate with many of the services currently provided by BIAs in the UK but the SIOs also highlighted more innovative areas where currently, BIAs do not routinely provide advice. Suggested areas for future development of behavioural investigative advice included;
• assistance with house to house enquiries;
• prioritisation of messages into the incident room; and
• enhancing team welfare and moral.

Specifically in relation to profiling, it seems investigators want as much advice as possible regarding the likely background of the offender, but repeatedly the following features were all deemed of practical use to their enquiries;

• the likely relationship to the victim;
• age;
• ethnicity;
• previous criminal history;
• living arrangements; and
• likely employment of the offender.

The SIOs also stated they wanted advice which was supported by statistical information or based upon the experience of the BIA. The team approach to profiling, perhaps incorporating a BIA with experience in crime investigation, analysing and searching police databases, being used in combination with a clinically based adviser with experience in interviewing and treating offenders and patients, was advocated.

The interviewees stated they wanted to receive advice from a BIA as early as possible, although some reported they may be very busy and have other considerations requiring attention in the first few hours. A repeated suggestion was for advice to be supplied throughout the course of the enquiry with findings refined as more information becomes available.

In line with current ACPO guidance, the investigators wanted the BIA's findings reported in writing, disseminated in a secure manner and within the agreed timescales. Additional verbal presentation back to the enquiry teams was also highlighted as being worthwhile.
In relation to study two which explored patterns and relationships between variables in previously detected cases of murder, all statistical analyses found statistically significant relationships between the variables available to the police about the offence and the known characteristics of the offender responsible. In addition it seems that in some cases, profiling advice may be enhanced by more detailed predictions regarding the offender as more information becomes available to the police. For instance, the findings from the CFA suggest that during the first hour of an investigation, very little can be advised unless the victim has been dismembered. However by the time more detailed information regarding the victim becomes available, further predictions could be made, but this may be limited to particular victim types. For example male, non white victims who are under 18 and are neither a prostitute nor have any known drug/alcohol problems or mental/physical disabilities are associated with offenders being familiar with the body recovery sites, not living alone, and unlikely to have served a previous term of imprisonment. Consideration of such findings however has to account for the number of cases upon which predictions are made, and as such, some findings are limited. The logistic regression analyses indicates that whilst some models can be better than those provided by 'best guessing' on the basis of base rate frequencies, in relative terms, any enhancements in prediction are minimal and as such may be of limited benefit to the investigation.

As such, the key findings highlighted in red in tables 8.18 and 8.19 are those which the current thesis recommends could be reliably (given appropriate caveats) suggested to investigators by suitably qualified BIAs at this time. Findings include the fact that most offenders responsible for previous murder offences held on the SCAS database are male. The vast majority are also white (90%), but this is particularly the case if the victim is also white (93%). The majority of offenders (82%) were also aged between 18-40 years, and most were living with someone (74%) at the time of the murder. Of interest the offender is likely to have known the victim in some capacity in most cases (61%), but this is particularly the case if the victim was a prostitute (84%), was a drug user or alcohol abuser (83%), if the body was found indoors (70%) or if no item of value is believed to have been taken from the victim (67%). In addition, all (32) of the offences involving a
white adult female victim who was a prostitute and considered vulnerable were killed by an offender not known to have been familiar with the body recovery site, and nearly all (29/32) were killed by a non white offender. Similarly, nearly all (20/21) of the offences involving an item of clothing, an item of value, or precautions to avoid detection being taken at the crime scene involved white offenders with no previous conviction for a sexual offence.

Regarding previous criminal history, the majority of offenders (71%) had some form of previous conviction at the time of the murder, although this was particularly true in the case of male victims (86%). All (N=12) cases involving a white, male victim under the age of 18 years who were neither a prostitute nor vulnerable were killed by offenders who had a previous conviction at the time of the offence. In addition, the previous conviction was unlikely to be for a sexual offence (i.e. only 15% had a previous conviction for a sexual offence), and it was even less likely the offender had a previous conviction for a sexual offence if clothing and an item of value had been taken from the crime scene and precautions had been taken by the offender to avoid detection (in only 5% of instances did the offender have a previous conviction for a sexual offence). Interestingly 65% of victims with no known drug use or alcohol abuse difficulties were killed by someone with no previous conviction for a violent offence, and 76% of offenders who committed a murder involving binding of the victim also had no such conviction. In need of further research was the finding that 70% of male victims, 69% of offences where no weapon was used, and 68% of victims who were drug users or alcohol abusers were killed by someone with a previous conviction which was not for a sexual, violent or dishonesty related offence. More research would provide further clarity and drill down into what types of previous conviction these offenders did have, and if there was any patterns of interest in these. This would enable potential hypotheses regarding the cause of such patterns to be elicited and tested further. Nevertheless it can be seen that such statistical ‘backing’ can be of great assistance to an investigator tasked with prioritising persons of potential interest in a difficult to detect murder investigation.
9.3 Contextualising the present research findings

9.3.1 The focus of previous research

As outlined in Chapter Three, much of the previous research in relation to offender profiling and behavioural investigative advice has been in relation to either:

- evaluating the contribution of behavioural investigative advice, for example via police officer satisfaction surveys (e.g. Copson, 1995), or
- identifying patterns and relationships between variables available regarding the offence and characteristics of the offender.

However the evaluation of advice has been based mainly upon retrospective accounts of police officers. Moreover the way BIAs provide advice has changed somewhat since the main study which took place in the UK (Copson, 1995) was conducted.

In addition, much of the research identifying relationships between offence and offender variables has been based upon specific sub sets of data such as gay homicide (e.g. Wherton, 2004), or the analysis (e.g. Lobb, 1999) or data (e.g. Francis et al, 2004) have been limited. Also the variables for inclusion have in the main been chosen by the researcher for the study, and are ultimately chosen by the BIA when it comes to application.

This thesis has aimed to bring together, and take forward, all of this previous research. However rather than undertaking another evaluation of advice, this research has aimed to articulate a proactive list of what experienced SIOs want from BIAs, and then, in relation to offender profiling, using information available to investigations at different stages, provide it. It has identified patterns within a pre-existing dataset of difficult to detect murder, and will suggest how these could be used to predict a multitude of offender features. Those features being predicted are those which the SIOs have articulated will be of use to their enquiries.
9.3.2 Findings consistent to previous research

The present thesis has reflected previous research findings. For example, the responsibility afforded to, and multitude of investigative and managerial skills required by SIOs reported in study one were reflective of the key three skill clusters of management, investigative and knowledge as outlined by Smith and Flanagan (2000) and similar to issues identified by managers of critical incidents (Crego & Allison, 2004). Skills such as planning, appraisal and prioritisation of material, sensitive internal (e.g. with ACPO or incident team members) and external team working (e.g. with the media, experts, community etc.), leadership, and having an underlying knowledge of legal requirements and investigative procedures were acknowledged as important skills.

Alongside such demands of the role, the existence of only limited detective expertise in relation to low volume serious crimes was highlighted in accordance with previous research (Adhami & Browne 1996). Moreover there appeared to be a lack of any agreed set of rules which may assist the investigator in making inferences about suspect parameters from crime scene variables (Adhami & Browne 1996). Study two sought to provide practical, yet empirical assistance in this vein.

Results from study two are also consistent with previous research, including the well established finding that most offenders are male (e.g. Egger, 1990; Francis et al, 2004; Hazelwood & Douglas, 1980; Warren, Hazelwood, & Dietz, 1996). Also offenders are likely to have previous convictions of some sort at the time of the murder (Francis et al, 2004; Lobb, 1999; Marogna, 2005; Soothill et al, 2002) which are unlikely to be for sexually related crimes (Lobb, 1999; Marogna, 2005; Soothill et al, 2002).

Other consistent findings include the results of the odds ratio calculations that suggest 67% of the offenders who did not steal from the victims, and 70% of offenders who left the victim’s body indoors, knew their victims. This is reflective of previous findings by Silverman and Mukherjee (1987) who found robbery in an offence indicative of a stranger offender, and Silverman and Kennedy (1987) who found that victims murdered in their own home were less likely to have been killed by strangers.
9.3.3 Findings at odds with previous research

Other results appear contrary to what may have been anticipated. Previous writings have suggested that some sexual murderers may be loners (Geberth, 2003; Holmes & Holmes, 1996) and therefore by implication may be more likely to live alone, or have difficulty relating to others socially (Brittain, 1970; Lunde, 1976). However the findings from study two suggest that offences involving victims who had been subject to a sexual assault, having a foreign object inserted (and there was injury to the breast, anus or genitalia) but the victim was not found naked, were perpetrated more commonly by offenders with no previous conviction for sexual offences and by offenders who were living with someone at the time of the offence.

Some base rate findings exploring frequency of occurrence (although primarily in the USA or using mainly serial offenders’ data) have demonstrated features such as overkill (Canter et al, 2004; Ressler et al, 1988), foreign object insertion (Canter et al, 2004; Ressler et al, 1988; Warren et al, 1996), victims being found naked (Ressler et al, 1988), concealed (Ressler et al, 1988) or having souvenirs or trophies taken from them (Geberth, 2003; Ressler et al, 1988) occur far more frequently than was noted in the current dataset. Whilst difference in definition may account for some of the findings, such dissimilarities are of note. Also previous research has found that homicides with an overt sexual element are more frequently committed by strangers (e.g. Brooker, 2003; Geberth, 2003; Hazelwood & Douglas, 1980; Langevin, 1991; Wherton, 2004). Whilst the Chi-square for this finding was initially significant in the present research, it was not significant after Bonferroni adjustments (or Holm corrections).

Also previous research has indicated that offenders are unlikely to travel far when committing violent offences (Rossmo, 1993), difficult to solve, lust, serial or sadistic homicides (Geberth 2003; Lundrigan & Canter, 2001; Santtila et al, 2007; Santtila, Laukkanen, Carlsson, Kardell, Faggiano, Picozzi, Zappala & Zanchetti, 2004, cited in Santtila et al 2007; Warren et al, 1996). An inference from these findings could be that the offender is likely to have been familiar with the area in which the offence occurred. However, the current dataset found this was known to have been the case in relation to body recovery sites in only 53% of instances.
9.3.4 Previously highlighted research issues which have been dealt with in the present research

The research literature has criticised previous profiling endeavours for;

- their lack of quantitative and formal evidence base from case histories or studies (Almond et al, 2007; Snook at al, 2007);
- primarily using inappropriate datasets overwhelmingly skewed towards homicides involving someone known to them (e.g. Francis et al, 2004; Hakkanen & Laajasalo, 2006; Salfati 2000);
- using datasets where variables of interest are missing or confusingly combined (Francis et al, 2004);
- looking only at very specific subsets of murder (e.g. Aitken et al, 1995; Wherton, 2004);
- using primarily bivariate analysis (e.g. Lobb, 1999; Marogna, 2005);
- being designed to predict only one feature regarding the offender (e.g. Brooker, 2003; Wherton, 2004); and
- choosing variables by means of what is available or is deemed of interest to the researcher.

This research has attempted to address all of these issues by;

- providing quantitative, evidence based case histories for BIAs to present to SIOs;
- using the most appropriate dataset in the UK for this purpose (although specific with regard to ‘serious crime’);
- limiting the missing data wherever possible;
- not (in the view of this researcher) ‘confusingly combining’ categories;
- considering multivariate, alongside univariate and bivariate analysis, to predict a number of different offender characteristics; and
- using variables chosen (in the main) by practitioner SIOs.

The current research has therefore built upon previous research and has been developed in light of previous academic criticism. Some findings were commensurate with; some
differed, to those noted in previous studies. In summary therefore, using a framework of Pragmatic Psychology, the current research programme has aimed to provide evidence based advice to BIASs regarding when SIOs want behavioural investigative advice, what type of advice they want, and given some initial suggestions as to how best they may be able to provide it.

9.4 Pragmatic Psychology

There are many theories regarding how, where and why, people commit crime (e.g. Wilson, 1993). However Ainsworth’s (2001:182) opinion is that “most enlightened academics would today admit that crime is multi-causal”.

The focus of this thesis has been concerned with the potential for practical application, as well as enhancing conceptual understanding. As advocated by previous research which has utilised a pragmatic stance, the aims of the present study (as outlined in section 4.7 above) were to:

- Focus on practical problems and solutions.
- Take previous working knowledge and practitioner views into account to ensure findings are relevant and will be of use to SIOs.
- Take context and system (including organisational) issues into account, enabling findings to be appropriately situated and usable within a policing environment.
- Undertake systematic enquiry which is structured and disciplined enough to be scientific, yet flexible enough to incorporate new ideas and various research methods.

Each of these aims will be considered in turn.

9.4.1 Focus on practical problems and solutions

Fishman (1999) states pragmatic study should not only address the problems of a specific client in context but that consideration should be given to how well the program worked to achieve any proposed solutions. i.e. consideration should be given to how well the research performed both
• internally as a process – how well the process worked as a method; and
• externally regarding outcome – how impactive, successful or effective it was or could be, for example via the use of performance indicators.

Addressing problems of a specific client in context: The clients in this research were the SIOs and BIAs working in difficult to detect murder investigations. The problems were outlined via the research objectives, namely to explore,

• what information is available to the police at different stages of an investigation;
• what advice investigators want from BIAs in difficult to detect murder investigations, and in relation to offender profiling - how best to provide it;
• when investigators want advice from BIAs;
• the format in which investigators want the advice;
• whether there is any relationship between offence and offender variables in previously detected difficult to detect murder cases; and if so
• whether or not these relationships can be enhanced (the number of relationships, or predictability of the relationships) with the passage of time and more information.

How the pragmatic research program worked to achieve solutions - internally as a process: As outlined throughout this thesis, the essence of ‘Pragmatic Psychology’ (Fishman, 1999) is to explore specific practical problems in applied situations and where possible provide solutions for those problems. This research wanted to explore what assistance SIOs wanted from BIAs in relation to difficult to detect murder, and where possible to offer potential practical solutions and recommendations regarding such advice. Pragmatic Psychology therefore emphasised and epitomised the overall purpose of this research. Pragmatic Psychology framework assisted in the following ways: By

• providing an overarching framework within which the research could be conducted yet focussing upon the end purpose of the research - to create future best practice for BIA advice to SIOs;
allowing the mixing of research methods to be employed;
- suggesting a structure for presentation of the research;
- ensuring areas such as the guiding conception were fully explored; and by
- evaluating how successful the research was.

*How the pragmatic research program worked to achieve solutions - externally regarding outcome:* This research has been focussed upon the end user and practical requirements throughout. Initially the research objectives were identified from gaps in previous research, in combination with practical experience as a BIA. Then the customer driven approach of utilising client (SIO) knowledge to assist in formulating the required ‘data out’ or end product required (from BIAs), and giving an indication of likely ‘data in’ or information available at certain stages of an investigation to assist behavioural investigative advice and analysis, was entirely pragmatic and driven toward final practical application.

Moreover, the use of performance indicators (pattern matching, cost effectiveness) to assess the value and potential use of any statistical profiling findings from study two ensured outcomes were not only scientifically, but also practically insightful.

*9.4.2 Accounting for previous working knowledge and practitioner views*

As the eventual aim for this research was to be of assistance to practitioners, it was felt important that practitioner views and working knowledge were taken into account. As previous researchers have acknowledged,

"Issues need to be understood in terms of the accounts that investigators themselves give...decision support systems will only be effective if they map onto the narrative form that any particular investigator is following"

Canter (2004), pg7.

The clients of BIAs are the SIOs and yet this obvious first step has been somewhat overlooked in previous research endeavours. There is a recognised “critical shortage of experienced senior investigating officers” in the UK (Alison, 2005, pg18), and as Crego and Alison (2004) note, capturing the views of senior police officers is rare - their time is
precious and both conducting and analysing interviews is resource intensive. However, the pragmatic framework assisted in recommending that enquiry begins with the practitioners themselves, to ‘ask the clients’ and highlights the importance of professional experience and best practice from individual case based knowledge. As such, this was viewed as a necessary pre-requisite in order to obtain the information required to consider the research objectives. Finding and recording this type of information from 11 willing participants of such calibre was therefore held to represent a significant repository of knowledge and experience. This study has taken one more step towards developing a pragmatic ‘database’ of cases (in this instance interviewees) by expanding our limited existing knowledge base regarding the provision of behavioural investigative advice in the specific area of investigating difficult to detect murder. Furthermore, in any sphere, the pragmatic questioning of end users themselves in order to develop research or any practice based model appears to be of benefit.

The use of one to one semi-structured interviews was felt to be appropriate as it enabled both the answering of specific research objectives, yet also maintained a degree of flexibility for the development of any emergent issues. Though time consuming, the interviewees expressed candid views and this method provided a great awareness as to the decisions and considerations of the SIO practitioners. It was successful in providing an initial insight to these investigators’ individual perceptions of the investigative process and the use of behavioural investigative advice.

Asking the investigators to produce a ‘timeline’ of a specific investigation for plotting what information comes in to an investigation at what stage was also deemed of use, as it enabled the interviewees to ground their responses in a real life scenario and ensured the account elicited included practical considerations they had to undertake when conducting an enquiry. It also allowed for comparison between respondents of the information available and decisions taken at various points of the investigations. Such methods have far reaching applications into other areas of psychology, social science and beyond. Indeed consideration of plotting a timeline could be of benefit in any form of future research which has temporal considerations. Investigators were also asked to refer to decision logs, policy files or notes made during the enquiry for verification where
necessary which may have enhanced the reliability of their recall. Although Wright (2008) has also recently utilised decision logs as a potential source of data, this underused source may be of interest to future researchers to gain an insight to SIO decision making.

However whilst this research wanted to take practitioner views into account, continual negotiation with the research participants (as advocated by post-modern paradigms) was not deemed feasible due to their busy schedules, geographic locations and the time already committed by them. Pragmatic Psychology was of value as it advocates the use of practitioners as and when required and the use of any method (qualitative or quantitative) which is appropriate to consider the research objectives. As such qualitative content analysis could be used (despite the quantitative focus of the subsequent studies). In particular, the use of the concept book approach was easy to follow, providing clear step by step guidance. The use of such was beneficial as the richness of the interviewees’ idiosyncratic comments could be retained, yet also enabled the researcher to extrapolate comparative holistic themes to consider the research objectives.

9.4.3 Consideration of context and systems

For this research ‘real world’ application was crucial, and as such pragmatic considerations, highlighting features such as taking context and systems (including organisational) issues into account, meant that findings were appropriately situated and usable within the policing environment for which it was intended.

In the SIO interviews in study one, Pragmatic Psychology assisted in highlighting the importance of understanding the context. In particular, the initial use of open ended questions to understand the holistic process of the investigation and role of the SIO and BIA within it, before molecular refinement into the particular domain of interest - the delivery of profiling advice to investigations, was useful as it allowed for the contextualisation of the results.

In relation to study two, Pragmatic Psychology also assisted in the choice of variables. Pragmatic Psychology promotes the inclusion of rich, multivariate and contextual variables in recognition that many aspects influence applied research and holistic consideration of
cases is beneficial. As such as many variables as (reliably) possible were included. Yet Pragmatic Psychology also assisted in allowing molecular, drilling down and focussing upon specific areas of interest, utilising relevant variables to test key relationships for further consideration. As such for study two, the research was primarily focused upon the specific area of offender profiling.

The context of the actual process of undertaking the research was also able to be taken into account by using Pragmatic Psychology which advocates research which is organic. This was done in several regards;

- via the use of a pilot interview in study one, the interview schedule and process was adapted accordingly;
- throughout the course of the interviews, the use of ‘contact summary sheets’ and ‘memos’ during transcription ensured lessons learnt in relation to interviewing were continually developed, and if certain issues were highlighted by interviewees, these could be explored in subsequent interviews; and
- the variables in study two were selected in light of the findings and analyses of from the SIO interviews in study one.

The use of Pragmatic Psychology also assisted in drawing attention to other organisational system levels (i.e. different ranks and roles). The temptation was to focus solely upon the direct clients’ (SIO and BIA needs), however the pragmatic stance considers all system levels as they may impact upon the research and implementation of findings. This resulted in a further study arising from this research. In 2007 a follow up questionnaire (Wenman et al, in preparation) was sent out to a greater number of police personnel consisting of a wider range of ranks and roles (N=54 participants, from 26 UK police forces, ranked from Detective Sergeant to Detective Superintendent). The findings were largely consistent to those reported above, in that investigators wanted assistance from BIAs regarding the likely motive of the offence, the likely risk of reoffending, information regarding interview strategy and crime scene interpretation. In relation to profiling, features such as the likely relationship between the offender and victim, the offender’s age, gender, ethnicity, lifestyle and previous convictions were highlighted as being of use.
The respondents also confirmed ideally they would prefer assistance from the BIA throughout the course of an investigation. This subsequent study not only enhances the reliability of the initial interviews conducted in study one, but also indicates the results may be transferable to the wider investigator population and demonstrates they appear to have remained constant over (at least this period of) time.

