

JUVENILE SEX OFFENDING: AN INVESTIGATIVE PERSPECTIVE

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by

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ABSTRACT

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The first chapter of the thesis critically reviews the research on juvenile violent and sexual offending and highlights the heterogeneity of such offenders in terms of those that persist and those that assault different types of victim. Research on juvenile stranger sex offenders and their offence characteristics is explored. Chapter 2 presents empirical research on the behavioural consistency and distinctiveness of juvenile stranger sex offending and whether case linkage can accurately identify the crimes of serial offenders. Calls from personality psychologists to consider the context of behaviour when investigating behavioural consistency are responded to with preliminary research into incorporating context in case linkage. Evidence for behavioural consistency and distinctiveness is reported for serial juvenile stranger sex offenders, however evidence for consistency in 'if(victim behaviour)-then(offender behaviour)' contingencies is less convincing. Chapter 3 investigates ways of prioritising sex offences for crime analysis. Whether juvenile serial stranger sex offenders escalate in their use of physical aggression is investigated with few "increasers" being identified. Preliminary findings suggest some characteristics on which increasers vs. non-increasers differ that might inform investigative risk assessment. However, escalation appears largely related to learning behaviour and progression to more elaborate sexual assaults. Preliminary findings suggest some offence behaviours that appear more characteristic of offences occurring later in a series. Chapter 4 investigates and contrasts group rape by juvenile and adult perpetrators. How applicable social psychological theories of group violence are to group rape is tested with findings suggesting that theories of group dynamics as well as social convergence are relevant. Further, aggression in group rapes appears both expressive and instrumental in purpose. Roles adopted by group members are investigated. Evidence of distinct leaders and followers in group rapes is identified using both Porter and Alison's (2001) Scale of Influence and through the use of pragmatics theory. Additional roles are discussed.

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INTRODUCTION TO THE THESIS

Juvenile sex offenders have become the focus of clinical and academic research over a number of decades but particularly in the last 25 years. Whilst research has been conducted with female juvenile sex offenders (see Blues, Moffat & Telford, 1999; Vandiver & Teske, 2006), the discussion will focus solely on males since they constitute the majority of offenders in treatment settings and are reportedly responsible for the vast majority of sexual offences committed by juveniles (Hunter, Becker & Lexier, 2006; Ronis & Borduin, 2007; Woodhams, 2004). For the same reasons, the focus of this PhD thesis will be on male juvenile sex offenders. The increased attention from clinicians and academics occurred for a number of reasons, one being the attempt to identify risk factors for sexual offending to inform the development of treatment programmes (van Wijk, Vermeiren, et al. 2006). In more recent years, awareness has developed regarding the scale of sexual offending by male juveniles. The Criminal Statistics publication for 2003 (Home Office, 2004) recorded 9121 defendants who were proceeded against for sexual offences and of these 1060 were juveniles (aged under 18 years), equating to 12%. Although the age category includes adults as well as juvenile offenders, British Crime Survey data suggests a higher figure, with 16% of rapes and sexual assaults reportedly being committed by offenders aged less than 19 years (Myhill & Allen, 2002). Thus, juvenile sex offenders are of interest to both clinicians and criminal investigators.

Research has consistently documented that involvement in delinquent activities peaks during childhood and adolescence (Brame & Piquero, 2003) and a large proportion of adolescents and juveniles engage in delinquent behaviour at some point during this time (Stouthamer-Loeber & Loeber, 2002), however most desist before reaching adulthood (Kosterman, Graham, Hawkins, Catalano & Herrenkohl, 2001). A smaller proportion of this group are involved in violent behaviour and an even smaller proportion demonstrates a subtype of violent behaviour, namely sexually violent behaviour. As an illustration, Stouthamer-Loeber and Loeber (2002) found over 20% of their sample of youths to be engaged in serious violent offending (e.g. gang fighting, rape). Other researchers have reported similar prevalence rates of criminal behaviour by adolescents, e.g. 21% (Herrenkohl et al., 2001).

As noted above, the majority of juvenile sex offences are committed by males. Similarly, males are more likely to use physical aggression than females and are more

often the perpetrators of aggressive crimes (Richardson & Hammock, 2007), a research finding that has been reported since the 1920s (Archer, 2004). Explanations for why males are more often the perpetrators of sexual and non-sexual violence can be found in behavioural genetics, evolutionary psychology and socialization.

A recent theory recognises the interaction of biological and social forces in the development of sexual aggression. Ward and Beech's (2006) integrated theory of sexual offending explains that temperament and the tendency to seek basic human needs (including sexual interactions) are genetic predispositions which are inherited. It is argued that these can interact with evolved mating strategies resulting in "gender linked vulnerabilities" associated with sexual violence. In their integrated model of sex offending, Ward and Beech (2006) propose that these gender linked vulnerabilities interact with social learning events in a person's developmental history affecting brain development and resulting in sexual aggression through neurological functioning (Ward & Beech, 2006).

Evolutionary psychology describes men and women as having contrasting mating strategies (Buss, 2003). Men are described as preferring short-term strategies (uncommitted sex), whereas women are argued to prefer longer-term strategies, requiring a degree of commitment from a sexual partner. According to evolutionary psychology, males prefer females who are physically attractive and young for their reproductive qualities, however such women are highly desirable to all men. The most desirable females show a preference for males who can provide resources to them and who are dependable and stable (Buss, 2003). The former quality can be assessed through a male's social status, economic resources, ambition and industriousness. As a result not all men can access the most desirable females. It has been suggested that rape can occur when less desirable men, in the presence of other characteristics (such as hostility to women, impulsivity, hypermasculinity, empathy deficits, and a tendency to dominate others), use force to gain sexual access to desirable women who would otherwise refuse them (Buss, 2003; Hunter et al., 2004).

Like Ward and Beech (2006), Figueredo et al. (2000) recognize the role of social learning in evolutionary theories of sexual aggression. They propose that a propensity for sexual aggression is more likely to emerge where an individual's developmental history includes observing the benefits of using coercive strategies by family members or peers. Similarly, Hunter et al. (2004) propose that homes characterised by sexual aggression towards women and male antisocial role models encourage the development

of hostile masculinity (an antagonistic approach to women interfering with access to sex), psychosocial deficits, and little knowledge of the mating strategies that women value (e.g. sensitivity, the sharing of resources). They explain that such youngsters will be at a disadvantage to their pro-social peers and will therefore have to rely on coercion to obtain sexual access. They suggest that such attempts will result in further rejection from females creating a cycle whereby a distrust of women intensifies.

More recently, McKibbin, Schackelford, Goetz and Starratt (2008) have proposed that evolutionary theory would suggest the existence of different types of rapist. As noted above, some males are proposed to resort to rape when they cannot access women consensually. Such rapists have been referred to as 'disadvantaged men' (McKibbin et al., 2008) or 'competitively disadvantaged males' (Figueredo et al., 2000). It has been hypothesized that such rapists would more likely possess characteristics making them reproductively undesirable (e.g. low socio-economic status). McKibbin et al. (2008, p. 89) further propose the existence of 'specialised rapists' who are sexually aroused by sexual violence itself. They suggest that because rape is potentially associated with high costs to a male, a type of rapist may have evolved who possesses "a psychology that motivates quicker arousal and ejaculation during rape". A further type is the 'high-mating-effort rapist' who is characterised by greater sexual experience, higher self esteem, aggression and who is potentially psychopathic (McKibbin et al., 2008). Such individuals are proposed to seek uncommitted sexual encounters using coercion and violence when other strategies are ineffective. It has been hypothesized that some sex offenders will therefore show a greater preference for impersonal sex (Lussier, Leclerc, Cale & Proulx, 2007). The final type of rapist is referred to as the 'partner rapist'. They are proposed to use sexual violence against intimate partners when they suspect their partner has had sexual relations with another male. This would represent a condition of increased sperm competition. To prevent them investing time and resources into another male's offspring, termed genetic cuckoldry (Buss, 2003), such men are proposed to rape their partners (McKibbin et al., 2008)

In terms of empirical evidence for evolutionary theories, Buss (2003) cites research evidence supporting his assertion that young, physically attractive women are more often victims of rape and that rapists are men who are reproductively unattractive (e.g. has low socio-economic status). Research studies have found convicted sexual aggressors towards children and adult females to have uncommitted sexual histories and

a larger number of sexual partners (Lalumiere & Quinsey, 1996; Lussier, et al., 2007) which would support the assertion that sexually coercive men have a preference for short-term mating strategies. Unrestricted socio-sexual orientation (short-term mating strategies) has been found to have a genetic basis and be associated with the use of sexual coercion (Westerlund et al., in press). With their sample of adult sex offenders, Scully and Marolla (1985) found evidence that some rapists commit rape to gain sexual access to women who they otherwise perceived as unobtainable. For example, one adult male they interviewed described his victim as “a real fox, beautiful shape. She was a beautiful woman and I wanted to see what she had” (p. 257). Rape was reported to occur when a victim refused the offender’s sexual advances following investment on his part of time and money. A number of rapists reported targeting women who were older than themselves because of their greater sexual experience. Whilst this contradicts Buss’ (2003) proposition that younger, physically attractive women would be the common recipient of sexual coercion, the males’ accounts revealed that the motive for this behaviour was still sexual access. The adult male rapists reported resorting to rape because “they also believed that these women would not be sexually attracted to them” (Scully & Marolla, 1985, p. 258). The motive of sexual access was also reported to explain some inter-racial rapes, where black males assaulted white females (Scully & Marolla, 1985).

Archer (2004) reports that, in terms of physical aggression, two theories have attempted to explain why males are more aggressive than females. These are sex selection from evolutionary psychology and social role theory. Sex selection theory has been partly outlined above in terms of sexual aggression, however, in addition, it proposes that because males have to invest less than females in terms of parenting they experience greater reproductive competition and that an outcome of this is overt aggression (Archer, 2004). Because reproductive competition is highest when males are younger it is proposed that they will be more overtly aggressive at this time. Barber (2008, p. 247) notes that younger males use aggression to address social status issues because these determine “mate value and mating success”. The environment can also affect reproductive competition. This is greater when there are fewer females in the population and during harsh economic conditions. Evolutionary theory also proposes that harsh childhood environments (characterised by little parental investment) result in children who are more aggressive and exploiting of others (Barber, 2008).

Socialisation is also argued to influence the expression of physical aggression in terms of gender roles. Different gender roles are proposed to result in the two genders expressing aggression differently (Herrenkohl et al., 2001). The male gender role “is characterized by dominance, aggressiveness and power” (p. 418), whereas femininity is not associated with aggression (Richardson & Hammock, 2007). Where socialization according to gender roles is strong, gender differences in direct forms of aggression are predicted to emerge (Richardson & Hammock, 2007). This is because physical aggression by males is tolerated more by care-givers and wider society (Walker & Richardson, 1998). In addition, it is suggested that what society deems ‘appropriate’ reasons for expressing aggression vary across the genders because of gender-roles. For females, aggression can be expressed due to a loss of control or experiencing anger, whereas it is more legitimate for males to express aggression instrumentally, as a means to control others or a situation (Archer, 2004; Richardson & Hammock, 2007). Archer’s (2004) meta-analysis of studies with both children and adults across 10 different countries found supportive evidence for both the sexual selection theory and the social role theory of non-sexual aggression.

Twin and adoption studies have been used to investigate the relative contribution of genetics and the environment in the expression of physical and sexual aggression (Rowe, 2002). Research on psychological and physical aggression has found a modest genetic predisposition towards engaging in aggressive behaviour against intimate partners and extra-familial persons (Hines & Saudino, 2008). However, Hines and Saudino’s twin study also suggests that people with such a genetic predisposition will engage in different forms of aggressive behaviour depending on environmental influences. Such environmental influences could include high exposure to violence by others during childhood (Hines & Saudino, 2008). A recent twin study of adult males by Westerlund et al (in press) found sexual coercion to be significantly influenced by genetic factors, however, again, non-shared environmental influences also explained a lot of the variance.

The explanatory theories cited above propose several risk factors that would be evident in the developmental histories of male juvenile violent and sexual offenders. For male juvenile violent offenders we might expect to see evidence of exposure to violence perpetrated by family members and peers, and families and peers possessing attitudes supportive of aggressive behaviour. The adoption of short-term mating strategies in adolescent and adult males, which is argued to represent a gender linked

vulnerability for sexual aggression, is reported to stem from low parental investment in childhood (Lalumiere & Quinsey, 1996) and little emotional closeness (Barber, 2008). Even if not measured directly, these characteristics might be inferred from higher rates of truancy, less parental supervision, and disrupted attachments in samples of juvenile sex offenders. We might also expect male juvenile sex offenders to have psychosocial deficits, to score higher than comparison groups on measures of hypermasculinity, and to have a history of witnessing domestic violence or the abuse of females within their peer-group. Competitively disadvantaged males are hypothesized to be at higher risk of sexual aggression because of their reproductive unattractiveness to females (Figueredo et al., 2000). One measure of reproductive unattractiveness is low socio-economic status (Buss, 2003). We might therefore expect male juvenile sex offenders to come from homes characterised by low socio-economic status.

A number of studies which will be reviewed have considered the factors that seem to direct a male juvenile towards violent or sexually violent behaviour. What “makes” a violent juvenile and how male juveniles who desist differ from those who persist in violent behaviour will be considered. A further question that researchers have considered is whether those individuals who are physically violent to others are somehow different from those who are sexually violent. This is an important question as it affects whether psychological interventions should be different for male juvenile sex offenders compared to other male juvenile offenders (van Wijk, Vermeiren et al., 2006). A related question is why some male juvenile sex offenders seem to cease their offending whereas others continue offending. A number of factors have been identified by studies addressing sexual recidivism in juveniles which may go some way to answering this question. This literature is reviewed in Chapter 1.

More descriptive studies, often conducted by clinicians working with these individuals, have looked at the characteristics of male juvenile sexual offending in general. Very recently a subgroup of juvenile sex offenders has started to be investigated in their own right, juveniles who sexually assault victims who were previously strangers to them (Woodhams, 2004). These juvenile stranger sex offenders have been studied for two reasons. Firstly, researchers have identified a stranger victim-suspect relationship to be a risk factor predictive of sexual recidivism (Långström, 2002; Worling & Långström, 2003). Juvenile stranger sex offenders are therefore of great interest to clinicians. Secondly, stranger sex offences, including those committed by juveniles, are one of the more difficult crimes to investigate because the police must

try to identify a previously unknown offender using information provided by a traumatised victim. A sizable minority of sexual assaults are committed by offenders who were strangers to their victims. For example, Feist, Ashe, Lawrence, McPhee and Wilson (2007) reported 14% of their sample of sexual assaults to have been committed by strangers. Recent findings have suggested that juveniles are responsible for a sizeable minority of stranger sexual offences (Woodhams, 2004). Juvenile stranger sex offenders are therefore also of great interest to criminal investigators. Although such offenders have been the focus of policing initiatives and investigations for some time (Häkkinen, Lindof, & Santtila, 2004), only recently have they attracted the attention of researchers. Little is therefore empirically known about this subgroup of juvenile sex offenders.

Crime analysts (civilian police personnel) can assist police investigations of stranger sex offences by providing services, such as case linkage. Case linkage involves “identifying behavioural similarities between offences that point to them being committed by the same perpetrator” (Woodhams & Grant, 2006, p. 245). Offenders who have committed several crimes of the same type against different victims are termed *serial* offenders and the offences that a serial offender has committed are collectively referred to as a *series* (Woodhams, Hollin & Bull, 2007). Through case linkage, crime analysts can advise the police of potential serial stranger sexual offences and offenders. Although case linkage is common practice and is applied to juvenile crimes, it is not empirically known whether juvenile stranger sex offenders are consistent in their offending behaviour across series, a fundamental assumption underlying case linkage. Since case linkage evidence can and has been considered in legal proceedings in the United States and South Africa (Hazelwood & Warren, 2003; Labuschagne, 2006) it is important that its use with juvenile offenders receives empirical scrutiny. One focus of the current research was therefore to establish whether juvenile stranger sex offenders demonstrate consistency in their sexual offending behaviours and whether linked crime pairs (those committed by the same offender) could be detected using evidence of behavioural similarity. In addition, procedures to improve the accuracy of identifying ‘linked’ crimes were tested. Such findings are also relevant to the development of psychological theory on behavioural consistency. The findings of this research are reported in Chapter 2.

A dilemma often facing crime analysts is which offences to prioritise for analysis. Two factors have emerged in the psychological literature on sex offending

which could be used to justify prioritisation. These factors are the likelihood that an offender is a serial offender (Grubin, Kelly, & Brunsdon, 2001), and the likelihood that an offender is going to escalate in his/her use of physical violence (e.g. Warren et al., 1999). The rationale for prioritising serial offenders is their propensity to cause injury to a large number of victims. For offenders at risk of escalation, the rationale for prioritisation is their inherent dangerousness. At present, only a few studies (Grubin & Gunn, 1991; Grubin et al., 2001; Hazelwood, Reboussin, & Warren, 1989; Warren, Reboussin, Hazelwood, & Wright, 1991; Warren et al., 1999) exist which could guide crime analysts in this prioritisation task and these have all sampled adult sex offenders. It remained to be investigated whether such indicators of risk existed for juvenile sex offenders. Extending this research was the focus of a study reported in Chapter 3.

Studies have noted the association of juveniles and adolescents with group sexual offences (Amir, 1971; Porter & Alison, 2006; Wright & West, 1991), which are reported to be more physically and sexually violent in nature (Gidycz & Koss, 1990; Woodhams, 2004). Research on group sexual offences has studied leadership (Porter & Alison, 2001) and has considered theoretical reasons for the higher incidence of physical and sexual violence in such offences (Woodhams, Gillett & Grant, 2007). Often such studies have been flawed due to a failure to preserve the temporal sequencing of victim and offender actions making it impossible to infer causality. Chapter 4 reports a study which sought to overcome this limitation and advance our understanding of role-taking and aggression in group sexual offences.

CHAPTER 1

AN INTRODUCTION TO JUVENILE VIOLENT AND SEXUAL OFFENDING

1.1 Juvenile Violent Offenders

Sexual offending can be considered to be a type of physical violence due to its relationship to power, hostility and anger (Canter, Bennell, Alison & Reddy, 2003; Groth & Birnbaum, 1990). Some typologies specifically identify a type of perpetrator whose motivation for sex offending is related to anger that pervades their life and is targeted at individuals other than their victims (Knight, 1999). Also, the commission of sexual crimes often involves a degree of physical violence. Juvenile and group sex offenders are reported to be particularly violence-prone (Miranda & Corcoran, 2000; Gidycz & Koss, 1990). With these issues in mind, the following section first considers factors related to juvenile offenders' propensity to offend violently, and, following this, whether these factors overlap with their propensity to offend sexually.

1.1.1. Factors associated with the propensity to offend violently

Since literature reviews of juvenile offending report great versatility in crime types committed (Klein, 1984), we might not expect juvenile violent offenders to differ greatly from other juvenile offenders. Considerable versatility has indeed been found in the offending of *serious violent juvenile offenders* (Stouthamer-Loeber & Loeber, 2002). However, research studies have identified a number of factors which appear to differentiate violent from non-violent juvenile offenders. These are reviewed below.

Before reviewing this literature there are two issues to consider. First, there is variation between countries in what constitutes a juvenile or adolescent offender. Rather than limit the review to what constitutes a juvenile in British Law (a person aged less than 18 years), studies of 'child', 'adolescent' and 'juvenile' offenders are reported. Second, it is important to consider what is meant by "violence". Investigating the epidemiology of violent juvenile behaviour is complicated by little research having directly assessed juvenile violence. Rather it has studied aggression or delinquency (Farrington & Loeber, 2000).

Violence has been defined as "the threatened or actual use of physical force on another person or group that encompasses acts that may be reactive or proactive, criminal and non-criminal, acts that can occur within the context of other problem behaviours, and acts that can result in lethal and non-lethal outcomes" (Dahlberg & Potter, 2001, p. 4). Hollin (1989, p. 63) defines violence as the "Use of strong physical

force against another person, sometimes impelled by aggressive motivation”. These definitions suggest that violence can be physical or verbal. Aggression is “The intention to hurt or gain advantage over other people without necessarily involving physical injury” (Hollin, 1989, p. 63). Aggression is therefore a state of mind which could precede violence. Aggressive behaviour could include violent behaviour, but not all aggressive behaviour will be violent, e.g. indirect forms of aggression (Walker & Richardson, 1998). Delinquency has been defined as “Illegal behaviour committed by juveniles” (Quinsey, Skilling, Lalumiere & Craig, 2004, p. 3).

Where aggression and violence can apply to a range of ages, delinquency is more specific to children or adolescents but could encompass both aggression and violence providing the acts were contravening the law. Rather than considering “delinquency”, which may or may not include acts of violence, or “aggression”, which may or may not result in violence, the review focuses on violence by juveniles. Some studies use the term “violent offending” indicating that the behaviour would be illegal, whereas others use the terms “violent behaviour” or “youth violence”. The literature review therefore considers the use or threat of physical force by juveniles, which may or may not contravene the country’s laws, although the focus is on illegal behaviours.

1.1.1.1. Biological Factors

Several biological factors have been suggested which are related to violent behaviour. Neurological dysfunction is a biological risk factor that has received substantial interest. Damage to the brain, in particular to the temporal and frontal lobes, the hypothalamus and amygdala, has been associated with violent populations (Martens, 2002; Volavka, 2002). Both Martens and Volavka report brain damage to result in behavioural and emotional disturbances, which could lead to criminal behaviour. Martens (2002) draws links between neurological dysfunction and the poor development of moral reasoning which is argued to increase the potential for criminal behaviour. Similarly, Volavka (2002) suggests that intelligence mediates the association between brain dysfunction and violence. However, the methodology of the research studies precludes the establishment of a causal relationship. For example, Volavka (2002) explains that whilst neurology might affect a person’s propensity to engage in violent behaviour, behaving violently (e.g. fighting) could increase the chance of receiving brain damage.

An imbalance of biological chemicals in the body (e.g. serotonin, glucose, testosterone), and the presence of metallic toxins, such as lead (and their impact on an

individual's neurology), have also been associated with violent behaviour (Brain, 1999; Coccaro & McNamee, 1998; Martens, 2002; Volavka, 2002). However, in relation to serotonin, Olivier (2004) cautions that its role in aggression is unclear at present.

Dahlberg and Potter (2001) conducted a review of the literature on factors associated with youth violence during juvenile years. They concluded, as have other authors (e.g. Brain, 1999; Martens, 2002; Volavka, 2002), that the influence of biological factors is difficult to delineate because such factors can interact with other risk factors. For example, it is proposed that biological factors such as neurological impairment due to trauma sustained from pregnancy or delivery, may impact indirectly on an individual's propensity to be violent through factors such as impulsivity. Dahlberg and Potter also note that family factors such as parental responsiveness and quality of parent-child interactions could impact on the brain's development and hence result in violent behaviour.

1.1.1.2. Family Factors

Empirical research suggests that a juvenile's family can impact on the likelihood of violent offending via several pathways. Dahlberg and Potter (2001) note the family's importance in the learning and development of attitudes, beliefs, prejudices and behaviour. It would therefore be assumed that if family members hold attitudes and beliefs supportive of violent behaviour, and if they themselves demonstrate violent behaviour, the developing child may also adopt such attitudes and beliefs and engage in violent behaviour. Research has supported the relationship between family factors, such as parent's use of poor discipline styles, a lack of parental support, a lack of parent-child interaction, poor attachment, familial conflict, experience of and witnessing aggression, and separation, and violent behaviour (Blitstein, Murray, Lytle, Birnbaum & Perry, 2005; Dahlberg & Potter, 2001; Fonagy, 2004; Gudlaugsdottir, Vilhjalmsdottir, Kirstjansdottir, Jacobsen & Meyrowitsch, 2004; Hawkins, Herrenkohl, Farrington, Brewer, Catalano, & Harachi, 1998; Herrenkohl et al., 2001; Lipsey & Derzon, 1998; Nofziger & Kurtz, 2005; Ousey & Wilcox, 2005). However, Lipsey and Derzon's (1998) meta-analysis, which rank ordered risk factors for youth violence, found family discord and parental abuse at ages 6-11 and 12-14 to be amongst the poorest predictors. The measures of strength of association reported by Hawkins et al. (1998) are also quite weak for such factors.

A 6 year longitudinal study with 503 US male juveniles also identified child maltreatment, the absence of a biological parent, and having an unemployed caregiver

as risk factors for *serious juvenile delinquency*, which included violent behaviour (Stouthamer-Loeber, Wei, Homish, & Loeber, 2002). However, the effect of child maltreatment was moderated by family demographics. With regards to parental absence, a recent study found its effect on involvement in delinquency to disappear once family processes, such as forms of direct (supervision) and indirect control (parent-child closeness), were accounted for (Demuth & Brown, 2004). This study included measurement of involvement in violent delinquency. Dahlberg and Potter (2001) have stressed that other factors, such as socio-economic conditions, can act upon the family unit to exacerbate already difficult situations. It is also important to consider that the impact of the family on violent offending seems most potent during younger years (e.g. 6-11 years) (Lipsey & Derzon, 1998; Loeber & Stouthamer-Loeber, 1996). After this time the impact of the family is replaced by the influence of the peer group.

1.1.1.3. Peer Group Membership

The effect of the peer group in later juvenile years is reported by many researchers (e.g. Farrington & Loeber, 2000; Hawkins et al., 1998; Herrenkohl et al., 2001; Lipsey & Derzon, 1998; Nofziger & Kurtz, 2005; Ousey & Wilcox, 2005) as an important risk factor in the development of violent offending. Association with a delinquent peer group is thought to occur as a result of poor parenting (Dahlberg & Potter, 2001). This can be operationalised as poor parental control (through supervision and closeness) (Demuth & Brown, 2004) or as poor parent-child attachment which, if resulting in poor social skills and less pro-social attitudes, can lead to the individual being rejected by their pro-social peers (Dahlberg & Potter, 2001). Once the juvenile is incorporated into the delinquent peer group, the peer group is hypothesised to reinforce and strengthen antisocial attitudes. As with the family, values and beliefs supportive of violent behaviour are learnt and rewarded through interactions with delinquent peers (Dahlberg & Potter, 2001; Herrenkohl et al., 2001). Research with delinquent gangs has supported these hypotheses (Baron & Tindall, 1993). Gang members have been found to be more involved in youth violence (Thornberry, 1998). Some authors have argued that this is not because individuals attracted to gangs are more violent individuals (called the selection effect) (Thornberry, 1998) rather, once part of a gang, socialisation processes and norms supportive of violence are proposed to increase an individual's involvement in violence (called the social facilitation effect) (Bendixen, Endresen & Olweus, 2006). This argument is based on evidence that involvement in violence decreases after departure from the gang (Thornberry, 1998). However, other

longitudinal research on violence in adolescence suggests that there is both a selection effect and a social facilitation effect but that the facilitation effect is stronger than the selection effect (Bendixen et al., 2006). Violence within gangs is a topic returned to in Chapter 4.

Other explanations for the association between peer group membership and violence are the modelling of violent behaviour, exposure to violent situations, and a motivation to defend violently the group's reputation (Conway & McCord, 2002; Rosenfield, Bray & Egley, 1999). A juvenile's position in the group hierarchy can be increased by their commission of delinquent acts and therefore status could be another motivating factor for violent offending (Dahlberg & Potter, 2001). Research evidence has suggested that modelling is a valid explanation for the association between peer group membership and violence (Conway & McCord, 2002). The explanatory power of modelling and status in the emergence of violence in group sexual offending is a topic returned to in Chapter 4.

1.1.1.4. Alcohol or Drug Abuse

The use of alcohol or other drugs is reportedly a risk factor for violent juvenile behaviour. Blitstein et al. (2005) found alcohol use predicted violent behaviour in their sample of 12-15 year olds. Gudlaugsdottir et al. (2004) found alcohol use and smoking to be predictors of violent behaviour with their sample of 15-16 year olds.

1.1.1.5. Schooling

Several school-related risk factors have been identified for violent behaviour in juveniles. These include poor academic performance (Hawkins et al., 1998; Lipsey & Derzon, 1998), truancy (Hawkins et al., 1998), low intelligence (Lipsey & Derzon, 1998), poor attachment to school (Ousey & Wilcox, 2005), hyperactivity and attention difficulties (Herrenkohl et al., 2001; Lipsey & Derzon, 1998). Dahlberg and Potter (2001, p. 9) explain poor integration into school life as resulting from the delinquent child's experiences at home. Poor school achievement, association with delinquent peers and a weak family environment are proposed to form a "mutually reinforcing relationship".