The principle of a systems model was also adapted in the present study to include a timeliness element considering what information is likely to be available when and when assistance from a BIA is likely to be of most benefit to the SIO.

9.4.4 Systematic – scientific, yet flexible enquiry

Following many cases of high profile criticism, the current policing environment requires transparency and accountability in decision making. As such any pragmatic recommendations emanating from this research would need to be based upon scientific enquiry. However, the very fact that the research is being conducted upon actual murder cases, and being used within a practical setting, means that strict scientific control is not always possible. Pragmatic Psychology assisted in focussing this research so that the enquiries were systematic, structured and disciplined enough to be scientific. It encouraged the use of rigorous scientific method in conducting the interviews with SIOs in study one, and in order to extrapolate general patterns and reliable trends in the data for study two, allowing for the use of both quantitative and qualitative analysis as appropriate. It also highlighted the need to consider measures of performance. In addition the Pragmatic Psychology paradigm enabled the research to focus upon usefulness, being flexible enough to be innovative, relevant and applicable in practice.

An advantage with, but also a difficulty when it came to actually using Pragmatic Psychology was that it did not prescribe a specific method to follow. It suggests tools to assist in exploring the research objectives, and advises upon how to present the research, but there was no specific ‘method’ to follow, and limited previous psychological research of this nature upon which to build.
It seems therefore that despite its limited previous use in this domain, Pragmatic Psychology has successfully assisted in addressing the aims of the present research.

However in addition to the aims outlined above, there were several problems anticipated with using Pragmatic Psychology in this applied area (see section 4.10). Namely,

- science and law may clash;
- selectivity in write up;
- boundary problems;
- testimony;
- acceptance of pragmatism; and the
- requirement of scientific rigour.

These will be considered in turn, with reference to how they were encountered in the present research.

9.4.5 Science and law may clash

As noted previously the scientific need for group based, probabilistic findings, may clash with legal requirements of specific application to individual cases.

In this research, answers to a number of different questions posed to individual SIOs have been analysed to elicit overall group or composite answers to explore the research objectives regarding what information is generally available to investigations at different stages of a murder enquiry and what information the SIOs generally want from BIAs at different times. In specific relation to offender profiling, study two explored probabilistic findings of patterns occurring in a dataset of previously detected murder cases in order to apply to individual, undetected cases.

Therefore the findings here, whilst potentially applicable to individual cases in the future, emanate from scientific, group based, probabilistic research. As such whilst resultant predictions regarding potential offenders are unlikely to be legally utilised as evidence in a court of law, with appropriate caveat, they may be of use as intelligence information to
SIOs during the investigation stage. As long as there is knowledge regarding this distinction, these scientific findings may assist in building a legal case, rather than their being a ‘clash’ of interests.

9.4.6 Selectivity in write up

Issues have been highlighted relating to bias in only writing up successful cases and problems (e.g. Seligman, 2000). In the present research analysis has been undertaken on all of the data, interviewee responses have been reported verbatim, and whilst only ‘significant’ findings have been reported, by inference the other findings were not statistically significant and therefore of less interest for discussion. However ‘significance’ was further considered in terms of actual pragmatic performance, and indicators were used to discuss the validity and usefulness of findings.

Selectivity in write up is a potential issue in relation to report writing by BIAs. Specifically in relation to offender profiling it is important that all findings are reported to the SIO to enable them to make an objective judgement. Although an element of selection is required to ensure the reports are succinct and are neither confusing nor contradictory, the BIAs role as an ‘objective scientist’ should be promoted. Part of the reason for presenting overt recommendations for practice (below) and highlighting some of the findings for use in red (in tables 8.18-8.19) is to reduce the temptation for BIAs to ‘cherry pick’ certain findings and ensure that only these more reliable results are used by BIAs at this stage.

The format of BIA written reports are also worthy of consideration in this vein. As outlined in section 3.8 above, Villejoubert et al (2008) highlighted how suspects with characteristics reported as having a low probability of occurrence may still be prioritised. Whilst these should be interpreted as being less common, the mere fact they have been mentioned appears to bring them to the attention of the SIO who may misinterpret the characteristics as being of significance. Any written reporting therefore should consider the audience for which it is intended, and reporting of both sides of likelihoods – of having and not having certain characteristics may be of value.
9.4.7 Boundary problems
As outlined earlier, the ‘boundary problem’ considers how many cases, and how much detail within those cases, to look at. Although ‘thick’ description and multivariate work is encouraged in pragmatic research (Fishman, 2004), there is a need to reduce the data to make it manageable. In this research consideration was given to ‘natural’ units and what was feasible. For example when the findings from the SIO interviews reached saturation point in that repeated themes were emerging, it was decided unnecessary to identify and interview any more investigators. Whilst only a limited number of investigators were interviewed, it was felt to be a fairly representative sample of the small number of experienced investigators having dealt with BIAs and difficult to detect murder investigations of this kind within the UK. Also although the idiographic accounts of specific SIOs were sought, many themes were repeatedly highlighted by the group, suggesting wider application to other SIOs dealing with such investigations was likely.

In relation to the second study, all of the detected murders on the SCAS database were initially considered although multiple offenders and victims were excluded for the reasons outlined in section 7.2.3. Also as many variables as possible were fed into analysis – if they were felt by the investigators to be available (the predictor variables) and of use to them (the outcome variables). The only real problems in relation to boundaries related to the number of variables being restricted by the number of difficult to detect murder cases held on the SCAS dataset. So for example only 5 offence variables could reliably be fed into the CFA when using a dataset of this size. However the dataset could not be expanded at the time.

A related issue is in relation to the ‘bandwidth-fidelity’ trade off discussed in sections 3.6 and 6.3.3 above. Whilst investigators want accurate predictions, they do not want predictions as broad as to be unusable (saying the offender is aged between 1-100 years for example). Any research which presents only dichotomous findings – e.g. that an offender is likely to have a certain feature, or not, could be criticised for being ‘too broad’ in its application. As such the best utilisation of the findings of this research will be in the presentation of an overall profile, with predictions about several different offender features at once. Whilst statistically this is possible as account has been taken of multiple
testing (of the same dataset via Bonferroni adjustments and Holm corrections), future research considering other statistical methods which predict different levels or multiple offender features, may be worthwhile (e.g. CHAID - Chi-Squared Automatic Interaction Detection analysis, see Magidson & Vermunt, 2005 for a summary).

9.4.8 Testimony
As discussed in 3.9.6, it is unlikely that offender profiling advice would currently be admissible within UK courts. As such consideration of whether the results of pragmatic enquiry would be admissible appears somewhat redundant at this time in this context. It is therefore a difficulty, however is not a fatal problem, the solution to which is to ensure all are aware and recognise the appropriate role of the BIA in an investigation and how their advice should be best utilised.

9.4.9 Acceptance of pragmatism
Pragmatic Psychology is not widely used within psychological enquiry, and its use within the specific field of behavioural investigative advice has been extremely limited. As such, although the benefits and rigour of Pragmatic Psychology have been argued throughout this thesis, it is possible the findings may face some difficulties in currently being accepted in the wider psychological community. From the experience of the researcher however, police officers themselves, and police work by its very nature is primarily 'pragmatic', and as such Pragmatic Psychology may be a welcome paradigm for future development in this environment.

9.4.10 Requirement of scientific rigour
As outlined previously, in a recent review of published profiling literature it has been noted that methodological sophistication is lacking, with half of the publications not including any statistics whatsoever (Dowden et al, 2007). A major obstacle is in accessing reliable and accurate data. Whilst exploratory, the current study has been fortunate enough to access police personnel and data, and has attempted pragmatic levels of methodological rigour. With appropriate replication and caveats, it is suggested the findings could be applied to new cases of difficult to detect murder.
The Chi-square analyses was useful in suggesting potential areas of association, and the odds ratio calculations, were found to be of use in consideration of the effect size of these associations. They also have the advantage of being easy to understand and can be particularly impactful – e.g. “if the victim was white, the odds were 13 times higher that the offender was also white.” Whilst they are univariate and therefore somewhat simplistic, they are a frequently remembered and cited tool in other areas of serious crime (Davies et al, 1998 in relation to stranger rape; personal communication, Tony Osborne, 2008 in relation to child homicide), and were therefore worthy of consideration.

The configural frequency analysis was also found to be a good method for consideration of patterns within groups of cases. Whilst time consuming, somewhat underused and not available in standard statistical packages, it was felt appropriate for use on this data, and discovered potential relationships between cases that were not found during the other statistical analyses. However, practically it was only appropriate for application to certain cases (i.e. where ‘types’ were identified), and although discovered patterns which occurred more often than chance, does not further quantify the data. Also, due to the size of the sample, there were restrictions on the number of variables which could reliably be input at any one time.

The restriction of variables due to the size of the sample was also a consideration for the logistic regression analysis, and similarly only certain offence variables were found to be of impact in the prediction of certain offender features. As noted by Aitken et al (1995), with a sample of just over 300, any method would only be able to predict an outline of characteristics with an acceptable level of reliability, and although some models were significant, actual increases in prediction were disappointing.

The main difficulty encountered in relation to the need for scientific rigour was that many of the associations and patterns found were not ‘significant’ in statistical terms. Even if the probability of something occurring by chance was less than 5%, as repeated tests were used on the same dataset, this 5% value had to be adjusted by means of Holm corrections or Bonferroni adjustments which meant many ‘significant’ findings no longer held. In addition, when combined with the pragmatic need for results to additionally
perform as tested by performance indicators, not many results remained of interest. Although practitioners want ‘quick fix’ answers (Alison & Canter, 1999b) and BIAs want to provide SIOs with the best, and most reliable predictions possible, scientifically there are many cases for which no, or only very limited reliable predictions can be made at this time.

The present research was also unable to consider offender predictions in terms of causation. Whilst predictions with appropriate caveat can be made on the basis of previous patterns in the data, causation - the reasons behind those patterns cannot be inferred. For example whilst most offenders are male and therefore any future offences are likely to have been committed by males, it is beyond the scope of this thesis to consider grand theories of criminology or gender, and no reasons as to why this may be the case have been discussed. What the findings do do however is provide a starting point, an exploration of patterns, to enable future research, testing of hypothesis, and future proposition of potential theories.

9.5 Contribution to conceptual understanding – study one: the SIO interviews

The use of Pragmatic Psychology in the first study involving interviews with SIOs has contributed to our understanding of how to inform behavioural investigative advice by;

- outlining some of the skills required and constraints faced by SIOs in the process of leading a difficult to detect murder investigation;
- highlighting the usual information available to investigators at different stages of the investigation, and identifying some of the actions which result at such times; and
- illustrating what information SIOs ideally require from BIAs, when they want it, and the format in which they want it to be presented.

These have been summarised in the form of a proposed model (depicted in Figure 6.1 above) of the SIOs investigative process and how this relates to the product they would like to receive from the BIA. Each of the contributions to understanding outlined above
will now be considered in turn. This will be undertaken with reference to previous research, and how current understanding from the present findings, has developed and supported the proposed model.

9.5.1 Skill requirements and constraints faced by SIOs

Naturalistic decision making theory proposes that decisions are more reasoned than mathematically logical, and are likely to be constrained not only by individual cognitive capacity, but also by the social environments in which they are made (Klein, 1997). In support of this notion, as summarised in the model in Figure 6.1 and described in 6.3.2 above, this research has found that when making high stake decisions in the pressured environment of a difficult to detect murder investigation, SIOs use their previous managerial and investigative ‘skills’ and experience of previous crimes. Unfortunately however, SIOs may use only previous cases which easily come to mind (are ‘available’) or which somehow resemble the offence under investigation (are ‘representative’) i.e. engage heuristic biases.

Moreover, they are reliant upon the limited ‘information available’ to them, and have to work within the other ‘constraints’ of their wider legal, cultural, and social environment when deciding which actions and lines of enquiry are necessary (also detailed in section 6.3.2 and surmised in Figure 6.1).

The Recognition Primed Decision Model (RPD - Klein, 1997) suggests decision making involves recognition and understanding of a situation with evaluation of potential actions and results. Akin to this, the interviewees in this study indicated how they have to initially identify the crime as a murder, determine possible lines of enquiry (including utilisation of appropriate experts) and evaluate the potential consequences of making decisions based upon their advice. Further exploration specifically in relation to what decisions are made and how these decisions are made is beyond the scope of this thesis, however this study has highlighted it as an interesting area of further research from this theoretical standpoint.
9.5.2 Information available and resultant actions

The interviews with the SIOs elicited what information was available to investigators and explored some of the actions they undertake as a result. The type of information available from the victim and crime scene is detailed in section 6.3.2 and summarised in Figure 6.1 along a timeline of when such information generally becomes available, together with the types of actions which usually result. This knowledge has assisted in contextualising the role of the BIA, and provided information regarding the potential data available to investigators and BIAs at different times in preparation for study two.

In addition, naturalistic decision making research regarding jurors, has found they evaluate evidence from testimony and use this in combination with their knowledge to construct a ‘story’ about what has happened. They choose verdicts which most closely fit this story and fill any gaps with consistent information (Pennington & Hastie, 1986). Significantly, these stories may be inflexible to change, and conflicting information may be ignored or re-interpreted in line with the original frame (Pennington & Hastie, 1986).

The findings from the investigators in study one support this idea in that they discussed in their interviews how they or colleagues similarly initially ‘frame’ the case and (on the basis of their previous experience) construct a story in a valid attempt to explain the offence. Yet as noted by others (Alison & Barrett, 2004; Innes, 2003) and recognised during this research, the SIO is an active and integral participant in setting and prioritising lines of enquiry thereby steering the course of the enquiry and shaping the focus of the investigation. As such, the collation and analysis of additional information may be interpreted in view of the SIO’s own ‘story’ or narrative. For example, if the investigation has a ‘good suspect’ an SIO may be tempted to prioritise attempting to prove this person’s guilt, (to confirm the hypotheses), above undertaking other lines of enquiry (in an attempt to consider the null). Again further research considering the setting of actions or ‘framing’ of cases by SIOs may produce valuable insight to this theory.

Unfortunately seeking assistance from a BIA in order to keep an open mind and consider further suspects or hypotheses can bring its own biases. Whilst not articulated in the interviews in the present study, Alison et al (2003) found that when police officers and forensic professionals are presented with an ambiguous profile of an offender, they are
likely to be subject to the effects of 'confirmation bias' and may perceive the profile as being accurate in supporting their suspect. When two incongruent profiles were presented to two groups, the same profile was described by both as being an accurate depiction of the offender. The participants appeared to selectively attend to the accurate 'hits', paying less attention to the 'misses'.

Clearly a greater amount of research into investigative decision making is required in order to determine how and why key decisions are made by investigators. In the meantime the need for transparency and sharing in both SIO and BIA reasoning and decision making (for example via policy files and clear report writing) seems an essential component in the investigative process.

9.5.3 Information SIOs require from BIAs – what, when, how
Due to the practical nature of the question – what, when and how SIOs want information from BIAs, there is little previous conceptual foundations upon which to build. However, previous research does suggest that experts do better in predictable domains but less well in unpredictable or unusual ones (Shanteau, 1992). This implies that application of generic investigative expertise in unusual or difficult to detect murder investigations may be less reliable. As such, in this type of offence, behavioural investigative advice may be of increased assistance in attempting to scientifically back, and further justify investigative decision making.

This study has only just begun to proactively explore what, when and how investigators want advice, and only touched upon (via the articulation by means of a timeline) what is done or would be done with this information in terms of actions at different times. However the model outlined in Figure 6.1 has provided an overall summary of both the process of the investigation from an SIO perspective, together with what, when and how these investigators would ideally like the product from the BIA to assist them in difficult to detect murder enquiries.
Further research in relation to why SIOs want particular types of advice, why they want it at certain stages and in certain formats, and what they do with it, would therefore be of benefit.

9.6 Contribution of study two: provision of an offender profile
The use of Pragmatic Psychology in the second study involved exploring patterns in the pre-existing SCAS dataset in order to provide a profile of the likely offender, on the basis of offence information. This has contributed to our understanding of how to inform behavioural investigative advice by;

- eliciting general base rate information regarding offences and offenders;
- determining associations between certain 'offence' and 'offender' variables;
- exploring multivariate patterns and relationships between combinations of 'offence' variables and individual offender variables at different stages of an investigation; and
- suggesting potential predictions regarding the offender at different stages of an investigation, in certain circumstances and with appropriate caveat.

These will be considered in turn, with reference to how the current understanding has expanded previous research and could lead to the potential development of future theories.

9.6.1 Eliciting general base rate information regarding offences and offenders
There are many stereotypes in relation to a ‘typical’ sexual offender or murderer, and unwittingly if such stereotypes have been reinforced by limited exposure to more commonplace previous cases in the SIO’s likely repertoire, they may incorrectly be incorporated into SIO decision making.

For example, whilst some of the findings from the current research appear in line with some commonly held notions and previous research (e.g. the offender is likely to be a white male or have some form of previous conviction – Aitken et al, 1995; Francis et al, 2004; Soothill et al, 2002), some are potentially at odds with lay inference (e.g. it is
unlikely the offender will have a previous conviction for a sexual offence and likely he will have been living with someone at the time of the murder. Empirically refuting such inferences is invaluable in the development of theory regarding the types of person who commit such crimes and why, and importantly in encouraging an investigation to keep their options open and explore more relevant potential avenues of suspect generation.

9.6.2 Determining associations between certain ‘offence’ and ‘offender’ variables

Some of the findings from the base rate and comparative odds ratio analyses in study two appear to make intuitive sense and may enable possible theories to be built. For example, findings such as 80% of the victims who were known prostitutes, drug users or alcohol abusers were killed by people who knew them, are of interest. Whilst speculative it could be that through these practises they come into contact with more unsavoury characters that are more likely to offend against them. Future research exploring such potential patterns would be worthwhile.

Other findings support previous research and may be of use in developing other potential theories. For instance, when a body is discovered at an indoor location, the present research indicates that 70% of offenders were known to the victim. This is akin to previous research which has indicated more stranger offenders committed their homicide/s, and more bodies were recovered outdoors (Brooker, 2003), in the street, in a commercial establishment (Riedel & Zahn, 1985), or in an open area (Wherton, 2004).

Conversely the occurrence of an attack within the victim’s residence is an indication of a close relationship between the victim and offender (Carcach & James, 1998; Karlsson, 1999; Messner & Tardiff, 1985; Redl & Best, 1998). As such, it seems logical that offenders depositing bodies outdoors may be more likely to be strangers and the present research concurs with previous findings in this vein. Intuitively a theory may now be generated, and hypothesis tested, for example that if the offender were known to the victim, the offence (and hence body recovery) may have been more likely to have taken place in either the victim’s or offender’s residence.
Other potential theories regarding the underlying reasons behind associations can also be considered. For example routine activity theory (Cohen & Felson, 1979) suggests that in order for a crime to occur, the offender and victim have to come together in a particular time and space (the victim without guardianship) enhancing the likelihood of an attack. Moreover individuals are limited by their own time and space – for example they have to undertake day to day activities, and offences are often committed when individuals are engaging in this ‘routine activity’. One of the findings from the CFA indicated adult female prostitutes who were additionally vulnerable via drug use or alcohol abuse, were more likely to be found in areas in which the offender is not known to have had any familiarity. Whilst speculative, this could indicate that such victims may have been engaged in their routine activity (perhaps for example taking clients into known ‘safe’ areas), something may have gone wrong and the murder and body recovery may have occurred here. As such the offender may have less familiarity with such a scene as it was somewhat more ‘victim led’ – i.e. they may have gone to an area specifically to use a prostitute, and potentially the prostitute may have ‘led’ the crime scene location. Such hypothesis would require further exploration – for example the number of such murders committed by clients; the nature of interactions between prostitutes and clients (is it common for prostitutes to suggest areas to go to?), but would be worthy of further research.