1.1.1.6. Socio-economic Status and Community

As suggested previously, a family's socio-economic status and the community in which it resides is likely to impact on parents' abilities to provide a strong, stable, and pro-social family environment (Dahlberg & Potter, 2001). Meta-analyses have identified low family socio-economic status, neighbourhood poverty, a community with

a high presence of drugs, crime and racial prejudice, residing in an urban area, and low neighbourhood attachment as risk factors for violent behaviour in young people (Hawkins et al., 1998; Lipsey & Derzon, 1998).

Whilst, relative to juvenile delinquency, a limited number of studies have assessed juvenile *violence*, this review demonstrates the complex interplay of individual, social and community risk factors. No one factor predicts violent juvenile offending, rather these factors impact on one another to produce a cumulative effect. Herrenkohl et al.'s (2001) findings that risk factors during childhood have an indirect effect on violence in late adolescence through the adolescent's attachment to school and involvement with delinquent peers illustrates this cumulative effect. Through meta-analyses, the importance of a risk factor has also been shown to vary depending on the age of the juvenile (e.g. Lipsey & Derzon, 1998). Family is influential in younger years but is gradually replaced by the peer group in adolescence (Loeber & Stouthamer-Loeber, 1996). These complex pathways have been clearly articulated by Nietzel, Hasemann and Lynam (1999). They produced a flow diagram indicating probable and possible pathways from antecedents to violent behaviour (see Figure 1A for an adaptation).

These authors see the pathway to violence as starting with distal risk factors, such as neurological dysfunction, family characteristics and a number of others. These factors are grouped into three categories; biological, psychological and environmental, which can interact with one another. These risk factors encourage the learning of violent behaviour, result in the child developing certain behavioural disorders, and inhibit the learning of pro-social behaviour. These predisposing factors link with developmental processes which can influence the juvenile either by encouraging pro-social behaviour or by encouraging them along the pathway to violent and potentially persistent violent behaviour. The influencing factors at this stage are schooling, family, peers, the media and the individual's cognitive processes. How these factors are associated with violent behaviour has been outlined above. The final step in the pathway, "maintenance", recognizes that a violent individual may yet engage in pro-social behaviour depending on employment experiences and meaningful relationships with others. The absence of such positive experiences is proposed to result in an individual continuing their violent behaviour into adulthood.

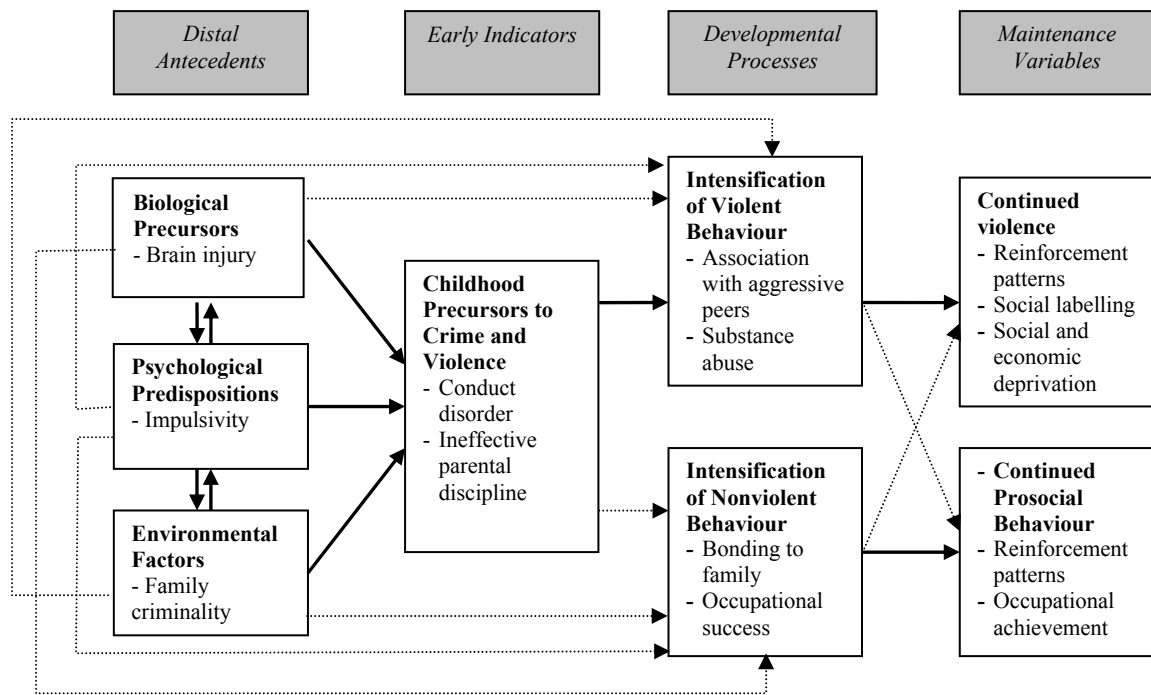


Figure 1A: Flow diagram adapted from Nietzel et al. (1999) indicating how violent crime can develop through the interaction of variables. The boxes contain just some of the examples given by Nietzel et al. Solid lines indicate probable pathways and dotted lines indicate possible, but less likely, pathways.

This model is advantageous because it explains the emergence and persistence of violent behaviour. Nietzel et al. (1999) hypothesize that a number of factors may encourage persistence of violent behaviour. The following section reviews the evidence for the existence of such risk factors.

1.1.2. Factors associated with persistence of violent offending

Although a number of juveniles engage in violent behaviour at some time, those who persist into adulthood represent a small but notable minority (Moffitt, 2006). (Although much of Moffitt's research was on anti-social behaviour and delinquency, her taxonomy extended to specific consideration of violent behaviour.) Kosterman et al. (2001) report that of the 55% of juveniles engaging in violent behaviour from 13-18 years, only 16% persisted in such behaviour at 21 years. A combination of factors appears to explain why some juveniles persist in violent offending whilst others do not. Loeber and Stouthamer-Loeber (1996) discuss a model of offending initially proposed by Loeber and Hay (1994). This model describes three pathways to serious offending. The pathway, of most interest with regard to violent behaviour, is the "Overt Pathway".

This captures offences related to the demonstration of aggression. It begins with more minor acts, such as bullying peers, and culminates in violent offences, such as rape and murder. An individual can follow more than one pathway at a time. The further along a pathway a juvenile is positioned, the older he/she is proposed to be. Fewer individuals are proposed to reach each stage as more and more desist.

Reasons for desistance can vary. Dahlberg and Potter (2001) suggest that an individual will desist from offending once socially normative behaviour becomes more rewarding. This idea has some similarity with Moffitt's (1993) theories of adolescent offending. Findings from other studies report police attention resulting in immediate desistance (Arnold & Kay, 1999). This does not, however, fully answer the question of why some individuals desist whilst others do not.

1.1.2.1. Prior Antisocial Behaviour and Age of Onset

As suggested by Loeber and Hay's (1994) model, prior antisocial behaviour has been studied and empirically supported as a risk factor for persistent violent behaviour (Kosterman et al., 2001; Lipsey & Derzon, 1998). What seems to be important is the age at which the juvenile begins offending with an early age of onset being a risk factor at least for persistent serious offenders (Stouthamer-Loeber & Loeber, 2002), serious habitual offenders (Arnold & Kay, 1999), and persistent violent offenders (Kosterman et al., 2001; Tolan & Gorman-Smith, 1998). However, questions have been raised as to whether early onset of antisocial behaviour is a predictor only for persistent violent offending or for general offending since the findings are not consistent across different samples (Tolan & Gorman-Smith, 1998).

1.1.2.2. Childhood Conduct Problems

Hyperactivity in childhood, impulsivity, childhood aggression, and diagnoses of disruptive behaviour disorder have been proposed as risk factors for persistent violent offending. However, again, it is unclear whether these are risk factors for persistent violent offending or persistent offending in general (Stouthamer-Loeber & Loeber, 2002; Tolan & Gorman-Smith, 1998).

1.1.2.3. Schooling

A significant difference has been found between persistent serious violent delinquents and non-delinquents with regard to school placement for behavioural problems (Stouthamer-Loeber & Loeber, 2002). However, it is likely that this relates to differences between the two groups in disruptive behaviour disorder. Kosterman et al. (2001) found school achievement to be a protective factor against persistent violent

behaviour in their longitudinal study. Interestingly, they report an apparent difference in protective factors depending on the juvenile's gender. Specifically, early pro-social development (e.g. bonding to family and school) was a protective factor for females but not for males.

1.1.2.4. Psychopathy

A diagnosis of psychopathy appears to be one risk factor for persistent violence in juveniles that is well supported by empirical research on juvenile violent recidivism. Participants with higher scores on the Psychopathy Checklist (Hare, 1985) have been found to be more likely to re-offend violently and receive more charges for violent offences both within and outside the institution (Forth, Hart & Hare, 1990). A Swedish study by Långström and Grann (2002) found participants diagnosed as psychopathic, using the Psychopathy Checklist-Revised (PCL-R, Hare, 1991), were more likely to be reconvicted for a violent offence. However, Factor 2 of the PCL-R, which measures the relative instability and antisocial lifestyle of the juvenile, was found to account for virtually all of this association. Therefore, it seems to be the antisocial and impulsive lifestyle of these individuals that contributes to violent recidivism rather than the affective element of psychopathy including traits such as callousness.

Researchers have, however, urged caution in the interpretation of such findings. Långström and Grann (2002) warn that their ratings for the affective elements of psychopathy were solely based on participant files, and argue that adolescents may not yet have fully developed all aspects of normal adult psychological functioning, such as empathy. Empathy is an individual's experience of an emotional reaction to another person's feelings, resulting in feelings such as anger or sadness, and the related concern for that individual's welfare (Vitaglione & Barnett, 2003). Johnstone and Cooke (2004) have also voiced concern about measuring psychopathy in children. They explain that some behaviours which would appear diagnostic of this disorder, such as egocentrism and oppositional behaviour, are normal developmental phenomena for children at certain ages.

1.1.2.5. Peer Group Membership

As noted above, the peer group has a substantial influence on juveniles and is considered a risk factor for violent offending. Kosterman et al. (2001) found early antisocial influences to be predictive of *persistent* juvenile violent behaviour. The global measure of "early antisocial influences" included a measure of the antisocial behaviour of friends at age 10.

1.1.2.6. Summary

From the literature reviewed it is clear that there is not one risk factor alone that can be used to predict violent offending in juveniles, rather the risk of violent offending needs to be understood in terms of a multitude of interdependent factors (Nietzel et al., 1999). Individual, family, peer-group, schooling and community factors all appear to play a role in the development of juvenile violent offending. Meta-analyses have been particularly useful for combining the findings of a large number of studies. The meta-analyses discussed (Hawkins et al., 1998; Lipsey & Derzon, 1998) have only sampled longitudinal studies. A longitudinal design is considered advantageous because it can provide information about “developmental sequences and pathways” and persistence and desistence in behaviour (Loeber & Farrington, 1994), and because it can illustrate a factor’s differential influence over time (Rutter, Giller & Hagell, 1998). Longitudinal studies have however been the subject of criticism. They can suffer from sample attrition (Robson, 2002). Brame and Piquero (2003) criticise longitudinal studies for losing track of members of the group of offenders they should be most interested in, namely high rate offenders. They argue that these offenders are more transient and are unlikely to be found during follow up periods or that these offenders are likely to have been incarcerated again making them difficult to follow up. It is therefore advisable to interpret findings from longitudinal studies with this limitation in mind.

The picture of risk factors for *persistent* violent behaviour is less clear. Age of onset appears to be a promising risk factor although in some studies flawed methodology inhibits the interpretation of the findings. It is equally unclear whether hyperactivity, impulsivity, childhood aggression and diagnoses of disruptive behaviour disorder are predictive of persistent violent offending or persistent offending in general. Some support for psychopathy as a risk factor for persistent violent behaviour has been reported (Forth et al., 1990; Långström & Grann, 2002). These studies suggest a relationship between psychopathy, as measured by versions of the Psychopathy Checklist (Hare, 1985), and subsequent violent offending, previous violent offending and violent behaviour in institutional settings. However, Långström and Grann (2002) suggest this relationship is limited to the impulsive and antisocial lifestyle factor of psychopathy rather than the callous persona more commonly associated with the term ‘psychopath’ (Taylor, Loney, Bobadilla & Iacono, 2003). The relationship between psychopathy and persistent violent offending therefore needs further investigation. At present, it seems possible to differentiate violent juvenile offenders from juvenile

offenders in general using the risk factors discussed, but differentiating violent juvenile offenders who desist from those who persist is more difficult.

1.2. Juvenile Sex Offenders

Juvenile sex offenders have become the focus of much research by both clinicians and academics in the last 25 years. Prior to the 1980s, the attitude towards juvenile sex offenders was less concerned, viewing sexually coercive behaviour as normal for experimenting adolescents (Barbaree, Hudson & Seto, 1993). Recent research, however, recognises juvenile sexual offending as a social problem (Masson & Erooga, 1999). The primary aim of this more recent research has been to understand what factors contribute to the risk of a said individual becoming a sex offender, with the objective of stopping juvenile sex offenders becoming adult sex offenders. The research has focused on static factors, those which have occurred in the individual's past and that cannot be changed, and dynamic factors, those which treatment programmes can target to prevent recidivism. A number of factors have been identified that appear to be risk factors for sexual offending; these will be reviewed. In the previous section, factors considered to be risk factors for violent offending were outlined. This section examines whether a sexually violent offender can be distinguished from a generally violent offender and therefore what risk factors are *specific* to sexual offending.

Within the population of sexually violent juveniles exists a group of individuals who, as with violent offenders, continue to re-offend in childhood with some continuing into adulthood. Although sex offenders are more likely to recidivate non-sexually, rates of sexual recidivism, measured over time periods of 6 months to 23 years, have ranged from less than 5% to 25% (Hanson & Bussiere, 1998; Långström & Grann, 2000; Nisbet, Wilson & Smallbone, 2004; Rasmussen, 1999; Schram, Milloy & Rowe, 1991; Vandiver, 2006; Waite et al., 2005; Worling, 2001). The question of what factors differentiate those individuals that desist from their persistent counterparts is considered below. Studies claiming to have identified such factors are outlined and evaluated. Such repeat offenders will, of course, be of interest to both the police and treatment professionals.

Several studies have investigated the nature of juvenile sex offending, including the type of offence behaviours displayed, the types of victims targeted, and the type of sexual offences committed (e.g. Långström & Lindblad, 2000). These studies have

identified what appear to be distinct groups of individuals within the juvenile sex offender population. These are offenders who target younger children and those that target victims the same age or older (Gunby & Woodhams, in press; Hendriks & Bijleveld, 2004; Hunter, Hazelwood & Slesinger, 2000). Initial research has also suggested differences in characteristics between offenders that assault as a group as opposed to those who assault a victim on their own (Bijleveld & Hendriks, 2003).

Whilst a considerable amount of literature has amassed on juvenile sex offenders, one group of juveniles has received little research attention, namely juvenile sex offenders who target victims that were strangers. Preliminary research suggests that *stranger sex offenders* are at greater risk of sexual recidivism (Långström, 2002). As such they warrant further research. Stranger sex offenders have been the focus of police attention for some time (Häkkinen et al., 2004), however, as of yet, formal research on juvenile stranger sex offenders is virtually non-existent. The first research to be conducted on this population is summarised in section 1.4 (Woodhams, 2004, Woodhams, Gillett & Grant, 2007). What is currently known about the sexual offending of this particular group will be outlined and the impact of such offending on victims and on policing resources will be discussed.

Before proceeding it is important to consider what is sexual offending and what constitutes a sexual offence. The Sexual Offences Act 2003 includes within its definition of sexual offences a range of behaviours, from indecent exposure to rape. A fundamental issue in defining a sexual act as a sexual offence is whether the (adult) victim gave his/her consent. The Sexual Offences Act defines consent as if “He [/she] agrees by choice, and has the freedom and capacity to make that choice” (p. 35). With regards to children, the Act criminalises all consenting sexual behaviour between under 16 year olds. Children under the age of 13 years are considered unable to consent. Consent also forms an essential part of psychological definitions of sexual violence (Marshall & Barbaree, 1989). In 1994 the Criminal Justice and Public Order Act expanded the definition of rape to include non-consensual anal penetration thereby recognising the existence of male rape (Gregory & Lees, 1999), which is also recognised in the Sexual Offences Act 2003. The following definition of sexual offending will therefore be used: the engagement in sexual behaviours directed at a male or female victim who is unwilling, unable to and/or incapable of consent.

The various definitions considered above recognise a range of behaviours, varying in their severity, to constitute sexual offending. Whilst all types of sexual

assault are serious, police resources are often focused on more serious types. To capture this distinction, researchers often refer to contact and non-contact offences (e.g. Långström, Grann & Lindblad, 2000; Macpherson, 2003). The current literature review, with its focus on applying research to police practice, focuses on more serious sex offences, defined by Knight (1999, p. 306) as: “A sexual assault that involves physical contact with the victim”.

The Sexual Offences Act 2003 applies only to England and Wales, however the research considered below is cross-cultural. Cultural differences in sexual assault definitions are possible. In addition, as noted previously, the age range for what constitutes a juvenile varies between studies from different countries, because of factors such as the age of criminal responsibility. An awareness of such differences is needed when amalgamating the research. Instead of restricting the discussion to studies that reflect the same criteria as that used in England and Wales, a variety of studies are discussed.

1.2.1. Factors associated with the propensity to offend sexually

Early thinking on juvenile sex offenders was that they were different from juvenile offenders in general (Masson & Erooga, 1999). More recently, some authors have claimed that sexual offending is just one element of general offending (Veneziano & Veneziano, 2002). A number of factors have been identified which appear to predispose an individual to offend sexually. However, such findings need to be evaluated in the light of methodological flaws, such as inappropriate comparison groups (Ronis & Borduin, 2007). The question remains as to whether the research has demonstrated a clear distinction between sex offenders and other offenders or whether it is just distinguishing sex offenders from non-offenders and hence only identifying factors that predispose an individual to offend in general. This research can be grouped into four categories, individual factors, family factors, schooling, and peer factors.

1.2.1.1. Individual Factors

A range of risk factors relating to the individual have been considered, some are biological and some psychological. It has been stated that the research evidence for biological factors, such as hormonal imbalance or neurological dysfunction, as risk factors for sex offending is scant (Blanchard, Cantor & Robichaud, 2006; Lanyon, 1991; Ryan, 1991a). However, recent studies suggest some limited evidence. Långström and Lindblad (2000) found 38% of their sample of young sex offenders to have been diagnosed with a neurological or neuropsychological disorder. This was not

investigated with a comparison group. It is therefore unclear whether neurological/neuropsychological disorder is a risk factor specific to sexual offending. Harrison, Clayton-Smith and Bailey (2001) found a higher rate of chromosomal abnormalities among their sample of sex offenders than would be predicted according to population norms. However, they propose that chromosomal abnormalities are not associated with sexual offending behaviour for the majority of sex offenders but rather propose that there are a minority of sex offenders for whom chromosomal abnormalities interact with adverse family and environmental factors resulting in sexually abusive behaviour.

Intelligence has also been investigated and received mixed findings (Awad & Saunders, 1991; Jacobs, Kennedy & Meyer, 1997; van Wijk, Vreugdenhil, et al., 2007). In studies (Awad & Saunders, 1991) that have differentiated between juvenile child molesters, those who assault children younger than themselves, and juvenile *sexual assaulters*, those who assault peers and adults, intelligence has only been found to be a risk factor for sexual assaulters.

A number of psychological risk factors have been investigated. Van Wijk, Vreugdenhil, et al. (2007) found no difference between juvenile sex offenders and juvenile non-sex offenders on neuroticism, sensation-seeking, impulsivity or extraversion. However, both Hendriks and Bijleveld (2004) and van Wijk, van Horn, Bullens, Bijleveld and Doreleijers (2005) compared juvenile sexual assaulters and juvenile child molesters on neuroticism and found juvenile child molesters to score higher on the measure. Bijleveld and Hendriks (2003) found lone offenders to be significantly more neurotic than group offenders.

Social competence and social isolation have been suggested as potential risk factors for sex offending. Lane (1991) proposes that social incompetence and low self-esteem are instrumental in the development of sexually coercive behaviour. She hypothesises that feelings of inadequacy create a need in the juvenile sex offender to exert control to regain feelings of being in control themselves. Poor social skills are hypothesised to exacerbate the problem since the juvenile is unable to deal with the situation that is causing feelings of inadequacy in a pro-social manner (Lane, 1991). Empirical research appears to support this proposition (Knight & Prentky, 1993; Långström & Lindblad, 2000), however most studies suffer from the methodological flaw of not using a comparison group or using an inadequate comparison group. Often studies use a comparison group which is not mutually exclusive from the juvenile sex offender group. To determine whether risk factors are specific to juvenile sex offending

requires a comparison group that has not committed sexual offences. Ford and Linney (1995) attempted to overcome this flaw by using comparison groups in their study that were completely mutually exclusive. They ensured that violent offenders in the comparison sample did not have a history of sexual offending and that their sample of sex offenders did not have a history of violent offending. No differences in social competence were found between their juvenile sex offenders, juvenile violent non-sex offenders and juvenile status offenders. Whilst Ford and Linney attempted to develop mutually exclusive groupings, decisions about to which group each juvenile belonged appear to have been based on “previous adjudications”. Research has shown that the majority of sexual offences are not reported to the police (Myhill & Allen, 2002). It is therefore possible that the groups developed by Ford and Linney were not mutually exclusive. Also, Ford and Linney did not consider the heterogeneity of juvenile sex offenders. A more recent study which investigated juvenile sexual assaulters and juvenile child molesters separately found juvenile child molesters to have significantly more problems with their peers (van Wijk, van Horn et al., 2005). Hunter (2004) found psychosocial deficits to be a significant predictor of sexually offending against children (compared to peers/adults) however it only accounted for a small amount of the variance. Hendriks and Bijleveld (2004) and Gunby and Woodhams (in press) found juvenile child abusers to have significantly fewer age appropriate friendships, lower self-esteem/more negative self-image, and were more frequently the victims of bullying compared to peer-abusers. Bijleveld and Hendriks (2003) found lone offenders to be significantly less sociable than group offenders.

Poor impulse control is another psychological factor that has been purposed to be related to sex offending (van Outsem, 2007). In the absence of social and practical inhibitors it is proposed that sexual impulses can lead to harmful sexual behaviour (Caputo, Frick & Brodsky, 1999; van Outsem, 2007). However, when research has compared the impulse control of sexual offenders with non-sexual offenders, poor impulse control appears to be a characteristic of both types of offender (Caputo et al., 1999). Impulsivity, more generally, has been reported to differentiate juvenile group offenders from solo sex offenders (Bijleveld & Hendriks, 2003).

Juvenile sex offenders have also been found to score significantly higher on normlessness measures compared to juvenile delinquents (Miner & Munns, 2005), however this was only in relation to breaking social norms to gain acceptance from peers. This study used both official statistics and self-reported offending to ensure their

sex offender group and delinquent group were mutually exclusive. Van Wijk, Loeber, et al. (2005) found no differences on attitudinal measures associated with offending for juvenile sex offenders and non-sex offenders. These measures included attitudes to problem behaviour, to delinquency, and to substance use.

As with persistent juvenile violent offending, a deficiency in empathy has been suggested as a risk factor for sex offending. It has been incorporated into a number of treatment programmes for convicted sex offenders (Rice & Chaplin, 1994). Farr, Brown and Beckett (2004) found adolescent sex offenders to score lower on measures of empathy than non-offending adolescents and Whittaker, Brown, Beckett and Gerhold (2006) found adolescent child molesters to have less victim empathy skills than non-offending adolescents. However without a juvenile non-sex offending comparison group it cannot be claimed that empathy is a risk factor specific to sex offending. When using a juvenile non-sex offending comparison group, Lindsey, Carolozzi and Eells (2001) found both juvenile sex offenders and non-sex offending delinquent juveniles showed a reduced capacity to perceive the distress of others. However, a lack of compassion for others appeared to be specific to juvenile sex offenders.

McCrary et al. (2008) argue that cognitive distortions are the inverse of empathy. They studied the degree to which juvenile sex offenders endorsed generic self-serving cognitive distortions compared to general population norms. The generic self-serving cognitive distortions were measured using the How I Think Questionnaire (Gibbs et al., 2001 as cited in McCrary et al., 2008). They found juvenile sex offenders endorsed self-serving cognitive distortions to a significantly greater extent compared to the general population, however a non-sex offending comparison group was not used. There is therefore some preliminary support for empathy as a risk factor for sex offending but it needs further investigation with appropriate comparison groups.

Farr et al. (2004) investigated whether adolescent sex offenders would score higher on measures of hypermasculinity than non-offending juveniles. They found that adolescent sex offenders scored higher on the subscales measuring callous sexual attitudes towards females and adversarial attitudes towards females and sexual minorities. Yet for the same reasons as noted above it cannot be concluded that some elements of hypermasculinity are risk factors for juvenile sex offending.

Whether a lack of sexual knowledge is a risk factor for juvenile sex offending has been investigated (Whittaker et al., 2006). Adolescent child molesters were less

knowledgeable about sexual matters than their non-offending counterparts. However, a comparison group of non-sex offending juveniles or sexual assaulters was not used.

Finally, mental illness and mental disorder has been investigated as factors that may differentiate sex offenders from other offenders. In particular personality disorders and psychopathy have featured in the literature as possible risk factors. Långström and Lindblad (2000) found that 75% of their young sex offenders qualified for a diagnosis of personality disorder however without a comparison group this finding remains descriptive. Caputo et al. (1999) found evidence that juvenile sex offenders scored significantly higher than violent non-sex offenders and non-contact offenders on the Psychopathy Screening Device subscales measuring callous-unemotional traits. However, only 35% of the juvenile sex offenders demonstrated elevated scores for psychopathy, therefore this may not be a predictive factor for all juvenile sex offenders. In fact, Jacobs et al. (1997) could not distinguish juvenile sex offenders from juvenile non-sex offenders using the Psychopathy Checklist - Revised. Freeman, Dexter-Mazza and Hoffman (2005) found no significant difference between juvenile sex offenders' and non-sex offending delinquents' scores on the Minnesota Multiphasic Personality Inventory – Adolescent Version.

With regards to other diagnoses, Spacarelli, Bowden, Coatsworth and Sim (1997) could not distinguish juvenile sexual offenders, juvenile violent offenders, and juvenile low violence offenders from one another on the basis of measures of anxiety, depression, rumination and dissociation. Similarly, van Wijk, Loeber, et al. (2005) found no differences between juvenile sex offenders and juvenile non-sex offenders on depressed mood, anxiety, conduct disorder, oppositional defiant disorder, or attention deficit hyperactivity disorder. Van Wijk, Vreugdenhil, et al. (2007) also found no differences between juvenile sex offenders and juvenile non-sex offenders on anxiety disorders, affective disorders, disruptive behaviour disorders and psychotic disorders. Ronis and Borduin (2007) found no significant differences in emotional distress when comparing juvenile child molesters, juvenile sexual assaulters, juvenile violent non-sex offenders, juvenile non-violent non-sex offenders and juvenile non-delinquents. Similarly, Gunby and Woodhams (in press) found no differences between juvenile child abusers and juvenile peer abusers in terms of referrals to mental health services or incidence of self-harming behaviour. In fact, both groups of juvenile sex offender had pronounced histories of mental health problems. In contrast, Hendriks and Biljeveld (2004) found juvenile child molesters were significantly more likely to evidence

psychopathology at assessment than juvenile peer abusers. On the balance of the evidence, mental disorders and mental health problems seem unlikely to be risk factors for juvenile sex offending.

The ability of individual factors to explain the propensity to offend sexually is therefore mixed. Currently, a lack of compassion for others appears to differentiate juvenile sex offenders from other types of juvenile offender. Intelligence, social isolation, and neuroticism appear to differentiate juvenile sexual assaulters from juvenile child molesters. Limited evidence also suggests that the latter two factors, as well as impulsivity, differentiate juvenile group sex offenders from juvenile lone sex offenders.

1.2.1.2. Family Factors

Considerable research has turned to the family to try to explain the aetiology of juvenile sex offending. As the first environment where children learn socially appropriate behaviour, some studies have investigated attachment and disruption of attachment processes as explanatory factors. Attachment has been defined as a “Bond of love between parents and child” (Wenar, 1994, p. 34). It can be disrupted by death or separation or may fail to develop properly due to neglect (Wenar, 1994). Studies of juvenile sex offenders have identified caregiver instability in their backgrounds (Långström & Lindblad, 2000; Schwartz, Cavanaugh, Pimental & Prentky, 2006). Kobayashi, Sales, Becker, Figueredo and Kaplan (1995) investigated the role of parental bonding in the pathway to sexual aggression. Using structural equation modelling, maternal attachment was identified as a protective factor. Research using comparison groups has been mixed. Some studies suggest that juvenile sex offenders have experienced more disruption to attachments than comparison groups (Lightfoot & Evans, 2000) whereas others have found no difference between sex offenders and non-sex offenders in terms of broken families. When separating juvenile child abusers from juvenile peer abusers, a significant difference was found (Gunby & Woodhams, in press). Juvenile child abusers were significantly more likely to come from a household where parental figures were in flux.