9.6.3 Exploring multivariate patterns and relationships

Previous research has also suggested that offenders who previously knew the victims may be more likely to disguise the offence – and by inference perhaps conceal the body (Salfati, 2000; Santtila, Canter, Elfgen, & Hakkanen, 2001). One theory could be that they want to distance themselves from the body, and are aware they may become suspects once the body is found if they know the victim. This would be far less likely if the victim were a stranger. However there were mixed findings in relation to this from the present study. Whilst the actual numbers of cases involved were extremely small, the CFA analysis indicated that where victims were found outdoors, dismembered, concealed and naked – if the victim was female then the offender was more likely to have known them (3/3 cases), however if the offender was male then it was more likely the offender was a stranger (1/1 case). Clearly further research in determining the detail of such attacks may be worthwhile to explore further potential theories such as this.
9.6.4 Suggesting potential predictions regarding the offender

The analysis undertaken in study two can lead to potential predictions regarding the offender, some of which can use findings of previous research to build a relevant theory. For example the odds ratio in the present research suggests if a victim has been bound, the offender is less likely to have a previous conviction for a violent offence. Previous authors have indicated that serial killers’ binding of victims is primarily used to render the victim helpless and under the killer’s control (Holmes & Holmes, 1996) and may be central to their sexual arousal (Warren et al, 1996). One theory could be that binding may be used as a restraint instead of violence – i.e. research questions could include:

- Do offenders with violent previous convictions display increased levels of violence within the murder?
- Is there a negative relationship between binding and violence within the crime?
- Do violent people use physical violence (beating etc.) to subdue and control victims, whereas others may use binding for the same purpose?
- Is there an association between binding and sexual elements of the offence?

Whilst this thesis has been pragmatic and exploratory – attempting to identify what information is required, and whether any patterns were represented, a disadvantage is that this may be viewed as ‘backwards’ when compared to more traditional psychological research which aims to test a pre-existing theory with a pre determined hypothesis.

Although it is currently argued that the present approach is a pragmatic prerequisite for further development in the field, it has the disadvantage of finding potentially spurious correlations that may need further research to explore, replicate and attempt to explain in terms of causation. That said, in some respects it is felt the findings have expanded upon previous research, and have contributed to theoretical development as outlined above.
9.7 Conclusion

This chapter presented an overview of the findings from the studies undertaken in this thesis and then went on to contextualise them in relation to previous research endeavours. The chapter then considered the utility of the Pragmatic Psychology approach considering how well the framework assisted with the aims of the research, and how it fared in relation to anticipated problems. Finally it explored the potential contribution the research has made to conceptual understanding.

The following chapter will summarise the overall findings and bring the thesis together by drawing out conclusions in light of the research objectives - suggesting what the role of the BIA could encompass, proposing what advice could be given, how that advice should be presented and when the advice can be reliably used in difficult to detect murder investigations. A potential research agenda for future studies also will be proposed, and recommendations in relation to practice suggested.
CHAPTER 10: CONCLUSIONS

10.1 Introduction

“It is all too easy for academics to remain in their ‘ivory towers’ carrying out studies which might add to the individual’s impressive list of research publications but which achieve little else. If such studies have little relevance to, or application in, the ‘real world’ then surely the point has been missed.”

Ainsworth (2001) p184

The present study has used a Pragmatic Psychology framework to consider the research objectives. Throughout, the focus has been upon practical application, from choice of variables to use in the research, to how and when the findings will eventually be applied. A combination of both qualitative and quantitative methods have been utilised, and information from practitioners has been integrated with knowledge gleaned from systematically reviewed previous research. Importantly, this research has considered outcomes, using indicators to measure the performance of the potential statistical profiling techniques outlined in study two.

Previous chapters have presented an overview of murder investigation and the origins and developments in the provision of behavioural investigative advice; have detailed the reasons for undertaking the current research - highlighting the methods used and the subsequent results; and have contextualised the findings with regard to how they have built upon previous research. The last chapter considered the utility of the Pragmatic Psychology approach, and explored the research’s potential contribution to conceptual understanding of how BIAs may be able to assist SIOs in charge of difficult to detect murder investigations.

This final chapter summarises the overall conclusions in light of the research objectives, and also highlights the strengths and weaknesses of the research. It will detail what has been learnt - proposing what advice could be given by BIAs, how that advice should be presented and when the advice can be reliably used by SIOs, in difficult to detect murder investigations in the future. The chapter will then go on to suggest options for a future
research agenda, and finish by offering recommendations for current application of the findings in practice.

10.2 Overall conclusions
Consideration will be given to each of the research objectives in turn.

10.2.1 What information is available regarding the offence at different stages of an investigation?
The reason for examining the information available was to ensure that subsequent analysis only utilised variables which would actually be accessible to the investigation.

Information usually available in the first hour includes;

- the sex of the victim;
- location of body recovery;
- position of the body; and
- the state of undress of the body when found.

By 24 hours further details become available after the completion of initial enquiries e.g;

- the likely age and ethnicity of the victim;
- probable cause of death and nature of injuries; and
- whether or not items have been left at the crime scene.

Thereafter even more detailed information regarding the victim, offence and suspects becomes known. Such as;

- detail of the victim’s lifestyle – occupation, addictions, friends, family, living arrangements, medical history, financial information, telephone contacts;
- detail of the offence – forensic findings from the scene (e.g. the presence of semen, fingerprints, tyre tracks), items missing (e.g. clothing, jewellery, money, keys,
handbag), sequence of events (e.g. last movements of victim, last contacts, CCTV images); and

• detail regarding potential suspects – witness information, CCTV evidence, persons having committed similar offences previously, forensic results (e.g. DNA profile, presence of fibres).

Such information identifies

• there is a multitude of information generated by an investigation - therefore any assistance the BIA can give in relation to prioritisation of suspects/information would be worthwhile;
• much information is available of potential interest to a BIA within the first 24 hours of an investigation - therefore the feasibility of early analysis by the BIA should be considered;
• information is ‘drip fed’ into the investigation at different stages - therefore a timeliness element, or repeated analysis at different stages of an investigation should be considered; and
• the idiosyncratic nature of this information is likely to differ from case to case, but there are some patterns in the nature of the information generally available at different times - therefore categories of information/variables could be identified as being available at different stages.

In summary, a multitude of information comes in to the investigation at different times, but in general the sex of the victim; location of body recovery; position of the body; and the state of undress of the body when found is known within the first hour. Information regarding the likely age and ethnicity of the victim; probable cause of death and nature of injuries; and whether or not items have been left at the crime scene is usually available within 24 hours, and additional information comes in regarding the victim, offence and potential suspects accumulates thereafter. This was important to ascertain as any subsequent statistical analysis could take account of the features readily available at different times of the investigation.
10.2.2 **Different kinds of advice wanted by SIOs from BIAs**

SIOs want a variety of advice from BIAs in relation to offender profiling. They articulated the usefulness of detail regarding the offender's likely:

- Relationship with the victim.
- Age.
- Ethnicity or ethnic appearance.
- Previous criminal history.
- Living arrangements.
- Education.
- Employment.
- Access to potential weapons.
- Specialist knowledge – for example tying knots? Martial arts?
- General lifestyle – what do we expect the offender to do day to day?
- Hobbies.
- Sociability.
- Way they conduct themselves/demeanour.
- Medical conditions.
- Family background.
- Do they abuse their wife, children or pets?
- Aspirations.

In fact interviewees articulated that any background information could assist them in attempting to trace the offender.

Additionally there were areas other than profiling where advice from BIAs were articulated as being of use:

- Assistance with interview strategy for witnesses - e.g. to glean relevant information for subsequent behavioural investigative advice, and interview strategy for suspects - e.g. to initiate communication. In conjunction with relevant police personnel.
• Risk assessment of future offending - to assist resource prioritisation and deployment.
• Assistance with questionnaires and schedules for the purpose of conducting house to house enquiries – to glean as much relevant information as possible.
• Assistance with house searches – to detail what information one may expect to find in a suspect’s house which for example may appear inadvertent to the untrained eye, but may provide intelligence toward a person of interest.
• Prioritisation of actions and messages coming into the incident room.
• Aid with management of team welfare and assistance in boosting morale in protracted investigations or when things go wrong.
• Geographic considerations - attempting to locate suspects, offenders, crime scenes, body or weapon recovery sites; potential routes and methods of travel to and from scenes (in conjunction with geographic profilers as appropriate).
• Crime scene interpretation – possible sequence of events, interactions between offender, victim, and witnesses, things that ‘don’t fit’ or appear disparate.
• Consideration of motivation or the reasons why the offence occurred in that way at that particular place and time.
• What and how to release details to the media to use this resource in the best way – e.g. utilisation of witness testimony research to prompt relevant memory from appropriate witnesses.
• Generation, testing and revision of hypotheses – acting as an objective scientist, viewing things from a different perspective and considering alternatives (this is in line with investigative thinking as specified in the ACPO Murder Manual).
• Offence linkage on the basis of similarities and differences in offence behaviour where no forensic links exist.
• Prioritisation of lines of enquiry which appear more likely to lead to relevant persons of interest.
• Search parameters for tracing persons of interest, witnesses, and weapons etc. for areas or specific locations, in conjunction with relevant police personnel. And,
• Prioritisation of suspects or persons of interest for example from intelligence led DNA screens.
In summary in relation to profiling advice the SIOs articulated that any background information would be of use to them in trying to trace the offender and that this should not merely be limited to those features searchable in police systems. They also highlighted other areas of advice in which behavioural assistance may be of benefit which is of use for future research and practice. This was important to understand from the viewpoint of the SIO to enable subsequent behavioural investigative advice to be tailored to their specific needs.

Much of the advice requested by SIOs is correspondent with what previous authors have stated is currently being provided to them (e.g. Rainbow & Gregory, 2009; West, 2001). Similarly the outcome variables used in this research are similar to what previous researchers have attempted to predict (Davies et al, 1998; Francis et al, 2004; Lobb, 1999; Marogna, 2005, Santtila et al, 2004). However some findings are notable – for example the fact that investigators wanted any background information regarding the offender – including those features not readily searchable on existing police systems. In addition services such as assistance with house to house questionnaires, prioritisation of messages coming into the incident room, and assistance with the management of team welfare and boosting morale are areas in which BIAs do not currently routinely provide assistance.

However, whilst obtaining such ‘wish lists’ from SIOs was deemed necessary for pragmatic enquiry and provides an ideal model for future BIA practice to aim, in reality it is not currently possible to provide all of, and the type of services requested. For example whilst investigators want information regarding the offender’s probable lifestyle, hobbies and aspirations – this information just is not available. Similarly although assistance from BIAs into new areas (such as assisting with house to house searches) may be possible – there is a conflict for the BIA between promoting innovative practice and the requirement not to step beyond ones recognised professional boundaries of expertise.

In addition, as highlighted by Alison et al (2003) statements made by BIAs are often nomothetic – making general predictions; deterministic – assuming all offenders behave similarly; and can be tautological – the trait can be both inferred from, and explained by
the behaviour. Also there are guidelines as to how BIAs can best articulate findings to SIOs (e.g. Alison et al, 2005; Rainbow, 2008). As such whilst predictions can be in line with those ‘wished’ by the SIO, this is not enough – there are scientific considerations (such as not going beyond ones area of competence; non misleading and accurate reporting of results) which also need to be taken into account to ensure BIAs are providing both useful, and professional advice.

10.2.3 Optimal timing of advice – when do SIOs want assistance.

In attempting to identify the optimum time of BIA involvement the SIOs indicated that the quicker profiling advice could be received the better, although a repeated suggestion was for advice provision throughout the course of the investigation, with initial findings being refined as more information becomes available. Specific types of advice (e.g. assistance with suspect interviews) would obviously be appropriate at different stages - as and when requested by the SIO (e.g. when a suspect has been identified).

If the statistical findings from this thesis are going to be utilised, consultation between the BIA and SIO for offender profiling purposes is more appropriate when the investigation become aware that the offence falls within SCAS criteria (i.e. where there is a known sexual element or motivation, or offences where the relationship between the offender and victim is unknown or stranger, where the motive is unknown). In addition, as is common practice in profiling endeavours, and as recommended by previous research (Sturidsson et al, 2006) it is suggested only unsolved crimes where all major leads have been investigated are the subject of advice. For example it is recommended that in the majority of cases immediate suspects are eliminated and obvious forensic analysis is undertaken, before BIA deployment (e.g. running any DNA evidence across the National DNA database to see if a previous offender could be matched to it). However at the request of the SIO it is possible in certain circumstances to provide some types of indications regarding the offender at a very early stage of the investigation if required.

In summary it seems that advice from a BIA is best received throughout the course of the investigation and this should be explicitly negotiated between the SIO/BIA.
10.2.4 Format of advice

In some situations - such as the provision of brief, real time interview advice, the SIOs did not expect this to be followed up in writing for their purposes. However, in accordance with ACPO guidelines for UK BIAs (Rainbow, 2008) they wanted the advice from BIAs in a written format. The interviewees also wanted this to be disseminated via secure means – for example via a secure email due to the likely confidential nature of the contents.

The benefits of providing a written report include:

- Less likelihood of misinterpretation.
- Providing an evidence base to the SIO from which they can make decisions.
- A reference point for the SIO (and others as appropriate) to repeatedly refer to.
- Providing a direct, auditable input into the incident room (e.g. onto the HOLMES system).

However the SIOs also wanted reports which:

- Are submitted within agreed timescales.
- Are not too lengthy. Suggestion was made that a full report was written with a front bullet pointed page acting as a succinct executive summary, outlining the main issues, in an easily understood format (as advocated by Alison et al, 2007).
- Are supportive of, and did not contradict (unless amended in light of new information obtained) previous recommendations from the BIA. For example if the BIA had made any verbal suggestions at the initial briefing, these should be included and justified.
- Detail inferences and recommendations which were backed by relevant
  - research
  - databases, or
  - previous experience of similar cases. And,
- Incorporate a variety of experience as and when appropriate (e.g. via a ‘team’ approach to profiling utilising both statistical and clinical BIAs).
Additional verbal presentation of findings back to the investigation team was also advocated as beneficial. The BIA could present the profile points which hopefully would further reduce the likelihood of any misunderstandings, and the investigation team could directly question the BIA in relation to the report and conclusions drawn. Discussion could continue with the management team (either with or without the BIA present) surrounding the potential practical use of the profile, and actions which could be considered as a result of its content.

In summary, wherever possible the SIOs wanted to receive the advice from BIAs in a report professionally backed with appropriate expertise. The reports should be disseminated via secure means in a written format with additional verbal presentation if possible. This was important so as the SIO had an ‘audit trail’ of where the BIA decisions had come from, so in turn they too would have an audit trail for their own decisions made on the basis of such advice.

10.2.5 Relationship between available crime scene information and offender characteristics

The research also considered whether there was any relationship between the variables available to the police about the offence and any known features of the offender responsible.

Bivariate analysis found associations between some specific offence and offender variables that occur more often than would be anticipated by chance. For example a significant association was found between a victim being white and the offender being white. Subsequent odds ratios indicated the likelihood the offender was white were 13 times greater if the victim was white. However such information is somewhat meaningless without comparison to base rate figures. It was suggested that for pragmatic application, only the results that were the most robust – i.e. those where the odds ratio findings were complementary to base rate information, should be utilised by BIAs. As such, information such as “93% of white victims were killed by white offenders” could be reliably reported to investigations on the basis of this research.
The findings from configural frequency analysis also found patterns which exist more often than would be anticipated by chance. However, whilst there were many statistically significant findings, the 'hit rate' level of successful prediction was also taken into account, and consideration was also given to the numbers of cases showing such patterns. For example, whilst a significant type (i.e. a pattern in the data is observed which occurs more often than expected by chance) may have been apparent, and prediction was 100%, if this was only based upon 1/1 case being correct, then care should be taken in over interpreting the findings at this stage.

Finally the logistic regression analysis provided predictions in relation to:

- The likely relationship between the offender and victim from information available to the investigation within the first hour of the enquiry.
- The ethnic appearance of the offender from information available to the investigation within 24 hours of the enquiry commencing. And.
- The likelihood of the offender having previous convictions of any kind, from information available to the investigation within 24 hours of the enquiry commencing.

Whilst these models were statistically significant, when account was taken of the amount of percentage increase in correct prediction of category membership, the results were disappointing and no model increased prediction by more than 3%. As such the 'cost' involved in performing such analysis does not appear worthwhile at this stage.

In conclusion, the statistical analysis found associations between some specific offence and offender variables that occur more often than would be anticipated by chance. However, whilst there were statistically significant findings, due to the pragmatic nature of this research the hit rate level of success and actual enhancement to correct predictions was also taken into account.
Summarised below are the key statistical findings it is felt can be reliably reported, and would be useful to SIOs, on the basis of this research. These can be incorporated into subsequent BIA reports as appropriate but given due caveat and explanation.

- Taking no other features of the offence into consideration, 97% offenders were male. In addition, in all cases where the body was recovered concealed outdoors, where no weapon or vehicle is known to have been used; and in all offences where clothing, and an item or value was taken was from the crime scene and precautions to avoid detection were taken by the offender; the offenders were men.
- 90% of the offenders in this dataset were white and this increased to 93% where the victims were white. Moreover in 20/21 offences involving taking of clothing, and an item of value being taken from the crime scene and precautions to avoid detection being taken by the offender; the offender was white.
- However it should be noted that in 29/32 cases involving a white, adult, female prostitute who was otherwise vulnerable; the victim was killed by a non white offender.
- 82% of cases involved an offender aged between 18-40 years at the time of the attack and this increased to 85% when the victims were not known to have been prostitutes.
- In all 32 cases involving a white, adult, female victim who was a prostitute and otherwise vulnerable; the offender was not known to have been familiar with the body recovery site.
- Where the information was known, nearly three-quarters of offenders (74%, 182/246) were living with someone else at the time of the murder. This increased further when the victims were not prostitutes (77%) or drug users / alcohol abusers (78%).
- 84% of prostitute victims, and 83% of drug users / alcohol abusers were killed by someone known to them. Similarly the majority of cases where the body was recovered indoors (70%), or were there was no evidence of any item of value being taken (67%); involved offenders who knew the victim.
- 71% of the offenders had some form of previous conviction at the time of the attack. This rose to 86% when the victim was male. In addition all 12 white male
victims under the age of 18 who were not prostitutes or otherwise vulnerable were murdered by someone with a previous conviction. However, the conviction is unlikely to be for a previous sexual offence – 85% of offenders had no such conviction.

- If the victim was not a drug user / alcohol abuser (65%) or was found bound (76%), the conviction was not likely to be for a violence related offence.
- Finally 70% of male, and 68% of drug user / alcohol abuser victims; were killed by someone with a previous conviction for an ‘other’ type of offence. Similarly 69% of offences not known to have involved a weapon involved offenders with this kind of conviction.

10.2.6 Reliability of BIA advice – can it be enhanced with the passage of time and increase in offence information

It appears that an increase in information available regarding an offence allows for enhanced suggestions and more detailed predictions regarding the offender. For instance, whilst only limited predictions may be possible during the first hour of an investigation, as more information becomes available regarding the offence, and in particular about the victim, predictions can be improved.

Thus in the first hour of an investigation, investigators are usually able to ascertain the sex of the victim. If the victim was male we can predict from the odds ratio that the offender is likely to have some form of previous conviction. However other offence information received subsequently may lead to additional suggestions. For example if after some time it is discovered the victim was a prostitute, we additionally may be able to suggest the offender is also likely to have known the victim.

However, it should be noted that many findings appear no better (i.e. prediction is no more, or only very slightly more accurate) than those obtained from ‘best guesses’ based upon frequency of offender characteristics. As such, waiting for additional offence information in order to utilise more complex forms of analysis may not always be worthwhile. This is particularly pertinent when the initial base rate frequencies are high. For example from the base rate, 97% of offenders are male. As such, whilst waiting for
additional offence information regarding whether or not any sexual assault took place, a
vehicle had been used, or whether and what type of items have been taken from the
crime scene may improve prediction in some instances (based upon the configural
frequency analysis), waiting for this information does not in seem worthwhile. An SIO
presented with a 97% likelihood the offender is male, would be highly likely to prioritise
male suspects, and no doubt would appreciate this information as early as practically
possible.

How these findings can be applied in practice, will be considered in the following section.

10.3 Recommendations for practice

Taking previous research into account, the following section summarises the practice
recommendations emanating from the findings of this thesis as applicable to:

- SIOs - detailing how and when they should use behavioural investigative
  advice;
- BIAs - detailing their role requirement as defined by SIOs, ethical obligations,
  when and how findings can be applied and presented to future difficult to detect
  murder investigations; and
- NPIA and the wider police service - regarding how the findings of this thesis
  should be incorporated into wider organisational practice.

10.3.1 Practice advice for SIOs

Investigators are reminded by means of investigative doctrine (ACPO, 2005) to

- ensure decisions are appropriate and justifiable;
- have an awareness regarding the source of any material (including behavioural
  investigative advice);
- use the most appropriate method;
- identify specialist expertise required;
- consider the most appropriate time for advice;
- set clear objectives for the report;
• obtain reports as early as possible; and
• ensure they understand the report and its potential contribution.

Furthermore, they are encouraged to consider alternative explanations, seek clarification of any inconsistencies or ambiguities, identify and if possible secure any further material required, and challenge the meaning and reliability of the report (ACPO, 2005). Specifically in relation to operational assistance, investigators are advised to “consider consulting the Operations Centre at the earliest opportunity to draw on any relevant experience and expertise” including the use of behavioural investigative advice (ACPO, 2006, p111).

The recommendation to SIOs is therefore to use BIAs, but, like with any source material, with the caveat that appropriate evaluation of the advice received is required.

On the basis of this thesis, the following further recommendations are made to SIOs in relation to difficult to detect murder.

The type of advice provided
• The SIO needs to articulate and discuss the potential requirements of the investigation to the BIA, however broad. The BIAs role in an investigation can be varied and advice can be sought in relation to many areas. Whilst these include ‘traditional’ areas of advice such as offence linkage, interview strategy, risk assessment, media advice and offender profiling for example, if there is any area which the SIO requires assistance and feels a behavioural contribution may be appropriate, this should be discussed. There should be a recognition however that whilst the specific BIA may not be able to provide all types of advice, they may be able to suggest other appropriate individuals who may be in a better position to assist the investigation. And,
• The SIO should be aware that all behavioural analysis is based upon underlying assumptions (which will be caveated in any BIA report – for example that predictions are based upon what is known about previous offenders who have committed offences in similar ways), and all predictions will be made on the basis of probability (rather than certainty).
Who should provide that advice?

- SIOs should only use the services of ACPO accredited BIAs who have the necessary skills, competence and relevant experience to provide the advice requested. Such BIAs should also have access to other appropriate experts, research, data and case files in order to assist their analysis. And,

- SIOs should utilise the services of more than one BIA during the course of the investigation if different skill sets and/or different types of advice are requested which are beyond the expertise of one individual.

When advice can be provided

- SIOs should consult a BIA as early as they feel appropriate in the knowledge that the BIA will be able to give guidance regarding the optimum time of deployment for the specific requirements of the investigation. However there should be an awareness that in relation to offender profiling:
  
  o Generic 'base rate' information may be of use and could potentially be made available via SIO training packages, courses and guidance manuals such as the SIO development course or for inclusion in the murder investigation manual. For example knowledge that the majority of offenders committing offences of difficult to detect murder are white males aged between 18-40 years may be appropriate. SIOs should be aware however that such 'generic' advice would be no substitute for full involvement with specifically tailored BIA advice as and when appropriate.

  o The statistical findings from this thesis are appropriate when the investigation becomes aware that the offence falls within SCAS criteria, when immediate persons of interest have been eliminated, and when immediate forensic actions have been exhausted (e.g. if there is a DNA profile that this has been run against the National DNA Database with no 'hits').

  o Some predictions may require more information regarding the offence or victim than is currently available to the investigation team.
How the advice should be presented

- SIOs should set clear terms of reference with the BIA, to include items such as the requirement of submission of a written report, within agreed timescales and the confidentiality of information.
- If the investigation team want the report verbally presented back to them, this should be requested by the SIO.

What should be done with the advice received?

- The SIO should evaluate the advice received from the BIA and clarify any points as necessary.
- Whilst the provision of advice is usually in conjunction with an advisory NPIA team of individuals, once investigators have made the decision to accept the advice provided, further investigative support from Crime Operational Support (e.g. from the BIA, Crime Investigative Support Officers and/or Regional Advisers) regarding how best to incorporate this advice into investigative actions or strategy is strongly recommended.

10.3.2 Practice advice for BIAs

Experts have received suggestions regarding how to provide advice to UK investigations. For example an overview of what should be included in a post-mortem report is outlined by ACPO (2006, p165) and forensic psychologists have received practice advice in relation to report writing to promote quality in forensic assessment (Heilbrun et al, 2004). Some principles are transferable to the work of a BIA;

- accepting referrals only within appropriate area of expertise, experience and knowledge;
- determining the role to be played by the expert;
- setting terms of reference with the investigator;
- using multiple sources of information utilising a combination of experience, research and data, obtaining relevant historical information (e.g. case papers);
- describing the limitations of the work.
Specifically in relation to behavioural investigative advice, as Copson et al (1997) suggest, advice provided should be custom made, and interactive with the investigation.

In a series of studies, Alison and others have provided further recommendations regarding the format and content of behavioural investigative advice (Alison et al, 2003, 2004, 2005, 2007; Almond et al, 2007; West & Alison, 2007). Evidence from the present research supports their suggestions, especially:

- in formatting a profile professionally by suggesting how to clearly lay out data – list case materials, recommendations;
- indicating what to include - such as terms of reference including what is required and when the request was received; the competence of the authors; sources and limitations of advice; reference the rationale and backing for suggestions made;
- how to articulate what can be done with the report – legal implications, and the report should not be distributed outside of the investigation for example.

The importance of appropriate wording and framing of claims has also been highlighted (Alison et al, 2003; Heilbrun et al, 2004; Villejoubert et al, 2008). For example an awareness of the advantages of reporting both sides of arguments to avoid low probability characteristics being incorrectly prioritised; and using words such as 'likely' rather than 'suggests' as they are less ambiguous (Villejoubert et al, 2008), should be taken into account by BIAs when compiling reports. This research supports these proposals.

On the basis of this thesis, the following further recommendations are made to BIAs in relation to difficult to detect murder:

The role of the BIA

- The BIA needs to make it clear that their role is to support investigators when they are making and evidencing objective and justifiable decisions. The BIA needs to clarify to the SIO that they will provide advice, but that it is up to the SIO whether or not to heed it. The BIA should not breach role boundaries - it is the SIO who is in charge of the investigation.
• The BIA should discuss with the SIO what advice they feel they may be able to offer the investigation, as there may be areas of advice which the SIO is unaware.
• The BIA should be aware that the information provided by them needs to assist SIOs with the issues which face them, namely
  o in making objective and justifiable decisions by providing them with scientific backing and rational;
  o augmenting their potential limited experience with information from previous cases/past experience;
  o enhancing their accountability by providing a professional, written, evidence base for decisions;
  o lightening their workload - assisting them for example with
    ▪ prioritisation of persons of interest,
    ▪ understanding offence behaviour, and
    ▪ refining potential lines of enquiry.

Professional/ethical commitments
• The BIA should only work within their boundaries of competence and areas of expertise in line with British Psychological Society and American Psychological Association codes of conduct (see also Alison et al, 2007).
• The BIA should clearly articulate appropriate caveats regarding the nature of the data (e.g. sample size, dataset) and findings (e.g. the need for replication) and in relation to the underlying assumptions of behavioural investigative advice in general (e.g. they are based upon findings in relation to offenders of previously detected crimes) in all reports.

When advice should be provided
• After discussion with the SIO, the BIA should inform the investigation if they are able to provide the type of advice requested at the present time. However it is recommended that any immediate suspects are eliminated and pertinent forensic analysis are undertaken prior to BIA deployment.
• The BIA should provide advice throughout the course of the investigation wherever possible.
Use of the findings from study one – SIO interviews

- The BIA should be cognisant of the findings from the SIO interviews in study one, in particular in relation to the type of information investigators find of assistance. As such BIAs should include predictions regarding the offender which will be of potential use to the SIO – i.e. features such as the likely relationship to the victim, age, ethnicity, previous criminal history, and any other background and lifestyle information which may assist in attempting to trace and identify the offender.

Use of the findings from study two – statistical profiling

- The findings presented in table 10.1 should only be used in difficult to detect murder investigations which fulfil SCAS criteria. As the research has been elicited from data from the SCAS database, it is relevant only to subsequent cases fulfilling these criteria. The validity of application of these findings to other cases cannot be assured.
- The Occam’s Razor principle\(^{40}\) should be adopted to apply the ‘best guess’ method using base rate statistics. This seems to be as reliable a means of prediction as some of the more complex statistical analyses and therefore should be reported whenever appropriate. However although further research in this vein is recommended (see 10.5.3), rather than merely reporting the univariate findings, it is recommended that multivariate offence information be used to tailor offender predictions. For example if a female adult prostitute was found dead in the street, searching the SCAS system for all adult, female, prostitute victims whose bodies were recovered outdoors and reporting what is known about the offenders who committed offences involving this combination of variables, will be of more interest than merely reporting:
  - in every case involving a female ‘x’ number of offenders were male etc.,
  - in every case of a prostitute victim ‘y’ number of offenders were male etc.,
  - in every case where the body was found outdoors ‘z’ number of offenders were male etc. etc.

\(^{40}\) I.e. the principle that if scientists have two competing theories that make exactly the same predictions, the simpler one is the better (Gibbs, 1996).
Whilst the choice of type and number of offence variables can be subjectively manipulated by the BIA (which may be considered as an advantage - it allows for expert interpretation and flexibility; or as a disadvantage - reducing objectivity), the use of this method appears worthwhile for several reasons:

1. the initial analysis reported here has indicated this base rate comparison is a reliable method; 
2. the 'live' SCAS dataset can be used so as any potential changes to patterns can be ascertained immediately; and 
3. the analyses are quick and easy to perform and interpret.

The only 'cost' involved is the time taken by the SCAS Crime Analyst to retrieve the information, and the time for the BIA to interpret and utilise it. However the need for evidenced based advice makes such analysis worthwhile. Also the joint expertise of the Crime Analyst working with the BIA will assist in ensuring the most appropriate searches are conducted.

- In circumstances where the findings from the configural frequency analysis are to be reported the BIA should
  - use appropriate wording and caveats, and
  - highlight the fact that such findings are only valid when these specific variables are replicated in the offence in question.
- The BIA should consider the potential benefits in using a combination of statistical approaches, depending upon the variable requiring prediction, requirements of the SIO, and the stage of the investigation.
- The BIA should use the findings from this research only part of analyses in combination with other methods and in conjunction with other evidence. And,
- The BIA should highlight to investigators that the advice provided may be amended as more information becomes available and recommend they retain contact and supply advice throughout the duration of the enquiry. It may be that some statistical information is not significantly bettered, however.

*How the advice should be presented*

- Findings should be presented in writing. The report should be submitted within agreed timescales and disseminated via secure means. Any prior advice (e.g. any
verbally indicated from initial briefing) should be incorporated and justified in any subsequent written report. And,

- Verbal presentations to the investigation team should be undertaken where feasible in order to limit misunderstandings and give the team an opportunity to question and clarify findings. In addition it will provide a useful means of critical feedback to the BIA and will enhance their knowledge base by enlightening them as to the investigation's considerations and concerns.

10.3.3 Practice advice for the NPIA and police service

On the basis of this thesis, the following further recommendations are made to the police service in relation to the provision of behavioural investigative advice in relation to difficult to detect murder.

Training and continual professional development - SIO

- Pertinent findings (from this or other research) should be included in the murder investigation manual and SIO training programmes to enhance knowledge and dispel some of the myths regarding difficult to detect murder offences. For example the majority of offenders do not have previous convictions for sexual offences, and most are living with someone at the time of the offence. SIOs should however be made aware that 'generic' advice would be no substitute for BIA advice tailored for their investigation. And,

- A description of the role of the BIA should be included in the murder investigation manual and SIO training programmes to enhance their use of BIA advice. This could include detail regarding - what information BIAs can and cannot provide; caveats regarding the use of behavioural investigative advice; how, when and why to request assistance from a BIA; and what to do with the advice once it has been received.
Training and continual professional development - BIA

- A basic understanding via training of the methods used, findings and potential pragmatic application of this research should be disseminated to BIAs who regularly provide offender profiles to difficult to detect murder investigations within the UK. This should include explanation, appropriate caveats, and examples of appropriate (and inappropriate) use.

- In order to contextualise their role, and give an insight to their decision making process, BIA training and development should include training and/or shadowing an SIO when in charge of a serious crime investigation. This would enable the BIA to understand of the role of the SIO, constraints faced by them, and how BIA advice would fit into the overall investigation.

- It has been recognised in relation to SIOs that debriefing in order to transfer expertise is vital (Smith & Flanagan, 2000). Whilst attendance at debriefs are considered best practice for BIAs, such opportunities seem to have been limited. Although opportunities may increase alongside continual involvement of the BIA throughout the course of an investigation, the invitation of the BIA to any debrief should be strongly promoted. And,

- Similarly in relation to SIOs, relevant opportunities and attachments, mentoring, and encouragement of self-development are vital (Smith & Flanagan, 2000). Increased support for BIA mentoring, self-development and attachments, such as working with offenders or within investigation teams for example, are likely to enhance their performance within the role.

Data - quality

- Whilst the SCAS database has strict quality control procedures, it is only as reliable as the data provided from forces allows, and the reliability (for example of data regarding the description of the offender) is unknown. Consideration should be given as to how improvements could be made to the quality and recording procedures of all police recorded data.

- In addition there are individual differences in the recording practices of different forces in relation to information held about offenders. Standardisation, making it a

41 See also section 10.4 below.
requirement (for either the individual police force or some other central organisation) to gather and record the type of information SIOs state would be of use to them to know about this type of offender (e.g. medical records, family history etc.) would be of benefit.

- Similarly it seems that potentially pertinent information is held by a range of organisations – including the police, probation, health and prison service. Scoping what databases are held by other organisations and consideration of amalgamation into a central archive - what is known regarding the backgrounds of offender’s responsible for difficult to detect murder offences, would greatly enhance our ability to consider any behavioural patterns which exist between such individuals. And,
- There are significant omissions in some database information (e.g. detail of where the offence took place in the Homicide Index). As such consideration should be given to the current and potential uses of such databases, and categories of information should be expanded as appropriate.

Data – access
- There is a requirement for current BIA advice to be supported by appropriate research, experience, statistical or case based knowledge and data. As such, all ACPO accredited BIAs should have access to other experts, peers, research, databases and policing case files as required to perform their role to the best of their ability.

Research
- Due to the requirement for current BIA advice to be verified by appropriate research, scientific and statistical findings, a research agenda should be set and undertaken in relation to the provision of behavioural investigative advice in the UK. It is strongly recommended that any such agenda has a pragmatic focus, and that research teams are multidisciplinary - consisting not only of appropriate academic personnel, but also practitioners working in the field who can ensure the applicability of findings.
Resourcing

- All recommendations outlined in this section require varying levels of resource commitment – these need consideration by the appropriate bodies.
- SIOs have articulated areas other than those routinely provided by BIAs in which BIAs may be able to assist. For example assistance with house to house enquiries, prioritisation of actions and messages, and aid with the management of the team’s welfare and morale were discussed as being of potential use, yet obviously require further exploration, research and consideration.
- In addition, SIOs have requested:
  - teams of BIAs (consisting for example of those with different backgrounds and competencies) as appropriate;
  - BIA assistance throughout the duration of the investigation; and
  - BIA findings to be verbally presented back to investigation teams.

The resource implications for such requests also require consideration.

10.4 Limitations with the data

Some of the limitations relating to the present research data will be considered here, and other limitations will be addressed in view of the future research agenda proposed below.

As would be anticipated due to the confidential nature of the data, obtaining access was a lengthy process and subject to tight restrictions. There were strict protocols which needed to be followed, including submission of a detailed research proposal and agenda for agreement by an internal research panel. In addition, due to the operational nature of the unit, there were logistic difficulties in practically getting someone to retrieve the data, and other issues had to be considered in relation to confidentiality and storage of information. Whilst time consuming, these difficulties were overcome.

Moreover, whilst arguably one of the best, and most reliable datasets in the world, recognised as setting European standards (personal communication Nicky Miller, 2008), the SCAS database is still reliant on information known to the police. The material is not collected for the purposes of research and the quality of data may be compromised – for example it may be based upon retrospective accounts (e.g. third party statements) or
archival material (in the case of older/cold cases) and hence their use is controversial. Frequently such offences are not witnessed, and often if witness accounts are available they are confused and/or contradictory. For example false sightings of missing persons who subsequently are found to have been murdered before the time they are witnessed, are common (personal communication Tony Osborne, 2008). Any deficiencies in police files and data (e.g. from the Police National Computer) will be replicated in the SCAS database.

Also the data are somewhat limited in that the strict SCAS criteria for offence submission means that the SCAS database is not representative of all UK homicides but is skewed towards difficult to detect or sexually motivated offences. Whilst this was viewed as a benefit – as it is this type of offence for which behavioural investigative advice is sought and therefore the cases should be highly relevant, there is a potential difficulty in initially identifying which offences will fall into this criteria (and for which this research may be relevant). As suggested above therefore it is recommended that the findings of this research are only utilised once the case is acknowledged as falling within the SCAS criteria.

There is also a potential issue in relation to force compliance. Whilst it is likely the SCAS database receives a representative sample of its criteria of cases, differences in forces' individual compliance levels may mean that if specific types of offence or offenders occur in specific areas, dependant upon the compliance levels of that area, the cases could be over/under-represented. Currently whilst every attempt is made to achieve 100% compliance, and the numbers of offences submitted by different forces are available, the levels actual offence occurrence fulfilling the SCAS criteria are unknown.

In addition, to enhance reliability, the use of data was limited to information known regarding convicted offenders. As previously acknowledged, it is likely that reporting and recording of such offences in the UK is high, and the detection rate for murder is typically well above 90% (Home Office, 2005). However an implicit assumption has been made in relation to behavioural consistency between offenders (and their offences) in that undetected offenders share characteristics and offence features with those previously
caught and convicted at trial. It is possible that for some reason different patterns exist between the cases analysed here and unreported offences or undetected offenders. There is a similar issue regarding generalisability of findings in that as based on past cases we are assuming that future offenders will conduct offences and have similar characteristics, again assuming consistency between individuals.

Finally, due to the use of nominal data in study two, the use of only non-parametric statistical tests was available. In addition, due to the limited sample size of 312 cases (which practically could not be enhanced) limitations were also placed on the numbers of variables that could be included in analyses at any one time.

10.5 Suggestions for future research

10.5.1 Replication of present findings

_SIO interviews in study one_

Replication of the SIO interviews is recommended as;

- views and requirements of SIOs may change over time;
- targeting of SIOs from England and Wales experienced in difficult to detect murders meant the population of individuals from whom to choose was relatively small. As such the sample of 11 individuals interviewed is small and all incidentally were male;
- although utilising the knowledge of experienced SIOs was practical, as they are the lead investigators, the sample was purposive rather than random, and may not have been representative of, and hence generalisable to, the whole investigator population. Although as discussed previously (in section 9.4.3) views were validated by a separate follow up study on a larger and more diverse group of UK investigators (Wenman et al, in preparation), expansion to personnel of different ranks, roles (including B1As) and experiences would be worthwhile.

Other research methods could also be considered – for example;

- focus groups, or simulation studies could ascertain when and what type of behavioural investigative advice would be of use (e.g. Crego & Alison, 2004); and
- sorting tasks (see Crego & Alison, 2004) could prioritise what information is available regarding the offence when, or what information regarding the offender is of most assistance to investigators. SIOs could be provided with the full list of SCAS variables and highlight when offence features are generally available, and rank the offender features which would be of most use to them. Whilst this was considered, the reliability of data may have been reduced by SIOs choosing SCAS questions for which data is often unavailable, or which were more subjective and open to interpretation.

**Statistical analyses in study two**

As this research was exploratory, an obvious future enhancement would be to increase the number of cases included in study two. Subsequent detected cases coming into the SCAS UK database could be analysed – either incorporating the present sample (to boost the sample size), or by comparing findings from analyses of the new cases alone. However, due to the rarity of such offences, and the time taken for offenders to come to justice, sufficient additional cases would not be available for some time. Nearly three years after data collection, only an additional 51 cases fulfilling the selection criteria have been added to the SCAS database (personal communication, Theresa Jennings, 25/09/09).

Replication could focus upon investigating findings which were of interest but were excluded by virtue of statistical significance criteria. For example the configural frequency analysis found the offence variables - victim not found naked, where there was no evidence of any sexual assault, foreign object insertion, or sexual injury, to be more frequent than would have been expected by chance, in combination with the offender not having a previous conviction for a sexual offence (i.e. this was a significant type). When performance was looked at however, 117/132 cases were correctly predicted – i.e. 89%. Yet for this research 90% correct prediction was required so these findings were not reported. Any 'near miss' findings such as this would benefit from further exploration.

Alternatively the findings could be validated on another appropriate dataset. The use of other datasets (such as the Homicide Index or CATCHEM) could be considered, however
they do not record the level of behavioural detail required, and they are composed of
different types of homicide than those considered here (e.g. brawls between males and
persons related to one another; only cases involving children and young people).

Obtaining comparison data from other countries using similar VICLAS datasets may be
possible, but there would be inherent practical and methodological difficulties relating to;

- translation of data from other languages (all are input in native tongue – personal
  communication Nicky Miller, 2008);
- reliability of coding (quality control and input methods differ – personal
  communication Nicky Miller, 2008);
- sample size (the majority of the other Countries have even smaller datasets\textsuperscript{42});
- potential cross cultural differences in offending behaviour; and the fact that
- the datasets are not completely similar in content and format (personal
  communication Nicky Miller, 2008).