Poor attachment is hypothesised to lead to poor social skills, low self-confidence, and a distrust of relationships (Marshall, Hudson & Hodgkinson, 1993). Burk and Burkhart (2003) have proposed that poor parental attachment can explain the emergence of sexual offending behaviour. Poor attachment is purported to result in inadequate internalisation of self-regulatory skills and subsequent reliance on external

interpersonally-based self-regulatory strategies. In the presence of other environmental and experiential factors, Burk and Burkhart hypothesise that sexually aggressive behaviour can emerge as an external interpersonally-based self-regulatory strategy. Ryan (1991b) argues that it is not the strength of attachment that is important but its distorted nature, resulting perhaps from the exploitative nature of some parent-child relationships.

Family cohesion has also been investigated as a risk factor. Whilst, Ronis and Borduin (2007) found juvenile offenders to have less cohesive families than non-offending juveniles, there were no differences in family cohesion between juvenile sex offenders and juvenile non-sex offenders. There were also no significant differences between juvenile child molesters and juvenile sexual assaulters. The same patterns applied to observations of families for evidence of negative affect (Ronis & Borduin, 2007). Similarly, family conflict failed to significantly differentiate juvenile sex offenders from juvenile non-sex offenders (van Wijk, Vreugdenhil, et al., 2007). As a potential indicator of bonding to the family, van Wijk, Loeber, et al. (2005) found sex offenders, compared to non-sex offenders, to be more likely to run away from home.

Despite evidence of the intergenerational transmission of crime, in general (Gregory, 2004; Murray, Jansen & Farrington, 2007), van Wijk, Vreugdenhil, et al. (2007) were unable to distinguish juvenile sex offenders from juvenile non-sex offenders on the basis of parental involvement in crime. In contrast, Gunby and Woodhams (in press) found significant differences between juvenile child abusers and peer abusers on family involvement in criminal activity. Family criminality was more elevated for peer abusers.

That exposure to domestic violence is present in the background of juvenile sex offenders has been repeatedly claimed (Caputo et al., 1999; Schwartz et al., 2006; Van Ness, 1984). Ford and Linney (1995) found a significant difference in exposure to family violence in their sample of juvenile sex and non-sex offenders. However, this difference was limited to child molesters who witnessed significantly more family violence than juvenile rapists, non-violent sex offenders or status offenders (youths charged with incorrigibility, runaway or truancy). In contrast, the opposite was found by Gunby and Woodhams (in press). They found significantly more juvenile peer abusers to have witnessed domestic violence compared to juvenile child abusers. Whilst, there is therefore some evidence suggesting that a history of family violence may be related to propensity for sexual offending this evidence is mixed. A number of

studies have not found this to be a discriminating factor between juvenile sex offenders and other juvenile offenders/delinquents (e.g. Lightfoot & Evans, 2000; Spacarelli et al., 1997).

A related risk factor for juvenile sexual offending could be experience of physical and/or sexual abuse during childhood. The link between experiencing sexual abuse and becoming a perpetrator is hypothesized to result from intimacy and power becoming sexualized through the child's sexually inappropriate behaviour being directly rewarded by the abuser, or due to the child's need for closeness not being satisfied by other means (Masson & Erooga, 1999). Sexual abuse, physical abuse, psychological abuse and neglect have been found in the histories of juvenile sex offenders (Aylwin, Studer, Reddon & Clelland, 2003; O'Brien, 1989, as cited in Ryan, 1991b; Schwartz et al., 2006). Kobayashi et al. (1995) found physical abuse by the father and experience of abuse by a male adult in childhood to increase the probability of sexual aggression. Johnson and Knight (2000), using path analysis, found experience of sexual abuse in childhood to have a direct effect on sexual coercion. Physical abuse had an indirect effect. This evidence is, however, problematic because none of these studies utilised a comparison group. It cannot therefore be concluded that experience of physical and/or sexual abuse are risk factors for juvenile sex offending. Some studies utilizing a comparison group have found no difference between juvenile sex offenders and non-sex offenders with regards to a history of abuse (e.g. Awad & Saunders, 1991; Spacarelli et al., 1997; van Wijk, Loeber, et al., 2005). Yet it is possible that experience of sexual abuse is a risk factor for some juvenile sex offenders. Bijleveld and Hendriks (2003) found lone sex offenders were significantly more likely to have been a victim of sexual abuse when compared to group sex offenders.

Some authors have suggested that it is the witnessing of sexually inappropriate behaviour or witnessing the abuse of others as a child that is important in relation to future sexual offending (Lightfoot & Evans, 2000). Observing the abuse of others by care-givers or other significant role models may result in the juvenile modelling such behaviour (Ryan, 1991b). Whilst not employing a comparison group, Schwartz et al. (2006) found that 31% of their juvenile sex offenders had witnessed some form of sexual deviance in the home. Ford and Linney (1995) found more exposure to hard core pornography in the histories of juvenile sex offenders compared to violent non-sex offenders and status offenders, and for child molesters in particular, this exposure

occurred at a relatively younger age compared to the juvenile sexual assaulters (termed juvenile rapists).

Parental mental illness and family income have been investigated as risk factors for juvenile sex offending but they have not received the same research attention as other risk factors outlined above. The limited studies that have investigated these factors have failed to find significant differences between sexually abusive children and other juvenile offenders (Lightfoot & Evans, 2000; Van Ness, 1984; van Wijk, Loeber, et al., 2005; van Wijk, Vreugdenhil, et al., 2007).

Several other family factors were investigated by van Wijk, Loeber, et al. (2005). No differences were found between juvenile sex offenders and juvenile non-sex offenders on experience of physical punishment, level of supervision, involvement in family, or parental stress. However, Gunby and Woodhams (in press) found a significant difference between juvenile child abusers and juvenile peer abusers on parental supervision. Peer abusers were significantly more likely to experience inconsistent parental supervision. Peer abusers were also more likely to come from homes with lower socio-economic status.

The ability of family factors to explain the propensity to offend sexually is therefore mixed. Disruption to attachment seems to be a potential risk factor. Exposure to domestic violence might also prove to be a risk factor for juvenile child molesters in particular with further research. Whether the experience of physical or sexual abuse as a child is a risk factor that can differentiate between sex offenders and offenders in general is unclear. It is a factor present in the backgrounds of many offenders.

1.2.1.3. Schooling

Problems at school were identified in the previous section as a risk factor for violent offending. With regard to sexual offending, Långström and Lindblad (2000) found evidence of hyperactivity and poor concentration in the histories of 62% of their young sex offenders. The majority of their sample had attended a special education school (64%) and 45% had left school with below average grades indicating poor school adjustment. Seventy six per cent of Schwartz et al.'s (2006) sample of juvenile sex offenders were in special education. Twenty eight per cent of the boys had a learning disability. However, neither Långström and Lindblad (2000) nor Schwartz et al.'s (2006) studies utilised a comparison group. When using a comparison group, van Wijk, van Horn, et al. (2005) found juvenile sex offenders to be more likely to attend a special education school, however they dropped out of school less than juvenile violent

offenders. Other researchers (Awad & Saunders, 1991; Ronis & Borduin, 2007; Jacobs et al., 1997; Lightfoot & Evans, 2000; van Wijk, Vreugdenhil, et al., 2007) have found no differences between sexually abusive children and comparison groups in terms of academic performance or attendance at special educational establishments. A recent study by van Wijk, Loeber, et al. (2005) found juvenile sex offenders to have higher academic achievement than juvenile violent offenders. In combination, these studies suggest that poor school adjustment and lower academic achievement are related to offending in general rather than sexual offending.

1.2.1.4. Peer Group Membership

The apparent impact of the peer group on juvenile violent offending raises the question of whether the peer group is influential in the development of juvenile sexual offending. Sex offenders are often considered to be socially isolated (Ross & Loss, 1991) and juvenile sex offenders have self-reported significantly more feelings of social isolation from peers compared to juvenile delinquents (Miner & Munns, 2005). Comparisons of juvenile sex offenders and juvenile non-sex offenders have found no difference in emotional bonding and use of aggression with peers (Ronis & Borduin, 2007) or socialising with antisocial peers (van Wijk, Loeber, et al., 2005). Such findings could suggest that the peer group would have little impact on the propensity to sexually offend. However, some findings of differences between groups of sex offender on social isolation suggest that the impact of the peer group might vary depending on the type of juvenile sex offender. Awad and Saunders (1991) found adolescent sexual assaulters to be significantly less socially isolated than adolescent child molesters. In fact, when compared to a non-sexual delinquent comparison group, the sexual assaulters were significantly more likely to socialise with older peers. The sexual assaulters were also more likely to sexually offend with others and some evidence suggested that the sexual offending of these individuals was encouraged by the peer group “daring” an individual. The peer group was hypothesised to disinhibit the juvenile sex offender (Awad & Saunders, 1991). In contrast, Ronis and Borduin (2007) found no difference on scores of emotional bonding to peers or aggressive peer-interactional style for juvenile sexual assaulters and juvenile child molesters.

Sanday (1990) found the impact of the peer group to be substantial in encouraging fraternity gang rape. She found there to be considerable peer pressure to be sexually successful and that individuals were ridiculed for avoiding male “bonding” practices, which included gang rape. Gang rapists convicted in their late teens have

explained that “Part of [the] rape’s appeal was the sense of male camaraderie engendered by participating collectively in a dangerous activity” (Scully & Marolla, 1984, p. 259). These young men explained that rape was about domination and control but that peer pressure and feelings of machismo also played a role. The phenomenon of group rape is returned to in Chapter 4. The peer group may, therefore, play some role in the etiology and, potentially, the maintenance of sexually abusive behaviour for some types of juvenile sex offender.

1.2.1.5. Alcohol and Drug Abuse

Only a few studies have considered the influence of alcohol and drug abuse on juvenile sexual offending. Most of these studies are also of a very dated nature. The influence of alcohol and drug use on the aetiology of sexual offending is unclear (Lightfoot & Barbaree, 1993). Some researchers (Awad & Saunders, 1991; Davis & Leitenburg, 1987) have claimed that there is no evidence that alcohol and drug use are risk factors for juvenile sex offending and a comparison of juvenile sex offenders with juvenile non-sex offenders found both groups to be similar with regards to their use of drugs and alcohol (van Wijk, Loeber, et al., 2005) and the prevalence of substance abuse disorders (van Wijk, Vreugdenhil, et al., 2007). However, other research contradicts this. Following interviews with adolescent rapists and a file review, Vinogradov, Dishotsky, Doty, and Tinklenberg (1988) determined that in 72% of the offences the offenders were under the influence of drugs. Alcohol was implicated in a number of offences either on its own or in combination with other drugs. In addition, a path analysis by Johnson and Knight (2000) found alcohol abuse to have a direct effect on coercion used by juveniles to achieve vaginal or anal penetration. In interviews, adult rapists have reported the use of alcohol and drugs as contributing to their sexual offending (Scully & Marolla, 1984). Whether offenders’ self-reports of a relationship between alcohol and drug abuse and sexual offending are accurate, or whether such disclosures are a means of avoiding personal responsibility, is unclear. The differences observed in study findings may result from methodological differences (Lightfoot & Barbaree, 1993), such as the use or not of a comparison group. Whether alcohol and drug use can be considered a potential risk factor for sexual offending specifically remains to be established.

As with violent offending, Lanyon (1991) has proposed that the aetiology of sex offending is explained by multiple factors rather than a single factor. Due to methodological limitations, it is however difficult to draw conclusions about many of

the potential risk factors discussed. With regard to the question of whether juvenile sex offenders are distinct from juvenile non-sex offenders, some literature reviews of risk factors have concluded that there are more similarities than differences between these two populations (Allan, Allan, Marshall & Kraszlan, 2002; Veneziano & Venezino, 2002) whereas others have concluded that these two groups can be differentiated on some factors (van Wijk, Vermeiren, et al., 2006). In particular, juveniles who offend sexually are argued to have the most in common with juveniles who offend violently (van Wijk, Loeber, et al., 2005). Differences seem to emerge when juvenile sex offenders are treated as a heterogeneous group and are separated into groups who offend against children and groups who offend against peers or older victims. It has also been proposed that juveniles who sexually assault strangers appear more similar to other delinquent juveniles than those who target acquaintances (France & Hudson, 1993). (A more recent study comparing juvenile stranger sex offenders with juvenile delinquents could not be identified.) Research that considers such heterogeneity may be more successful at identifying distinctive risk factors for juvenile sexual offending.

1.2.2. Factors associated with the persistence of sexual offending

Research on factors associated with persistent sexual offending in juveniles is limited. A literature search failed to identify any longitudinal studies for juvenile sex offending, such as those longitudinal studies that have been conducted for persistent violent offending (see section 1.1.2.) Studies that attempt to identify factors that are related to recidivism do, however, exist. These studies differ from the studies for persistent violent offending reported in section 1.1.2 both in the nature of their sampling and their measures of re-offending. Whilst longitudinal studies sample the general population, recidivism studies solely sample apprehended sex offenders. It is therefore possible that offenders who remain at large may differ from those who have been sampled by recidivism studies. Longitudinal studies usually measure self-reported delinquency/violent behaviour, although they do also use official statistics. Recidivism studies typically use official statistics, such as records of reconviction or re-arrest as evidence of re-offending. Official statistics are renowned for underestimating the prevalence of persistent offending particularly statistics for sexual offences, which are notoriously under-reported (Myhill & Allen, 2002). These methodological flaws should be remembered when reviewing the findings about persistent sex offending taken from recidivism studies. Recent reviews of recidivism studies with juvenile sex offenders (e.g. Worling & Långström, 2003) indicate some consistent factors that seem to be

associated with persistent offending and other factors that may be risk factors but that require future validation.

1.2.2.1. Sexual Deviance

Sexual deviance, as revealed through sexual interests, behaviour or fantasies, has been consistently suggested as a risk factor for recidivism. It was cited by Caldwell (2002) as an emerging risk factor following his literature review. Kenny, Keogh and Seidler's (2001) path analysis found deviant sexual fantasies to have a direct relationship with recidivism. However, their model accounted for 22% of the variance in recidivism indicating that a large proportion of recidivism remained unexplained. Miner (2002) also found sexual preoccupation with children to be associated with increased risk of recidivism with his sample of adolescent sex offenders. Schram et al. (1991) found sexual recidivists to be significantly more likely to have deviant sexual arousal patterns. Worling and Långström's (2003) literature review of risk factors for sexual recidivism identified deviant sexual interest in children as a relatively strong risk factor for juveniles.

1.2.2.2. Social Competence

Poor social competence, as measured by social isolation and poor social skills, has also been suggested as a risk factor for sexual recidivism. Långström and Grann (2000) found an association between poor social skills and increased risk of sexual recidivism. Kenny et al.'s (2001) path analysis showed poor social skills to have a direct effect on sexual recidivism. Beckett (1999) also highlighted low social competence as a risk factor for re-offending, however he did not differentiate between general and sexual recidivism.

1.2.2.3. Attitude towards Previous Sex Offending

Denial of sexual offending has been suggested as a risk factor for sexual recidivism in juveniles (Kahn & Chambers, 1991; Smith & Monastersky, 1986). Kahn and Chambers (1991) found significantly higher levels of sexual recidivism for offenders that denied their offence and blamed their victim. However, following their literature review, Worling and Långström (2003), considered denial to be an unlikely risk factor for sexual recidivism due to conflicting empirical evidence.

1.2.2.4. History of Abuse

A history of physical and/or sexual abuse is often cited as a risk factor for sexual recidivism, however much of the empirical data available suggests that individuals with such histories are at no greater risk of recidivism than other juvenile sex offenders

(Worling & Långström, 2003). Rasmussen's (1999) research is cited, amongst others, as supporting this assertion. However, Rasmussen herself reports within her data a trend, which although not significant, suggests a relationship between history of sexual abuse and recidivism. Several other studies have found some evidence of a relationship (Beckett, 1999; Friedrich & Luecke, 1988; Smith & Monastersky, 1986) but in some cases statistical tests were not computed (Friedrich & Luecke, 1988) making it difficult to have confidence in the findings. The likelihood that a history of physical and/or sexual abuse is a risk factor for sexual recidivism is therefore debatable.

1.2.2.5. History of Truancy

Schram et al. (1991) compared sexual re-offenders to juvenile sex offenders who did not re-offend during the follow-up period (which was on average 6.8 years). They found the sexual recidivists to be significantly more likely to have a history of truancy.

1.2.2.6. Psychological and Psychiatric Characteristics

Using Cox regression analysis, Miner (2002) found an association between impulsivity and increased risk of sexual recidivism with his sample of incarcerated male juvenile sex offenders. Impulsivity was defined as "Being reckless, being aggressive and acting on irresistible impulses" (p. 431). Considering Miner's definition of impulsivity, Beckett (1999) reports similar risk factors for persistent sexual offending in juveniles, namely, childhood conduct disorder, psychopathy, delinquency, and aggression in adolescence. However, Beckett (1999) failed to differentiate general from sexual recidivism.

When differentiating between sexual and non-sexual recidivism, no evidence that psychopathy is a predictor for sexual recidivism for adolescent sex offenders was found (Gretton, McBride, Hare, O'Shaughnessy & Kumka, 2001). Worling and Långström (2003) noted similar variables as possible risk factors for sexual recidivism in juveniles. They highlight impulsivity and an antisocial lifestyle as factors requiring more research attention and state that until then they should be used with caution. A more recent study by Waite et al. (2005) found scores on the Impulsive/Antisocial Behaviour Scale of the Juvenile-Sex Offender Assessment Protocol (J-SOAP) were significantly higher for juvenile sex offenders who re-offending compared to those who did not in a 10 year period.

1.2.2.7. Victim Characteristics

A number of studies have considered whether the characteristics of the offender's victims are associated with persistence. The victim's age and gender have

received attention. Smith and Monastersky (1986) found having older victims to be associated with sexual recidivism. Långström and Grann (2000) found having a male victim to be associated with risk of sexual recidivism. However, Kahn and Chambers (1991) found that juveniles who sexually assaulted an unrelated child to be at greater risk of sexual recidivism than those that assaulted peers. Hagan, Gust-Brey, Cho and Dow (2001) compared the sexual recidivism of juvenile child molesters and juvenile rapists and found no difference in recidivism rates between these two groups. Worling and Långström (2003) consider neither victim age nor gender to be risk factors. They cite just one victim-related risk factor, the existence of a stranger victim-offender relationship. A number of studies sampling juvenile, adolescent, and adult sex offenders have noted significant correlations between rates of sexual recidivism and sexually assaulting a stranger (Hanson & Bussiere, 1998; Långström, 2002; Smith & Monastersky, 1986). Ross and Loss (1991) also note stranger adolescent sex offenders to be at higher risk of recidivism. Lee, Cottle, and Heilbrun's (2003, as cited in Worling & Långström, 2003) meta-analysis of predictors of recidivism for juvenile sex offenders, cited a stranger victim-suspect relationship as one of four risk factors. This illustrates the importance of conducting research on this particular sub-group of juvenile sex offenders.

1.2.2.8. Intensity of Past Sex Offending

A relatively consistent finding in the literature is the relationship between past sexual offending and future sexual offending (Worling & Långström, 2003). Whilst measured in different ways, the intensity and frequency of past sex offending is cited repeatedly as a risk factor for sexual recidivism (Caldwell, 2002; Långström & Grann, 2000; Rasmussen, 1999; Schram et al., 1991). Worling and Långström (2003) cited number of victims as a risk factor supported by the empirical literature.

1.2.2.9. Previous Offence Characteristics

The nature of previous sexual offences has also been investigated as a risk factor, in particular, the degree of verbal or physical coercion/violence used by the offender. Caldwell (2002) identified *violent* sexual offending as a potential risk factor. Kahn and Chambers (1991) found an association between verbal coercion and risk of sexual recidivism. The empirical literature supports 'violence used within the sexual assault' as a risk factor for sexual recidivism (Worling & Långström, 2003), as does the literature on risk assessment (Ross & Loss, 1991) and actuarial risk assessment scales (Greer, 1991).

The literature on persistence in juvenile sexual offending is in its relative infancy. However, some consistent findings are reported in the empirical literature. Deviant sexual fantasies and interests, social incompetence, a stranger victim-offender relationship, and a previous history of sexual offending, especially if this is of high intensity or involves verbal or physical violence, appear to be associated with sexual recidivism. Clearly, positive findings regarding dynamic risk factors, such as social incompetence, which can be addressed through intervention, are of great interest to practitioners treating apprehended juvenile sex offenders. However, knowledge of risk factors for sexual recidivism can also be useful to the police. By using such knowledge, offenders predicted to be at high risk of recidivism could be prioritised for police investigation, representing an investigative form of risk assessment. Contrary to working in a therapeutic setting, often the police are working without knowledge of an offender's identity. If they do not know who the individual is who is responsible for a sexual offence, many of the risk factors for persistent sexual offending that have been identified in the research literature cannot be used in an investigative risk assessment. This is because they cannot be determined from the limited information that the police have about the unidentified offender. The type of data available to the police in such scenarios will be limited to physical descriptions of the offender and the victim and of the offender's behaviours during the offence (as reported by the victim). Indicators of risk, such as victim characteristics and the nature of the offender's offence behaviour, which are not reliant on knowing about the individual offender, could, however, still be useful in investigative risk assessments. There also exist other, more specific, offence behaviours that would be known to the police even when the offender is still at large which have yet to be investigated through empirical research. These form the focus of Chapter 3.

1.2.3. Summary of risk factor research

The proposition in academic literature (van Wijk, Loeber, et al., 2005) that juvenile sex offenders share many similarities in risk factors to juvenile violent offenders may not be entirely accurate. More recent studies of risk factors for juvenile sexual offending have suggested that there exists a significant flaw in some studies, which has been to consider juvenile sex offenders as a homogenous group. Differences in risk factors between subsets of juvenile sex offenders may become more apparent with further research. Until this line of inquiry is further investigated the question of whether there are factors indicative of a propensity to offend sexually cannot be

satisfactorily answered. The next section of the thesis further considers in more detail the various types of juvenile sex offender that have emerged from the research.

Research into persistent sex offending by juveniles is relatively limited. However, some consistent risk factors are emerging. In addition, some of these studies suggest that certain types of juvenile sex offender are more at risk of persistent offending than others. This indication, however, requires further investigation before any firm conclusions can be reached. This is particularly the case when the studies' designs are considered. Many studies of risk factors for violent and sexual offending have used cross-sectional designs or are solely descriptive. Causal relationships cannot, therefore, be inferred between risk factors and (re)offending. There are also differences in the measurement of offending behaviour, which is problematic since little agreement has been found between prospective self-reports, retrospective self-reports and official measures for onset of offending (Kazemian & Farrington, 2005).

Research into risk factors for sex offending and its persistence has typically been conducted from a therapeutic perspective with the primary goal of identifying factors that can be addressed through treatment programmes. As noted previously, such findings can also hold relevance for policing. Factors which reliably indicate that an offender is likely to continue offending could be used to allocate police investigative and analytical resources. In the author's experience of working as a crime analyst, such "investigative risk assessment" tends to be conducted in a rather subjective and informal manner. Empirically supported risk factors relating to crime scene behaviour or victim characteristics could form the basis of an actuarial investigative risk assessment tool. This topic is returned to in Chapter 3.

1.3. Characteristics of Juvenile Sexual Offending

Early indications from research on the characteristics of juvenile sex offenders suggest that differences exist between juveniles that assault children (termed child molesters) and those that assault either their peers or older victims (termed sexual assaulters). Preliminary research is also noting differences between juvenile sex offenders who assault as groups as opposed to lone offenders. Before continuing and examining these potential typologies it is important to consider the nature of juvenile sex offending in general and how this differs from adult sex offending.

Some juveniles commence their sexual offending at a very young age with some studies reporting juvenile sex offenders as young as six years (Lewis, Shankok, &

Pincus, 1979). Typically, juvenile sex offenders' victims are reported to be younger than the offenders (Barbaree et al., 1993) and are acquaintances (Kjellgren, Wassberg, Calberg, Långström & Svedin, 2006; Miranda & Corcoran, 2000; Wood, Welman & Netto, 2000). However, such findings may be a product of the samples studied (Woodhams, 2004). Juvenile sex offenders assault a wide age range of victims, from toddlers to the elderly (Långström & Lindblad, 2000). Much of the literature reports their victims to be female (e.g. Kjellgren et al., 2006). However, Awad and Saunders (1991) found the likelihood that a victim will be male increases with decreasing victim age.

A finding that has clearly varied from study to study is the degree to which juvenile sex offenders operate alone or as a team. Hunter et al. (2000) and Långström and Lindblad (2000) found the majority of their samples to offend alone. In contrast, others have found co-offending to be commonplace (Boelrijk, 1997, as cited in Bijleveld & Hendriks, 2003; Wood et al., 2000). Woodhams (2004) and Kjellgren et al. (2006) have reported the proportion of group versus lone offences to be closer to 50:50. These variations might again result from differences in the samples studied, such as the offenders' ages, the victim-suspect relationships, and the offenders' legal and mental health status.

Juvenile sex offenders display the same sexually abusive behaviours as adult sex offenders (Barbaree et al., 1993). These range from non-contact offences, such as exhibitionism, to penetrative offences, such as rape or more severe cases of indecent assault (Becker, Johnson & Hunter, 1996). However, juveniles are more likely to penetrate digitally their victim whereas adults are more likely to penetrate their victims anally, orally, and vaginally with a penis (Grubin & Gunn, 1990; Miranda & Corcoran, 2000). Juveniles are also more likely to use force in their sexual offences than adults (Miranda & Corcoran, 2000). The likelihood of penetration and the use of violence/coercion are reported to increase with victim age (Davis & Leitenberg, 1987; Kaufman, Hilliker & Daleiden, 1996). In fact, the incidence of violence in juvenile sex offending is relatively high. Juvenile sex offending is reported to result in physical injury to the victim in one-third of cases (McDermott & Hindelang, 1981). Långström and Lindblad (2000) found 71% of their offenders had used violence in their offence and 14% had used a weapon. Grubin and Gunn (1990) reported that their sample of juvenile rapists were more likely to have used a weapon in the offence compared to their sample of adult rapists. Considering the prevalence of non-sexual offending in the criminal

histories of juvenile sex offenders it is interesting that their sexual offending often occurs in the context of non-sexual offending, such as a burglary or a robbery (Hunter et al., 2000; Vinogradov et al., 1988).

The characteristics of juvenile sex offending can therefore vary between studies. It is argued that this is a product of sampling criteria and procedures resulting in varying compositions of child molesters versus sexual assaulters, stranger versus known victims, and group versus lone offenders. The apparent differences in risk factors for these groups were discussed above. The differences in the offending behaviour of these groups will now be examined in the next section.

1.3.1. Typologies of juvenile sex offenders

1.3.1.1. Child Molesters versus Sexual Assaulters

Research studies have begun to identify two subtypes of juvenile sex offender, juvenile child molesters and juvenile sexual assaulters (Barbaree et al., 1993; Hunter, 2004; Hunter et al., 2000; Kjellgren et al., 2006; van Wijk, van Horn, et al., 2005). Juvenile child molesters are significantly more likely to be of White ethnic origin and to be lone offenders (Hunter et al., 2000), whereas sexual assaulters are more likely to offend in a group (Hunter et al., 2000; Kjellgren et al., 2006). However, the latter is not a consistent finding (Hunter, Figueredo, Malamuth & Becker, 2003). Juvenile child molesters are more likely to have an acquaintance or familial victim, whereas sexual assaulters are more likely to assault strangers and acquaintances (Gunby & Woodhams, in press; Hunter, 2004; Hunter et al., 2000, 2003; Kjellgren et al., 2006; Zolondek, Abel, Northey & Jordan, 2001). Juvenile child molesters are also more likely to assault male victims than juvenile sexual assaulters (Hunter et al., 2000, 2003; Zolondek et al., 2001).