Moreover, with any subsequent research, the difficulty of creating a self fulfilling prophecy
would also need consideration. As articulated by Ormerod (1999) there is;

"a risk that the police will direct their enquiries only towards such people,
therefore leading to proportionately higher conviction rates of such people,
thus feeding back into the statistical data from which we began."


10.5.2 Expansion of present findings

Although this thesis has focused upon variables the SIOs felt were of most use, and which
were practically available and believed to have been most reliably coded from the SCAS
database, future analysis could also look at:

- Additional offender variables. SIOs suggested that the investigation may hold a
  variety of information regarding a suspect's background and lifestyle such as

\textsuperscript{42} The only exceptions are Canada which has in excess of 300,000 offences but collect many lesser offences,
and Germany who hold roughly equivalent to us per population – personal communication Nicky Miller, 2008.
habitual behaviour, medical records, previous prison reports, schooling, statements from friends, family, and details of associates. If the offence is recorded within the HOLMES system this would all be stored and easily retrievable from the offender’s nominal account. An initial scoping exercise was undertaken, with letters sent to forces to ascertain the type and amounts of information held regarding the offenders convicted of murder held on the SCAS database (as of 18/02/2005). As a pilot exercise, five offences/offenders, from different forces, were coded in relation to the type of information held (e.g. medical history; education; family). There were huge individual differences regarding the information available, ranging from detailed timelines of the offender’s life, to the briefest of summaries. Whilst it was beyond the scope of the present thesis to explore this further, these nominal accounts could provide a valuable source of additional offender information for future research.

- Taking further account of context:
  - It is possible that some variables chosen were not known by the offender – for example whether or not the victim was a prostitute. Further exploration of the circumstances of offences may be worthwhile.
  - The actions of the victim and reasons behind the actions of the offender remain unknown and are difficult to glean. Post conviction interviews with offenders may be one potential source of information, although these come with difficulties such as offenders may not confess or know why they have killed (Morgenbesser, Burgess, & Safarik, 2008) and would bring a host of other potential biases and research complications (see Fiest & Page, 1998). However before more detailed interpretations of offender and victim actions can be discovered, this type of future research may be a necessary component.

- Idiosyncratic features. General patterns and trends were looked for at the potential detriment of some idiosyncratic behavioural detail - there may be one off behaviours which could significantly predict specific offender characteristics recorded in ‘free text’ or other unexamined areas of the SCAS database. For example, previous research has made links between animal cruelty in childhood and the methods utilised in serial killing (Wright & Hensley, 2003). Future research
combining lower frequency or 'signature' aspects of offences (see Clark, 1999; Keppel, 1998), would be a valid enhancement.

- **Splitting variables:**
  - Relating to the offence - for example in nearly 90% of the present sample the victim received some form of injury to their head, face or neck. Previous research has identified that whilst half of a mentally ill sample of offenders injured the face of their victim, 68% of the schizophrenic sub-sample displayed this behaviour (Hakkanen & Laajasalo, 2006). In addition the neck has previously been associated with offenders who previously knew the victims and with sexual attacks (Wherton, 2004). It may be therefore that specific types of offender are more likely to concentrate injuries to more specific areas than has been captured in the current analysis. As such splitting the variable into more specific areas of injury may be of interest.
  - Relating to the offender –
    - For example other researchers (Lobb, 1999; Marogna, 2005; Soothill, Francis & Liu, 2008) have considered features such as the number of previous convictions, type of first conviction, age at first conviction, dominant (modal), and co-conviction types.
    - The variable 'previous conviction - other' was repeatedly apparent as being predictable from the odds ratio findings. Whilst it would have been unfeasible to have looked at every idiosyncratic type of previous conviction, due to the repeated significance of this variable indicating its potential value, drilling down into this further, determining the type and frequency of convictions coded within this category may be worthwhile.

- Different *offender* features in combination. For example it may be hypothesised that the number and type of previous convictions an offender possesses could be dependant upon other offender variables, such as their age. If the offender is older, she/he may have more previous convictions than if they are young. Future research considering the dependant (offender) variables in combination (e.g. via CHAID analysis) may be worthwhile.
• Testing the validity of findings from specific previous research on the current dataset. For example:
  o Is there a negative relationship between foreign object insertion and mutilation, with sexual assault (as suggested by Ressler et al, 1988)?
  o Do ‘organised’ offence features actually co-occur, and do these correspond with the relevant ‘organised’ offender features (in a similar way to Canter et al, 2004)?
• Exploration of the homology principle (see Mokros & Alison, 2002).
  o Some combinations of offence variables were repeatedly found to be witnessed in significant CFA types – e.g. dismembered; weapon used; injury to head/face/neck; overkill; binding are seen more frequently with both the offender living alone and being a stranger. Consideration could be given to why repeated offence combinations occur (perhaps via zero-order CFA), and why these combinations appear to be able to suggest more features about the offender.
  o Further exploration of certain key features such as looking only at the backgrounds of those offenders who dismember, may given additional insight to such individuals. And,
  o Similarly looking at specific characteristics of offenders and then identifying any similar features within their offences could also be worthwhile. For example, one such study conducted by Hakkanen and Laajasalo (2006) looked at offenders with different types of mental illness and found differences in their offence behaviour.

10.5.3 Minimum (comparison case) requirements
When considering utilisation for ‘live’ cases, it is recommended that a valid method would include:

1. Selection of offence variables of interest from the undetected case of interest by the BIA (e.g. adult, female, prostitute, body found outdoors and naked). The offence variables of interest should include those available to investigations as outlined in this research.
2. Obtaining details of all detected offences containing this combination of features from the SCAS database (via the SCAS Crime Analyst).

3. Calculating the base rate frequencies of the information regarding the offenders known to have been responsible for these offences (e.g. if all were male, white, if 90% were aged between 18-40 years etc.). The details of the offender should include those variables of interest to SIOs as outlined in this research.

However there are considerations with this method which may require further exploration. Namely, as more offence variables are included and the searches become more specific, prediction (from the decreasing number of similar cases), becomes less robust. For example if only one offence variable ('victim female') was used, a large number of cases for comparison is likely to be returned. However, as more offence variables are utilised, the resultant sub-sample of cases from which to draw offender information will reduce. For instance it may be that 300 cases involve a female victim, but only 50 offences fulfil the additional criteria of being an adult, prostitute, whose body was found naked outdoors. Fundamental questions for future research therefore need to investigate the number of variables, and number of cases, from which valid predictions can be made. In the same way that calculations were undertaken to ensure 6 variables were valid for input to configural frequency analysis on a sample size of 312, it should be possible to predict the variable number and sample size required to ensure valid predictions can be made.

10.5.4 Cross cultural validation

It is unclear whether these findings would be applicable in different countries. Potentially if the offence fell within SCAS criteria, and the base rate frequency of occurrence of variables (e.g. most offenders are male etc.) were comparable to those found in this dataset, the findings may have validity elsewhere. However further research or appropriate caveats would be required.

10.5.5 Behaviour beyond ‘the offence’

Whilst this thesis focused upon what occurs during the offence, further exploration in relation to the antecedents and post offence consequences, could also be of benefit and
enhance the provision of behavioural investigative advice. Hakkanen and Laajasalo (2006) looked at behaviour prior to the offence (e.g. in 62% cases an argument preceded the killing) and post offence behaviour (78% of offenders were caught in first 24 hours, 86% confessed to the offence) in 182 homicide cases.

Evidence from previous offences or statements of family members or individuals involved in consensual relationships with the offenders may be of benefit to identify any consistent behaviour displayed by an offender prior to an offence (e.g. binding consensual sexual partners and subsequent offence victims). This would be of interest not only in relation to profiling the offender, but also for the Crime Analyst when searching for additional offences they may have committed. Similarly information regarding post offence behaviour could be actively sought from current family, partners or associates in order to determine if there was any unusual behaviour displayed after such offending. If any behaviours are found (e.g. if an offender called in sick to work), research could explore if such patterns are consistent between offenders.

10.5.6 Evaluation
This research was exploratory and proactively asked what advice SIOs would ideally seek from BIAs. From the pragmatic stance of evaluation of performance however, future research should also attempt to evaluate what currently BIAs are doing well and where there is need for improvement:

- Methods to elicit what makes an ‘effective’ BIA or BIA report akin to those previously used with detectives could be used. For example the repertory grid technique could involve investigators choosing elements of effective/less effective BIAs/BIA reports by outlining the similarities and differences between three experiences of using them (Kelly, 1955 - see Smith, & Flanagan, 2000). However gaining a sample of individuals suitably and repeatedly experienced in the use of BIAs may be difficult.
- There has been an apparent improvement in BIAs transparently articulating their decision making in written reports; however the most recent analysis suggests that still only 34% of claims made in UK BIA reports have formal support or backing
(e.g. research by XXX, or data from XXX database). This requires further deconstruction and consideration via future research (e.g. what is the backing? Is it reliable? How can we improve the backing – with the findings of this research?).

- Verbally presenting BIA reports back to SIOs was encouraged as good practice from the interviewees in study one. Directing future research into scoping and considering the benefits (e.g. for investigations, for BIA welfare and development) and costs (increased resources) of such undertakings would be worthwhile. Again the pragmatic method of exploring this further with both SIO practitioners and BIAs, who have already used this method, may be fruitful.

- Research should also consider retrospectively testing absolute performance, by for example investigating the accuracy of BIA reports (also advocated by Bennell et al, 2006). As written reports are now accepted as good practice by UK BIAs and transparent rationale and falsifiable detail are encouraged, once convicted, the accuracy of statements made can now be more easily tested (e.g. did the offender fall within the age parameters suggested?). Whilst it is acknowledged that profiling statements are necessarily probabilistic and should be considered in combination as a means of prioritisation only, the endeavour would be worthwhile in identifying weaker areas of advice provision in need of further research. Previous attempts have identified difficulties in evaluating the success of how ‘correct’ profiles were (e.g. Copson & Holloway, unpublished cited in Gudjonsson & Copson, 1997), but some of the problems encountered such as much information being personality based and unverifiable may now be less relevant. Also whilst Kocsis (2003a) highlighted in one instance more than 60% of the profilers approached declined to participate in the research, in the UK, BIAs increasingly appear to welcome and develop in accordance with constructive comment (e.g. Almond et al, 2007).

- However Kocsis (2006) warns that it is insufficient to merely look at ‘pure’ (e.g. percentage) accuracy as the usefulness of the product needs also to be considered. Pragmatic enquiry, asking SIOs to rate the usefulness of suggestions, combined with consideration of what was/is done with advice (was it ignored, how was it utilised) would be extremely beneficial. Decision log and policy file entries post receipt of a BIA visit or report would provide a valuable source of data in relation to
this. In addition to evaluating the utility of the advice, it would also assist in ascertaining:

- whether any specific pieces of advice are requested by SIOs more often, and therefore are worthy of further research. Allison et al (2004), have similarly advocated the need for an increased awareness regarding what profilers are being asked to do, for which crimes, why SIOs have approached certain individuals, and at what point in the inquiry assistance is sought, and
- valuable feedback to BIAs who often are unaware of how, or even if, their advice has been used.

10.5.7 Extension of other databases

Whilst in the present research a pre-existing database of cases has been utilised, pragmatic enquiry would support the development of an archive or database of BIA reports (e.g. Allison et al, 2004). This could be for applied use by practitioners - who could refer to similar previous cases, and researchers for academic endeavours. Whilst a ‘case management’ system currently utilised by NPIA BIAs holds a list and detail of cases worked on, construction of such a database specifically for case comparison could further advance professional practice.

10.5.8 Consideration of specific variables

In accordance with pragmatic endeavours, as many independent variables as (statistically) possible were fed into the analysis in study two at any one time. However in the CFA and LR analysis undertaken, the independent variables influence the solution and irrelevant variables can merely add noise to the calculations. In relation to rape, previous research has indicated that some offence behaviours may be better predictors than others (Mokros & Alison, 2002). In the present study, the variables which influenced the significant logistic regression analysis predictions are included in table 10.2 below.
Table 10.1 Variables which influenced significant logistic regression analysis.

<table>
<thead>
<tr>
<th>Offender</th>
<th>Offence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Victim gender</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>Dismemberment/none</td>
</tr>
<tr>
<td></td>
<td>Naked/clothed</td>
</tr>
<tr>
<td></td>
<td>Body recovered in/outdoors</td>
</tr>
<tr>
<td></td>
<td>Body concealed/not</td>
</tr>
<tr>
<td>Ethnic appearance</td>
<td>Victim gender</td>
</tr>
<tr>
<td></td>
<td>Victim age</td>
</tr>
<tr>
<td></td>
<td>Victim ethnic appearance</td>
</tr>
<tr>
<td></td>
<td>Victim prostitute/not</td>
</tr>
<tr>
<td></td>
<td>Victim vulnerable/not</td>
</tr>
<tr>
<td>Previous conviction</td>
<td>Victim gender</td>
</tr>
<tr>
<td></td>
<td>Victim age</td>
</tr>
<tr>
<td></td>
<td>Victim ethnic appearance</td>
</tr>
</tbody>
</table>

Victimology: Many of the key variables identified as relevant were in relation to victimology (written in italics in table 10.1). For example the variables victim gender, victim being a prostitute and the victim being vulnerable were repeatedly apparent as predictor variables. But this was not only the case in the logistic regression analysis, but also in both the odds ratio and configural frequency analyses. As such, it may be that these variables are key, and worthy of further research. This supports previous literature regarding the importance of victimology (e.g. Clark, 1995; Francis et al, 2004; Kocsis, Cooksey & Irwin, 2002; Luckenbill, 1977; Meloy, 2000; Safarik, Jarvis, & Nussbaum, 2002; Santtila et al, 2004; Wilson, 1993; Wolfgang, 1958). In addition, policing good practice has already identified its use stating:

“Understanding the lifestyle and routine activities of a victim may help to establish the reason their death and the likely identity of the offender.”

ACPO, 2006, p51.
Further research looking specifically at the importance of the type of victim, and what this may indicate about the type of offender, is suggested.

For example general research regarding prostitute or vulnerable victims may be of benefit to ascertain the ages and backgrounds of clients of prostitutes, and circumstances of the interactions. Whilst there may be methodological difficulties in gaining direct access to such groups even via anonymous means, information gleaned from ex-prostitutes, specialist police officers, support workers etc. may be of interest.

In addition, some of the specific findings in relation to the victim being a prostitute require further exploration. For instance the odds ratio indicates it was less likely that offender was a stranger if the victim was a prostitute. Under the coding considerations of the SCAS database, an offender who was believed to have been a client of a prostitute at the time of the murder can be coded as either stranger or acquaintance (i.e. known) depending upon whether or not they were known to have had previous contact. Further exploration of the nature of the relationship, where the victim and offender initially met (red light district?) in this subset of cases would therefore be of interest.

Variables of less potential relevance: Alternatively there are some variables, for example the use of a vehicle, or a weapon being left at the scene, which infrequently appeared in the findings of interest. Such offence information could be excluded in future research to explore what (if any) effect this had upon findings by 'reducing the noise' of these potentially irrelevant variables.
10.6 Final comments

The pragmatic stance has proved to be a valuable way of considering the applied research objectives in this research, and the utilisation of both qualitative and quantitative methodology has been vital to this end.

This thesis set out to explore the potential provision of behavioural investigative advice to difficult to detect murder investigations within the UK. Utilising the previous working knowledge of experienced SIOs, study one elicited what information investigators want, when they want it, and in what format. Study two then went on to statistically explore a pre-existing database of detected cases, searching for patterns between what is known regarding the offence, and what could reliably be predicted regarding the offender, in order to provide SIOs with the information they require.

This thesis has greatly expanded knowledge regarding what investigators want from BIAs and whilst appropriate caveats would be required, has attempted to provide BIAs with evidenced based findings they can utilise when producing offender profiles for unsolved difficult to detect murder investigations in the future. Building upon previous practice advice (e.g. ACPO, 2006; Alison et al, 2005) recommendations have also been proposed for SIOs, BIAs, NPIA and the wider police service regarding the potential use and future development of these findings.

However this research has focused upon one specific area of behavioural investigative advice – offender profiling of difficult to detect murder. Whilst areas for future research have been outlined, the research conducted here has been within this very specific remit. Similar systematic treatment, undertaking pragmatic research and analysis is now required in relation to the many other aspects of BIA work – the other services provided such as the provision of offence linkage, interview or media advice; and in relation to other offence types. Only then will psychology be able to claim it is able to make a reliable and valid contribution via the provision of behavioural investigative advice, to serious crime investigations in the future.
References


Clarke, T. (1999). “It was a perverted...ritual thing”. What is offender signature and does it exist? Unpublished BSc dissertation, University of Plymouth.


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APPENDICES

Appendix 5i - Rules for Drawing Visual Models for Mixed-Methods Designs

1. Give a title to the visual model
2. Choose either horizontal or vertical layout for the model
3. Draw boxes for quantitative and qualitative stages of the data collection, data analysis, and interpretation of the study results
4. Use capitalized or lowercase letters to designate priority of quantitative and qualitative data collection and analysis
5. Use single-headed arrows to show the flow of procedures in the design
6. Specify procedures for each quantitative and qualitative data collection and analysis stage
7. Specify expected products or outcomes of each quantitative and qualitative data collection and analysis procedure
8. Use concise language for describing procedures and products
9. Make your model simple
10. Size your model to a one-page limit

Ivankova et al, 2006, p15
Appendix 6i - Interview schedule

Introduction

Hello ........
Thanks once again for agreeing to participate in this interview.

Before I begin I should just introduce myself. My name is Terri Cole and I'm conducting this research as part of my studies for a PhD at Surrey University. The PhD is looking at homicide offence features and attempting to ascertain what these can tell us about the likely background characteristics of the unknown perpetrator. So as a basic example, a body found outdoors might be indicative of a stranger attack or suchlike.

In my role as a behavioural investigative advisor at the NCOF, I anticipate the results of this study will assist us as a practical tool when providing future profiling advice to homicide investigations.

This is the very initial stage of the research and I am hoping to use your expertise to improve the future service offered.

Did you read and can we now sign a copy of the research agreement? Did you have any questions regarding this? Obviously all findings will be recorded in the strictest confidence. Read briefly and both sign.

Is it OK for me to tape record this interview?

If you have any questions during or subsequent to the interview then please ask. You can contact me on the following numbers should you wish to do so (provide business card).

If you would like feedback about the research findings let me know and I will also provide these.

I will be using prompt cards mainly at the end to just check I have covered everything.

Any questions at this stage?
Interview Questions (with probes to consider)

1. What is your role as an SIO?
   - Specifically in relation to murder investigations
   - If difficulties are mentioned probe these

2. Can you talk me through a homicide investigation in which you were SIO? As outlined in the letter I sent you, if possible this will be a type of homicide in which profiling advice was/could have been of assistance - i.e. one in which the suspect was not immediately identified and where it was 'difficult to detect' as opposed to being 'difficult to prove'. I want to be able to understand the information available and your decisions from your perspective as an SIO. If it is OK with you as you are talking I am going to plot this in the form of a timeline like this......beginning with how you were initially notified? E.g. of probes
   - What were you told by whom?
   - What you did next?
   - Is that routinely what happens?
   - 'Antecedents Behaviour Consequences' for each decision
   - What information from the crime scene is seen as salient to you?
   - How does this lead the investigation?
   - What were you thinking at this stage? Why?
   - What type of information came into the investigation and at which stage?
   - What lines of enquiry/actions were taken and why?
   - Is it solved?
     - a. How did the offender's name come into the enquiry?
     - b. When did the name come in?
     - c. When and how did it turn from a name/suspect into the offender
   - Tell me...
   - What about...
   - If I could ask you.....
   - Who, what, why, where, when, how
   - Tell me more about....
   - What do you mean?
   - Mmm
   - Repeat/reflect back answers
   - In what way?
   - What are the other issues involved?
   - Can you think of another...
   - Why do you feel that?
   - Can you be more specific?
   - Can you explain more?
   - Anything else?
3. Did you use a profiler?  
   • If yes
     • At what stage were they brought into the investigation? Why then?
     • From your perspective what type of behavioural advice was of assistance? My purpose here is not trying to evaluate the advice received or to hear necessarily that profiling works or does not work, merely what information (if any) was useful – I can then ensure the research notes this type of information may be useful to investigations in the future
     • What else do you think may have benefited the investigation to have known regarding the likely suspect?
   • If no
     • Have you used a profiler before
       • If yes
         • At what stage were they brought into the investigation? Why then?
         • What type of behavioural advice was of assistance to you previously? My purpose here is not trying to evaluate the advice received or to hear necessarily that profiling works or does not work, merely what information (if any) was useful – I can then ensure the research notes this type of information may be useful to investigations in the future
         • What type of behavioural advice do you think would have been of assistance for this offence?
       • If struggling use a list of possibles e.g. ‘ideally you’d like their CRO I expect’ BUT only to prompt – attempt to elicit in an ideal world what they would like to know. If still stuck use ‘age parameters’ and see if any further information forthcoming. ‘Others have said...’
       • If no
         • Ask if they have knowledge of profiling - what do you understand the profiler could do for the investigation? Explain the purpose is to provide background characteristics of unknown offender

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1. Offender profilers are now known as Behavioural Investigative Advisors (BIAs) however the term BIA and profiler were referred to to ensure the interviewees understood the types of individuals the researcher was referring to. Some of the SIOs had only used ‘profilers’ when they were called such and may not have been aware of the change in title.