Differences have been observed in the locations of the offences with sexual assaulters more likely to commit the offence outdoors or in a public place (Hunter et al., 2000; 2003). Such findings are quite likely related to the nature of the offender's relationship with the victim. Sexual assaulters are also more likely to attack their victim whilst involved in the commission of another offence (Hunter et al., 2000). Some studies report child molesters to be significantly less likely to use physical force or a weapon against their victim in comparison to the sexual assaulters (Gunby & Woodhams, in press; Hunter, 2004; Hunter et al., 2000, 2003), instead relying on deception or coercion (Gunby & Woodhams, in press; Zolondek et al., 2001). This difference may be explained by variations in victim resistance. However, not all studies

have found a difference between the two groups on physical violence used (Kjellgren et al., 2006). The occurrence of multiple sexual acts was not significantly different between the child molesters and sexual assaulters (Hunter et al., 2000). These findings mirror those found with adult rapists in comparison to adult child molesters (Hunter et al., 2000). Child molesters were also significantly more likely to be under the influence of drugs or alcohol during the offence (Hunter et al., 2003). (This finding does not contradict with those reported in section 1.2.1.5 because this study is comparing two types of juvenile sex offender, it is not concerned with comparing juvenile sex offenders with juvenile non-sex offenders). The researchers do however note a problem with their studies. For example, in Hunter et al. (2003), some cross-over in sampling was apparent with some juveniles having a history of sexual offending that would have enabled placement in both subgroups (e.g. 15% of those that assaulted prepubescent victims and 30% who assaulted a pubescent victim). One solution would have been to use three groupings; child molesters, sexual assaulters, and offenders who displayed both types of offending. Despite this limitation, there does seem to be some differences between juvenile sexual assaulters and juvenile child molesters.

1.3.1.2. Group versus Lone Offenders

As well as observed differences in the modus operandi of juvenile child molesters versus juvenile sexual assaulters, researchers have noted differences in offending behaviour between offenders who act as a group as opposed to those who act alone. Group rapists appear to be more violent towards their victims than lone rapists (Gidycz & Koss, 1990; Woodhams, 2004), however this is not a consistent finding. One study comparing group and lone juvenile sex offenders found no difference in the amount of physical violence inflicted on the victim (Kjellgren et al., 2006). Group offenders are significantly less likely to abuse children, are more likely to assault an acquaintance, and have one rather than multiple victims (Kjellgren et al., 2006). Lone offenders had a more extensive sexual offending history than group offenders (Bijleveld & Hendriks, 2003). However, it is very important to note that the lone offenders were significantly more often older than the lone offenders and this could account for this finding (Bijleveld & Hendriks, 2003). Whilst limited research has been conducted, it suggests there are differences in the characteristics and offending behaviour of group and lone offenders.

1.3.1.3. Methodological Considerations

The majority of the research conducted to date with juvenile sex offenders has sampled clinical populations of apprehended offenders undergoing assessment or treatment. Such research, therefore, suffers from several methodological limitations. The participants' apprehended status means they represent a select group of offenders, whose victim choice or crime scene behaviour may have contributed to their apprehension. In addition, a number of these studies have relied on self-reporting of offence behaviours. Yet, sex offenders are reported to be reluctant to discuss their offending for a variety of psychosocial or legal reasons (Ahlmeyer, Heil, McKee & English, 2000; Groth & Lorendo, 1981), which could affect the reliability of the data. Adolescent sex offenders in particular are reported to minimise or deny their past offences (Saunders & Awad, 1988). One method of gaining a more representative picture of juvenile sexual offending is to use a different sampling approach, sampling crime reports and victim accounts of juvenile sex offences. A study which took just this approach, and which forms part of this thesis was published in 2004 and 2007 (Woodhams, 2004; Woodhams, Gillett & Grant, 2007). The findings of this study are summarized in the next section.

1.4. Characteristics of Juvenile Stranger Sex Offending

Little research exists on stranger sex offenders. Only one research study conducted thus far has focused solely on the characteristics of juvenile stranger sex offending (Woodhams, 2004; Woodhams, Gillett & Grant, 2007). One study was identified on *adult* stranger rapists detained in high security hospitals in England (Greenall & West, 2007). This study reported on the backgrounds, offence behaviours and motivations of a very select sample of 41 adult stranger rapists, namely those detained in high security hospitals in England under the Mental Health Act 1983. Over half the offences occurred in public. The approach used by the rapists to procure his victim was a near equal split between con and surprise style approaches. A weapon was used in three-quarters of the rapes and physical violence was used in nearly 50% of the rapes. All victims were vaginally raped and over half were also subjected to multiple forms of penetration.

The author is working with Northamptonshire Police at present on a study of stranger sexual offences which analyses a more representative sample of adult-perpetrated allegations. Other than the study by Greenall and West (2007), academic

literature on adult stranger rapists has tended to focus on the psychological themes within their sex offending behaviour (e.g. Canter, 1995), or has made comparisons between the characteristics of rapes where different victim-offender relationships exist (Koss, Dinero, Seibel & Cox, 1988; Ullman, Filipas, Townsend & Starzynski, 2006). Victims report stranger rapes as more aggressive, involving more verbal threats to harm and physical violence (Koss et al., 1988), and as being associated with greater perceived life threat (Ullman et al., 2006). Stranger rapes more often involved multiple perpetrators (Koss et al., 1988), an older victim, and victims from ethnic minorities (Ullman et al., 2006). It should be noted that the victims sampled in both studies (Koss et al., 1988; Ullman et al., 2006) were not asked the age of their attacker. Therefore, their samples may contain offences by juveniles and adult sex offenders.

Woodhams (2004; Woodhams, Gillett & Grant, 2007) analysed the characteristics of all stranger sex offences reported to the London Metropolitan Police in the UK in 2001, where the offence was alleged to have involved a juvenile perpetrator (aged less than 18 years). The sample consisted of 495 allegations. These were first analysed to identify characteristics common to such offences, and second to identify variables which were associated with offence severity (as indicated by penetration and physical violence). The data about the alleged offences were extracted from a police crime reporting system.

The majority of suspects were male and their ages ranged from 6-17 years although, most suspects were aged 14-17 years. (The perpetrators are referred to as suspects as the data were allegations and not solved offences. This terminology is used elsewhere in the thesis where appropriate). Approximately, 60% of allegations were committed by lone suspects. Ninety six per cent of victims were female. Their ages ranged from 5-77 years, although most were aged 11-20 years. Most victims were assaulted by a suspect younger than themselves. The most common location for the assault was outdoors.

As reported by previous 'clinical' studies of juvenile sex offenders, juvenile *stranger* sex offenders also engage in behaviours of varying severity. Acts of physical violence (such as punching, kicking and beating) were used but this was in the minority of offences (14%) (Woodhams, 2004). This figure of 14% contrasts with previous 'clinical' studies (e.g. Långström & Lindblad, 2000) that reported greater incidence of physical violence. Physical violence was more likely to occur in offences involving a group of suspects (Woodhams, 2004), a finding that has been noted by other researchers

(e.g. Gidycz & Koss, 1990). With regards to the severity of forced sexual acts, the majority of allegations involved non-penetrative offences, although over 10% of offences did involve some type of penetration (Woodhams, 2004). Penetration was significantly more likely to occur in offences involving, younger victims (in particular it was graphically demonstrated that victims aged 12-16 years were most at risk), older suspects, suspects who were older than their victims, and a group of suspects (Woodhams, 2004).

Woodhams, Gillett and Grant (2007) further investigated the interactions between victim characteristics and penetration and violence. They found older male and younger female victims to be at particular risk of penetrative and physically violent sexual assaults. How the age gap between suspect and victim affected the characteristics of the sexual assaults was examined descriptively using the assaults on female victims. (The number of male victim assaults was too few.) Assaults on older females tended to be only penetrative where physical violence was used. In contrast, penetrative attacks on younger females in the absence of physical violence were common. These differences were explained by the methods of approach used by the suspects. It was argued that an older female will not go with a juvenile suspect unless force is used. In contrast, a younger victim might more easily be deceived and persuaded to accompany the suspect to a secluded location, thus requiring the use of less violence to achieve penetration.

The co-occurrence of penetration and violence in group and lone sexual offences was also investigated by Woodhams, Gillett and Grant (2007). This study suggested that violence in juvenile stranger sex offences did not solely serve the purpose of controlling the victim so that penetration could take place. It also appeared to serve an expressive purpose. In psychology, instrumental aggression and expressive aggression are differentiated in terms of their purpose. If aggression is instrumental it is being used to achieve a further goal, whereas expressive aggression is emotionally prompted and by being aggressive the aversive emotional state experienced by the individual is reduced (Feshbach, 1964; McClellan, 2008; McGuire, 2004). Similarly, in the sexual offending literature, a distinction is made between violence or aggression which is emotionally prompted and violence and aggression which is used to gain compliance so that the sexual assault may take place. Expressive aggression has been referred to as “aggression stemming from the offender’s uncontrollable rage, anger, or need to control the victim” and is “evidenced by force far beyond what was necessary to gain victim

compliance” (Prentky, Burgess & Carter, 1986, p. 77). Davies (1992) does not use the term “expressive aggression” but instead refers to gratuitous violence; violence which does not occur in response to resistance by the victim. Holmstrom and Burgess (1980) define an anger rape as a rape where more force is used than is necessary to ‘subdue’ the victim. Häkkänen et al. (2004) and Smith (2000) also differentiate between violence for the purposes of controlling the victim and violence that is unrelated to control. Whether violence in group sexual offences serves an expressive or instrumental purpose is a line of investigation which is further developed in Chapter 4.

1.5. The Impact of Juvenile Stranger Sex Offending

The sample size in Woodhams (2004) is indicative of the scale of offending by stranger juvenile sex offenders. Five hundred cases per year for each large metropolitan city in the UK make for a considerable number of alleged offences requiring police investigation. Official statistics of juvenile sex offending against all types of victim also highlight the scale of this social problem. Between the years 2000-2002, male juveniles (aged under 18 years) were arrested for 7,500 sexual offences in England and Wales, approximately 16% of all sexual offences for these two years (Ayres, Perry & Hayward, 2002). The British Crime Survey 1998 and 2000 (Myhill & Allen, 2002) reported suspects aged under 16 years to be allegedly responsible for 1% of rapes and 2% of sexual assaults. The figures dramatically rose for suspects aged 16-19 years, with this group being allegedly responsible for 10% of rapes and 20% of sexual assaults. Since sexual offences are notoriously underreported (Simmons & Dodd, 2003) the incidence of juvenile (stranger) sex offending could be even higher. Juvenile stranger sex offenders clearly require considerable investigative resources.

In sexual assaults in general, one third of victims receive physical injuries (Feist et al., 2007). The psychological impact for the victim is also substantial and can be long-lasting (Resnick, 1993). Victims’ reactions to rape include post-traumatic stress disorder, eating disorders, fear, depression and anxiety, alcohol and/or drug abuse, low self-esteem, experiencing feelings of blame and loss, and sexual dysfunction (Crome & McCabe, 1995; Faravelli, Giugni, Salvatori & Ricca, 2004; Resnick, 1993). Victims may alter their lifestyles and can experience difficulties in their relationships with others. Such outcomes have been termed Rape Trauma Syndrome (Burgess & Holmstrom, 1974). More recently, researchers have investigated how the losses experienced by victims of crime might be quantified. One approach has been to

calculate the number of quality-adjusted life years lost by victims. Using this approach, it is victims of rape that suffer the most (Dolan, Loomes, Peasgood & Tsuchiya, 2005). The average monetary cost of a sexual assault to society has been calculated at £31, 400 with the cost to the victim being £27, 200 (Home Office, 2007).

Although these outcomes may be experienced by victims of all types of rape, differences have been reported in the experiences of victims of acquaintance versus stranger rape (Katz, 1991; Petretic-Jackson & Tobin, 1996). The betrayal of trust inherent in an acquaintance rape is proposed to result in cognitive reactions, such as self-blame and a decrease in self-esteem (Petretic-Jackson & Tobin, 1996). Katz (1991) found victims of stranger rape to experience less self-blame, view themselves more positively, and report better recovery than victims of other types of rape. No significant differences were found for the women's experience of psychological distress. A more recent study comparing the recovery of victims assaulted by strangers, acquaintances, relatives and romantic partners (Ullman et al., 2006) found victims of sexual assaults committed by strangers and relatives to show more post-traumatic stress disorder symptoms and to report experiencing more negative social reactions than victims assaulted by acquaintances and romantic partners.

Whilst victims of stranger rape appear to make a better recovery in some aspects than victims of acquaintance rape, the impact of stranger rape is still substantial. Victims may experience acute reactions to rape for only the first few months post-assault, however more chronic reactions can be experienced for decades after the incident (Crome & McCabe, 1995; Resnick 1993). Juvenile sex offending does not only carry considerable human cost, it impacts on society through economic costs and fear of crime (Hough, 1995). Engaging in stranger sexual offending has been proposed as a risk factor for future recidivism (Worling & Långström, 2003). In the long term, juvenile stranger sex offenders could be even more costly to society because several offences require investigation, because of the impact on multiple victims, and potentially because of the costs of repeated incarceration.

Whilst psychologists can develop effective treatment programmes for these offenders and can assist the recovery of victims, the potential also exists for psychology to assist in the investigation of sex offending. With only one-third of stranger rapes in England and Wales being detected by police (Harris & Grace, 1999), and with conviction rates for sexual offences ranging from 6-13% (Feist et al., 2007), any such contribution from psychology could be important. The contribution of psychological

research to the proposed process of investigative risk assessment has already been outlined and is discussed further in Chapter 3. Psychological theory and research can also contribute to the process of case linkage, the identification of serial sex offences, and to knowledge of group sexual offending. These contributions are reported in more detail in Chapter 2 and 4, respectively.

CHAPTER 2

BEHAVIOURAL CONSISTENCY AND LINKING CRIMES

2.1 Introduction

Much of the introduction to this chapter was published in Woodhams, Hollin and Bull (2007) and Woodhams, Hollin and Bull (2008a).

2.1.1. Investigating stranger sex offending: Linking crimes

Stranger sex offending is a policing priority (Häkkinen, et al., 2004). As well as being investigated by police officers in the traditional manner, civilian personnel are employed by the police to analyse crime. Such personnel are called crime analysts. Crime analysts work on a variety of crimes including stranger sexual offences. They can be employed at the police force level, however a specialist analysis unit has also been established in England with national responsibility for the analysis of stranger sex offences. This agency is called the Serious Crime Analysis Section (SCAS) of the National Policing Improvement Agency.

A major role of such crime analysts is to conduct case linkage. Case linkage is also known as linkage analysis (Hazelwood & Warren, 2003) and comparative case analysis (Bennell & Canter, 2002; Merry, 2000). It involves “identifying behavioural similarities between offences that point to them being committed by the same perpetrator” (Woodhams & Grant, 2006, p. 245). It therefore assists in targeting the minority of offenders who are committing the majority of the crime. Such offenders are termed *serial* offenders and the offences they commit are collectively referred to as a *crime series* (Woodhams, Hollin & Bull, 2007). Typically, case linkage is conducted with serious types of crime, however it is also used with volume crime, such as robbery (Woodhams & Toye, 2007), burglary (Bennell & Canter, 2002; Bennell & Jones, 2005) and car crime (Santtila, Korpela & Häkkinen, 2004; Tonkin, Grant & Bond, 2008).

Ideally, physical evidence such as DNA or fingerprints would be used to link offences to a common offender. However, physical evidence is not always available (Davies, 1991). In such cases, crimes can be linked by behavioural similarity. Linking crimes to a common offender has a number of benefits for the police. First, information from various crime scenes can be pooled, potentially increasing the evidence against an offender (Grubin, Kelly & Brunsdon, 2001). Second, crimes suspected of being committed by the same individual can be investigated together, rather than separately. Limited police resources can therefore be deployed more effectively. Also if crimes are

shown to be linked, each individual victim gains credibility from the others (Davies, 1992). For example, evidence that a sexual offence is linked to another offence significantly increases the odds of securing a conviction (Feist et al., 2007).

Evidence of behavioural similarity can be, and has been, presented as similar fact evidence in legal proceedings (Hazelwood & Warren, 2003; Labuschagne, 2006). Such evidence was admitted in England in 1952 for the case of *R v. Straffen* where the defendant had been accused of a series of murders. Robert Hazelwood provided expert testimony in the case of the State of New Jersey v. Fortin (2000) as to the behavioural similarity between a sexual homicide and a sexual assault. More recently, Labuschagne (2006) presented linkage analysis evidence in the case of the Newcastle serial murderer in South Africa.

2.1.2. Conducting case linkage

The process of case linkage requires a form of behavioural analysis (Davies, 1991). The first stage involves the analyst studying each crime in detail to try to gain an understanding of the offender's behaviour in each. Behaviours can be physical or verbal. The source of this information is usually the victim's account of the crime, where the crime did not result in the victim's death. This can be in the form of a statement made to the police, the transcript of a victim interview, or a video-recording of the interview itself. Since 2002, the advice to police officers in England and Wales has been to interview child and other vulnerable witnesses (including rape victims) according to the Achieving Best Evidence guidelines (Home Office, 2002), which are based on the cognitive interview (Akehurst, Milne & Köhnken, 2003). Research suggests that the cognitive interview results in a similar proportion of correct information to the standard interview but elicits a larger amount of detail from the interviewee (Köhnken, Milne, Memon & Bull, 1999). Despite these improvements there are still difficulties associated with using this source as information about offender behaviour (Alison, Snook & Stein, 2001; Woodhams & Grant, 2006).

From studying this material, the analyst must identify the relevant behaviours in each offence (Grubin et al., 2001). Historically, there has been debate as to whether *modus operandi* (MO) behaviours, that is those necessary to commit successfully the offence (Davies, 1992; Hazelwood & Warren, 2003), should be used in the behavioural linking of crimes. Some authors warn that MO is susceptible to change because it is learned behaviour (Davies, 1992; Douglas & Munn, 1992). Instead, it is proposed that ritualistic, or fantasy-based behaviours, should be analysed. However, for crimes

including robbery such behaviours are unlikely to be displayed due to the nature of the crime. In addition, empirical studies have identified linked crimes with some accuracy using MO behaviours (e.g. Grubin et al., 2001; Woodhams & Toye, 2007).

The next stage of the linking process requires the analyst to compare the behaviours in each crime with all others, noting any similarities and differences. This is not a simple task since the analyst must also consider the antecedents for each behaviour. The context in which a behaviour occurs can be important, for example, the property stolen in two robberies committed by the same offender might appear to vary if on one occasion cash was stolen but on another occasion jewellery was stolen. However, when considering the context of the behaviour in the second offence, the analyst may discover that the offender did demand cash from the victim but on discovering they did not have any, jewellery was demanded instead. In summary, this stage requires the analyst determining the “degree of match” between the offences (Grubin et al., 2001).

Whilst two offences might share a number of similar behaviours, the analyst must also consider whether these similarities are due to coincidence (Grubin et al., 2001). In essence, they must weight the similarities between the offences by considering the frequency with which each similar behaviour occurs in its population of crimes. For example, whilst two robberies might share a common feature of cash being stolen, this is not strong evidence of linkage if cash is the most common property stolen in robberies. The co-occurrence of a number of similarities is important. Offences may share a few similar offence behaviours, but they may have a multitude of others that are dissimilar. Hazelwood and Warren (2003) add that it is the *specific combination* of similar behaviours that can indicate a common offender.

Bennell and Canter (2002) have proposed that the practice of linking crimes shares similarities with making medical diagnoses. They explain that with two possible decisions for an analyst to make (linked or not linked) and two possible realities (actually linked, not actually linked) there are four possible outcomes to the task of linking crimes. These include correctly identifying linked crimes (hits) and correctly rejecting unlinked crimes (correct rejections). Alternatively, incorrect decisions can be made. An analyst may mistakenly link crimes by different offenders (false alarms) or fail to link crimes by the same offender (misses). This has parallels with other decision-making tasks in forensic psychology, such as the risk assessment of offenders. Like risk assessment, case linkage can also involve actuarial and clinical elements. The first

author has been involved in helping a police force develop a more actuarial method for linking crimes using statistical programmes. However, even if such programmes are successful at identifying linked offences, the (clinical) expertise of the analyst is still required since the programmes are not yet at a stage where they can take account of the potential impact of the context of a behaviour. Instead they can only capture whether a behaviour occurred or not.

2.1.3. The assumptions of case linkage

To link crimes accurately to a common offender based on their behavioural similarity two assumptions must be satisfied; the assumption of behavioural consistency, and the assumption of inter-individual variation.

2.1.3.1. Behavioural Consistency

For crime analysts to be able to identify crimes committed by a common perpetrator, criminals must show a degree of consistency in the way they behave when committing their crimes. Canter (1995) referred to this assumption as the Offender Consistency Hypothesis. However, this is not a newly developed concept but one that has received considerable attention in the last four decades in the field of Personality Psychology (Pervin, 2002). It is only in more recent years that these principles have been applied to criminal behaviour.

In the 1970s, the field of Personality Psychology, suffered what was described as a paradigm crisis (Bem & Allen, 1974). This crisis developed because the intuitive stance that people show consistency in their behaviour across situations seemed in conflict with the research evidence, which was suggesting variability (Mischel, Shoda & Mendoza-Denton, 2002). In essence, some researchers held the view that people were consistent in their behaviour because of personality traits (the person side of the debate) whereas others rejected that people were consistent and instead proposed that the situation affected consistency (the situation side of the debate) (Kamrath, Mendoza-Denton & Mischel, 2005; Pervin, 2002; Shoda & Mischel, 2000).

The person-situation debate is at the stage now where the influence of both the person and the situation is recognised. Researchers, such as Mischel (1999), suggest that the situation interacts with attributes of the person to produce behaviour. The way in which this occurs is through a personality processing system. Mischel and Shoda (1995) have suggested their cognitive-affective personality system (CAPS) and similar models have been proposed by other authors (Greene, 1989; Meyer, 1990). These systems are constructed of mental representations (e.g. goals, expectations, beliefs,

plans and strategies) “Whose activation or inhibition leads to the behaviours displayed” (Mischel et al., 2002, p. 53). The features of a situation and how a person interprets them stimulate certain cognitions and affects, which in turn activate plans, strategies and, ultimately, behaviours through “stable associative links” (Shoda, LeeTiernan & Mischel, 2002). The resulting behaviour therefore depends on how the situation and person variables interact.

In an interpersonal type of crime, the situational input for one person can be the other person’s behavioural output (Shoda & Mischel, 2000). In single-offender, single-victim sex offences, the offender’s behavioural output can be the victim’s situational input and vice versa. In the case of group rape, things are more complicated. One offender’s behavioural output can be the situational input for both the victim and his/her co-offenders and vice versa.

The likelihood of activation (or being reminded of a behavioural strategy) is related to how similar previous situations are to the current situation (Meyer, 1990). Similar situations elicit similar cognitions, affect and behaviour (Mischel, 1999). What makes two situations similar is not their physical characteristics but their psychological meaning (Shoda, 1999). Situations that have been rated as more similar have been shown to elicit consistent behaviour in a non-forensic setting (Funder & Colvin, 1991; Furr & Funder, 2003; Shoda, Mischel & Wright, 1994; Wright & Mischel, 1987).

Internal events, as well as external events, can trigger the personality processing system (Mischel, 1999). Greene (1989) has proposed that similar goals will trigger similar behavioural strategies and therefore result in consistent behaviour. He adds that the more frequently a strategy is activated the stronger it becomes and the more likely it will be activated in the future. In addition, the amount of time that has passed will affect the likelihood of activation because the memory trace is proposed to decay if it is not activated (Meyer, 1990).

These theories of behavioural consistency therefore suggest that the behaviour an individual will display will depend on the person’s current goal, the situational characteristics and the person’s past learning experiences. Mischel and colleagues (Mischel, 1999; Wright & Mischel, 1987) have therefore proposed that people will have their own *distinct* ‘if (situation) – then (behaviour)’ profiles or behavioural signatures (Shoda et al., 1994). However, Greene (1989, p. 202) proposed that “Because some things work in achieving goals and others do not, people will tend to establish similar representations of action-outcome relationships”. Therefore in the context of rape, for

example, some behavioural repertoires will be more successful than others for all rapists. Greene adds that we would expect a degree of correspondence between the objective aspects of a situation and the triggers for a behaviour. Therefore, the more similar the objective characteristics of a situation, the more similar its psychological meaning, and the more similar the resulting behaviour.

Findings from non-forensic studies that similar situations elicit greater behavioural consistency would suggest more potential for the practice of case linkage than for offender profiling. Offender profiling involves the prediction of offender characteristics based on the individual's behaviour at the crime scene (Ainsworth, 2000). The effect of the situation has never been considered in studies of case linkage whether at a macro or micro level. Case linkage assumes consistency over the same type of situations (i.e. across a series of stranger rapes). Whereas offender profiling assumes a degree of consistency between the way someone behaves during a crime and the way they behave in their everyday lives. For example, Canter (2000, p. 39) stated that crime "Is an extreme form of non-criminal activity, and is therefore likely to reflect variations that occur in ordinary day-to-day interpersonal activities". There are still likely to be variations in an offender's behaviour across their series, however for case linkage it would be predicted that this variation is less than the offender's consistency. An offender's behaviour might change due to learning from previous victims, contact with the police and legal processes, media publicity, victim resistance, and the offender's perception of the victim (Davies, 1992). The cognitive personality models proposed to explain behavioural consistency can theoretically account for the effect of these factors.

2.1.3.2. Inter-Individual Variation

To assign offences to the same offender, criminals must not only be consistent, they must be consistent in a relatively individual manner. If offenders were consistent in their behaviour but consistent in the same way it would be impossible to distinguish one individual's offences from those of another individual. Canter (1995, p. 349), whilst not articulating it as an assumption of case linkage, alluded to this situation. He states "The way an offender commits crimes is characteristic of that individual and distinguishable from the offence 'style' of other offenders committing similar crimes". When evaluating the assumptions of offender profiling, Alison, Bennell, Mokros and Ormerod (2002) articulate this as the necessary condition of greater inter-individual variation in behaviour than intra-individual behavioural variation. In other words, there

must be greater variation in the way different offenders behave in their offences compared to the variation that an individual offender might show in the way he/she commits offences. Researchers of non-criminal behaviour have termed this “distinctive consistency” (Furr & Funder, 2003) and it has received empirical support in personality psychology (e.g. Funder & Colvin, 1991).

The proposed personality processing systems would predict inter-individual variation as well as intra-individual consistency. Zayas, Shoda and Ayduk (2002, p. 856) state “Individuals’ cognitive affective personality system networks are expected to differ in the availability of specific cognitions or affects, as well as in the pattern and strengths of the associations among the cognitions and affects, which determines the ease with which they are activated”. In the same way that such a system would predict consistency in an individual’s behaviour across psychologically similar situations, the same situation might result in different behaviour from different individuals because of their distinctive personality processing systems. Shoda, Mischel and Wright (1993) explain that individuals encounter and react to situational demands differently. For example, Mischel and Shoda (1995) explain that in a situation of receiving criticism from an intimate partner, individuals more sensitive to rejection would be more upset than those less sensitive. This theory suggests that we can expect to observe, under certain conditions, both behavioural consistency and behavioural distinctiveness.

2.1.4. Factors affecting behavioural consistency

Theory and research from personality psychology suggest that factors other than the psychological similarity of situations will affect behavioural consistency. Some of these factors are relevant to case linkage. Pervin (2002) explained that the shorter the time span over which a behaviour is observed the greater the behavioural consistency shown. This has been observed with examples of aggressive behaviour (Walters, 2000). Such findings are quite likely because the passage of less time will afford the individual with fewer opportunities for new learning experiences and subsequent modification of mental representations. This suggests that crime analysts can expect greater consistency in crime series which occur over shorter time periods.

Greater behavioural consistency has been predicted in adulthood compared to childhood (Pervin, 2002). Mischel (1999) explains that the cognitive affective personality system will change during periods of development. However, Shoda et al. (1993) found children to be consistent in their *aggressive* behaviour across psychologically similar situations. Juvenile offenders may show greater consistency in

some behaviours than others. For example, during a period of sexual maturation and change, we might expect less consistency in the sexual offending behaviours of juveniles. These findings have implications for linking crimes committed by juvenile offenders, a topic not previously researched, but a focus of this thesis.

Finally, research in personality psychology has indicated that consistency varies depending on the type of behaviour being measured. Furr and Funder (2003) found greater consistency in automatic behaviours, such as laughing and gesturing, rather than planned behaviours. It is unclear quite how this would transfer to the task of case linkage. More applicable are findings from Funder and Colvin (1991) who differentiate behaviours that are *elicited* from the individual in direct response to a specific situational stimulus (and are therefore stimulus-specific or situation-specific), and behaviours that are *emitted* by the individual. Emitted behaviours are predicted to be displayed across a wide range of situations because they do not require a specific eliciting stimulus. Instead they are proposed to “express the characteristics of the behaving person” (p. 791), such as personality dispositions.

Similarly, Hettema and Hol (1998) distinguish behaviours under *primary control* and those under *secondary control*. Primary control behaviours involve acting on the environment. They reflect the needs or desires of the individual and are goal-directed. Research suggests they are consistent across situations. Criminal behaviours might be expected to fall within this category suggesting that they would show consistency across a series. In addition, the imbalance of power seen in some interpersonal crimes may provide an ideal opportunity for an offender to manipulate or act on his/her environment. Although not referring to crime, Hettema and Van Bakel (1997) summarise this well. They state that “Consistency is to be expected, particularly in...relationships where goal-directed persons meet situations allowing them to transform the situation in the direction they prefer” (p. 225). This raises questions about the impact of victim resistance on offender consistency in interpersonal crimes. A less resistant victim may enable the offender to manipulate the situation to fit his/her goals resulting in behavioural consistency, whereas if encountering a more resistant victim or if disturbed by witnesses, the offender must react to a stimulus and might be less consistent.

Further, Hettema and Van Bakel (1997) explain that such situations are particularly likely to arise where the actor is experienced in the activity. Serial sex offences could fall into this category if the serial offender is considered to be

experienced at committing sexual offences, whereas the victim is unlikely to be, unless they have previously experienced sexual victimization. Consistency in offending behaviour might, therefore, be expected to increase the more experienced an offender becomes. Using a non-forensic sample, Hettema and Van Bakel (1997) found experience/familiarity with a situation to increase behavioural consistency. Cognitive-affective personality models can account for this finding. As noted above, the more frequently a behavioural strategy is activated the stronger it becomes and the more likely it will be activated in the future (Greene, 1989).

Emitted behaviours (those not dependant on a specific stimulus and that reflect the characteristics of the acting individual) are therefore reported to be more consistent than elicited behaviours (those that occur in direct response to a specific stimulus). By borrowing an example from Bennell and Canter (2002) this can be related to the task of linking crimes. Bennell and Canter (2002) explain that stealing property during burglaries very much depends on what property is available to steal. This would seem to represent an elicited behaviour (Funder & Colvin, 1991), as what property is stolen is stimulus-specific. It follows that little behavioural consistency would be expected in this behaviour. Related to this is the finding of greater consistency in unstructured situations (Pervin, 2002). It is probable that unstructured situations provide greater opportunity for emitted behaviours because the individual is not tied to a formal script. Crime could be considered, at least partly, an unstructured situation.

In summary, there are two assumptions that underlie the practice of linking crimes. With regards to the assumption of behavioural consistency, research by personality psychologists has suggested that people are consistent in their behaviour across situations providing the situations are psychologically similar. There is also supportive evidence for the second assumption of inter-individual variation in behaviour. Personality psychologists have found people to have distinctive but stable behavioural signatures. The non-forensic literature therefore suggests support for the practice of linking crimes under certain conditions. Forensic psychologists have more recently begun to research the assumptions underlying linking crimes with forensic data.

2.1.5. Empirical evidence for the psychology of linking crimes

Some studies conducted with offenders have assessed whether offenders show consistency in aspects of their offending behaviour. Only four studies thus far have directly assessed the consistency of sexually violent criminal behaviour (Canter et al.,

1991; Grubin et al., 2001; Knight, Warren, Reboussin & Soley, 1998; Santtila, Junkkila & Sandnabba, 2005). These studies are discussed below. Other studies exist whose findings are relevant in assessing the consistency of sexually violent behaviour although these studies were not necessarily conducted with this purpose in mind.

In 2000, Walters reviewed the literature on the cross-situational consistency of aggressive behaviour. He noted that the evidence for cross-situational consistency of aggression was not impressive but that the more similar the situations were the more likely the consistent use of aggression. Aggressive behaviour may therefore be consistent from one crime to the next.

In relation to sex offending in general, studies have demonstrated stability in victim type (defined by age, gender and relationship to offender), particularly stranger victims, type of sex offence, and offence behaviours over time (Cann, Friendship & Gozna, 2007; Sjöstedt, Långström, Sturidsson & Grann, 2004; Soothill, Francis, Sanderson & Ackerley, 2000). Offence behaviours assessed included penetration, use of threats and violence.

Knight et al. (1998) investigated the consistency of offence behaviours across series of offences in more depth. The aim of their study was not to assess linkage analysis but to determine if crime scene behaviours could be used to predict rapist type (as categorised on the Massachusetts Treatment Center, Rapist Typology Version 3 (MTC:R3). Their participants were serial male rapists who had assaulted adult female victims. Each offender's five most recent crimes were rated on behavioural scales. Consistency in behaviour was assessed by calculating correlations for each scale item (a behaviour) within each offence pair and categorising each scale item as showing 'none' to 'very high' consistency based on the number of significant correlations. They found considerable variation in the consistency of offence behaviours with some behaviours showing consistency and others showing little consistency. A selection of their findings is displayed in Table 2A. What becomes apparent from their paper is that some behaviours that would be expected to occur in a rape have not been recorded, for example more minor sexual acts and behaviours relating to escaping the scene undetected. In addition, some of the coding categories seem to overlap, for example "planning of rape" and "extensive planning".

Table 2A: The Relative Consistency of Offence Behaviours over Time for a Sample of Serial Rapists

High Consistency Behaviours	Moderate Consistency Behaviours	Low - No Consistency Behaviours
Gun/rifle present	Alcohol/Drug use during crime	Macho behaviour
Cut/slash clothing	Intentional infliction of pain	Weapon use
Excessive response to resistance	Excessive profanity	Overpowering approach
Victim bound	Sexual dysfunction	Offender biting
	Interest in victim enjoyment	Victim injury
	Inquisitive	Demeaning about victim
	Humiliation of victim	Sexual ritual
	Sadistic infliction of pain	Sexual comments
	Foreign object used in sex	

Source: A selection of data extracted from Knight et al. (1998).

Findings of less consistency in modus operandi have also been reported. Several studies from different countries with incarcerated sex offenders have shown that some offenders are not stable in their choice of victim with regard to victim age, victim gender, or victim-offender relationship (Abel, Becker, Cunningham-Rathner, Mittelman & Rouleau, 1988; Cann et al., 2006; Elliott, Browne & Kilcoyne, 1995; Grubin & Kennedy, 1991; Langton & Marshall, 2001; Simon, 2000; Studer, Clelland, Aylwin, Reddon & Monro, 2000). Some variation has also been reported in sex offenders' offence behaviours (Langton & Marshall, 2001; Simon, 2000). On the surface, these research findings seem to contradict previous findings, indicating little support for behavioural consistency in sex offending. However, a more comprehensive study by Guay, Proulx, Cusson and Ouimet (2001) has found that whilst some types of sex offender show variation in their offending behaviour, others are much more consistent. Guay et al. (2001) found sex offenders who targeted adults or prepubescent children to be relatively stable in their victim choice over time. However, offenders who targeted pubescent children showed less stability in their offence behaviour. The relationship with the victim (familiar versus unfamiliar) also showed relative stability for offenders who assaulted adults or prepubescent children. The majority of offenders were also stable in the gender of their victims. Guay et al. (2001) found offenders who targeted

unfamiliar adult women were the most stable in their offending and any variation that did occur related to the alternative targeting of teenage girls. Stranger sex offenders therefore seem to be the type of sex offender most likely to show behavioural consistency. However, the research reviewed thus far has sampled adult rather than juvenile sex offenders. These studies, whilst interesting, are limited in their applicability to the practice of linking crimes because of the behaviours they have measured and the methodologies they have followed.

Specific research into linking crimes began in 1976 with a study by Green, Booth and Biderman of residential burglaries. Green, et al. investigated whether linked series of burglaries could be identified using cluster analysis. They considered six modus operandi categories: location of entry, side of entry, location on block, method of opening, day of week, value of property and type of material taken (this last variable was divided into eight subcategories). They used a sample of 15 burglaries committed by three burglars. The cluster analysis allocated all but one of the offences to the correct offender on the basis of similarity. It should however be noted that the authors specifically selected these series of burglaries on the basis that their MOs differed from one another.

Since 1976, fourteen other studies were identified which have aimed to assess the consistency of criminal behaviour (Bateman & Salfati, 2007; Bennell & Canter, 2002; Bennell & Jones, 2005; Canter et al., 1991; Goodwill & Alison, 2006; Grubin et al., 2001; Hammond, 1990 as cited in Canter, 1995; Santtila, Fritzson & Tamelander, 2004; Santtila et al., 2005; Santtila et al., 2008; Salfati & Bateman, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007; Yokota & Canter, 2004). These studies have sampled residential and commercial burglaries, vehicle thefts, commercial robberies, arsons, homicides and rapes. They have all indicated that offenders are consistent *to a degree* in their offending behaviour. These studies have therefore provided some support for the assumption of behavioural consistency.

In relation to the second assumption of case linkage, eleven studies have gone on to determine whether linked offences can be distinguished from offences committed by other offenders based on behavioural similarity. Again this has been successful to varying degrees using commercial and residential burglary (Bennell & Canter, 2002; Bennell & Jones, 2005; Goodwill & Alison, 2006), commercial robbery (Woodhams & Toye, 2007), sexual offences (Canter et al., 1991; Grubin et al., 2001; Hammond, 1990 as cited by Canter, 1995; Santtila et al., 2005), homicide (Santtila et al., 2008), car

crime (Tonkin et al., 2008), and arson (Santtila, Fritzon & Tamelander., 2004). Some studies have reported linkage accuracy greater than chance (Bennell & Canter, 2002; Bennell & Jones, 2005; Grubin et al., 2001; Santtila et al., 2005; Santtila et al., 2008; Tonkin et al., 2008; Woodhams & Toye, 2007) but accuracy appears to vary depending on the types of behaviour used in the linking task. Some of these studies have allocated individual offence behaviours to domains representing behaviours with a similar function (Bennell & Canter, 2002; Bennell & Jones, 2005; Grubin et al., 2001; Tonkin et al., 2008; Woodhams & Toye, 2007). Allocation of behaviours to domains has been on the basis of past literature on the crime type under investigation. The predictive accuracy of each behavioural domain has then been investigated separately.

Bennell and Canter (2002) and Bennell and Jones (2005) found geographical distance between crimes to be the best predictor of linkage, with crimes geographically proximate being more likely to be by the same offender. Little variation was found in the predictive accuracy of more traditional MO variables (target selection, entry behaviours and property stolen). Target selection represented behaviours related to choosing the property to be burgled. Entry behaviours were how the premises were entered by the offenders (e.g. through the front door, window, etc). Property stolen is self-explanatory. Whilst the predictive accuracy of these variables was better than chance the levels of predictive accuracy were relatively low according to published standards (Hosmer & Lemeshow, 2000).

Similar findings were reported by Tonkin et al. (2008) for their study of serial car theft. Inter-crime distance and inter-dump distance (the distance between the sites at which the vehicles were left) reached good levels of predictive accuracy. Whilst similarity in target selection behaviours predicted category membership significantly better than chance, its predictive accuracy was low according to published standards (Hosmer & Lemeshow, 2000). Neither target acquisition nor disposal behaviours predicted category membership significantly better than chance.

Woodhams and Toye (2007) also found geographical distance between crimes to be an accurate predictor of linkage, however, in contrast, they also found Control behaviours to have high predictive accuracy. Control behaviours included the style of communication used with witnesses, and the type of weapon used. Planning (e.g. wearing a disguise, gloves) and target selection behaviours were less accurate predictors. Property stolen was also investigated as a behavioural domain by

Woodhams and Toye (2007), however its use was abandoned due to little variation between offenders in the type of property stolen.

In their study of serial homicide, Bateman and Salfati (2007) also found greater consistency in their domain of control and planning. This domain contained similar behaviours to those used by Woodhams and Toye (2007). However, Woodhams and Toye investigated planning and control behaviours as separate domains. It is possible that the consistency observed for this domain in Bateman and Salfati's study could entirely be explained by the control behaviours. In addition, other behaviours indicative of planning and avoiding escape were located within alternative domains. For example, 'body parts scattered' was located within the mutilation behaviour domain yet this could be an attempt to avoid detection (and hence would represent an escape or planning behaviour).

Grubin et al. (2001) also found control and escape (related to planning) behaviours to show greater consistency across series than sexual or style behaviours in their sample of serial stranger rapes. The Sexual behaviour domain is self-explanatory. The Style domain represented behaviours which were not required to commit the offence (e.g. apologising to the victim and the offender making excuses for his behaviour). Grubin et al. (2001) found the inclusion of geographical and temporal proximity increased the hit rate (accurate identification of linked crimes) but at the same time it increased the miss rate (failure to identify linked crimes).

Goodwill and Alison (2006) found geo-spatial and temporal information to outperform traditional MO variables in linking burglaries. However, the relatively poor performance of MO variables might be explained in two ways. Goodwill and Alison did not break the MO variables down into functional domains. Considering the variation of reported predictive accuracy for different MO behaviours, it is quite possible that more effective MO variables would have been missed. In addition, control behaviours do not tend to occur in burglaries because of the nature of this type of crime. In summary, whilst only limited studies have tested the relative predictive accuracy of crime scene variables, geographical proximity, control and planning (escape) behaviours are emerging as reliable predictors for case linkage.

Grubin et al. (2001) suggest two reasons for these findings. First, is that these behavioural domains may contain behaviours that are more accurately recalled by the victim. Victims may better remember how the offender threatened them (a Control domain behaviour) compared to whether the offender disclosed something about

himself (a Style domain behaviour). A further possibility is that, when interviewing a victim or writing a victim statement, the police are trying to demonstrate clearly that an offence occurred. In both robbery and sexual assault the officers will be keen to establish how the victim was controlled and how the offender made his escape, as this could have implications for the likelihood of obtaining a conviction, defining an offence (for example as robbery rather than theft or burglary), and for the ongoing investigation. More details may therefore be available about such behaviours (Woodhams & Toye, 2007). Second, the behavioural domains reported to have greater predictive accuracy may capture behaviours that are more inherent of the offender, or as Bennell and Canter (2002) explain, behaviours that are less situation-dependent. This relates to findings mentioned above, where personality psychologists have found greater behavioural consistency for behaviours *emitted* by the offender (Funder & Colvin, 1991).

Paraphilias are one reason why we might observe consistency in sexual offending behaviours as sexual fantasy is something that is inherent to the offender. Paraphilias are “repeated and intense sexual urges, behaviour or fantasies in response to objects or situations that society deems inappropriate” (Bennett, 2006, p. 262). Whilst, not all are illegal, it is quite likely that evidence of a paraphilia, such as frotteurism, paedophilia and sexual sadism, would be apparent from a sex offender’s offence behaviour. Indeed, paraphilias have been found to co-occur with sexual aggression (Abel & Rouleau, 1990; Bradford, Boulet, & Pawlek, 1992, both as cited in Lussier et al., 2007).

Frotteurism involves “sexually arousing fantasies, sexual urges or behaviors involving touching and rubbing against a non-consenting person” (American Psychiatric Association, 1994). Another paraphilia, partialism, involves the person being focused exclusively on one part of the body, for example, the feet. Such behaviours if displayed in a sexual offence would be located within the Sexual domain, as defined by Grubin et al. (2001).

Paedophilia refers to “sexually arousing fantasies, sexual urges or behaviors involving sexual activity with a prepubescent child or children (generally aged 13 years or younger)” (American Psychiatric Association, 1994). To be diagnosed with paedophilia, the offender would need to be aged 16 years or older and the child must be at least five years younger than the offender (American Psychiatric Association, 1994), therefore this diagnosis would not apply to all juvenile sex offenders. In terms of linking crimes, we might expect to see such offenders showing consistency in the type

of victim they target, however this would not necessarily always be the case. The DSM-IV (American Psychiatric Association, 1994) makes a distinction between paedophiles who are sexually aroused by a specific gender of child and those who are not. The latter type may not, therefore, be consistent in their choice of victim gender. The DSM-IV (American Psychiatric Association, 1994) also differentiates between exclusive and non-exclusive paedophiles, with the latter sexually assaulting children as well as peers and/or adults. With the latter type of paedophile, variation could be expected in victim age across a series. As was noted earlier in this thesis, some adult sex offenders do show consistency in the age and gender of victim they assault but there is also evidence to suggest “cross-over” in victim type for other adult sex offenders. With regards to juvenile sex offenders in particular, Leclerc and Tremblay (2007) found nearly one fifth of their adolescent child molesters assaulted both females and males.

Sexual sadism is another paraphilia defined within the DSM-IV (American Psychiatric Association). It is defined as “sexually arousing fantasies, sexual urges or behaviors involving acts (real, not simulated) in which the psychological or physical suffering (including humiliation) of the victim is sexually exciting to the person” (American Psychiatric Association, 1994). Knight’s (1999) typology of rapists, developed using a sample of 254 incarcerated rapists aged 15-39 years old, whose offending was described as “highly repetitive and/or violent”, recognises the occurrence of sexual sadism in sexual offences whereby one type, the overt sadistic rapists, act out their violent fantasies through their offending behaviour. Recently, Greenall and West (2007) applied the MTC:R3 categorisation system reported in Knight (1999) to 41 rapists who were current or ex-patients of English secure hospitals. They found 10 of the 41 rapists to have a sadistic motive for their sexual offending, however this was not further categorised into overt (acted out) versus muted (fantasy-limited) sadism. Kirsch and Becker (2007) report that only a small proportion of rapists and murderers are sexual sadists. Similarly, Hunter (2001) reports that emerging or fully developed sexual sadism is rare in *juvenile* sex offenders but that isolated cases do occur. He describes one case study of a young male who abused his siblings. The types of offence behaviour the young male displayed were gagging, violence and torture. These types of behaviour would appear within the Control domain and some within the Style domain, as defined by Grubin et al. (2001). Such figures suggest that the presence of paraphilias in sexual offending would be relatively infrequent but the recurring and intense nature of sexual fantasies associated with paraphilias means that for these minority of

offenders a degree of consistency in Control, Sex and Style behaviours that relate to their fantasy would be expected.

Hazelwood and Warren (2000) similarly note that fantasy plays a key role in the sexual offending of some serial sex offenders but not all. Based on case studies from their research and field work of adult serial rapists who assaulted females, Hazelwood and Warren differentiated between impulsive and ritualistic offenders. They propose that fantasy plays a minimal role in the sexual offending of impulsive individuals in terms of their sexual behaviour and victim selection. Hazelwood and Warren state the impulsive offenders will show little preference for a type of victim other than a more general category, such as “adult woman”. In contrast, ritualistic offenders are described as being driven by fantasies which represent a range of paraphilias. The exact paraphilia is argued to affect the “relationship” the offender has with the victim during the offence. Such relationships include master-slave for sadistic offenders, and boyfriend-girlfriend for an offender with a fantasy of a consenting sexual relationship. They add that an offender’s fantasy can impact significantly on the speech used by the offender during the offence which would arguably result in consistency in speech acts (Woodhams & Grant, 2006). In terms of behaviours that would be located in the Control domain, Hazelwood and Warren (2000) explain that the behaviours used to control the victim will be very relevant to the offender’s fantasy. If the offender has a fantasy of a consenting relationship, they argue, he will not want to resort to physical violence to control the victim, whereas physical violence will be important to the sadistic offender. Providing ritualistic offenders’ fantasies are consistent, as suggested by the definition of a paraphilia, a degree of consistency as well as distinctiveness would be expected in the Control domain.

Contrary to Hazelwood and Warren (2000), Gee and Belofastov (2007) state that, whilst the minority of offenders would be diagnosed as having a paraphilia, for the majority of sex offenders their offending behaviour is fantasy-driven. Based on a large scale study of apprehended sex offenders, Gee and Belofastov predict that an offender’s core sexual fantasy will affect victim selection, the location of the offence, the method of approach, the methods used to control the victim, and the behaviours needed to complete the offence without being apprehended. Whilst not defining them in these terms, these represent behaviours that would be categorised as Control and Escape domain behaviours, as defined by Grubin et al. (2001). Based on their research they propose that an offender’s core sexual fantasy remains static over time but that the

complexity of the fantasy can develop. They state “Hence, a sexual offender is more likely to deploy similar strategies and resources across offences, in keeping with the origin of their core fantasy structure” (p. 64). This would suggest that crime analysts could see both stability and evolution in a serial offender’s sexual offending behaviour.

The theory and research on paraphilias and sexual fantasy with regards to sexual offending therefore suggests that for some, if not most sex offenders, their behaviour during the offence will be influenced by their sexual fantasy and that this could manifest in consistency as well as distinctiveness in terms of behaviours that would be located within the Control, Escape, Sex and Style domains.

That some types of behaviour might be more accurate predictors of linkage than others has implications for the data collection role of crime analysts. This aspect of a crime analyst’s role is particularly time-consuming (Innes, Fielding & Cope, 2005). Being able to prioritise certain data for collection would therefore be advantageous (Bennell & Canter, 2002). In addition, the process of linking crimes can put considerable cognitive load on the analyst (Santtila, Korpela & Häkkänen, 2004). Focusing on a smaller number of behaviours shown to be accurate predictors of linkage could reduce this cognitive load. In addition, such findings would indicate the behaviours that are salient for linking crimes enabling crime analysts to focus on these rather than using potentially inaccurate predictors of linkage which could lead to false alarms or misses.

2.1.6. Adopting an interactionist approach to linking crimes

As noted above, the more traditional *modus operandi* behaviours have often been reported as less accurate predictors of linkage than geographical distance between crime pairs. This has led some researchers to suggest that *modus operandi* behaviours might be less effective for linking purposes (Goodwill & Alison, 2006). However, the question is raised as to whether predictive accuracy suffers when solely considering offender behaviours devoid of the context (or situation) in which they occur. For example, by neglecting to consider the if-part of the contingency, one might incorrectly assume that the occurrence of a behaviour in one offence but its absence in another is evidence that the two crimes were committed by different offenders. However, in reality they might be committed by the same offender but differences in victim behaviour, and thus differences in the psychological meanings of the two offence situations, have resulted in different offender behaviours being produced. Likewise an apparent similarity between a pair of offences of the victim being kicked may initially

suggest they were committed by the same person, however if the contexts in which the kicking occurred are considered (one, for example, in reaction to victim resistance, and one following victim compliance), the offender's behaviour could be interpreted as quite different.

The pervading practice in studying case linkage has been to focus on consistency in behaviour without taking into account how behaviour is the result of interaction with the situation. It could be argued that this research implicitly assumes that the same type of crime represents the same type of situation. However, as Shoda et al. (1993, p. 1024) state, "The 'same' situation observed on two different occasions...is never exactly the same". That the situation can affect the behaviour that is expressed by an offender at a crime scene is apparent in writings about the practice of case linkage (Hazelwood & Warren, 2003). Such writings advise practitioners of case linkage to consider the possibility that the situation may lead to "Aspects of the crime being diluted, modified or interrupted" (Hazelwood & Warren, 2003, p. 590) and to "Be prepared to discuss any dissimilarities noted across the series of crimes and why they do not negatively impact the opinion" (Hazelwood & Warren, 2003, p. 594). Yet, whilst it is commonplace for the situation to be considered in practice, and whilst some researchers recognise that the situation may affect consistency (Santtila et al., 2008), empirical research on case linkage has not yet investigated whether incorporating the interaction between the situation and the behaviour improves linkage accuracy. This is not surprising, since even in Personality Psychology, there are few studies on this topic (Furr & Funder, 2004). This is in part because of the difficulty of identifying what characteristics of the situation are psychologically salient (Shoda et al., 1993), and thus relevant in studying how the situation and behaviour interacts.

Before such empirical research could commence in forensic psychology, what constitutes psychological similarity and what features of situations are salient in *criminal* interactions would need to be understood. First, how situational similarity has been conceptualised in Personality Psychology is described.

2.1.6.1. Situational Similarity in Personality Psychology

Psychological salience of situations is described in Personality Psychology in terms of features that activate feelings and thoughts in the personality system (Shoda & Mischel, 2000). Situational similarity in relation to psychologically salient factors has been conceptualised in several different ways (Furr & Funder, 2004; Mischel & Shoda, 1995; Shoda et al., 1993).

2.1.6.1.1. Situational similarity as task type and task demands

Several researchers have discussed situational similarity in terms of the demands the situation places on the individual. For example, Shoda et al. (1993) refer to social, cognitive, self-regulatory, physical, and motor control demands. Similarly, Furr and Funder (2004) partly defined situational similarity as similarity in the task the participant was to complete. They manipulated the task type by presenting participants with three scenarios. These were an unstructured 'getting acquainted' task, a co-operative task, and a competitive task. In both of these studies, situational similarity, as defined by task demands, was found to be associated with greater behavioural consistency.

2.1.6.1.2. Situational similarity as valence

Mischel and Shoda (1995) identified the valence of a situation (which can be positive or negative) as a psychologically salient feature important in determining similarity between situations. Being teased, provoked, or threatened are given as examples of negative valence, and receiving positive peer contact and receiving praise from an adult were considered to be situations possessing positive valence. Whilst Mischel and Shoda (1995) do not provide a definition of valence, these examples seem to suggest that valence relates to the face-threatening or face-saving quality of a situation. According to Thomas (1995), the term 'face' refers to an individual's self-image, with communications either being face-threatening, threatening to the hearer's self image, or face-saving and protecting of the hearer's self-image. Mischel and Shoda (1995) cite empirical evidence that supports the premise that situations of similar valence result in consistent behaviour. However, they add that valence cannot be the only factor that affects situational similarity. They observed some variation in behaviour between the three situations of negative valence, suggesting that whilst these three situations shared the feature of negative valence, they continued to represent psychologically distinct situations for the individuals encountering them.

2.1.6.1.3. Situational similarity as partner type

As well as defining situational similarity with regard to the type of task a participant was to complete, Furr and Funder (2004) hypothesised that situations involving the same partner would appear more similar to the participant than situations involving different partners. Similarly, Magnusson, Gerzen and Nyman (1968), as cited in Shoda et al. (1993) conceptualised situational similarity in terms of interacting with the same or different group of participants. These researchers have therefore

conceptualised psychological salience in situations as relating to the characteristics of the person with whom the participant was interacting. Furr and Funder (2004) give the example of a participant interacting with an extroverted versus an introverted partner. They investigated this hypothesis empirically by asking each participant to engage in a set of tasks with two different partners. They found greater behavioural consistency when the participants were working with the same partners.

Shoda et al. (1993) also partially conceptualised psychological similarity as being affected by the type of person with whom the participant was interacting. In their study, they compared behavioural consistency between situations where a child was interacting with a peer versus an adult. They found greater behavioural consistency in situations where the child interacted with the same type of person. In summary, personality psychologists have suggested that the similarity an individual perceives between situations will be affected by the type of person with whom they are interacting, the type of task (competitive, cooperative, or unstructured) and the competencies it demands, and the valence of the situation.

It should, however, be noted that the effect of situational similarity on behavioural consistency is thought to be mediated (Shoda et al., 1993). That is to say, where a situation demands competencies that the individual has difficulty providing, this will be experienced as more stressful and will elicit negative affect. Such stressful situations are hypothesised to result in more automatic behaviours, which show greater consistency across situations (Furr & Funder, 2004; Shoda et al., 1993). In contrast, less stressful situations are thought to allow greater cognitive mediation of behaviour, with subsequent behaviours being less automatic and impulsive. Behaviours that are cognitively mediated are hypothesised to show less cross-situational consistency because the demands made by the situation become less important (Shoda et al., 1993). If victim resistance was considered a situational feature that might cause an offender negative affect or stress, this might partly explain why greater consistency has been observed in control behaviours in serial stranger sex offences, homicide, and robbery (Bateman & Salfati, 2007; Grubin et al., 2001; Woodhams & Toye, 2007). Evidence from personality psychology for the mediation effect of automatic versus cognitively mediated behaviours is, however, mixed (Furr & Funder, 2004).

2.1.6.2. Situational Similarity between Crimes

A series of crimes is defined as offences committed by one offender (or group of offenders) against *different* victims. The offender is, therefore, interacting with a

different partner in each situation. Personality psychology would suggest, therefore, that individual crimes in a series could represent psychologically different situations. However, it could also be argued that the task type, as defined by Furr and Funder (2004), remains the same across a crime series. For example, a series of rapes represents a series of competitive tasks, where the offender's and victims' aims are diametrically opposed (Grant & Woodhams, 2007). The same could be said for robbery (Luckenbill, 1981) and homicide. This would suggest that crimes in a series represent psychologically similar situations. However, whilst not articulated in this way, there is other forensic psychology research that suggests that individual crimes in a series might vary in their psychological meaning for an offender.

Victim behaviour has been the principle focus of this research (Davies, 1991; Davies, 1992; Grubin et al., 2001). Victim resistance has been reported to result in increased verbal and physical aggression (Davies, 1991), a reduction in sexual behaviour (but conversely an increase in sexual behaviour for sexual sadists), and a decrease in 'ingratiating social behaviours' (Davies, 1992, p. 191) by offenders in sexual offence series. Studies of victim resistance in rape and robbery offences report different victims using verbal protests, running away, and fighting offenders (Block & Skogan, 1986; Greenfield, 1997; Wright & West, 1991). Burgess and Holmstrom (1976) report the use of additional behaviours, such as stalling, flattery, and bargaining, by some victims of rape. In differentiating situations on the basis of the demands they place on individuals, Shoda et al. (1993) refer to demands that could have some relevance to interpersonal types of crime, such as rape and robbery. These were 'requires the ability to resolve disagreements with peers' (a social demand), 'requires the ability to resolve disagreements with adults' (a social demand), 'requires the ability to tolerate frustration' (a self-regulatory demand), 'requires the ability to delay gratification' (a self-regulatory demand), 'requires physical strength' (a physical demand), 'requires resistance to injury' (a physical demand), and 'requires physical quickness' (a physical demand). These different types of situational demands suggest that different types of victim behaviour could place different demands on an offender, in terms of social, self-regulatory, and physical demands. In addition, victim behaviour might affect the degree to which a crime represents a competitive task. For example, in their study of victim resistance in attempted homicides, Fritzon and Ridgway (2001) report that two-thirds of the cases sampled did not involve victim resistance. Thus,

psychological meaning and situational similarity in interpersonal crimes, such as rape, robbery, and attempted homicide, could be affected by victim behaviour.