2. All interviewees answered yes to this question however the ‘if no’ contingency was considered prior to interviews. Whilst SIOs may have had experience in difficult to detect murder and in using a BIA/offender profiler, they may not have been used on the investigation described. E.g. they may have experience in using a BIA on many previous rape enquiries, but did not utilise their services on the difficult to detect murder they were describing. Similarly whilst these SIOs were suggested to me, the information I had received about their profiling experience may have been redundant – i.e. they may have asked for a profiler initially but may not have utilised their advice. Whilst neither of these situations were found to be the case, with all interviewees answering ‘yes’ to the initial question, contingency planning took place incase this occurred.
perpetrators based upon information from the crime scene
- What type of behavioural advice (i.e. characteristics of your offender) do you think would have been of assistance for this offence?
- **If struggling** use a list of possibles e.g. 'ideally you’d like their CRO I expect' BUT only to prompt – attempt to elicit in an ideal world what they would like to know. If still stuck use 'age parameters' and see if any further information forthcoming. ‘Others have said...’
- Discussion also covered the research difficulty of which group of homicides on which to focus (stranger, sexual) when talking of e.g. relationship to victim.

4. **From your perspective, how would such advice link into potential lines of enquiry?**
- Which enquiries are routinely made anyway?

5. **In your view, when would this type of information be useful?**
- Hour one?
- Day one?
- Week one?
- All at once or drip feed information?

6. **In what format would you find the information useful?**
- Verbal?
- Written?
- Electronic reporting?

7. **In your force how much suspect information is gathered for court preparation or post conviction?**
- Would such information have been useful to know for suspect identification?
- Why?
- What happens to this information subsequently?
- How long and where is it generally held?
- Discussion can also cover the research difficulty of which data I should collect – view policy books or HOLMES – too much information? Intrusive? What do they think I’ll find useful? If this is not brought up then introduce it as a topic.

8. **Is there any information you feel I may benefit in knowing to assist my research?**
9. Just finally, do you have any comments upon how you experienced the interview, views or advice regarding the research?

Conclusion

Thank you for your time and answers. I think that’s everything I wanted to discuss unless there’s anything else you’d like to say on the matter?

I'll just reiterate that the information you have provided will be held in confidence and any findings anonymised. If you want to withdraw or if you have any questions about it, you can always contact me at any time.

As I have said this is the initial stage of the research and the information you have provided me with has given me an excellent insight and basis to further the research into a useable profiling tool.

Thanks again for your time.
Appendix GII – Example of a plotted timeline

SEQUENCE
- Missing Person
- Evidence to strongly suggest a death was found
- The 'on duty' SIO took it on
- Interviewee became SIO

LINES OF ENQUIRY /ACTIONS
- In relation to a missing person enquiry
- Kept open mind and initiated:
  - House to house
  - Forensic searches
  - Arranged a family liaison officer
- Initiated PoLSA searches and body found
- Attended scene
- Attended post mortem
- Focus activity in this area
- Focus activity regarding suspects
- Forensic discovery - wipe marks
- Forensic discovery - footprints
- Forensic match – then not match to suspect

PROFILE/ BIA
- May assist – Likelihood? Risk?
- May assist profile
- May assist profile
- May assist scene assessment
- Would they 'fit'?
Appendix 6iii - Initial phone conversation

Hello, my name is Terri Cole and I am one of the profilers at the Crime Faculty. I am studying part time for a PhD looking at profiling of murders and as an initial stage would like to discuss the issues with some experienced SIOs. One of my colleagues has suggested you may be a good initial source and I wondered if you would mind being interviewed?

I anticipate asking you to talk through a recent homicide you have worked on so as I can get a feel of the investigation from the perspective of an SIO – hopefully then the profiling advice can be tailored to information that will be of use to future investigations.

If you agree I will send you a summary of the topics I’d like to talk about and if you have any queries you can contact me once you have had sight of this.

Perhaps we could set a provisional date to meet now? When would be a convenient time?

Where will I find you, or would you rather come to Bramshill? If I come to you, would you prefer to come to my hotel to avoid office interruptions?

OK I’ll get a summary of the research questions and confirmation in the post.
Appendix 6iv – Letters to SIOs

Terri Cole - Behavioural Investigative Advisor
National Crime and Operations Faculty
Foxley Hall
Bramshill Police Staff College
Near HOOK
Hampshire
RG27 0JW

SIO name
SIO address

Date

Dear Sir

Profiling of homicide research

Thank you for agreeing to participate in the above research. I am writing to confirm our proposed meeting for time, date, location.

Further detail regarding the research interview is enclosed in Appendix i, however as a general guide I would like to discuss the following with you:

• A now solved ‘difficult to detect’ (rather than prove) homicide investigation in which you were SIO.
• Whether you have used profiling or behavioural advice and how useful it was?
• What other behavioural advice you would like to be made available to you?
• When during an investigation is the optimum time, and what is the preferred method of delivery for receiving such profiling advice?

I have also included in Appendix ii, a copy of a research agreement. I would be grateful if you could read this in advance so as we can both discuss and sign this when we meet.

If you have any questions please do not hesitate to contact me on 07789 923 548 or Professor Jennifer Brown at the University of Surrey on 01483 686897. Unless I hear from you, I will telephone to finally confirm the time and final arrangements, the day before our meeting.

Yours faithfully

Terri Cole BSc (hons)
Appendix 6v – Topics for discussion

(AppENDIX i to letter)

I anticipate the ‘interview’ will take the form of an informal discussion. Its content will be flexible so if there is any information you feel may be of benefit please introduce it for discussion. My aim is to understand the information available to you, and what answers you require in an attempt to ascertain how profiling advice can best add value to investigations.

I also welcome your views and advice regarding the research.

Obviously information gleaned will be held in the strictest confidence, and all sources will be immediately anonymised. Should you have any concerns whatsoever regarding this please do not hesitate to discuss these with me in advance.

- Initially I will ask you to describe your general job title and role as SIO.

- I will ask you to talk through a solved homicide investigation in which you were SIO. If possible this will be a type of homicide in which profiling advice was/could have been of assistance – i.e. one in which the suspect was not immediately identified and where it was ‘difficult to detect’ as opposed to being ‘difficult to prove’. For example a stranger or sexual homicide rather than a domestic or drugs/criminally related crime. If it is possible to bring any policy book or reference information to assist your recall please do not hesitate to do so. Sighting of these will not be requested.

- We then will discuss what type of profiling advice you feel that may have been/was of assistance to your lines of enquiry in this or other investigations.

- I will then ask in your view when this type of information would have been useful and in what format (verbal, written, or electronic).
Appendix 6vi – Research agreement

(APPENDIX ii to letter)

1. I the undersigned voluntarily agree to take part in a study looking at behavioural assistance in homicide investigations.

2. I have read and understood the topics of discussion detailing the nature and purpose of the research. I have been given the opportunity to ask questions on all aspects of the study and have understood the advice and information given as a result. I understand the research will be conducted in line with the British Psychological Society guidelines.

3. I consent to the researcher tape recording the interview to enable an accurate, word for word account of our conversation. I do this on the understanding that after the research the tape will be transcribed then destroyed. (If however you do not agree to recording, alternative arrangements - such as possible note taking - can be discussed.)

4. I understand that data generated from these interviews is held and processed in the strictest confidence. I understand myself and the interviewer are the only people who know I have been involved in the research. I understand that whilst the researcher has initially asked the advice of colleagues about investigators it may be beneficial to interview, they are unaware of which individuals have been identified and finally chosen. I agree that I will not seek to restrict the use of the results of the study on the understanding that my anonymity is preserved.

5. I understand that I am free to withdraw from the study at any time without needing to justify my decision and without prejudice, and that my interview will at such a time be discarded from the research. Additionally if there is a particular question I do not wish to answer for whatever reason then I will advise the researcher to move onto the next topic.

6. I understand that in the course of the interview I may be describing explicit material which could be potentially distressing. If necessary I will be given contact details for people who will be able to provide me with support.

7. I confirm that I have read and understood the above and freely consent to participating in this study. I have been given adequate time to consider my participation and agree to comply with the instructions and restrictions of the study.

Name of volunteer - including rank (BLOCK CAPITALS) .................................................................

Signed ........................................................................................................................................

Date ...........................................................................................................................................

Name of witness (BLOCK CAPITALS) ........................................................................................

Signed ........................................................................................................................................

Date ...........................................................................................................................................

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Appendix 6vii – Example of contact summary sheet written after the interview

Contact summary sheet – initial thoughts regarding interview between researcher and participant X.

- Interviewee had attended a day long course and so our interview did not begin until after 17:30 – this meant everyone was slightly tired and whilst the participant stated he was in no hurry to get away (it would be better to wait for traffic to die down) I did feel he wanted to get straight on with talking about his case – this may have been a consequence of the introductory letter/phone call I made or that he possibly wanted to get away – though nothing else indicated the latter – consider in future NOT interviewing individuals at the end of a long day or reducing the rapport building – this certainly appeared unnecessary in this interview.

- I felt the officer wanted to ‘lead’ the interview more so than be led by the questions. This may be due to the briefing as discussed above, my inexperience of interview skill, the high rank of the individual involved being used to running such meetings, the clear interest in the case or any number of other factors. This meant I stuck less to ‘the script’ though I checked this through at the end and the major themes had been covered and probed. Unsure if this approach was better as a bit less structured, as long as things aren’t missed out. Certainly another interviewee did not like my more formal previous reference to prompt cards. To discuss further with supervisor.

- Formality: I attempted to smile more and believe the interview achieved less formality than the last one.

- Seating: Seating was again placed at close right angles around a table, which seemed to work well.

- Considered requesting name, rank force for the tape as advised however after comments from another interviewee regarding their concerns about confidentiality and anonymity it was decided to leave these off – I will just keep a separate confidential record of who was which interviewee rather than have it on the tape.
Appendix 6viii – Example of memo written during transcription

Memo – initial thoughts from transcription of interviewee XX.

- Whilst I could hear myself clearly, hearing the participant proved difficult, the tape recorder was close to us but some words were lost in transcription.
- This may have been easier if transcription had occurred sooner after the interview as I may have remembered what was said (though then this in turn may have been inaccurate).
- Consider ‘testing’ the recorder from both seats prior to interview in future.
Appendix 7i - SCAS criteria for murder offences

Where the relationship between the offender and victim is unknown or a stranger:

- All murders with a sexual motive
- Murders with an unknown motive, in consultation with SCAS management

Where the victim and offender have (or have previously had) a sexual relationship:

- All murders or where there is a strong fantasy element, role playing, or the is victim drugged by the offender or the victim is subjected to a level of violence resulting in hospitalisation
- All murders where there is intelligence to suggest that the offender is sexually offending outside of the relationship

Where the victim and offender are known to each other, but they have not had a previous sexual relationship:

All murders with a sexual element
Appendix 7ii - Copy of current NPIA Specialist Operational Support research protocols

NPIA Specialist Operational Support Research Protocols

Introduction

It is recognised that there are clear benefits for the release of police data for research purposes. Both the NPIA and the police service are committed to encouraging and assisting serious research. The majority of the data held by NPIA Specialist Operational Support relates to 'live' operations where there is an obvious concern for the integrity of the investigative process. Consequently, due to the nature of this data, it is necessary to balance the potential risks in releasing such data against the potential benefits to the service.

This paper aims to clearly set out the issues that need to be considered for the release of NPIA Specialist Operational Support data for external research purposes. It summarises the research protocols for the use and management by external researchers of NPIA Specialist Operational Support data.

The protocols described in this paper have drawn on existing guidelines published by the Home Office (Home Office Circular 48/95) on the release of police data for academic research. At present, the Association of Chief Police Officers (ACPO) Research Committee approves access to all police data, but have delegated decision-making on access to NPIA Specialist Operational Support data to the NPIA Specialist Operational Support Research Approvals Panel.

The National Crime Faculty was founded in 1995 with the aim of providing a totally integrated approach to the investigation and reduction of serious crime by bringing together training and development, operational support, analysis and research. In 2002, NCF merged with the National Operations Faculty to become the NCOF, recently renamed as NPIA Specialist Operational Support. NPIA Specialist Operational Support is currently supported in terms of research through the Effective Investigations Programme that is being undertaken by the Home Office Crime and Policing Group (CPG). CPG, in collaboration with NPIA Specialist Operational Support and ACPO Crime Business Area, have developed a programme of research that aims to improve the ability of the police service to deal with the problems associated with serious crime.

While Home Office researchers based in NPIA Specialist Operational Support carry out much of the work, some of the research is also undertaken by external consultants. This group includes police officers that have been awarded fellowships and researchers from other institutions who have successfully tendered for Home Office-sponsored research projects.

This paper relates to the release of NPIA Specialist Operational Support data for external researchers only (other arrangements exist for Home Office-funded research and research conducted in-house by NPIA Specialist Operational Support).
External researchers are defined as:

- researchers in academic or other research institutions who undertake research projects not funded directly by the Home Office;
- university/college students who wish to use the data for academic study;
- those individuals who wish to undertake a particular project out of general interest.

The paper is divided into three sections. Section one describes briefly the major NPIA Specialist Operational Support database. Section two highlights a number of issues that need to be considered for the release of NPIA Specialist Operational Support data for the purposes of external research. Section three summarises the conditions under which external researchers have to work to access and employ this data for research purposes.

Section One: The NPIA Specialist Operational Support Database

The NPIA Specialist Operational Support database relating to serious crime is the responsibility of the Serious Crime Analysis Section (SCAS), which forms part of NPIA Specialist Operational Support. SCAS has a national remit from the Association of Chief Police Officers (ACPO) and their Scottish counterpart (ACPOS) to carry out analytical work on behalf of forces. It conducts comparative case analysis on cases of stranger rape, murder and abduction.

The types of offences covered by SCAS are not contained by individual force boundaries. Some offenders deliberately take advantage of this factor to hide their serial offending by spreading their offences across multiple forces. SCAS will also analyse the offenders' behavioural traits and use any timeline information available for each offender to identify if there are any further cases that the offender might be responsible for.

The database is based upon the Violent Crime Linkage Analysis System (ViCLAS) developed in Canada. It stores the details of appropriate offences covering over 120 variables. These include details pertaining to the offence itself, including locations involved within each offence; victimology; offender details (if known); verbal behaviour; and behavioural and forensic information if available. At the time of writing (January 2006), the SCAS database has details of 4,095 stranger rapes and attempted rapes (1,707 solved), 181 abductions (75 solved), and 622 murders (378 solved). Details are also held on 2,659 lesser sexual offences (1,009 solved). The database holds over 10,000 cases in total.

Traditionally, research in this field has suffered from a lack of available quality data. SCAS aims to have the most definitive and accurate database of these types of crimes available. SCAS is committed to facilitating operationally-relevant research into these types of crimes and the offenders who commit them.
Section Two: Considerations for release of NPIA Specialist Operational Support data for research purposes

The Home Office Circular 46/95, concerned with the release of police data for academic research, highlighted a number of issues that police officers should consider when deciding whether or not to get involved in working with external researchers. These were broadly focused on assessing the scope of the research, the benefits to the service (e.g. costs, relevance and sensitivity) and the management of the research process (e.g. data confidentiality, data protection, access, ownership and the publication of the findings).

These issues must also influence the process by which NPIA Specialist Operational Support data is released for external research purposes. Of particular relevance are:

• Data sensitivity
NPIA Specialist Operational Support needs to be cautious about the release of its data to external researchers as the database includes material pertaining to live, ongoing cases with detailed information relating to offences, offenders and victims. The data on particular cases may form part of holdback evidence in unsolved cases or be subject to disclosure at court. Furthermore, there is also an ethical obligation to respect the rights of the victim's family and friends.

Consequently, issues of confidentiality and data protection need to be considered when releasing data.

• Cost implications of access
There are a number of costs associated with access to NPIA Specialist Operational Support data. Given the sensitivity of the data, any released data would need to be fully anonymised, which has an obvious cost implication in terms of both staff time and resources. Direct access to NPIA Specialist Operational Support data should in normal circumstances be given only to those who have been security cleared by the Home Office. This in itself incurs costs and is a lengthy procedure. Finally, any supervised access to data would require some project management and supervision by NPIA Specialist Operational Support, ensuring that any agreements made between the external researchers and NPIA Specialist Operational Support concerning access to, and use of, the data were adhered to.

• Benefit to the police service
It is vital that NPIA Specialist Operational Support assesses the benefit of the research to the service in terms of its operational relevance against the cost implications and the sensitivity of the data. The research must provide 'added value' for the police service as a whole. This, together with managing access to NPIA Specialist Operational Support data, will be discussed further in section three of this paper.

• Publication
It must be made clear that access to data is for specific undertakings only. Any findings derived from it remain the property of NPIA Specialist Operational Support and can only be published, presented or otherwise placed in the public domain with NPIA Specialist Operational Support's explicit written permission.
Section Three: Managing access to the NPIA Specialist Operational Support database

Developing a research protocol for external access to NPIA Specialist Operational Support data needs to balance a number of objectives. It needs:

- to function with the minimum of bureaucracy;
- to provide external researchers with reasonable access to allow the development of operationally relevant research;
- to be fair and transparent;
- to be efficient in terms of its drawing upon NPIA Specialist Operational Support resources; and
- to respect the sensitivity of the data.

External researchers wishing to obtain access to the NPIA Specialist Operational Support data will be asked to submit a detailed research proposal for consideration by an Approval Panel. It is intended that this panel will meet once or twice a year according to prescribed dates.

The research proposal should provide details concerning:

- the aims and hypotheses of the project;
- the research methodology to be adopted;
- the nature of the sample (including where possible the variables required) and how it is to be obtained;
- how the research will be supported;
- a detailed statement of how the research will benefit the police service;
- a detailed timetable (including internally- or externally-set deadlines) for the duration of the research project; and
- details concerning the security and storage of the data.

The Approval Panel will then assess the feasibility and usefulness of any external research proposals put forward to NPIA Specialist Operational Support. Each proposal will be evaluated against criteria drawn in part from current Home Office research tendering protocols:

- a clear description of the research's aims and objectives;
- an indication of how the research adds value to the service;
- current police service priorities for research;
- demonstration of familiarity with the relevant literature and research;
- the suitability of the candidate in terms of research skills and ability;
- the ability of the candidate to anticipate research problems that may be identified in the course of conducting the research project;
- the likely costs of providing data etc for the study to NPIA Specialist Operational Support;
- an indication of the candidate's ability to complete the research to an acceptable level of quality (e.g. resources in place to undertake the study, relevant skills); and
- the provision of a clear timetable.

The candidates who meet these criteria will then be invited to a meeting with the relevant members of NPIA Specialist Operational Support to discuss their proposal in more depth. Only after this meeting will access be agreed and the terms under which data can be accessed clarified. If, at any time during the research, NPIA Specialist Operational Support feels that the researchers are not complying with the agreed terms, the data will be returned to them immediately.
Section Four: Confidentiality and Non-Disclosure Agreement

Once access to the database has been agreed between NPIA Specialist Operational Support and the external researcher, both parties must sign a confidentiality and non-disclosure agreement.

It is important to emphasise the following points contained within this agreement, namely that:

- regular updates (negotiated by the researcher with the Approval Panel) on the progress of the study must be provided to NPIA Specialist Operational Support to ensure that the research is continuing on time and remains in line with the agreed research proposal;
- the data will be anonymised prior to being provided to the external researcher;
- no details or findings of the research based on the data provided by NPIA Specialist Operational Support may be published or otherwise placed in the public domain without prior written consent from NPIA Specialist Operational Support; this includes presentations at conferences, seminars and workshops;
- any amendments to the original research proposal agreed between NPIA Specialist Operational Support and the external researcher must be agreed in writing;
- a draft copy of the research will be supplied to NPIA Specialist Operational Support for comment and approval to submit; and,
- all data supplied must be returned to NPIA Specialist Operational Support within thirty days of the date of completion of the work. Completion of the work is deemed to be at the stage at which an acceptable draft has been approved by NPIA Specialist Operational Support for publication.
Appendix 7ii – Copy of formal notification letter granting access to data

Department of Psychology
University of Surrey
GUILDFORD
Surrey
GU2 7XH

10 April 2002

Dear Sir/Madam

I am writing as head of the National Crime Faculty Serious Crime Analysis Section regarding the research being undertaken by Terri Cole. Further to her business plan submitted I formally confirm she has been granted access to all of the data and data-sources available from the National Crime Faculty for the duration of her research.