As well as potentially making varying demands of the offender and affecting the task type, victim behaviour is also likely to affect the valence of the offence situation by threatening or saving the face of the offender. A victim trying to stall for time is less face-threatening than a victim who shouts obscenities at his/her offender.

Personality psychologists have been able to manipulate situational circumstances (e.g. changing partner and task type), varying the 'if' part of the if-then contingency to investigate its effect on behaviour. In addition, they are able to ensure that each participant experiences each 'if'. Thus, a complete data set of 'if(situation)-then(behaviour)' contingencies can be derived for each participant (C. Bennell, personal communication, June 13, 2008). However, in forensic psychology, this type of manipulation is not possible. The 'if(situation)s' an offender is exposed to is beyond the control of the academic investigator because forensic data is naturally occurring. However, as is suggested, it seems plausible that the circumstances of crimes might vary in similar ways to the qualities of situations manipulated and investigated in personality psychology.

2.1.6.3. Determining the Appropriate Level of Investigation

As well as considering how personality psychology research on situational similarity relates to the investigation of criminal behaviour, there is also a question of what level of investigation is appropriate.

2.1.6.3.1. The crime type level

The crime scenario in its entirety could represent a situation, and thus, a series of the same type of crime could be considered as representing similar, if not the same, situations. If this is the case, behavioural consistency across crime series would represent more a form of temporal stability (Woodhams & Grant, 2006) than cross-situational consistency. As previous studies of case linkage have demonstrated, there can be quite considerable behavioural consistency across series of the same class of offence (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007). Such consistency suggests that this might not be an inappropriate level at which to consider situational similarity. In this scenario, the 'if' part of the 'if(situation)-then(behaviour)' contingency would represent the overall class of crime (e.g. 'if[rape]-then[offender . . .]').

2.1.6.3.2. The individual crime level

Alternatively, different crimes within a series could be deemed to represent different situations. As noted above, it seems likely that crimes within an offender's series might vary in task type, task demands, and valence. In such a scenario, the if-part of the 'if(situation)–then(behaviour)' contingency could be 'if(resistant victim)–then(offender...)'. To investigate whether the findings from personality psychology—that situational similarity is associated with behaviour consistency—generalise to criminal behaviour, the situational similarity of each crime pair in a series could be quantified. Whilst the same method used in personality psychology could not be used for reasons outlined above, it should be possible to investigate whether greater situational similarity is associated with greater behavioural consistency if similarity in psychologically salient characteristics, such as valence, task type, and task demands, can be measured.

2.1.6.3.3. The offender–victim interaction level

A further possibility is to view each crime in a series as representing a collection of numerous if–then contingencies. In an interpersonal type of crime, such as robbery, attempted homicide, or rape, each separate interaction with the victim could represent an if–then contingency. For example, 'if victim screams–then offender hits the victim'. If 'if(victim behaviour)-then(offender behaviour)' contingencies can be developed it should be possible to investigate whether offenders are consistent in the way they react to particular situations (victim behaviours) as represented by if-then contingencies.

2.1.7. Rationale and research questions

Whilst widely practiced, research into case linkage is still in its infancy with some crime types awaiting research and many requiring cross-validation. Whilst the validity of linking sexual crimes has received investigation by three research studies (Canter et al., 1991; Grubin et al., 2001; Santtila et al., 2005), how appropriate it is to link sexual crimes committed by juveniles remains to be investigated. This is not only of interest from a theoretical perspective but has implications for practice. During the development of the thesis, the author obtained access to a small sample of juvenile sex offenders ($N=7$). Their behavioural consistency was assessed using similar methodology to that outlined in this chapter. Details of this investigation were published in Woodhams, Hollin and Bull (2008b).

Research from Personality Psychology suggests support for the process of linking crimes. As noted above, greater consistency has been observed in situations of

greater similarity, in situations separated by shorter time spans, and for behaviours that are emitted by the individual, expressing their goals, needs and motivations. The similarity in situations across a series of crimes could be argued to be substantial. In the author's professional experience, case linkage typically occurs for crime series that have occurred over a period of weeks or months. Forcing someone to engage in sexual acts against their will could also be argued to represent behaviour associated with exerting one's will, a defining characteristic of emitting behaviours.

Theory and research from Personality Psychology suggests caution when linking juveniles' crimes. That juvenile sex offenders' cognitive-affective processing systems are likely to be going through a developmental process means that the behaviour displayed during their offending is less likely to be consistent. Theories of the development of juvenile offending highlight the changing influences of risk factors during this time (e.g. Moffitt, 1993). Researchers have also noted that juveniles tend to specialize in a particular type of offending as they age (Donald & Wilson, 1999) although this is not supported by all research (Piquero & Buka, 2002). Other theorists have proposed increasing seriousness of offending for juveniles with increasing age (Loeber & Hays, 1994). As childhood and adolescence are periods of change it is quite possible, therefore, that juveniles will vary in their offending behaviours during a series more than adults because of these developmental changes.

With regard to sex offending, variability may occur because of the growing influence of peers throughout adolescence, with increasing sexual knowledge, with changes in physique, and with the general increase of life experience. With regard to the physical changes that a juvenile will experience, Barbaree, Blanchard and Langton (2003) sampled male sex offenders and reported that the male libido appears to be highest in adolescence, due to greater erotic responsiveness, following which it declines. In relation to changes in sexual knowledge, Grubin et al. (2001) noted, with their sample of adult sex offenders, that some observed behavioural variation could be accounted for by the evolution of sexual fantasy as a crime series progressed.

The assumption of behavioural consistency may therefore be inappropriate, less appropriate, or only appropriate for some behaviours, when considering juvenile stranger sex offenders. It is therefore important to establish the degree of consistency across juvenile sex offenders' series and whether they are perhaps more consistent in some behaviours than others. In addition, the appropriateness of using behavioural similarity to link crimes with juvenile stranger sex offences requires testing since whilst

juveniles might show consistency, this may be insufficient for linking or there may be little inter-individual variation preventing the distinction of one juvenile's crimes from those of another juvenile.

Previous researchers have suggested the potential use of the offender's speech (Davies, 1992) in linking crimes. Whilst verbal behaviours do feature in some of the behavioural checklists of previous researchers (e.g. Grubin et al., 2001), their use in linkage has not received systematic investigation. The types of verbal behaviour included within the checklists are not a complete set of the various speech strategies that a sex offender could use when committing his/her crime (Woodhams & Grant, 2006). Woodhams and Grant's (2006) paper was drawn upon to ensure a better representation of verbal behaviours in the behavioural checklist thus allowing verbal behaviours to receive greater attention.

Personality Psychology has highlighted the importance of considering if-then contingencies when studying behavioural consistency. The traditional approach to investigating behavioural consistency in forensic psychology has been to solely consider the 'then – offender behaviour' part of the if-then contingency (Bateman & Salfati, 2007; Bennell & Canter, 2002; Bennell & Jones, 2005; Canter et al., 1991; Goodwill & Alison, 2006; Grubin et al., 2001; Hammond, 1990 as cited by Canter, 1995; Salfati & Bateman, 2005; Santtila, Fritzson & Tamelander, 2004; Santtila et al., 2005; Santtila et al., 2008; Tonkin et al., 2008; Woodhams & Toye, 2007; Yokota & Canter, 2004). As stated above, this approach may be appropriate if situational similarity is defined at the crime-type level. However, if an offence is considered to comprise a collection of situations, or if offences of the same type vary in psychologically salient characteristics, just considering the offender's behaviours without the context in which they occurred could be problematic. The question as to the most appropriate level at which to consider situational similarity is one that does not seem to have been answered in the Personality Psychology literature. The research conducted thus far by personality psychologists appears to investigate situational similarity at the second level mentioned above. It is the characteristics of the overall situation that are being manipulated such as its valence, the goals it stimulates, and the skills it requires. However, this thesis did not limit itself to investigating the relationship between situational similarity and behavioural consistency at this level. The thesis investigated the relationship between situational similarity and behavioural consistency at the individual crime level and the victim-offender interaction level. At both levels,

situational similarity was conceptualised as similarity in victim behaviours. These are recognised in forensic psychology literature to affect valence, task type, and task demands, all psychologically salient features of situations that have been investigated in Personality Psychology.

Situations that are experienced as psychologically similar are hypothesised to elicit consistent behaviours in an individual (Furr & Funder, 2004). It follows that there will be a relationship between behavioural consistency and situational similarity, with greater situational similarity resulting in greater behavioural consistency. At the individual crime level, whether an association exists between situational similarity and *criminal* behavioural consistency was investigated. At the victim-offender interaction level, whether offenders were consistent in their reaction to victim behaviours, operationalised as ‘if(victim behaviour)-then(offender behaviour)’ contingencies was investigated.

Much of the previous research on behaviourally linking crimes has limited itself in considering only lone offenders when assessing behavioural consistency (Woodhams & Toye, 2007 being one exception). Santtila, Korpela and Häkkänen (2004) have recognised the potential difficulty of linking crimes committed by groups. Research has indicated that a substantial proportion of juveniles do, however, sexually offend as groups (Långström & Lindblad, 2002; Wood et al., 2001; Woodhams, 2004). The study reported in this chapter therefore investigated the effect of including offences by groups in the linking task.

The study aimed to:

- Investigate whether juvenile stranger sex offenders show consistency in their offence behaviours over offence series.
- Determine whether some offence behaviours show greater consistency across series than others.
- Determine whether known linked offences in the dataset can be accurately identified using behavioural similarity and therefore determine whether juvenile stranger sex offenders’ behaviours are sufficiently consistent and distinctive for case linkage.
- Investigate whether there is an association between situational similarity and *criminal* behavioural consistency.
- Investigate whether there is evidence of consistency across crime series in ‘if(victim behaviour) – then(offender behaviour)’ contingencies.

2.2. Methodological Review

Conducting the study that is reported in this chapter required various stages of data analysis. Initially, decisions had to be made as to the type of data that would be sampled. Following this, how the data would be coded required consideration. A variety of data analysis techniques have previously been used by researchers (Woodhams, Hollin & Bull, 2007). The advantages and disadvantages of these were considered before a decision was made. These deliberations are outlined below.

2.2.1. Data type

Several types of data exist which provide information about how offences were committed and the ways in which offenders behaved. One source is the offenders themselves. However, as noted in Chapter 1, sampling only apprehended offenders can result in a very select sample that may not share the characteristics or behaviours used by offenders still at large. Findings obtained from such samples are of limited generalisability. In addition, caution must be exercised in considering the reliability of the accounts given by offenders which can be inaccurate because of recall errors, under-reporting, or the “hyping up” of accounts (Hughes, 2005).

Media reports and law reports can and have been used to create samples of sexual offences for analysis (Porter & Alison, 2001, 2004). Porter and Alison (2004) argue that media reports of sexual offences represent a group of more robust allegations compared to samples of allegations made to the police. However, media and law reports also represent a very select population of rapes and rapists, and may present a distorted account of the offence, or contain omissions and errors.

An alternative source is victim accounts of offences to the police. These come in various forms. They can be the victim’s initial report as recorded by a police officer on a crime reporting system. Alternatively, a more complete version can be obtained from the victim’s statement, the transcript of their interview or a video-recording of the interview itself. Allegations to the police represent a less biased sample than media and law reports since they are less likely to be influenced by the well-documented attrition of rape cases and the select nature of those offences that are prosecuted (Fisher, Daigle, Cullen & Turner, 2003; Harris & Grace, 1999) and reported in the media (Los & Chamard, 1997). However, because rapes committed by multiple offenders and more violent rapes are more likely to be reported to the police (Clay-Warner & Burt, 2005), sexual offence allegations made to the police are still biased to a degree. Allegations made by victims to the police are a more direct source of information than media and

law reports and accounts by offenders. This is because victim accounts are less removed from what actually happened at the crime scene, because the time delay between the offence occurrence and the recording of a victim account is less, and victim accounts are also less open to researcher bias (Canter & Alison, 2003). However, it is unlikely that a victim account will represent a wholly accurate and complete record of the offence for a number of reasons. These include the victim's memory, their willingness or ability to report the details of the offence, the interviewer's skill and agenda and, in the case of a victim statement, how closely what is written in the statement reflects what the victim reported (Alison et al., 2001; Dale, 2003; Woodhams & Grant, 2006). As noted by Bennell and Jones (2005) such errors will add noise to the data, reducing the likelihood of finding relationships, rather than increasing this possibility. It is also possible that within a sample of victim allegations will be a subsample of false allegations. However, it is likely that such numbers would be low. Feist et al. (2007) reported 8% of their sample constituting false allegations.

In relation to victims' memories, within the sample it was anticipated that there would be child or adolescent victims. The reliability of a child's memory for a traumatic event and the child's subsequent account of an offence might be questioned. However, a study by Bahrick, Parker, Fivush and Levitt (1998) found that even very young children reported a substantial amount of accurate information about a highly emotional and stressful event some two to six months after the event. In addition, a volume of research has now been conducted which demonstrates that young and older children can recall a substantial amount of accurate information if interviewed using the cognitive interview or the enhanced cognitive interview (Akehurst et al., 2003). Whilst there are some limitations to sampling victim accounts it is argued they are more reliable than alternative sources of data. Also, by developing research findings from police data they should be applicable and familiar to the user (Canter, 2004).

The design of the study reported in this chapter necessitated confidence that an offender was responsible for a series of offences. One way to achieve this, which has been the approach of past studies, is to sample victim accounts of offences that have been solved. However, this leaves the possibility that offenders who have not been apprehended (and to whom case linkage is applied in practice) may differ somehow in their offence behaviour and consistency from apprehended offenders. Knowledge about case linkage developed from samples of apprehended offenders may not, therefore, be applicable to samples of unknown offenders, which is problematic if such knowledge is

to be used by practitioners in reality. As explained by Bennell and Jones (2005), solved crimes might be characterised by greater behavioural similarity and distinctiveness or geographical closeness hence why they were solved in the first place. One way of overcoming this problem is to sample offences that have been linked by physical evidence but where the offender's identity is unknown. For this reason, the study reported in this chapter sought to sample offences which had been linked by DNA rather than conviction. If this was not possible, the traditional method of sampling *solved* offences would be used. In this scenario, whilst other studies have considered offences for which a suspect has been arrested as solved, the more stringent criteria of a conviction would be used. However, it should be considered that the possibility remains even with convictions that an offender was not the perpetrator (Grubin et al., 2001). When it came to conducting the study reported below, it was not possible to sample offences linked by physical evidence in the absence of a conviction. Instead, where possible it was determined whether independent physical evidence also existed to confirm linkage rather than relying purely on convictions as proof of linkage. Approaches have recently been made by the author to the Forensic Science Service to obtain offences linked only by physical evidence to take this avenue of research forward.

2.2.2. Coding the offender behaviours

A common approach to investigating case linkage has been to code offences against a checklist of offender behaviours (e.g. Bennell & Canter, 2002; Bennell & Jones, 2005; Canter et al., 1991; Goodwill & Alison, 2006; Grubin et al., 2001). Typically checklists are generated from a content analysis of the victim accounts. However, some researchers have used checklists previously developed in other studies (Santtila et al., 2005), whereas others have just used codes already existing in crime reporting systems (Goodwill & Alison, 2006). Both of these latter approaches are problematic because behaviours unique to the sample would be missed from the checklist. For the study reported in this chapter and for that reported in Chapter 4, it was therefore decided that a qualitative analysis would be used to generate checklists of behaviours directly from the data. Constant comparison framework analysis was chosen as the qualitative analysis because it is a well-defined qualitative procedure that is systematic but dynamic in that it allows for changes to be made to the coding framework through the analytic process. The themes developed are largely driven by the data and the stages of the process encourage a comprehensive review of the data

collected so that themes are not missed. The latter quantitative stages of the study reported in this chapter required comprehensive lists of victim and offender behaviours. The analytical process is documented by the researcher therefore it is accessible to others and it enables easy retrieval of the original data (Ritchie & Spencer, 1994). This means the analytical process is open to scrutiny by others. Constant comparison framework analysis also allows for the development of themes at various levels (Willig, 2001). This was particularly advantageous for the study reported in this chapter, where later stages of analysis required the coding of victim behaviours into higher level themes.

It is typical for each offence to be binary coded against the checklist (e.g. Bennell & Canter, 2002; Bennell & Jones, 2005; Sjöstedt et al., 2004). Each behaviour on the checklist is recoded as absent from the offence (the behaviour is not reported as occurring), or present in the offence (the behaviour is reported to have occurred). Typically a 1 is recorded for “present” and a 0 for “absent”.

An alternative approach to coding behaviours dichotomously would be to develop coding with three or more options. For example, type of approach could have the three options of con-approach, surprise approach and blitz approach. However, in some victim accounts it is possible that the victim will not have reported a behaviour therefore in such cases an additional category of “don’t know” would be needed. Currently, little is known about how sex offenders commit their offences. It is therefore difficult for a researcher to know how behaviours should be grouped and thus take a top-down approach to coding. Another difficulty with using grouped categories is that a victim may report the occurrence of behaviours that occur in more than one category making it difficult for the researcher to know how to categorise the behaviours. A common method of coding offender behaviours in investigative psychology is to use binary coding which has been demonstrated to have good inter-rater reliability (e.g. Bennell & Canter, 2002; Canter et al., 2003; Canter & Heritage, 1990; Sturidsson et al., 2006). The approach taken by previous researchers of coding a checklist of behaviours dichotomously was therefore used.

2.2.3. Measuring and assessing the degree of behavioural consistency (similarity)

Behavioural consistency across offences can be measured as behavioural similarity between events. There are a number of different options for quantifying similarity. The decision had to be made as to what similarity measure was most appropriate to the task.

Different measures of consistency/similarity have been used by researchers of criminal behavioural consistency, including percentage agreement (e.g. Bateman & Salfati, 2007; Grubin et al., 2001), Cohen's kappa (e.g. Sjöstedt et al., 2004), and Jaccard's coefficient (e.g. Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007).

Grubin, et al., (2001) measured percentage agreement between offences committed by the same offender for the occurrence of particular types of behavioural domains which were developed through cluster analysis. The four overarching behavioural domains were generated from previous literature on sexual offences, and offender behaviours were allocated to each domain by the researchers. Cluster analysis was used to determine the contribution of each behaviour to each domain type. Four types were identified for each domain, e.g. Control domain type 1, type 2, type 3, type 4. The researchers allocated each offence to one of the four domain types for each domain yielding a profile of four domains for each offence, e.g. Control type 1, Escape type 2, Sex type 3 and Style type 4. An example of the domain types for the control domain is given in Table 2B.

Table 2B: Composition of the Four Control Type Domains (adapted from Grubin et al., 2001)

	Control Type 1	Control Type 2	Control Type 3	Control Type 4
Indoor Offence Location	35%	9%	7%	89%
Offender Known to Possess a Car	100%	0%	0%	1%
Opportunistic Attack	91%	87%	88%	8%
Offender Known to be Prowling	17%	54%	7%	12%
Surprise Attack	2%	66%	52%	76%
Victim was Moved	95%	88%	68%	4%
Offender Had a Weapon	38%	88%	0%	57%

On an individual basis, the percentage agreement for each behavioural domain was calculated for each offender, indicating how consistent they were in this domain (single domain consistency). So, for example, Grubin et al. (2001) explain that almost every offender in their sample demonstrated complete consistency in at least one domain. A similar approach was taken by Bateman and Salfati (2007), however they

calculated consistency for each offence behaviour rather than for each domain type. Salfati and Bateman (2005) also used a similar approach but this was limited to the percentage of offenders who consistently committed expressive versus instrumental homicides. They experienced some difficulties in discretely classifying offences into these two categories. Measuring consistency at such a high, thematic level is unlikely to be of use to practitioners in the real world (Woodhams, Hollin & Bull, 2007). The inability to classify all offences into categories would also be problematic for conducting case linkage in reality.

Sjöstedt et al. (2004) used Cohen's kappa as a measure of agreement between behaviours displayed in offences. A higher value indicated greater agreement. Such an approach was also recommended by Professor Martin Bland (personal communication, 13 January 2004) following an email that the author placed on the ALLSTAT list server. However, measures of overall agreement are not suitable for crime data. With crime data it is inappropriate to assume that because a behaviour is not recorded it definitely did not occur (Bennell & Canter, 2002). (Reasons for omissions in victim accounts were mentioned above.) Including joint non-occurrences (absent-absent) in the calculation of similarity can, therefore, be problematic. For this reason, Cohen's kappa was not used as a measure of similarity.

Jaccard's coefficient does not include joint non-occurrences in its calculation of similarity. It is a measure of similarity that has been commonly used in the case linkage literature (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007). Jaccard's coefficient is calculated from binary data and produces a score for each pair of observations in the dataset which ranges from 0-1. A score of 1 represents perfect similarity and 0 represents no similarity (Bennell & Canter, 2002). As Jaccard's coefficient is the most appropriate measure of similarity for the type of data that was utilised, it was therefore adopted.

To assess the validity of the two assumptions underlying the practice of case linkage (the assumption of behavioural consistency and the assumption of inter-individual variation) a method was required to determine whether crimes committed by the same offender are more similar and consistent than crimes committed by different offenders. Most previous studies (Bateman & Salfati, 2007; Bennell & Canter, 2002; Bennell & Jones, 2005; Canter et al., 1991; Salfati & Bateman, 2005; Sjöstedt et al., 2004) have not considered this question directly. Three exceptions are Grubin et al., (2001), Tonkin et al. (2008) and Woodhams and Toye (2007).

Grubin et al., (2001) determined whether the observed level of consistency in serial offences was greater than what would be expected by chance. They investigated the co-occurrences in the '2-offence series' sub-sample for each domain type (e.g. Control 1, Control 2, Control 3, and Control 4). The frequency with which each domain type occurred in the sample was calculated. Using this information, how many identical pairs would be expected in the sample by chance was calculated. For example, if domain type C1 occurs 20% of the time and if occurrence of domain type is assumed to be random, the chances that one individual will commit two [C1] offences in succession is 4% ($0.2 \times 0.2 = 0.04$). This is therefore the expected frequency of the co-occurrence of C1 by chance and this can be compared to the actual frequency. Grubin et al. (2001) also looked at multi-domain consistency. The expected and observed frequencies for co-occurrence for the 256 possible pairings of the four domains were calculated. Whether the observed co-occurrence rate was statistically different to what was expected was determined. The finer details of this statistical analysis are not available from the paper and were sought but could not be provided by the principal author of the paper. However, it is likely that chi-square analyses were used.

Woodhams and Toye (2007) (and more recently, Tonkin et al., 2008) investigated whether pairs of offences committed by the same offender (termed linked pairs which represented within-individual consistency) were significantly more similar compared to pairs of offences committed by different offenders (termed unlinked pairs which represented between-individual consistency). They found within-individual consistency to be significantly greater than between-individual consistency, supporting the assumptions underlying case linkage. This approach was adopted because it represented a simultaneous test of both assumptions underlying case linkage whereas Grubin et al.'s (2001) method only allowed for the testing of the assumption of behavioural consistency. Also, this method allowed for the comparison of within and between individual consistency for all offence behaviours (representing an overall measure of behavioural consistency), as well as for specific behavioural domains. Grubin et al.'s (2001) method did not allow for the former.

2.2.4. Assessing case linkage

A variety of techniques have been used to assess the predictive accuracy of case linkage including non-metric multidimensional scaling (Canter et al., 1991; Santtila et al., 2005), discriminant function analysis (Santtila, Fritzon & Tamelander, 2004;

Santtila et al., 2005), logistic regression and ROC curves (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007).

Forms of non-metric multidimensional scaling include multiple scalogram analysis (MSA), smallest space analysis (SSA), and partial order scalogram analysis (POSA). Multi-dimensional scaling techniques (MDS) are a way of visually representing similarity between observations typically on a two-dimensional or three-dimensional plot. It models similarity between pairs of observations as distances in geometric space (Borg & Groenen, 1997). Each dot represents an observation (e.g. a sexual offence). The closer together a pair of dots, the more similarities they share (Borg & Groenen, 1997). This type of analysis allows for the simultaneous manipulation of a number of variables. A hypothetical example of the type of graphical output that might be obtained when comparing the similarity of offences and how this might relate to their being part of a series, is given in Figure 2A below.

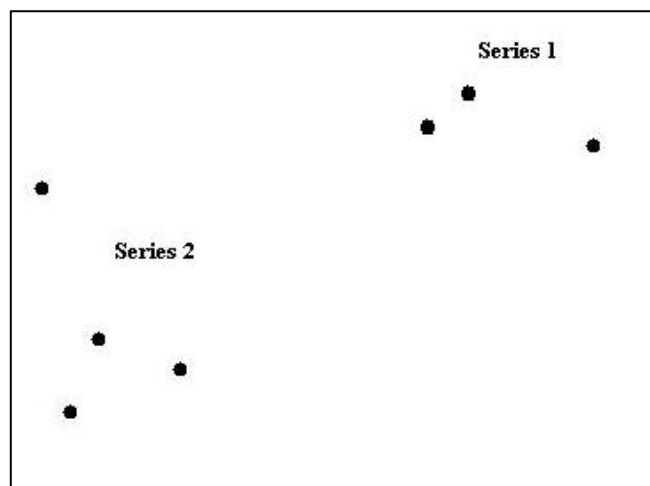


Figure 2A: A graphical illustration of how two separate series might be represented in an MDS plot.

MDS aims to represent accurately the data in as few dimensions as possible (e.g. two or three). Accurate representation is measured by goodness of fit, the most commonly used measure of which is called “Stress” (Borg & Groenen, 1997). With regards to the number of cases required per variable, since the aim of most research is to consider the phenomenon in low dimensionality (e.g. two or three dimensions), the

resulting MDS plot is argued to be relatively robust even with just a few cases (Borg, personal communication, 09/02/2004).

Canter et al. (1991) used MSA to investigate how accurately crimes could be linked. Behavioural similarity is represented on the MSA plot by proximity. The closer on the plot two dots (representing two crimes) are to one another the greater their behavioural similarity. The sample consisted of four series of three sex offences. Initially, a group of experienced police officers were asked to allocate the 12 crimes to four series. The officers were asked to explain their decisions. Using the officers' reasoning as the linking variables the same data were entered into an MSA producing a two dimensional plot. How closely offences from the same series were clustered was examined. The MSA was more accurate than the officers at correctly clustering the offences into their respective series.

Santtila et al. (2005) used MDS to investigate linkage. To assess the accuracy of linkage, for each offence the five offences clustered most closely to it were examined. How many of the five were a member of the same series was noted and how often (expressed as a percentage) a crime from the same series was found within the closest five was calculated. This was repeated for the closest 10 offences. Whilst MDS has a lot of advantages with regard to helping researchers interpret the inter-correlations of a large data set, it has its critics. The validity of collapsing a multi-dimensional model into just two or three dimensions has been questioned (Boon, personal communication, 25 March 2003). Some researchers, such as Lakatos, Scavone and Cook (n.d.), and Mahmud and Rahim (2002), have noted the difficulty of ensuring sufficient cases for the interpretation of the MDS plot to be valid. The literature on MDS does, however, seem to suggest that if the data are being interpreted at a low-dimensionality, a relatively small number of cases is required (Borg, personal communication, 09/02/2004).

Goldstone (1998) has criticised MDS techniques for their lack of structure and noted that "Even if the dimensions can be interpreted, there is no mechanism for dimensional interactions, or for representing relations between dimensions" (p. 472). In addition to these criticisms, Grubin et al. (2001) criticised the specific use of MDS for case linkage. They noted that Canter et al.'s (1991) study sampled a small number of cases ($N=12$) and that were this number increased, it would become increasingly more difficult to interpret the two-dimensional plot for linkage purposes. They stated that with an increasing number of cases, "The spatial field would become so cluttered as to

be uninterpretable” (p. 55). This is an important criticism if the aim of research is to develop methodologies that would be useful in practice.

Grubin et al. (2001) assessed linkage accuracy using a computer algorithm to select from the overall data set those offences that were the most similar (top 10%) to the offence in question. The computer algorithm used similarity within the four behavioural domain types (control, style, sex and escape) to compute this. Like Santtila et al. (2005) how many linked offences were identified within this top 10% was calculated. This figure was compared with the number that would have been expected by chance. This procedure was followed for series of each length in turn. Again the finer details of the computer algorithm and the randomisation procedure were not provided making this methodology difficult to replicate. It is also likely that in the real setting, when dealing with databases of thousands of offences, the number of cases contained within a 10% sample would also be difficult to manage. This is criticism that Grubin et al. (2001) recognise. Canter (2000, p. 40) has criticized an earlier publication of this study (Grubin, Kelly & Ayis, 1997) for failing to take into account the potential for the results being “Contaminated by relationships between the different components of the offence”.

Discriminant function analysis is an alternative method that has been used to assess linkage accuracy. Santtila et al. (2005) used MDS to identify behavioural themes within their sample of stranger rapes. Four themes were identified (expressive involvement, sexual hostility, deceptive involvement, physical hostility). For each offence, the proportion of each behavioural theme it contained was calculated. These data were entered into a discriminant function analysis to investigate whether offences in the same series would be grouped together. In a similar method to that used with the MDS output, the probability of each offence belonging to a series was calculated. How often the series to which the offence actually belonged featured among the ten most likely series was calculated thereby giving an indication of linkage accuracy. Measuring consistency at the thematic level is arguably too general to be of use in distinguishing offenders from one another in practice, especially when searching through a database of many thousands of crimes. This approach was, therefore, not followed in the current study.

Bennell and Canter (2002), Bennell and Jones (2005), Tonkin et al. (2008) and Woodhams and Toye (2007) assessed linkage using logistic regression and ROC curves. In logistic regression, the ability of predictor variables to predict a dependent variable

(i.e. linked pair vs. unlinked pair) is assessed. This approach requires a sub-sample of linked pairs and a sub-sample of unlinked pairs. Behavioural similarity between each pair of crimes was measured using Jaccard's coefficient in all four of these studies. The coefficients for each pair were entered as the predictor variables. This analysis therefore investigates whether linked pairs can be distinguished from unlinked pairs on the basis of behavioural similarity and gives a measure of predictive accuracy. Predictive accuracy was also assessed using ROC analysis.

ROC curves are chosen here as an additional analysis of predictive accuracy to logistic regression because logistic regression assumes that the observations composing the dependent variable are independent. With regards to linking crimes, this means that logistic regression assumes that the linked and unlinked crime pairs (which compose the dependent variable) are statistically independent of one another. If they are not, estimates of standard error used in the calculation of measures of predictive accuracy, such as the Wald statistic, are unreliable (Bennell & Canter, 2002). This assumption of independence was violated in all four studies cited above because the authors have generated their unlinked sub-sample from the linked sub-sample (i.e. each unlinked crime pair was created by pairing together two crimes by two different serial offenders). Just how problematic this method of creating linked and unlinked pairs is has never been investigated. One aim of the study reported in this chapter was therefore to follow the methodology of these four studies and therefore generate the unlinked crime pairs from the linked crime pairs but, in addition, to also generate a statistically independent set of unlinked crime pairs. If the findings generated by both methods are similar this would suggest that the less labour-intensive method of generating unlinked crime pairs from linked crime pairs could be adopted in future studies with more confidence.

The measure of predictive accuracy in ROC curves, which is the area under the ROC curve (A_z), does not rely on standard errors for its calculation. Statistical independence of observations composing the dependent variable is therefore not as necessary if using this alternative measure of predictive accuracy (Bennell & Canter, 2002; Zhou, Obuchowski & McClish, 2002). This raises the question of why one should use ROC curves if the assumption of independence for logistic regression can be met using a different sampling technique.

ROC curves have several other advantages for assessing predictive accuracy (Bennell, 2005; Bennell & Jones, 2005). Unlike other measures of predictive accuracy, the A_z is independent of decision thresholds (Bennell & Jones, 2005). If using measures

other than the A_z , “It would be impossible to determine whether the level of accuracy achieved when using a particular linking feature is due to the inherent discriminatory power of that feature or is simply attributable to the decision threshold adopted” (Bennell & Jones, 2005, p. 27). Also because the “AUC is based on the proportions of various decision outcomes, rather than their raw frequencies, it does not depend on the relative frequencies of the diagnostic alternatives in any given sample (Swets, 1988)” (Bennell & Jones, 2005, p. 27). It is proposed that the actual number of linked and unlinked offences in reality varies and therefore the frequencies of diagnostic alternatives (a linked crime pair vs. an unlinked crime pair) would not be equal (Bennell & Jones, 2005).

ROC analysis is also used in other areas of forensic science where the accuracy of decision making is assessed. It has been used in detecting deception and assessing the identification of bite marks (Bennell, 2005). It is also used in other areas of psychology, such as in the evaluation of predictive tests in the risk assessment of offenders (Quinsey, Harris, Rice & Cormier, 1998; Swets, Dawes & Monahan, 2000). ROC analysis was chosen as well as logistic regression for the study reported in this chapter because of its additional advantages over logistic regression and because of its previous use by researchers investigating associated forensic and psychological tasks.

Bennell and Canter (2002) randomly separated their dataset of linked and unlinked offence pairs into half to create an experimental sample and a test sample. This was to prevent bias occurring due to a predictive model being developed on a data set and then being tested on the same data set. The predictive model was developed using logistic regression with the experimental sample and tested using ROC curves with the test sample. It was the intention of the study reported in this chapter to replicate this approach were the sample of juvenile serial stranger sex offences of sufficient size. Unfortunately, due to the limited sample size this was not possible.

2.2.5. Consistency within domains and predictive accuracy of domains

Past studies (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007) have used logistic regression and ROC analysis to investigate whether certain types of offence behaviour are better at distinguishing linked from unlinked crime pairs. The rationale for such investigations lies in Personality Psychology where it has been suggested that some behaviours are more situation-dependent and hence subject to variation across events (Funder & Colvin, 1991),

making them less reliable predictors of linkage. Variation in consistency between types of behaviour has also been found with criminal behaviours.

Bennell and Canter (2002), Bennell and Jones, 2005), Tonkin et al. (2008) and Woodhams and Toye (2007) have all calculated a direct logistic regression analysis for each domain, referred to as a simple logistic regression (Howitt & Cramer, 2005), followed by a forward step-wise logistic regression containing several domains as predictors. The stepwise logistic regression includes predictor variables in the model on the basis of statistical criteria (Tabachnick & Fidell, 1996). The addition of variables to the model stops when they add nothing further to the predictive power of the model. This analysis therefore identifies the optimal combination of predictor variables for predicting whether pairs of crimes are linked or not.

Following identification of the optimal combination of predictors, the ability of each predictor to differentiate linked from non-linked offences was tested using ROC curves. These analyses have been computed using the statistical programmes ROCKIT (© University of Chicago) and SPSS. The inputs for these analyses are the predicted probabilities produced by the logistic regressions. These two statistical programmes differ in their output and, as outlined above, ROC analysis has some advantages over logistic regression. It was therefore the intention that both logistic regression and ROC analysis would be used in the study reported in this chapter.

On the basis of the limited number of past studies on non-sexual serial offending and adult serial sexual offending, one might expect behaviours associated with controlling the victim and escaping the scene, to also show greater consistency in juvenile serial sexual offences, and for these domains and geographical proximity to be accurate predictors of linkage. To investigate this, the sexual offending behaviours must be arranged into domains. Having reviewed the literature, two predominant ways of grouping behaviours into domains were identified.

2.2.5.1. Grubin et al.'s (2001) domains

Grubin et al. (2001) identified four domains from the previous literature on sexual assaults. They explain that for a sexual assault to occur there must be three behavioural elements. First, the offender must create and maintain an environment in which the sexual assault can occur. Second, for the event to be defined as a sexual assault, some kind of sexual interaction must occur between the offender and victim. Third, the offender has to depart from the victim and avoid being detected. Grubin et al. (2001) labelled these three domains Control, Sexual, and Escape, respectively. In

addition, a fourth domain, “Style”, was included which captured behaviours emitted by the offender which were unnecessary for the commission of the offence.

It seems apparent that the behavioural domains of control, escape and sex represent modus-operandi (MO) behaviours (Hazelwood & Warren, 2003) since in both Grubin et al.’s (2001) and Hazelwood and Warren’s (2003) words they contain behaviours necessary to commit the offence. Within the linkage literature, a distinction is made between MO behaviours and ritualistic behaviours. The latter are defined as “Expressing the primary motivation or purpose of the criminal act” and being unnecessary in committing the offence itself (Hazelwood & Warren, 2003, p. 590). This seems similar to the behaviours which Grubin et al. (2001) labelled Style behaviours. By using Grubin et al.’s (2001) domains the questions of whether particular types of MO behaviour are more effective in linking and whether ritualistic behaviours are effective in linking or not can be investigated.

2.2.5.2. Canter and colleagues’ themes of sexual assault

Canter and colleagues have used multidimensional scaling (MDS) to identify types of offender/offence. These analyses have identified three types of offender or offence; pseudo-intimate (victim viewed as a person and attempts made at intimacy with the victim), criminal (victim viewed as an object to be used and controlled) and hostile (victim viewed as a vehicle for the offender’s anger and other negative affect) (Canter, 2000). Canter (2000) explains that these three types of offence relate to the social-psychological context of the offence and cites several studies which have found similar behavioural structures. Behaviours are located on the MDS plot dependent on their frequency of occurrence in the sample. Common behaviours are found towards the centre of the plot and rarer behaviours fall around the periphery (Canter, 2000). Behaviours towards the periphery will be of most use in linking crimes because common behaviours will not differentiate between offenders. Those around the periphery are reported to represent “signature” behaviours and those closer towards the centre reportedly represent modus-operandi behaviours (Canter, 2000).

Canter (2000) explains that each offence will contain elements of all three themes. As such the three themes of offender behaviour identified could be used to create three behavioural domains. If so, the question being investigated would be whether offenders are more consistent in pseudo-intimate, criminal or hostile behaviours. This methodology would not enable us to investigate whether MO

behaviours sharing a particular function are more or less useful, or whether ritualistic behaviours are more or less useful than MO behaviours, in linking crimes.

From the point of view of how this approach has been used in research on linking crimes, contrary to Canter's (2000) proposal that each offence will contain elements of all three themes, some researchers have categorised offenders into a type based on their predominant theme and measured the consistency of their offending at this thematic level. For example, Salfati and Bateman (2005) investigated whether homicide offenders consistently committed instrumental or expressive homicides. Some success has been reported in these studies. However, as stated above, it has been argued that such thematic categories are too broad to distinguish between offenders to be of use in practice (Woodhams, Hollin & Bull, 2007). Also it has become apparent that offenders and offences cannot *all* be categorised clearly into one predominant theme (e.g. Salfati & Bateman, 2005), which is unsurprising since all three themes should be present in an offence (Canter, 2000). Potentially more problematic, is the finding that the same behaviour does not always re-occur within the same theme. For example, in two studies of stranger rape, the offender behaviour of "cunnilingus" is found in two different themes. In Häkkänen, et al.'s (2004) study it is located in the hostility theme, whereas in Canter et al.'s (2003) study it is found within the involvement theme. In addition, Sturidsson et al. (2006) failed to replicate Canter and Heritage's (1990) thematic structure of rape behaviours. Such findings question the stability of the three themes. Also, in relation to the labels attached to, and the meanings of the themes, arguments have recently been made to move away from the labels of victim as a person, object and vehicle since they articulate what the victim might represent to the offender (Canter et al., 2003), requiring inferences to be made.

The four domains identified by Grubin et al. (2001) were chosen for the current study since the themes identified by Canter and colleagues can still be present within the four domains and are not lost. For example, within Grubin et al.'s Style domain are the behaviours 'affection shown', 'compliments', and 'consideration'. These are similar to behaviours within the pseudo-intimate or involvement theme (Canter et al., 2000; Häkkänen et al., 2004). The types of offence behaviour identified by investigative psychologists, such as Canter, can still therefore exert an influence on behavioural consistency and the linking of crimes through offenders adopting different types of control, escape, sex, and style behaviours. However, the

aim of the current study was to determine if there exist particular forms of offence behaviour which are less situation-dependent than others and thus better predictors of linkage. It has been argued (Douglas & Munn, 1992) that the more ritualistic behaviours will show greater consistency across a crime series and it follows that these would be more accurate for the behavioural linking of crimes. If such assertions are correct, behaviours which are not necessary for the commission of the crime, such as Grubin et al.'s (2001) Style behaviours, should be more reliable predictors of linkage. However, such individualistic behaviours can be problematic in the collation and management of large scale analytical databases used by crime analysts to link crimes. As explained by Grubin et al. (2001, p. 11), "To capture such information routinely on a standard proforma would require a questionnaire of thousands of questions to ensure that all possibly relevant characteristics were captured, most of which would be recorded as negative; even then, new variables would almost certainly need to be added over time".

As outlined earlier, the task of linking crimes is cognitively intensive (Santtila, Korpela & Häkkänen, 2004) and relies on the maintenance of large scale databases. The maintenance of such databases is considerable, particularly if one is trying to capture the nuances of each offender's ritualistic behaviour. If, contrary to the expectation of some researchers (Goodwill & Alison, 2006), MO behaviours can be successfully used in the accurate linking of crimes and if some MO behaviours are less situation-dependent and hence more reliable indicators, as has been demonstrated with other crime types (Bennell & Canter, 2002; Bennell & Jones, 2005; Woodhams & Toye, 2007), this will reduce the cognitive intensity of the linking task, as only certain behaviours could be focused upon, and reduce the effort required for maintaining databases for linkage analysis.

2.2.6. Investigating potential methodological limitations

2.2.6.1. *Generating Unlinked Crime Pairs from the Linked Crime Pairs*

As reported previously, past researchers of case linkage (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007) have used Jaccard's coefficient as a measure of similarity between linked and unlinked crime pairs as the input for logistic regressions and ROC analyses. Jaccard's coefficients for each crime pair have been calculated from the binary data representing the absence or presence of each behaviour on the offender behaviour checklist for each crime. It has

been commonplace to generate unlinked crime sub-samples from the linked crime sub-samples by pairing two offences by different serial offenders to form the unlinked pairs.

There are two difficulties associated with this approach. First, as outlined earlier by following this method the assumption of independence between the two samples (linked and unlinked) is violated which is problematic for subsequent logistic regression analyses (Bennell & Canter, 2002). Second, there is a question of whether, by adopting this method, researchers are artificially making the linking task easier. By sampling solved cases it could be argued that the dataset contains very consistent and distinctive crimes which were solved for this reason. If true, it follows that the significant differences observed between linked and unlinked crime pairs could result from the very consistent and distinctive way in which the offences were committed. Offender A's modus operandi if both highly consistent and distinctive would therefore appear to be very different to Offender B's so that when their two offences were paired to form an unlinked pair you would expect to see little similarity between them. Also by pairing all possible unlinked crimes with one another to form the unlinked sub-sample, one is not necessarily pairing like with like. For example, within the current dataset there are different types of sexual offence committed by different aged offenders against different aged victims. Previous research has noted that the characteristics of juvenile stranger sexual offences can vary with victim age and offender age (Woodhams, 2004; Woodhams, Gillett & Grant, 2007). By pairing different types of sexual offence, involving different aged offenders and victims, one could be inflating dissimilarity. For example, an indecent assault by an 11 year old offender against a 40 year old victim and a rape by a 17 year old offender against a 15 year old victim could have very different characteristics.

To determine if this methodology is as problematic as it could appear, it was imperative to compare the relative similarity of linked and unlinked crime pairs when the unlinked crime pairs were created from the linked sample and also when they were created from an independent but solved set of crimes. To investigate this, it was intended that a matched set of solved apparent non-serial sexual crimes would be collected to form a statistically independent set of unlinked crime pairs.

2.2.6.2. Exclusion of Rare and Common Offender Behaviours

Whilst Bennell and Canter (2002), Bennell and Jones (2005), Tonkin et al. (2008) and Woodhams and Toye (2007) used all offence behaviours derived from their content analyses in the assessment of behavioural similarity and tests of predictive

accuracy, some other researchers of case linkage have deleted from the list of offender behaviours those which were very common and/or rare (e.g. Grubin et al., 2001; Santtila, Fritzson & Tamelander, 2004; Santtila et al., 2005). One effect of deleting rare behaviours with coefficients, such as Jaccard's coefficient, is potentially to increase the degree of similarity, since behaviours that have occurred in only one crime will be deleted. However, this will increase both the similarity of linked and unlinked pairs. No previous research has considered to what degree this practice could influence the similarities between crime pairs. It was the intention of the study reported in this chapter to investigate this. To achieve this it was the intention to run separate analyses using a) the total set of behaviours and b) with rare and frequent behaviours having been removed.

2.2.6.3. Inclusion of Group Serial Offences

A literature review revealed no previous study which had considered the assessment of behavioural consistency for group criminal activities. Bennell and Canter (2002), Bennell and Jones (2005) and Tonkin et al. (2008) appear to have limited themselves to studying offences committed by lone offenders and have not included group offences in their datasets. Woodhams and Toye (2007) included group offences within their analysis of commercial robbery and showed that this method could successfully be used when linking group offences also. However, they did not investigate whether the inclusion of group offences affected the outcomes they observed. The question therefore remains whether this methodology is amenable to the study of group sex offences and what effect, if any, the inclusion of group offences has. If crime analysts are to automate part of the linking process and harness statistical techniques to identify similar pairs of crimes, it is more convenient to code group and lone offences in the same way. In this case, binary coding would be used in the same way for group and lone offences with the presence and absence of behaviours being recorded without necessarily allocating them to an offender in the group. Such an approach, if sufficiently accurate with group offences, would also overcome difficulties of allocating behaviours to offenders where sufficient detail is lacking from the victim's account. It was decided that for the study reported in this chapter, the effect of including group offences within the analysis using Jaccard's coefficient would be investigated.

2.2.7. An interactionist approach to linking crimes

To investigate whether serial offenders were consistent in ‘if(victim behaviour)-then(offender behaviour)’ contingencies across their offences a checklist of victim behaviours was required. For the reasons given in section 2.2.2, constant comparison framework analysis was also used to generate a victim behaviour checklist and offences were coded against the checklist in a binary fashion. Having created a checklist of victim behaviours the next stage involved identifying the ‘if(victim behaviour)-then (offender behaviour)’ contingencies.

Whilst previous studies using multidimensional scaling techniques have considered which victim behaviours co-occur with offender behaviours (e.g. Porter & Alison, 2004), such analyses cannot preserve the temporal ordering of victim and offender behaviours. For example, Porter and Alison note that the offender behaviour of demeaning the victim is located within the same region of the SSA plot as the victim refusing to comply. However, from this analysis, it is unclear whether the victim refusing to comply results in the offender demeaning the victim (e.g. ‘if[victim refuses to comply]–then[offender demeans victim]’), or whether the offender demeaning the victim results in the victim refusing to comply (e.g. ‘if[offender demeans victim]–then[victim refuses to comply]’).

Only one study was identified which preserved temporal sequencing of victim and offender behaviours. This was a study by Fossi, Clarke and Lawrence (2005) which examined the pathways through 14 bedroom rapes as composed of victim and offender behaviours using lag sequential analysis. It is unclear from the paper whether all types of victim-offender interactions that were found in the sample are reported. It was not therefore deemed appropriate to base the if-then contingencies for the current study on those interactions identified in the Fossi et al. (2005) paper. Rather, a method was needed to develop if-then contingencies with the current data set. The Fossi et al. (2005) paper suggested lag sequential analysis as one possible method. However, Fossi et al. (2005) report having to break each sexual assault down into seven stages which had to be analysed separately because to analyse the sexual assault as a whole event caused the production of misleading results. Also, all of the 14 offences they analysed had to pass through each stage in the same order requiring a sample of completed rapes. No attempted rapes or disturbed offences could be included in the analysis. In addition, the offences in their sample had to be divided into two groups due to the complexity of behaviours; offences that involved single sexual assaults and those that involved

multiple sexual assaults. These also had to be analysed separately from one another. Therefore, whilst if-then contingencies could be identified from such a process it is not desirable to be constrained to developing if-then contingencies for separate categories of sexual offence. For the contingencies to have the potential to be used in case linkage in the future, they needed to be generalisable to all types of sexual assault. An alternative method from linguistics was therefore chosen which had the same advantages as lag sequential analysis but which did not require any division of the data.

Linguists study collocations, which are “Relationship[s] of habitual co-occurrence between words” (Stubbs, 1995, p. 23). Linguists have devised specialist software to identify collocations and the degree of co-occurrence of specific words across large texts. In studying collocations, linguists specify a query word, the word they are investigating, and determine which words co-occur with it. The linguist specifies a “span”, “window” (Stubbs, 1995) or “horizon” (Scott, 2007), which refers to the number of words to the left and right of the query word which the computer programme is to consider. A boundary of 5:5 would require the programme to consider the five words to the left of the query word and the five words to its right. If expressed as a contingency, one example result of such analyses could be “if the word GOING is found – then it is followed by HOME”. In the same way, psychologists could specify a victim behaviour and determine which offender behaviours follow it in victims’ accounts of crimes. This approach was taken in the study reported in this chapter to identify ‘if(victim behaviour)-then(offender behaviour)’ contingencies. The WordSmith tool (© Mike Scott, 2004-2007) was chosen for the study since it contained the function to study collocations. As this was the first study of its kind, it was intended to generate if-then contingencies only for the three most common victim behaviours and following this investigate consistency in these if-then contingencies.

To investigate whether the relationship between situational similarity and behavioural consistency observed in Personality Psychology extended to criminal behaviour, themes of victim behaviour that varied in the psychologically salient characteristics manipulated by personality psychologists (Furr & Funder, 2004; Mischel & Shoda, 1995; Shoda et al., 1993), including valence, task type and task demands, needed to be identified. A review of the literature identified a study by Burgess and Holmstrom (1976) which had categorised victim behaviours into themes. The utility of Burgess and Holmstrom’s method of categorising victim’s coping strategies was therefore considered. This categorisation system has seven categories: cognitive,

affective, verbal, physical, psychological defence, physiological reaction, and no strategies. This categorisation system was not chosen for the study reported in this chapter because, as suggested by Personality Psychology (Shoda et al., 2002), what would be important with regards to influencing an offender's subsequent behaviour is what the victim is trying to achieve, the function of their behaviour, and subsequently how this is perceived by the suspect, rather than the mode used for its expression.

The literature review also identified that a similar task had been completed by researchers studying offender profiling. In these situations, the researchers attempt to make links between the way an offender behaves at the crime scene and personal characteristics of the offender. A common methodology has been to classify an offender into a type based on his/her modal type of crime scene behaviour. For example, Häkkänen et al., (2004) classified stranger rapists into three behavioural styles (hostility, involvement and theft). These styles were identified using multi-dimensional scaling techniques. Similarly, multidimensional scaling techniques could be used to identify styles of victim behaviour. A victim could then be categorised based on her dominant style of behaviour. However, in Häkkänen et al.'s study only 57% of offenders could be classified into a single dominant theme. This approach is also problematic since the strategies employed by a single victim in one offence can vary (Burgess & Holmstrom, 1976). Categorising victims by their modal type of behaviour would therefore lose information.

In the same way that constant comparison framework analysis can assist in the identification of discrete victim/offender behaviours, it can be used to identify higher-level themes (Willig, 2001). Constant comparison framework analysis was one method that could therefore be used to identify victim behavioural themes that differed in psychologically-salient qualities. However, to introduce methodological rigour it was decided to take a combined quantitative and qualitative approach.

Since this research topic had not previously been investigated it was appropriate to choose an exploratory form of quantitative analysis (Ball, 1971, as cited in Everitt, 1980). Previous studies of types of offending behaviour have used agglomerative hierarchical cluster analysis (Långström et al., 2000; Woodhams & Toye, 2007). These studies' sample sizes were 56 offences and 80 offences, respectively. Cluster analysis is typically used with large samples, whereas a sample of 56-80 offences is relatively modest. However, Långström et al. (2000) cite several published studies where such sample sizes have previously been used. It was intended that Jaccard's coefficient

would be used as the measure of similarity in the analysis because of its suitability for crime data (Bennell & Canter, 2002). This approach was taken by Woodhams and Toye (2007) when investigating types of commercial robber.

Hierarchical cluster techniques have been criticised for resulting in *chaining*, a “Tendency of the method to cluster together at a relatively low level objects linked by chains of intermediates” (Everitt, 1980, pp. 67-68). This is problematic when distinct groupings are being sought. Single linking techniques are particularly sensitive to chaining. Alternative methods of cluster analysis that can overcome this issue are optimisation techniques. However, these techniques require the number of groupings to be specified *a priori* (Everitt, 1980). Without any prior indication of the number of victim behavioural themes that might exist, this did not seem appropriate.

Another limitation of hierarchical clustering techniques is that if a case is poorly allocated at an earlier stage of the analysis, they offer no possibility for re-allocation later in the analysis (Everitt, 1980). This is a flaw of this methodology that needs to be recognised. With the advantages and disadvantages of cluster analysis in mind, and providing that sufficient data could be obtained, agglomerative hierarchical cluster analysis was therefore chosen as the quantitative analysis.

Everitt (1980) criticises the approach of some researchers to cluster analysis for failing to validate the clusters identified by one set of data. One way to do this is to split the data randomly in half and assess whether the same clusters are found in both data sets. It was decided that this approach would be taken in the current study to ensure that clusters identified with one data set can be generalised to other data sets providing enough cases could be sampled.

Having identified methods of determining victim behavioural themes the question arises of how to measure similarity in victim behavioural themes. It is commonplace to measure similarity in offender behaviour between crimes in a pair using Jaccard’s coefficient (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007). This is because of its suitability for crime data, where there can be uncertainty as to whether the absence of an offender behaviour in a victim’s account is due to it not occurring or because of poor memory, amongst other factors (Bennell & Canter, 2002). Similarly, a victim may fail to recall a behaviour of their own. Jaccard’s coefficient, therefore, makes an appropriate measure of similarity between situations (as conceptualised as similarity in victim behaviours).

Whether situational similarity and *criminal* behavioural consistency were associated with one another could be investigated in two ways. One method was to conduct an overall correlation between behavioural consistency (as measured using Jaccard's coefficient between linked crime pairs) and situational similarity (as measured using Jaccard's coefficient between linked crime pairs) for all series. The amalgamation of several series, and thus the offending of several offenders, into one analysis may, however, mask relationships between behavioural consistency and situational similarity that vary in strength between individual offenders. An alternative method was to conduct a correlation per series should there be series of sufficient length in the dataset. It was the intention that the latter approach would be adopted were the data sufficient or alternatively the former approach would be taken were this not the case.

2.3. Method

2.3.1. Data

The data were obtained from the Serious Crime Analysis Section (SCAS) of the National Policing Improvement Agency. SCAS is a police analytical unit located in the United Kingdom with national responsibility to carry out analytical work on behalf of all forces. SCAS collates and analyses information on serious crime that fulfils its criteria (predominately stranger murders and serious sexual assaults and/or rapes). This unit holds the most comprehensive collection of data on stranger sexual assault in the UK. The databases at SCAS were searched for suitable offences. Thirteen juvenile serial stranger sex offenders, who had been convicted of their offences, were identified and all of their 39 known crimes were sampled. A juvenile was defined as an offender aged less than 18 years of age. For some offenders in the sample, they were aged less than 18 years at the start of their series but were aged over 18 years for some of their later offences. Thirty-nine offences committed by non-series stranger sex offenders, where a conviction had been obtained, were selected that matched as closely as possible to the 39 serial juvenile stranger sex offences regarding type of offence (indecent assault, rape or attempted rape), offender age, victim age, number of offenders, victim ethnicity and offender ethnicity. The total sample constituted 78 stranger sexual assaults. For 9 of these 78 offences (12%) physical evidence (fingerprints or DNA) also linked the offender to the crime.

The type of offence was thought likely to affect the potential offence behaviours displayed since it is in part defined by what occurred in the offence. Both offender age and victim age have previously been found to affect offence behaviours in juvenile stranger sexual assaults (Woodhams, 2004) and therefore both were also considered to be important factors on which to try and match. Perfect matching on these three variables was not possible as the sample of juvenile stranger sexual offences with convictions was limited. Perfect matching was possible with 74% (29 of 39) of pairs on type of offence, with 17% (7 of 42) on suspect age, and 8% (3 of 39) on victim age. However, with regards to suspect age, for 57% of suspect pairs (24 of 42) the suspects' ages were within two years of one another. For victim age, for 26% (10 of 39) of pairs the victims' ages in a pair were within two years of one another and for 54% of pairs they were within five years.