All information obtained must be kept secure and as such no other persons other than herself and her immediate supervisors may have access to this data without prior consultation with the National Crime Faculty. Any data to be published or permitted within the public domain must first obtain approval from the National Crime Faculty. Persons should not be identified or identifiable, and any published findings will be depersonalized so that no victims will be identified.

The National Crime Faculty agrees to the conditions outlined above and wholeheartedly supports this research proposal.

Yours faithfully

Sean Sutton
Head of the Serious Crime Analysis Section
National Crime Faculty
## Appendix 7iv – Crime scene variables – predictor variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim gender</td>
<td>Victim male / female</td>
</tr>
<tr>
<td>In/outdoor</td>
<td>Victim’s body found indoor/outdoor location. Outdoor includes locations in the open air and exposed to the elements (including within vehicles, bus shelters and phone boxes)</td>
</tr>
<tr>
<td>Body naked/clothed</td>
<td>Victims body found naked / not naked</td>
</tr>
<tr>
<td>Body concealed/not concealed</td>
<td>Victims body found concealed for example buried, found in a box, trunk or skip, weighted in water, covered in branches / no known attempt at concealment</td>
</tr>
<tr>
<td>Body dismembered/not dismembered</td>
<td>Victims body found dismembered or serious attempt at dismemberment / no known attempt at dismemberment</td>
</tr>
<tr>
<td>Victim white</td>
<td>Victim appearance was white skinned European e.g. English, Scottish, French, German, Swedish, Norwegian, Polish / not white European</td>
</tr>
<tr>
<td>Sex</td>
<td>Known sexual assault on body which includes acts such as kissing, vaginal penetration, anal penetration, ejaculation onto body / no known sexual assault</td>
</tr>
<tr>
<td>Foreign object</td>
<td>Known foreign object insertion to anus or vagina – can include mouth if known sexual rather than controlling purpose / no known foreign object insertion</td>
</tr>
<tr>
<td>Victim age</td>
<td>Victim aged 18 years or over / under 18 years</td>
</tr>
<tr>
<td>Overkill</td>
<td>Overkill injuries apparent – i.e. injuries beyond those necessary to cause death / no overkill injuries apparent</td>
</tr>
<tr>
<td>Injhfneck</td>
<td>Known injury to head, face or neck / no known injury to head, face or neck</td>
</tr>
<tr>
<td>Injsex</td>
<td>Known injury to genitals, breast, or anus / no known injury to genitals, breast, or anus</td>
</tr>
<tr>
<td>Binding</td>
<td>Any binding known to have been used on the victim for whatever reason (control, sexual etc.) / no known binding</td>
</tr>
<tr>
<td>Weapon</td>
<td>Any weapon known to have been used against the victim / no weapon believed to have been used against the victim</td>
</tr>
<tr>
<td>Weapon left</td>
<td>Any weapon recovered from the offence scene / no weapon recovered from the offence scene</td>
</tr>
<tr>
<td>Prostitute</td>
<td>Victim known prostitute / no evidence of prostitution</td>
</tr>
<tr>
<td>Drugs</td>
<td>Victim known to have been an illegal drug user or alcoholic / not known to have been an illegal drug user or alcoholic</td>
</tr>
<tr>
<td>Disability</td>
<td>Victim known to have a medical history or taking medication for any mental or physical disability / not known to have a medical history involving any mental or physical disability</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Vulnerability&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Victim known to have been an illegal drug user or alcoholic or have had a medical history involving any mental or physical disability / not known to have been an illegal drug user or alcoholic or have had a medical history involving any mental or physical disability</td>
</tr>
<tr>
<td>Clothing taken</td>
<td>Clothing known to have been taken from the victim / no clothing known to have been taken from the victim</td>
</tr>
<tr>
<td>Value taken</td>
<td>An item of monetary value known to have been taken from the victim / no items of monetary value known to have been taken from the victim. Examples of monetary items taken include cash, cards, jewels, handbag, keys</td>
</tr>
<tr>
<td>Precaution</td>
<td>Offender believed to have taken precaution/s to avoid detection / no precaution/s to avoid detection believed to have taken by the offender. Examples of precautions taken include destroyed forensic evidence, gagged victim, wore a condom/gloves/mask</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Vehicle known to have been used in the offence / vehicle not known to have been used in the offence. Vehicle includes any kind of conveyance e.g. bicycles, boats etc. that were at any point used immediately prior/during/immediately after the offence. They may have been under the control of the offender, victim or an accomplice</td>
</tr>
</tbody>
</table>

<sup>3</sup> This variable involved merging of the 'drugs' and 'disability' variables. This 'merged' variable was used in the logistic regression and configural frequency analysis calculations described in Chapter 8, as the sample size limited the number of variables which could validly be entered at any one time.
## Offender variables – outcome variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>Offender known to have been familiar with body recovery site / offender not known to have been familiar with body recovery site. Familiarity includes for example having lived or worked in the road, known to have socialised in woodland or nightclub etc.</td>
</tr>
<tr>
<td>Age</td>
<td>Offender is between 18-40 years (inclusive) at the time of the offence / aged under 18/over 40 years</td>
</tr>
<tr>
<td>Gender</td>
<td>Offender male / female</td>
</tr>
<tr>
<td>Ethnic appearance</td>
<td>Offender appearance was white skinned European e.g. English, Scottish, French, German, Swedish, Norwegian, Polish / not</td>
</tr>
<tr>
<td>Living with</td>
<td>Offender living alone / not known to have been living alone – e.g. lived with partner, flatmates, relatives, at the time of the murder</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>Victim knew the offender / is not known to have known the offender and there is no known previous legitimate contact between them</td>
</tr>
<tr>
<td>Previous convictions</td>
<td>Offender is known to have previous convictions of some kind / is not known to have previous convictions of some kind at the time of the murder</td>
</tr>
<tr>
<td>Prison</td>
<td>Offender has served a previous period of imprisonment prior to the murder / offender is not known to have served a previous period of prior imprisonment</td>
</tr>
<tr>
<td>Precon sex</td>
<td>Offender is known to have a previous conviction for a sexual offence / is not known to have a previous conviction for a sexual offence</td>
</tr>
<tr>
<td>Precon violence</td>
<td>Offender is known to have a previous conviction for a violent offence / is not known to have a previous conviction for a violent offence</td>
</tr>
<tr>
<td>Precon dishonesty</td>
<td>Offender is known to have a previous conviction for a dishonesty offence / is not known to have a previous conviction for a dishonesty offence</td>
</tr>
<tr>
<td>Precon other</td>
<td>Offender is known to have a previous conviction for an offence other than for violence, sex or dishonesty / is not known to have a previous conviction other than for violence, sex or dishonesty</td>
</tr>
</tbody>
</table>
Appendix 7v – Significant Chi-square associations IV/IV

<table>
<thead>
<tr>
<th>Offence (IV/Predictor)</th>
<th>Offence (IV/Predictor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naked/not</td>
<td>Body concealed/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Body dismembered/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Victim white/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Sexual assault/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Foreign object insertion/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Evidence of binding/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Clothing taken/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>Naked/not</td>
<td>Precaution taken/not</td>
</tr>
<tr>
<td>Body concealed/not</td>
<td>Body dismembered/not</td>
</tr>
<tr>
<td>Body concealed/not</td>
<td>Evidence of binding/not</td>
</tr>
<tr>
<td>Body concealed/not</td>
<td>Clothing taken/not</td>
</tr>
<tr>
<td>Body concealed/not</td>
<td>Vehicle used/not</td>
</tr>
<tr>
<td>Victim gender</td>
<td>Victim white/not</td>
</tr>
<tr>
<td>Victim gender</td>
<td>Sexual assault/not</td>
</tr>
<tr>
<td>Victim gender</td>
<td>Victim prostitute/not</td>
</tr>
<tr>
<td>Victim gender</td>
<td>Victim disability/not</td>
</tr>
<tr>
<td>Body found outdoors/not</td>
<td>Vehicle used/not</td>
</tr>
<tr>
<td>Victim white/not</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>Sexual assault/not</td>
<td>Foreign object insertion/not</td>
</tr>
<tr>
<td>Sexual assault/not</td>
<td>Injury to genitals/anus/breasts</td>
</tr>
<tr>
<td>Sexual assault/not</td>
<td>Evidence of binding/not</td>
</tr>
<tr>
<td>Sexual assault/not</td>
<td>Clothing taken/not</td>
</tr>
<tr>
<td>Foreign object insertion/not</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Evidence of binding/not</td>
<td>Weapon used</td>
</tr>
<tr>
<td>Evidence of binding/not</td>
<td>Clothing taken/not</td>
</tr>
<tr>
<td>Evidence of binding/not</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>Evidence of binding/not</td>
<td>Precaution taken/not</td>
</tr>
<tr>
<td>Evidence of binding/not</td>
<td>Vehicle used/not</td>
</tr>
<tr>
<td>Weapon used</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>Weapon used</td>
<td>Precaution taken/not</td>
</tr>
<tr>
<td>Weapon used</td>
<td>Victim age</td>
</tr>
<tr>
<td>Victim prostitute</td>
<td>Victim user</td>
</tr>
<tr>
<td>Victim prostitute</td>
<td>Victim age</td>
</tr>
<tr>
<td>Victim user</td>
<td>Victim age</td>
</tr>
<tr>
<td>Clothing taken/not</td>
<td>Value taken/not</td>
</tr>
<tr>
<td>Clothing taken/not</td>
<td>Precaution taken/not</td>
</tr>
<tr>
<td>Clothing taken/not</td>
<td>Vehicle used/not</td>
</tr>
<tr>
<td>Value taken/not</td>
<td>Precaution taken/not</td>
</tr>
<tr>
<td>Value taken/not</td>
<td>Victim age</td>
</tr>
<tr>
<td>Victim age</td>
<td>Body found outdoors</td>
</tr>
</tbody>
</table>
There was association found between the following variables, however the expected frequency was less than 5 in more than 20% of cases therefore the findings may not have been valid and Fishers would be reported.

- Body dismembered/not
- Injury to genitals, anus of breasts
- Body dismembered/not
- Clothing taken/not
- Foreign object insertion/not
- Injury to genitals, anus or breasts
- Foreign object insertion/not
- Evidence of binding/not
- Victim age
- Body dismembered/not

-it is of interest that in all cases where the bodies were dismembered, the victims were aged 18 and over, however whilst of interest, this does not assist investigations and there is no apparent reason as to why younger victims may not be dismembered in future cases⁴.

⁴ Clearly in line with the argument that dismemberment is usually for purposes of body disposal (see for example Rajs, Lundstrom, Broberg, Lidberg & Lindquist, 1998), it could be hypothesized that as younger victims may be smaller, the need for dismemberment occurs more often with adult victims (although data from Beauregard, Stone, Proulx & Michaud, 2008 does not support this). However such assertions are merely speculative and beyond the scope of the present study.
**Appendix 7vi – Significant Chi-square associations IV/DV**

<table>
<thead>
<tr>
<th>Offence (IV/Predictor)</th>
<th>Offender (DV/Outcome)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known prostitute/not</td>
<td>Stranger/known</td>
</tr>
<tr>
<td>Victim drugs/alcohol/not</td>
<td>Stranger/known</td>
</tr>
<tr>
<td>Victim ethnic appearance</td>
<td>Offender ethnic appearance</td>
</tr>
<tr>
<td>Victim gender</td>
<td>Previous conviction/none</td>
</tr>
</tbody>
</table>
Appendix 8I - Significant profiles (p<=0.05) for stage 1 CFA

<table>
<thead>
<tr>
<th>STVs in combination with DV:</th>
<th>Types - more common than expect (ones in bold also have prediction level p&lt;=0.10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>1. Male victim, indoors, naked, concealed, not dismembered - offender not known to have been familiar with the body deposition site n=1/1</td>
</tr>
<tr>
<td></td>
<td>2. Male victim, outdoors, clothed, concealed, not dismembered - offender not known to have been familiar with the body deposition site n=2/3</td>
</tr>
<tr>
<td>Offender ethnicity</td>
<td>3. Male victim, indoors, naked, not concealed, dismembered - offender white n=1/1</td>
</tr>
<tr>
<td></td>
<td>4. Male, outdoors, clothed, concealed, dismembered - offender white n=3/3</td>
</tr>
<tr>
<td>Living with</td>
<td>5. Female victim, outdoor, naked, concealed, dismembered - offender living alone n=2/3</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>6. Male victim, outdoor, clothed, concealed, dismembered - offender known - n=2/3</td>
</tr>
<tr>
<td></td>
<td>7. Male victim, outdoor, naked, concealed, dismembered - offender stranger n=1/1</td>
</tr>
<tr>
<td></td>
<td>8. Female victim, outdoor, naked, concealed, dismembered - offender known n=3/3</td>
</tr>
<tr>
<td>Previous convictions</td>
<td>9. Male victim, outdoor, clothed, concealed, dismembered - offender previous conviction n=3/3</td>
</tr>
<tr>
<td>Prison</td>
<td>10. Male victim, indoors, naked, concealed, dismembered - offender previous prison n=1/1</td>
</tr>
<tr>
<td></td>
<td>11. Male victim, outdoors, clothed, concealed, dismembered - offender previous prison n=2/3</td>
</tr>
<tr>
<td></td>
<td>12. Female victim, outdoors, naked, concealed, dismembered - offender previous prison n=3/3</td>
</tr>
</tbody>
</table>
Appendix 8ii - Significant profiles (p<=0.05) for stage 2

<table>
<thead>
<tr>
<th>'Victimology' IVs in combination with DV:</th>
<th>Types - more common than expect (ones in bold also have prediction level p&lt;=0.10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offender ethnic appearance</td>
<td>13. Male victim, under 18, non white - offender white n=1/2</td>
</tr>
<tr>
<td></td>
<td>14. Male victim, over 18, non white - offender white n=3/7</td>
</tr>
<tr>
<td></td>
<td>15. Female victim, under 18, non white - offender white n=7/14</td>
</tr>
<tr>
<td>Precon sex</td>
<td>16. Male victim, under 18, white - offender previous conviction for a sexual offence n=5/13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>'Pathology' IVs in combination with DV:</th>
<th>Types - more common than expect (ones in bold also have prediction level p&lt;=0.10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with</td>
<td>17. Body dismembered, weapon used, injury head/face/neck, overkill, binding - offender lives alone n=1/1</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>18. Body dismembered, weapon used, injury head/face/neck, overkill, binding - offender stranger n=1/1</td>
</tr>
<tr>
<td>Offender age</td>
<td>19. Body dismembered, weapon used, no injury head/face/neck, no overkill, no binding - offender is under 18 years or over 40 years n=2/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>'Sexual elements' IVs in combination with DV:</th>
<th>Types - more common than expect (ones in bold also have prediction level p&lt;=0.10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>20. Victim not naked, but there is sexual assault, foreign object insertion, and sexual injury - offender - familiar with the body recovery scene n=5/8</td>
</tr>
<tr>
<td></td>
<td>21. Victim naked, and there is sexual assault, foreign object insertion, and sexual injury - offender - familiar with the body recovery scene n=3/9</td>
</tr>
<tr>
<td></td>
<td>22. Victim naked, and there is sexual assault, foreign object insertion, and sexual injury - offender - not familiar with the body recovery scene n=6/9</td>
</tr>
<tr>
<td>Offender gender</td>
<td>23. Victim not naked, no sexual assault, no foreign object insertion or sexual injury - offender male n=128/132</td>
</tr>
<tr>
<td></td>
<td>24. Victim not naked, but there is sexual assault, foreign object insertion and sexual injury - male offender n=7/8</td>
</tr>
<tr>
<td></td>
<td>25. Victim not naked, but there is sexual assault, foreign object insertion and sexual injury - female offender n=1/9</td>
</tr>
<tr>
<td></td>
<td>26. Victim naked, there is sexual assault, foreign object insertion and sexual injury - male offender n=9/9</td>
</tr>
<tr>
<td>Offender ethnic appearance</td>
<td>27. Victim not naked, no sexual assault, no foreign object or sexual injury - non white offender n=115/130</td>
</tr>
<tr>
<td></td>
<td>28. Victim not naked but is sexual assault, foreign object insertion and sexual injury - white offender n=2/7</td>
</tr>
<tr>
<td></td>
<td>29. Victim not naked but is sexual assault, foreign object insertion and sexual injury - living alone n=3/8</td>
</tr>
<tr>
<td></td>
<td>30. Victim naked with sexual assault, foreign object insertion and sexual injury - non white offender n=2/7</td>
</tr>
<tr>
<td>Living with</td>
<td>31. Victim not naked but there is sexual assault, foreign object insertion and sexual injury - not living alone n=7/7</td>
</tr>
<tr>
<td></td>
<td>32. Victim naked, there is sexual assault, foreign object insertion and sexual injury - living alone n=5/8</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>33. Victim not naked, no sexual assault, foreign object insertion and sexual injury - offender known n=78/115</td>
</tr>
<tr>
<td></td>
<td>35. Victim not naked, but there is sexual assault, foreign object insertion and sexual injury - offender known n=4/7</td>
</tr>
<tr>
<td></td>
<td>36. Victim not naked, but there is sexual assault, foreign object insertion and sexual injury - offender stranger n=3/7</td>
</tr>
<tr>
<td></td>
<td>37. Victim naked and sexual assault, foreign object and sexual injury - offender known n=4/8</td>
</tr>
<tr>
<td></td>
<td>38. Victim naked and sexual assault, foreign object and sexual injury - offender stranger n=4/8</td>
</tr>
<tr>
<td>Previous convictions</td>
<td>39. Victim not naked but sexual assault, foreign object insertion and sexual injury - offender not having a previous conviction of any kind n=5/8</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>40. Victim naked and sexual assault, foreign object insertion and sexual injury - offender having a previous conviction of some kind n=9/12</td>
</tr>
<tr>
<td>Offender age</td>
<td>41. Victim not naked, no sexual assault, no foreign object insertion, no sexual injury - offender under 18 or over 40 n=31/131</td>
</tr>
<tr>
<td></td>
<td>42. Victim not naked but is sexual assault, is foreign object insertion and sexual injury - offender under 18 or over 40 n=2/8</td>
</tr>
<tr>
<td></td>
<td>43. Victim not naked but is sexual assault, is foreign object insertion and sexual injury - offender aged 18-40 n=6/8</td>
</tr>
<tr>
<td></td>
<td>44. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender under 18 or over 40 n=2/9</td>
</tr>
<tr>
<td></td>
<td>45. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender 18-40 n=2/8</td>
</tr>
<tr>
<td>Prison</td>
<td>46. Victim not naked but sexual assault, foreign object insertion and sexual injury - offender not having previously been in prison n=4/7</td>
</tr>
<tr>
<td></td>
<td>47. Victim not naked but sexual assault, foreign object insertion and sexual injury - offender not having previously been in prison n=3/7</td>
</tr>
<tr>
<td></td>
<td>48. Victim naked and sexual assault, foreign object insertion and sexual injury - offender not having previously been in prison n=4/9</td>
</tr>
<tr>
<td></td>
<td>49. Victim naked and sexual assault, foreign object insertion and sexual injury - offender having previously been in prison n=5/9</td>
</tr>
<tr>
<td>Precon violence</td>
<td>50. Victim not naked but is sexual assault, is foreign object insertion and is sexual injury - offender no previous conviction for a violent offence n=6/8</td>
</tr>
<tr>
<td></td>
<td>51. Victim is naked, sexual assault, foreign object insertion and sexual injuries - offender no previous conviction for a violent offence n=3/9</td>
</tr>
<tr>
<td></td>
<td>52. Victim is naked, sexual assault, foreign object insertion and sexual injuries - offender having previous conviction for a violent offence n=6/9</td>
</tr>
<tr>
<td>Precon sex</td>
<td>53. Victim not naked, no sexual assault, no foreign object insertion and no sexual injury - offender no previous conviction for a sexual offence n=117/132</td>
</tr>
<tr>
<td></td>
<td>54. Victim not naked but is sexual assault, is foreign object insertion and is sexual injury - offender no previous conviction for a sexual offence n=8/8</td>
</tr>
<tr>
<td></td>
<td>55. Victim is naked, sexual assault, foreign object insertion and sexual injuries - offender no previous conviction for a sexual offence n=4/9</td>
</tr>
<tr>
<td></td>
<td>56. Victim is naked, sexual assault, foreign object insertion and sexual injuries - offender has previous conviction for a sexual offence n=5/9</td>
</tr>
<tr>
<td>Precon dishonesty</td>
<td>57. Victim not naked, no sexual assault, no foreign object insertion and no sexual injury - offender has previous conviction for a dishonesty offence n=76/132</td>
</tr>
<tr>
<td></td>
<td>58. Victim not naked but is sexual assault, is foreign object insertion and is sexual injury - offender has no previous conviction for a dishonesty offence n=6/8</td>
</tr>
<tr>
<td></td>
<td>59. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender has no previous conviction for a dishonesty offence n=3/9</td>
</tr>
<tr>
<td></td>
<td>60. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender has previous conviction for a dishonesty offence n=6/9</td>
</tr>
<tr>
<td>Precon other</td>
<td>61. Victim not naked but is sexual assault, is foreign object insertion and is sexual injury - offender has no previous conviction for an other type of offence n=6/8</td>
</tr>
<tr>
<td></td>
<td>62. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender has no previous conviction for an other type of offence n=2/9</td>
</tr>
<tr>
<td></td>
<td>63. Victim is naked, sexual assault, foreign object insertion and sexual injury - offender has previous conviction for an other type of offence other n=2/9</td>
</tr>
</tbody>
</table>
Scene/location IVs in combination with DV:

<table>
<thead>
<tr>
<th>Offender ethnic appearance</th>
<th>Types – more common than expected (ones in bold also have prediction level $p&lt;=0.10$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>64. Indoors, not concealed, weapon left - offender non white n=12/48</td>
<td></td>
</tr>
<tr>
<td>65. Outdoors, concealed, no weapon left - offender under 18 or over 40 years n=11/34</td>
<td></td>
</tr>
<tr>
<td>Precon violence</td>
<td>66. Indoors, not concealed, weapon left - offender has previous convictions for a violent offence n=27/49</td>
</tr>
</tbody>
</table>
Appendix 8iii - Significant profiles \( (p<=0.05) \) for stage 3

<table>
<thead>
<tr>
<th>'Victimology' IVs in combination with DV:</th>
<th>Types - more common than expected ( (\text{ones in bold also have prediction level } p&lt;=0.10) )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Familiarity</strong></td>
<td>67. Male victim, under 18, non white and not a prostitute nor vulnerable - offender familiar with body recovery scene ( n=2/2 )</td>
</tr>
<tr>
<td></td>
<td>68. Female victim, over 18, white prostitute and vulnerable - offender is not familiar with the body recovery scene ( n=14/32 )</td>
</tr>
<tr>
<td></td>
<td>69. Female victim, over 18, white prostitute and vulnerable - offender is not familiar with the body recovery scene ( n=18/32 )</td>
</tr>
<tr>
<td></td>
<td>70. Female victim, over 18, white prostitute and vulnerable - offender is not familiar with the body recovery scene ( n=32/32 )</td>
</tr>
<tr>
<td><strong>Offender gender</strong></td>
<td>71. Male victim, over 18, non white and not a prostitute but is vulnerable - offender is female ( n=1/3 )</td>
</tr>
<tr>
<td><strong>Offender ethnic appearance</strong></td>
<td>72. Male victim, under 18, non white, not a prostitute nor vulnerable - offender white ( n=1/2 )</td>
</tr>
<tr>
<td></td>
<td>73. Male victim, over 18, non white not a prostitute nor vulnerable - offender white ( n=3/4 )</td>
</tr>
<tr>
<td></td>
<td>74. Female victim, over 18, non white not a prostitute nor vulnerable - offender white ( n=7/11 )</td>
</tr>
<tr>
<td></td>
<td>75. Female victim, over 18, white, prostitute and vulnerable offender non white ( n=29/32 )</td>
</tr>
<tr>
<td><strong>Living with</strong></td>
<td>76. Male victim, under 18, non white, not a prostitute nor vulnerable - offender does not live alone ( n=2/2 )</td>
</tr>
<tr>
<td></td>
<td>77. Female victim, over 18, white, prostitute and vulnerable - offender lives alone ( n=13/28 )</td>
</tr>
<tr>
<td><strong>Relationship to victim</strong></td>
<td>78. Female victim, over 18, white, prostitute and vulnerable - offender known ( n=23/28 )</td>
</tr>
<tr>
<td><strong>Previous convictions</strong></td>
<td>79. Male victim, under 18, white, not a prostitute nor vulnerable - offender has a previous conviction of some kind ( n=12/12 )</td>
</tr>
<tr>
<td></td>
<td>80. Female victim, over 18, white, prostitute and vulnerable - offender does not have a previous conviction of any kind ( n=9/32 )</td>
</tr>
<tr>
<td></td>
<td>81. Female victim, over 18, white, prostitute and vulnerable - offender has a previous conviction of some kind ( n=23/32 )</td>
</tr>
<tr>
<td><strong>Offender age</strong></td>
<td>82. Female victim, over 18, white, prostitute and vulnerable - offender under the age of 18 or over 40 ( n=7/33 )</td>
</tr>
<tr>
<td></td>
<td>83. Female victim, over 18, white, prostitute and vulnerable - offender under aged 18 - 40 years ( n=26/33 )</td>
</tr>
<tr>
<td><strong>Prison</strong></td>
<td>84. Male victim, under 18, non white, not a prostitute nor vulnerable - offender has not previously been in prison ( n=2/2 )</td>
</tr>
<tr>
<td></td>
<td>85. Female victim, over 18, white, prostitute and vulnerable - offender has not previously been in prison ( n=17/31 )</td>
</tr>
<tr>
<td></td>
<td>86. Female victim, over 18, white, prostitute and vulnerable - offender has previously been in prison ( n=14/31 )</td>
</tr>
<tr>
<td><strong>Precon violence</strong></td>
<td>87. Female victim, over 18, white, prostitute and vulnerable - offender does not have a previous conviction for a violent offence ( n=16/32 )</td>
</tr>
<tr>
<td></td>
<td>88. Female victim, over 18, white, prostitute and vulnerable - offender does have a previous conviction for a violent offence ( n=16/32 )</td>
</tr>
<tr>
<td><strong>Precon sex</strong></td>
<td>89. Male victim, under 18, non white, not a prostitute nor vulnerable - offender has previous conviction for a sexual offence ( n=1/2 )</td>
</tr>
<tr>
<td></td>
<td>90. Male victim, under 18, white, not a prostitute nor vulnerable - offender has previous conviction for a sexual offence ( n=5/12 )</td>
</tr>
<tr>
<td></td>
<td>91. Female victim, over 18, white, prostitute and vulnerable - offender does not have a previous conviction for a sexual offence ( n=23/32 )</td>
</tr>
<tr>
<td></td>
<td>92. Female victim, over 18, white, prostitute and vulnerable - offender has a previous conviction for a sexual offence ( n=9/32 )</td>
</tr>
<tr>
<td><strong>Precon dishonesty</strong></td>
<td>93. Female victim, over 18, white, prostitute and vulnerable - offender does not have a previous conviction for a dishonesty offence ( n=15/32 )</td>
</tr>
<tr>
<td></td>
<td>94. Female victim, over 18, white, prostitute and vulnerable - offender does have a previous conviction for a dishonesty offence ( n=17/32 )</td>
</tr>
<tr>
<td><strong>Precon other</strong></td>
<td>95. Female victim, over 18, white, prostitute and vulnerable - offender does not have a previous conviction for an other type of offence ( n=13/32 )</td>
</tr>
<tr>
<td></td>
<td>96. Female victim, over 18, white, prostitute and vulnerable - offender does have a previous conviction for an other type of offence ( n=19/32 )</td>
</tr>
<tr>
<td>'Scene' IVs in combination with DV:</td>
<td>Types – more common than expect (ones in bold also have prediction level ( p \leq 0.10 ))</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Familiarity</td>
<td>97. Outdoors, concealed, vehicle used, no weapon left - offender not familiar with the body recovery scene ( n=10/18 )</td>
</tr>
<tr>
<td>Offender gender</td>
<td>98. Outdoors, concealed, vehicle used, no weapon left - offender male ( n=18/18 )</td>
</tr>
<tr>
<td>Offender ethnic appearance</td>
<td>99. Indoors, not concealed, no vehicle weapon left then more likely offender is non white ( n=11/40 )</td>
</tr>
<tr>
<td></td>
<td>100. Outdoors, concealed, vehicle used, no weapon left - offender white ( n=16/18 )</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>101. Indoors, not concealed, vehicle used, no weapon left - offender known ( n=27/39 )</td>
</tr>
<tr>
<td></td>
<td>102. Outdoors, concealed, vehicle used, no weapon left - offender known ( n=11/18 )</td>
</tr>
<tr>
<td>Previous convictions</td>
<td>103. Outdoors, concealed, vehicle used, no weapon left - offender has some form of previous conviction ( n=14/18 )</td>
</tr>
<tr>
<td>Offender age</td>
<td>104. Outdoors, concealed, vehicle used, no weapon left - offender under 18 or over 40 years ( n=7/18 )</td>
</tr>
<tr>
<td>Prison</td>
<td>105. Outdoors, concealed, vehicle used, no weapon left - offender has not previously been in prison ( n=11/17 )</td>
</tr>
<tr>
<td>Precon violence</td>
<td>106. Indoors, not concealed, vehicle used, no weapon left - offender has a previous conviction for a violent offence ( n=23/41 )</td>
</tr>
<tr>
<td></td>
<td>107. Outdoors, concealed, vehicle used, no weapon left - offender does not have a previous conviction for a violent offence ( n=13/18 )</td>
</tr>
<tr>
<td>Precon sex</td>
<td>108. Outdoors, not concealed, vehicle used, no weapon left - offender has a previous conviction for a sexual offence ( n=9/29 )</td>
</tr>
<tr>
<td></td>
<td>109. Outdoors, concealed, vehicle used, no weapon left - offender does not have a previous conviction for a sexual offence ( n=15/18 )</td>
</tr>
<tr>
<td>Precon dishonesty</td>
<td>110. Outdoors, concealed, vehicle used, no weapon left - offender does not have a previous conviction for dishonesty ( n=10/18 )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>'Criminal' IVs in combination with DV:</th>
<th>Types – more common than expect (ones in bold also have prediction level ( p \leq 0.10 ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>111. If no clothing nor anything of value taken nor any precautions taken - offender is familiar with the body recovery scene ( n=69/114 )</td>
</tr>
<tr>
<td></td>
<td>112. If clothing, item of value and precautions taken, likely offender is familiar with the body recovery scene ( n=11/21 )</td>
</tr>
<tr>
<td></td>
<td>113. If clothing, item of value and precautions taken, likely offender is not familiar with the body recovery scene ( n=10/21 )</td>
</tr>
<tr>
<td>Offender gender</td>
<td>114. If clothing, item of value and precautions taken - offender male ( n=21/21 )</td>
</tr>
<tr>
<td>Offender ethnic appearance</td>
<td>115. If clothing, item of value and precautions taken - offender white ( n=20/21 )</td>
</tr>
<tr>
<td>Living with</td>
<td>116. If clothing, item of value and precautions taken - offender not living alone ( n=7/18 )</td>
</tr>
<tr>
<td></td>
<td>117. If clothing, item of value and precautions taken - offender living alone ( n=11/18 )</td>
</tr>
<tr>
<td>Relationship to victim</td>
<td>118. If clothing, item of value and precautions taken - offender living alone ( n=11/54 )</td>
</tr>
<tr>
<td></td>
<td>119. If clothing, item of value and precautions taken - offender known ( n=13/20 )</td>
</tr>
<tr>
<td>Previous convictions</td>
<td>120. If clothing, item of value and precautions taken - offender has a previous conviction for some kind of offence ( n=16/21 )</td>
</tr>
<tr>
<td>Offender age</td>
<td>121. If clothing, item of value and precautions taken - offender is aged 18 - 40 years ( n=18/21 )</td>
</tr>
<tr>
<td>Prison</td>
<td>122. If clothing, item of value and precautions taken - offender does not have a prison record ( n=12/20 )</td>
</tr>
<tr>
<td>Precon violence</td>
<td>123. If clothing, item of value and precautions taken - offender does not have a previous conviction for a violent offence ( n=13/21 )</td>
</tr>
<tr>
<td>Precon sex</td>
<td>124. If clothing, item of value and precautions taken - offender does not have a previous conviction for a sexual offence ( n=20/21 )</td>
</tr>
<tr>
<td>Precon dishonesty</td>
<td>125. If clothing, item of value and precautions taken - offender does not have a previous conviction for a dishonesty offence ( n=12/21 )</td>
</tr>
<tr>
<td>Precon other</td>
<td>126. If clothing, item of value and precautions taken - offender does not have a previous conviction for an other type of offence n=10/21</td>
</tr>
</tbody>
</table>
Appendix 8iv - Significant model from stage 1 Logistic Regression analysis where overall prediction has improved.

The following model was 'significant', and improved the overall prediction rate.

1. Consideration of whether or not the offender is likely to be a stranger from stage one 'Golden hour' variables

As highlighted below, it seems adding the variables 'outdoors' and 'concealed' enhanced prediction of whether or not the offender is likely to have been a stranger.

<table>
<thead>
<tr>
<th></th>
<th>B (SE)</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.020</td>
<td></td>
<td>0.361</td>
<td></td>
</tr>
<tr>
<td>Victim gender</td>
<td>-0.454</td>
<td>0.331</td>
<td>0.635</td>
<td>1.220</td>
</tr>
<tr>
<td>Dismemberment</td>
<td>0.931</td>
<td>0.866</td>
<td>2.537</td>
<td>7.436</td>
</tr>
<tr>
<td>Naked</td>
<td>-0.478</td>
<td>0.351</td>
<td>0.620</td>
<td>1.095</td>
</tr>
<tr>
<td>Outdoors</td>
<td>-0.798</td>
<td>0.271</td>
<td>0.450</td>
<td>0.748</td>
</tr>
<tr>
<td>Concealed</td>
<td>-0.660</td>
<td>1.052</td>
<td>1.934</td>
<td>3.556</td>
</tr>
</tbody>
</table>

Note\(R^2=0.261\) (Hosmer & Lemeshow), 0.071 (Cox & Snell), 0.096 (Nagelkerke). Model chi2(1) 20.725, \(p<=.001\) *\(p<.05\). **\(p<.01\).

Initial best guess figures indicate that 61.2%\(^5\) of offenders in the sample knew the victim prior to the offence, however when utilising the model outlined above, the overall prediction rate increases to 64.4% - i.e. by 3.2%.

\(^5\) i.e. of the 281 cases where data regarding the relationship between the offender and victim is known, 61.2% (172/281) of the victims were known to the offender.
Appendix Bv - Significant models from stage 2 and 3 Logistic Regression analysis where overall prediction has improved.

The following models were 'significant', and improved the overall prediction rate.

2. Consideration of whether or not the offender is likely to be white from 'victimology' predictors.

As highlighted below, it seems adding the variable 'victim white' enhances prediction of whether or not the offender is likely to have been white.

<table>
<thead>
<tr>
<th>Included</th>
<th>B (SE)</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.582 (0.274)</td>
<td>13.230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim gender</td>
<td>0.377 (0.522)</td>
<td>0.524</td>
<td>1.458</td>
<td>4.057</td>
</tr>
<tr>
<td>Victim age</td>
<td>-0.388 (0.524)</td>
<td>0.243</td>
<td>0.679</td>
<td>1.897</td>
</tr>
<tr>
<td>Victim white</td>
<td>-2.675 (0.492*)</td>
<td>0.026</td>
<td>0.069</td>
<td>0.181</td>
</tr>
</tbody>
</table>

Note: $R^2=0.995$ (Hosmer & Lemeshow), 0.092 (Cox & Snell), 0.187 (Nagelkerke). Model chi2(1) 0.000, $p<.0001$. *$p<.0001$.

Initial base rate figures indicate that 89.4% of offenders in the sample were white, however when utilising the model outlined above, the prediction rate increases to 89.7% - i.e. by 0.3%.
The final (Block 3) model is also significant, still only due to the victim white predictor, however prediction is further increased to 90.1 (i.e. by a further 0.4%, or 0.7% in total).

<table>
<thead>
<tr>
<th>Included</th>
<th>B (SE)</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.683 (0.543)</td>
<td></td>
<td>14.632</td>
<td></td>
</tr>
<tr>
<td>Victim gender</td>
<td>0.108 (0.543)</td>
<td>0.385</td>
<td>1.114</td>
<td>3.227</td>
</tr>
<tr>
<td>Victim age</td>
<td>-0.396 (0.550)</td>
<td>0.229</td>
<td>0.673</td>
<td>1.979</td>
</tr>
<tr>
<td>Victim white</td>
<td>-2.613 (0.502*)</td>
<td>0.027</td>
<td>0.073</td>
<td>0.196</td>
</tr>
<tr>
<td>Victim prostitute</td>
<td>0.890 (0.575)</td>
<td>0.788</td>
<td>2.434</td>
<td>7.513</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>-1.001 (0.579)</td>
<td>0.118</td>
<td>0.368</td>
<td>1.143</td>
</tr>
</tbody>
</table>

Note: R² = 0.877 (Hosmer & Lemeshow), 0.105 (Cox & Snell), 0.213 (Nagelkerke). Model chi²(1) 0.000, p<.0001. *p<.0001.
3. **Consideration of whether or not the victim is likely to have a previous conviction of any kind from 'victimology' predictors.**

As highlighted below, it seems adding the variable 'victim gender' significantly enhances the model regarding whether or not the offender is likely to have a previous conviction.

<table>
<thead>
<tr>
<th>Included</th>
<th>B (SE)</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.778</td>
<td>2.178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.141)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim gender</td>
<td>1.301</td>
<td>1.597</td>
<td>3.673</td>
<td>8.450</td>
</tr>
<tr>
<td>(0.425*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NoteR2=unable to calculate with only one categorical predictor (Hosmer & Lemeshow), 0.040 (Cox & Snell), 0.057 (Nagelkerke). Model chi2(1) 11.896, p<=.001 *p<.0001.

However, the overall prediction rate does not increase – 72.9% of offenders in the sample had a previous conviction, and when utilising the model prediction does not increase.
At Block 2, whilst victim gender remains the only significant individual variable, this model (including the additional variables victim age and victim white) does appear to increase the overall prediction rate from 72.9% to 73.2% - i.e. by 0.3%.

<table>
<thead>
<tr>
<th>Included</th>
<th>B (SE)</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.870</td>
<td>2.386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.158**)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim gender</td>
<td>1.393</td>
<td>1.722</td>
<td>4.027</td>
<td>9.419</td>
</tr>
<tr>
<td>(0.433*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim age</td>
<td>-0.321</td>
<td>0.363</td>
<td>0.725</td>
<td>1.448</td>
</tr>
<tr>
<td>(0.353)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim white</td>
<td>-0.579</td>
<td>0.220</td>
<td>0.561</td>
<td>1.430</td>
</tr>
<tr>
<td>(0.478)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: R²=0.323 (Hosmer & Lemeshow), 0.046 (Cox & Snell), 0.067 (Nagelkerke). Model chi²(1) 13.999, p<=.01 *p<=.001. **p<.0001.

When additional variables (prostitute and vulnerability) are added in a final model in Block 3, whilst again victim gender remains significant, no further improvements are made in terms of percentage increase in prediction.
4. Consideration of whether or not the offender is likely to be a stranger from 'criminal' predictors.

As highlighted below, it seems specifically the variables 'value taken' and 'precaution taken' may enhance prediction of whether or not the offender is likely to be a stranger or someone known to the victim.

<table>
<thead>
<tr>
<th>Regression coefficients</th>
<th>SE</th>
<th>Lower</th>
<th>Exp b</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.009</td>
<td>0.991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing taken</td>
<td>-0.414</td>
<td>0.350</td>
<td>0.661</td>
<td>1.247</td>
</tr>
<tr>
<td>Value taken</td>
<td>-0.737</td>
<td>0.284</td>
<td>0.478</td>
<td>0.806</td>
</tr>
<tr>
<td>Precaution taken</td>
<td>0.595</td>
<td>1.080</td>
<td>1.812</td>
<td>3.040</td>
</tr>
</tbody>
</table>

Note: \(R^2=0.611\) (Hosmer & Lemeshow), 0.046 (Cox & Snell), 0.062 (Nagelkerke). Model chi2(1) - 13.227, \(p<=.01\). *\(p<.05\). **\(p<.01\).

Initial base rate figures indicate that 61.2% of offenders in the sample knew the victim prior to the offence, however when utilising the model outlined above, the prediction rate increases to 62.3% - i.e. by 1.1%.