Where perfect matching on all three variables was not possible matching was first attempted on type of offence. Where a perfect match was not possible on this variable an offence type that was most similar was chosen. For example, when trying to find a match for an indecent assault, if no other indecent assault was available, the author would try to match an indecent assault with an attempted rape rather than with a rape. When trying to match on offender and victim age, she first tried to identify another offence which was similar for victim and offender age. Where this could not be achieved she tried to find an offence as close as possible in age with a similar age range between offender and victim. It was possible to match all pairs in relation to whether they were committed by a lone offender or multiple offenders. In the case of multiple offenders, it was possible to match perfectly the number of offenders in one of the three pairs. The ethnicity of the victim and offender was matched where possible. Although no published literature was identified to suggest that ethnicity affects offence behaviour in juvenile stranger sex offences this was done as a precaution, however due to the absence of confirmatory literature this factor was not prioritised as highly for matching as those mentioned above. Matching on this variable was particularly difficult in the case of victims' ethnicity since in a substantial proportion of cases the victim's ethnicity had not been recorded in the police file. Perfect matching was achieved for suspect ethnicity and victim ethnicity for 50% (21 of 42) and 46% (18 of 39) of pairs, respectively.

The success of the matching process was assessed using statistical analyses. With regards to comparisons of offence type between the two groups a significant result

was found following a 2x3 Chi-square test ($\chi^2 = 7.42$; $df = 2$, $p < .05$). On examining the frequency table it was evident that a higher proportion of attempted rapes were contained in the non-series sample (23%, $n = 9$) compared to the series sample (3%, $n = 1$). The offenders' ages for the two sub-samples were compared using an independent samples t-test because the distribution for mean offenders' age was not significantly different to normal as tested by a Kolmogorov-Smirnov test ($Z = 1.06$, $p > .05$) (de Vaus, 2002; Kinnear & Gray, 2000). In the case of multiple offenders, the mean suspect age for the group was calculated and used within this statistical test. The mean ages for the matched non-series offences ($M = 17.51$) were found to be significantly older than those for the series offences ($M = 15.00$), ($t_{(76)} = 4.733$, $p < 0.001$). The victims' ages for the two sub-samples were compared using a Mann-Whitney U test because the distribution for victims' ages was significantly different to normal as tested by a Kolmogorov-Smirnov test ($Z = 1.56$, $p < .05$). The victims' ages between the two sub-samples were not significantly different from one another ($U = 572$, $p > .05$).

With regards to offender ethnicity, the assumption of Chi-square analysis of an expected count of five cases per cell could not be met and a Fisher's Exact test was not appropriate due to the number of categories. Offender ethnicity was therefore collapsed to form two categories of White European and Non-White European, as recommended by Brace, Kemp and Snelgar (2003). One case where the ethnicity of the offender was unknown was not included in the analysis. There was a significant association between the series group vs. the matched group and ethnicity ($\chi^2 = 7.57$; $df = 1$, $p < .01$) with a significantly greater proportion of White-European offenders in the matched sample. With regards to victim ethnicity, there were no significant associations between the series group vs. the matched group and ethnicity ($\chi^2 = 3.70$; $df = 3$, $p > .05$).

The information source for each sexual offence was recorded in the data collection process. The types of information source were victim statement, victim interview transcript, interview notes, court report and crime analyst's report. Whilst it was not possible to match offences on this variable since this information was not available until a case had been selected for matching and the case file had been requested, a Chi-square analysis was conducted to determine if there was a significant association between series group vs. matched group and types of information source. No significant association was found between series group vs. matched group and types of information source ($\chi^2 = 7.72$; $df = 4$, $p > .05$).

In summary, whilst great effort was put into matching the non-series dataset with the series dataset there remain some variables on which the two samples differ significantly. The two samples can be considered comparable on source type, victim age and victim ethnicity, however it must be noted that they differ on offender age, offence type and offender ethnicity.

Of the whole sample, most offences were committed by a lone juvenile offender (92%, $n = 72$). Where multiple offenders were involved, 4% ($n = 3$) of offences were committed by two offenders, 3% ($n = 2$) by three offenders and 1% ($n = 1$) by four offenders. All offenders were male. The mean offender age was 16.26 years ($Mdn = 16.00$, $SD = 2.65$, Range = 11–26). Where two or more offenders were responsible for an offence, their mean age was calculated. All victims were female. The mean victim age was 26.39 years ($Mdn = 23.00$, $SD = 13.72$, Range = 10–81). The sample of serial offences was committed by 13 offenders and the sample of matched offences comprised the offences of 39 offenders.

2.3.2. Procedure

The current author accessed the case file for each offence and a narrative of each offence was written from the victim's account. These were entered into a standard proforma (see Appendix 1). Each row in the proforma table represented an offender or victim behaviour to which a sequential number was given, and in which was recorded the actor (e.g. victim, suspect 1, suspect 2, and so on), the stage of the offence (1 – 5 representing the transition from approach, to maintenance, to the closure stage), and the behaviour and the context in which it occurred. The sequential occurrence of behaviours by offender(s) and victim was therefore preserved. The proforma contained the behaviours of offenders, victims and witnesses in the order reported by the victim. Identifiers such as the victim's name, offender's name, place names, were not recorded in the narratives to ensure they were anonymous.

2.3.3. Creation of the offender behaviour checklist

The narratives were qualitatively analysed through a constant comparison framework analysis (Ritchie & Spencer, 1994) in a similar manner to Swallow and Jacoby (2001). The analysis involved steps which are common to many different types of qualitative research which aim to develop themes (Bradley, Curry & Devers, 2007). The first is familiarisation, which involved the author immersing herself in the data by reading and re-reading the victims' narratives. Second, a framework was developed from the data with each theme (conceptual code) representing a type of offender

behaviour. The data were open-coded (Henwood & Pidgeon, 2006). Initially, each row of each narrative was assigned a code or codes on a row-by-row basis, according to the principles of grounded theory (Bradley et al., 2007). Each row in the narrative represented a natural break in the offender-victim interaction. Coding at this level of segmentation is considered appropriate and is recommended (Henwood & Pidgeon, 2006).

Whilst the codes were derived from the data rather than a pre-existing framework being used, the current author was well acquainted with the past theoretical and empirical research on the topic of rape. This and her past employment as a crime analyst may have influenced the labels given to codes. However, she did not *use* the past literature to develop a partial framework prior to data analysis. It is not problematic for the researcher engaging in framework analysis to draw upon *a priori* knowledge, providing the researcher attends to new concepts arising from the data (Henwood & Pidgeon, 2006; Ritchie & Spencer, 1994).

A definition was created for each code entry in the framework. For example, “Direct Re-dress” was defined as “The offender directed the victim to re-dress”. The codes/themes and their specifications were revisited and refined throughout the coding process in line with principles of grounded theory (Bradley et al. 2007; Henwood & Pidgeon, 2006). Occurrences of each code were compared to ensure they represented the same concept. The conceptual codes themselves were also compared to ensure they were distinct from one another. Where this was not the case, the coding was revised. Memoing was used and records of deliberations about the refinement of conceptual codes were kept, as recommended by Henwood and Pidgeon (2006).

The author engaged in indexing whereby each account was annotated with conceptual codes from the thematic framework (Ritchie & Spencer, 1994). An additional column was added to the offence narrative proforma to achieve this. The next stage in the process involved creating a chart of the thematic framework. In charting, “Data are ‘lifted’ from their original context and rearranged according to the appropriate thematic reference” (Ritchie & Spencer, 1994, p. 182). The occurrence of each offender behaviour and the line at which this behaviour occurred within the respective narrative was recorded within the framework of behavioural themes. By including the locations of the occurrences of the conceptual codes in each victim narrative the transparency of the framework development was assured. The product was a final coding framework for offender behaviours.

Whilst grounded theory principles recommend conducting further data analysis should unusual experiences/behaviours emerge (Bradley et al., 2007; Henwood & Pidgeon, 2006), this was not possible with the current dataset because the author could not obtain any further narratives from SCAS because the offences of all convicted serial juvenile stranger sex offenders, in their records at that time, had been collected and therefore there were no further cases to be sampled.

One hundred and forty eight offender behavioural themes were identified from the constant comparison framework analysis. These are listed within Appendix 2 with their corresponding definitions. The finalised coding framework was applied to the victims' narratives with each narrative being coded against the framework as to whether the code was present or absent. There was sufficient detail in the narratives to code all offender behaviours and all 78 accounts contained offender behaviours.

Ten percent of the narratives (eight narratives) were given to a second coder along with the coding scheme to assess inter-rater reliability (Bradley et al., 2007). The second coder was asked to indicate whether each behaviour on the offender checklist was present or absent in each of the eight offences. The second coder had not been involved in the development of the framework. Inter-rater reliability was assessed using Cohen's kappa and percentage agreement since publications in forensic psychology tend to cite either one or both figures (e.g. Hartwig, Granhag, Stromwall & Vrij, 2005; Porter & Alison, 2001, 2004, 2005, 2006; Santtila et al., 2005), and because there has been some debate about the appropriateness of kappa (e.g. Sim & Wright, 2005; Uebersax, 1987).

Cohen's kappa was 0.62 for the offender framework which was significantly different to a chance level of agreement ($p < 0.001$). Whilst the authors of published guidelines for articulating the magnitude of agreement report them as being "clearly arbitrary" (Landis & Koch, 1977, p. 165), they can be useful when gauging the degree of agreement. Against such guidelines, a kappa of 0.62 represents a good (Cicchetti, 1994) or substantial (Landis & Koch, 1977) level of agreement. This value is also similar to values reported in other studies of sexual assault behaviours which were considered acceptable (e.g. 0.62 in Porter & Alison, 2001, 2005, and 0.60 in Santtila et al., 2005). Percentage agreement (between raters) was 91.22% for the offender framework. This value is very similar to or higher than those reported in studies conducted with similar data (92.3% in Santtila et al., 2005, 92.8% in Santtila, Fritzon & Tamelander, 2004, and 88% in Porter & Alison, 2004, 2006). Both measures of inter-

rater reliability implied that the coding was sufficiently reliable for use in further analyses.

The spreadsheet of serial offenders' behaviours was checked for missing data and no missing data were observed. The frequency of each behaviour was calculated, firstly within the sample of serial offences, and secondly within the sample of serial offenders. The relative frequencies are also presented within Appendix 2.

2.3.4. Creation of the victim behaviour checklist

Constant comparison framework analysis was also used to create a victim behaviour checklist. One hundred and twenty four behavioural themes were identified from the constant comparison framework analysis. These can be seen in Appendix 3 where they are presented alongside their definitions.

For the serial offences, one victim behaviour was uncodable due to insufficient detail provided in the victim's account and two serial offences contained no victim behaviours. For the matched offences, one victim behaviour could not be coded due to insufficient information and one offence contained no victim behaviours.

Ten percent of the narratives (eight narratives) were given to a second coder along with the coding schemes to assess inter-rater reliability (Bradley et al., 2007). The second coder was asked to indicate whether each behaviour on the victim behaviour checklist was present or absent in each of the eight offences. The second coder had not been involved in the development of the victim behaviour framework. As with the offender behaviour checklist, inter-rater reliability was assessed using Cohen's kappa and percentage agreement.

Cohen's kappa was 0.59 for the victim behaviour framework which is significantly different to a chance level of agreement ($p < 0.001$). Against published guidelines, a kappa of 0.59 is at the very upper boundary of what Cicchetti (1994) considers a fair level of agreement and what Landis and Koch (1977) consider a moderate level of agreement. This value is again similar to levels reported in other studies of sexual assault behaviours which were considered acceptable (e.g. 0.62 in Porter & Alison, 2001, 2005, and 0.60 in Santtila et al., 2005).

Percentage agreement (between raters) for the victim framework was 94.25%, a value greater than that for the offender framework. This percentage agreement is greater than those reported in studies conducted with similar data (92.3% in Santtila et al., 2005, 92.8% in Santtila, Fritzson & Tamelander, 2004, and 88% in Porter & Alison, 2004, 2006).

Whilst the measure of percentage agreement suggested that the inter-rater reliability was greater than past studies using similar data, an interview was conducted with the second coder to determine reasons for discrepancies in coding. This revealed that several discrepancies related to subjectivity in the victim accounts. For example, in one account it was recorded that the victim tried to “hit the offender in the face”. Whilst the author had coded this as “hit/slapped”, the second coder had recorded this as “punched”. Another example is the behaviour of screaming. In many accounts, it was simply stated that the victim screamed whereas in others it was recorded that the victim screamed for help. The author had coded all occurrences of screaming as “verbal help-seeking”, however the second coder, who had a background in linguistics, considered that screaming could also serve an expressive purpose. The level of detail in the victim accounts was therefore not sufficient to determine whether a victim screamed to seek help or whether she screamed as an emotional release, or both. The problem of insufficient detail in police records is widely recognised (Canter & Alison, 2003). Some reasons for discrepancies in coding were therefore related to the nature of the data, rather than being a flaw of the coding scheme. The amount of detail in victim accounts is not something that improvements in a coding scheme could overcome.

2.3.5. Geographical location data

As well as collecting information about the behaviours displayed by offenders and victims during the 78 sexual offences, for each crime the geographical locations of the initial approach of the victim by the offender and the actual sexual offence were collated. Geographical information was provided by SCAS in the form of anonymized northings and eastings. The geographical locations for some of the older offences were only known to the closest 100m (with the northings and eastings only having four digits) whereas for the more recent offences accuracy was to the nearest metre (as indicated by six digit eastings and northings). This data were anonymized by SCAS by changing the actual locations of the offence but maintaining the distances between all crime pairs. Since the analysis was concerned with the difference in geographical distances between linked and independent-unlinked pairs this was not problematic.

2.3.6. Ethics

A proposal for the study was submitted to SCAS and was assessed and approved by their Research Approval Panel. The identities of victims, offenders and any witnesses were protected at all times. The case files were viewed at a secure location at Bramshill Police College. Identifiers within the offence narratives were replaced with

anonymized descriptors, e.g. Victim Name, Offender Name, Place Name, within the narratives to ensure they contained no identifying details. The narratives were stored electronically within password-protected files to which only the author had access. Paper versions of any data which were required during the course of the research were securely stored in a locked filing cabinet and immediately shredded when no longer required. The consent of the victims to use their accounts was not sought because all of the cases were at least three years old and it was agreed that to contact the victims for their consent could cause psychological harm. The anonymization of their accounts and the intention to use the research findings to improve the detection and prosecution of future offences mitigates, to some extent, this decision.

2.4 Results

To assess the research questions of whether juvenile stranger serial sex offenders are consistent in their offending behaviour and whether linked crime pairs can be accurately differentiated from unlinked crime pairs requires several stages of analysis. First, a checklist of offender behaviours must be created against which each offence is coded in a binary fashion. Second, a measure of similarity is calculated for each crime pair in the dataset. This allows comparisons in behavioural similarity to be made between the linked crime pair sample and the unlinked crime pair sample, such as whether the linked crime pairs are significantly more similar in behaviour than the unlinked crime pairs, as would be hypothesised. Third, logistic regression and ROC analysis are used to determine whether the similarity in behaviours between crime pairs is an accurate predictor of whether a given pair in the dataset is linked or not. These analyses are reported in the following sections.

The study reported in this chapter had the additional aim of investigating whether the situation, in terms of victim behaviour, could be integrated into the crime linking task. The study aimed to investigate whether behavioural consistency (similarity) was associated with situational similarity (similarity in victim behavioural themes). It also aimed to investigate the utility of linguistics software for producing ‘if(victim behaviour)-then(offender behaviour)’ contingencies. To investigate these research questions necessitated the development of the victim behaviour checklist, as well as the offender behaviour checklist. The analyses related to the interactionist approach to behavioural consistency are reported later in the thesis, in section 2.4.9.

2.4.1. The traditional paradigm for investigating behavioural consistency and accuracy of linkage

As noted previously, the common method of testing the assumptions underlying case linkage is to create a sample of linked crime pairs and unlinked crime pairs and compare the behavioural similarity between these two groups of pairs (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007). The linked crime pairs are formed by pairing together two crimes committed by the same offender. The unlinked crime pairs represent two crimes committed by two different offenders. If the assumptions of behavioural consistency and distinctiveness that underlie case linkage are correct the linked crime pairs would possess greater behavioural similarity than the unlinked crime pairs. This is operationalised as a larger Jaccard's coefficient, the preferred measure of similarity. The Jaccard's coefficients also form the input for the tests of predictive accuracy (logistic regression and ROC analysis) where the aim is to assess how accurately linkage status (whether a given pair in the dataset are a linked pair or an unlinked pair) can be predicted on the basis of behavioural similarity scores. This method was adopted for the study reported in this chapter and the findings are reported in the following sections.

2.4.2. Testing similarity with an independent-unlinked sub-sample vs. a dependent-unlinked sub-sample

One aim of the study reported in this chapter was to investigate the methodological question of whether the creation of unlinked crime pairs from linked crime pairs artificially inflated the difference in similarity between linked and unlinked crime pairs. As is outlined in the Method section, a matched set of apparent non-serial sexual crimes was obtained from SCAS which was used to create a set of unlinked crime pairs that were statistically independent from the linked crime pairs. This sample was referred to as the independent unlinked sub-sample.

Most previous research on behavioural similarity in serial crime has used all possible unlinked offences in their analyses, which makes for a considerable sample size overall. One effect of having a large sample size is the inflation of type 1 errors, finding a significant result where one does not exist (de Vaus, 2002). A considerable difference in sample sizes for linked and unlinked crime pairs would also violate the assumptions of some inferential statistical tests. Equal samples of linked and unlinked crime pairs were therefore used.

A dataset of 53 dependent-unlinked pairs were randomly chosen from the *dependent-unlinked* sample using the random select function in SPSS. Fifty three independent-unlinked pairs were also generated in the same way. Jaccard's coefficients were calculated using SPSS for both the independent-unlinked pairs and the dependent-unlinked pairs. These were statistically compared with those already generated for the linked pairs.

The distributions of the Jaccard's coefficients for the linked and unlinked-dependent crime pairs were assessed using Kolmogorov-Smirnov tests. Whilst the distribution of the linked pairs was not problematic ($Z = .663, p > .05$), the distribution for the unlinked-dependent pairs was found to be significantly different to a normal distribution ($Z = 1.489, p < .05$). A Wilcoxon Signed Ranks test was therefore used to assess whether the 53 linked pairs were significantly different in similarity from the 53 dependent-unlinked pairs. This test revealed that the linked pairs were significantly more similar ($Mdn = 0.29$), as measured by Jaccard's coefficient, than the dependent-unlinked pairs ($Mdn = 0.19$) ($Z = -4.08, p < .001$). The related nature of the two samples meant that it was appropriate to estimate the effect size directly using the means and standard deviations (Dunlap, Cortina, Vaslow & Burke, 1996). This approach was taken rather than calculating the effect size from the test statistic because in related designs calculating the effect size from the test statistic can overestimate the size of effect (Dunlap et al., 1996). However, the non-normal distribution of the dependent-unlinked pairs meant that the data, as they stood, were not suitable for Cohen's d calculations. This is because "Cohen's d was designed for use where scores of the two populations being compared are continuous and normally distributed" (Rice & Harris, 2005, p. 618). To overcome this, the data for both linked and unlinked pairs were transformed (personal communication from Dr. Raphael Gillett, 21st May 2007) with a constant of 1 being added to each score so that all values were greater than 1 (Tabachnick & Fidell, 1996). A square root transformation was unsuccessful in normalising the distributions. However, a log transformation normalised the distributions, as assessed by a Kolmogorov-Smirnov test (LOG Linked: $p > .05$; LOG Unlinked: $p > .05$). Cohen's d was then calculated using the transformed means and standard deviations and the effect size estimate was then back-transformed into the original units (personal communication from Dr. Raphael Gillett, 21st May 2007). The effect size estimate with the transformed data was 0.80. When this value was back-transformed, by squaring 0.80, the resulting effect size estimate was moderate to large

in size, at 0.64 (Cohen, 1988). (All Cohen's d calculations were conducting using Lee Becker's online calculator accessed at <http://web.uccs.edu/lbecker/Psy590/escalc3.htm>.) Pallant (2007) also explains that the effect size r can be approximated using the Z statistic produced by the Wilcoxon-Signed Rank test. The calculation for this is $Z/\sqrt{N}$. This also produced an effect size of medium – large size ($r = 0.40$).

The distributions of both the linked and *unlinked-independent* pairs were not significantly different to a normal distribution, as assessed by two Kolmogorov-Smirnov tests (Linked $Z = .663$, $p > .05$, Unlinked $Z = .620$, $p > .05$). Since the sample sizes were equal, an independent samples t-test was computed to compare the two subsamples for similarity. There is not a difficulty of an absence of independence within the two subgroups, because, as noted by Grubin et al. (2001, p. 7), the crimes constituting the linked pairs are discrete events, “And from a statistical point of view are independent of each other”. The linked pairs were significantly more similar ($M = 0.312$, $Mdn = 0.29$) than the unlinked-independent pairs ($M = .203$, $Mdn = 0.20$) ($t_{(91.9)} = -5.351$, $p < 0.001$, $d = 1.039$). Cohen's d represented a large effect by published standards (Cohen, 1988).

Whilst in both cases, the linked pairs were significantly more similar than either of the samples of unlinked pairs, the skewed distribution of the dependent set of unlinked pairs, (see the lower graph in Figure 2C), and their slightly lower median score (0.19 compared to 0.20 for the independent-unlinked sample) suggests that the generation of unlinked pairs from the linked pairs may exaggerate the relative difference in similarity between linked and unlinked pairs. This could suggest that past studies which have conducted logistic regression and ROC analysis with a dependent set of unlinked pairs (Bennell & Canter, 2002; Bennell & Jones, 2005; Woodhams & Toye, 2007) may have exaggerated the predictive accuracy of their models. This was tested in the current study by conducting two logistic regressions, one with the dependent set of unlinked pairs and the other with the independent set of unlinked pairs.

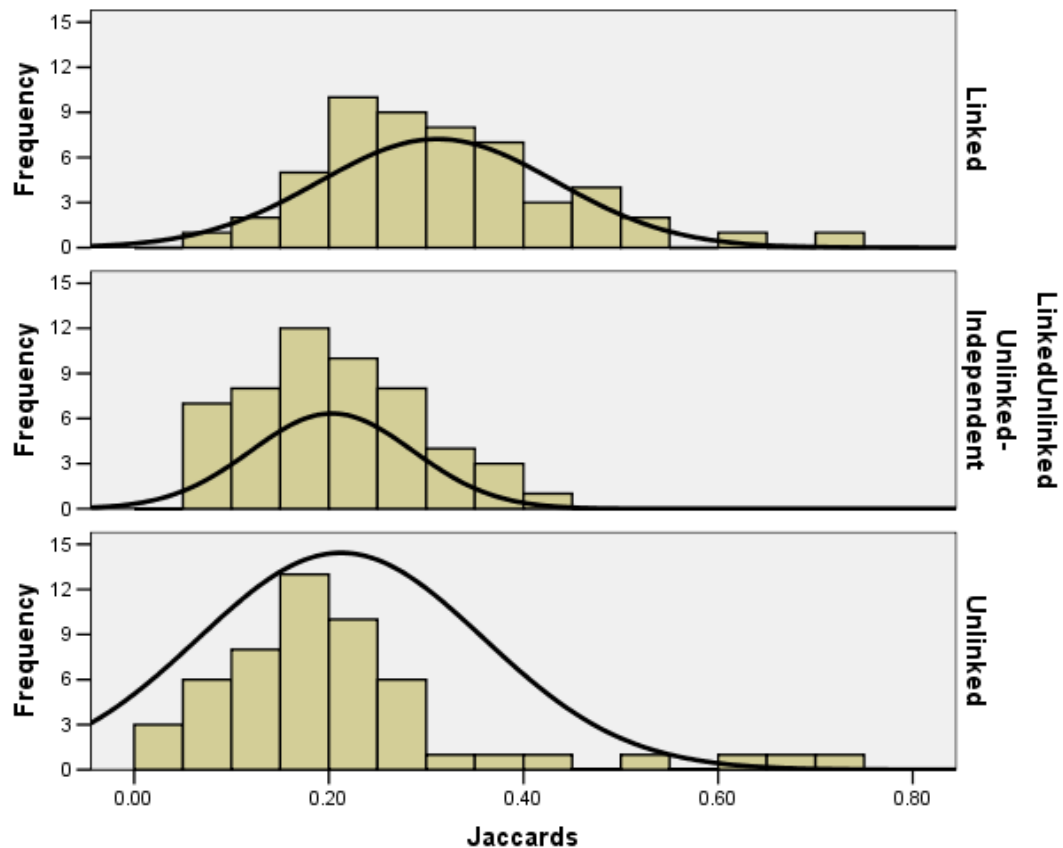


Figure 2C: Distributions for the 53 linked crime pairs, the 53 independent-unlinked crimes pairs, and the 53 dependent-linked crime pairs (normal curves included).

Logistic regression was an appropriate test to use to assess predictive accuracy since the dependent variable was a binary outcome (linked versus unlinked) and the independent variable was a continuous variable (Pallant, 2007). Whilst some authors (Howitt & Cramer, 2005, p. 434) argue that simple logistic regression “Achieves nothing computationally which is not more simply done in other ways”, it was necessary to conduct simple logistic regressions for the subsequent calculation of the ROC analyses, which require the predicted probabilities produced by logistic regression as their input (Bennell & Canter, 2002). In relation to the assumptions of logistic regression, with a sample size of 106 pairs in each analysis and only one predictor variable the ratio of cases to variables was sufficient (Peduzzi, Concato, Kemper, Holford & Feinstein, 1996). The datasets were checked for outliers through inspection of the residuals (Pallant, 2007). No outliers were identified for the linked and independent-unlinked comparison but three outliers in the dependent-unlinked pairs were identified for the linked and dependent-unlinked comparison. Whilst Pallant

(2007) recommends considering whether such cases should be removed from the analysis, they were not removed. The linkage status of the three pairs was checked and confirmed to be correct. We can be confident that in reality these pairs do in fact represent three offence pairs that were committed by six different offenders since offenders were matched to their crimes through a conviction. To remove them from the analysis would have artificially improved the model's performance.

Two logistic regressions were conducted to determine whether there was a difference in outcome where dependent-unlinked pairs were used in comparison to where independent-unlinked pairs were used. The assumption that the two outcomes (linked, unlinked) were independent was not met in the case of the linked and dependent-unlinked pairs comparison. Two ROC analyses were therefore conducted because these analyses, unlike logistic regression, do not require statistical independence of the observations that comprise the dependent variable (Bennell & Canter, 2002).

For the prediction of linked vs. independent-unlinked pairs, the prediction of category membership improved from 50% to 71%. The unlinked pairs were more accurately predicted (76%) than linked pairs (66%). The large p -value ($p=0.96$) for the Hosmer-Lemeshow test and the significant model chi-square ($\chi^2 = 27.160$, $df = 1$, $p < .001$) suggested good fit (Kinnear & Gray, 2000; Pallant, 2007). The Cox and Snell R square and the Nagelkerke R square statistics suggested that between 23% and 30% of the variability in category membership could be predicted by behavioural similarity (Brace et al., 2003; Kinnear & Gray, 2000). The positive beta value indicated that linked crime pairs were more similar than independent-unlinked crime pairs (as would be expected based on the earlier analyses). Jaccard's coefficient, measuring behavioural similarity between crime pairs, was a significant predictor of linkage status ($p < .001$).

For the prediction of linked vs. dependent-unlinked pairs, the prediction of category membership improved from 50% to 72%. Unlinked pairs were again more accurately predicted (77%) than linked pairs (66%). The Cox and Snell R square and the Nagelkerke R square statistics indicated that between 13% and 17% of the variability in category membership could be predicted by behavioural similarity (Kinnear & Gray, 2000). This was considerably less than was predicted in the previous logistic regression using linked versus independent-unlinked pairs. The positive beta value indicated that linked crime pairs were more similar than dependent-unlinked

crime pairs. Jaccard's coefficient, measuring behavioural similarity between crime pairs, was again a significant predictor of linkage status ($p < .001$).

Whilst the model χ^2 was significant ($\chi^2 = 14.232$, $df = 1$, $p < .001$), suggesting good model fit, the very small p-value ($p = 0.006$) for the Hosmer-Lemeshow test suggested a poor fit (Kinnear & Gray, 2000; Pallant, 2007). This contradiction is probably a result of the different ways in which goodness of fit is calculated for these two measures. The calculation of Hosmer-Lemeshow statistic relies on adequate expected frequencies. The similarity scores represent a continuous variable but the Hosmer-Lemeshow test calculates a contingency table by groups of scores, typically creating a table of 20 cells (Tabachnick & Fidell, 1996). From perusing the contingency table, it appears there are not sufficient expected frequencies because one cell has a value less than one and more than 20% of cells have a value of less than five. In such situations, Tabachnick and Fidell (1996) recommend using a goodness of fit test that does not use observed versus expected frequencies in its calculation, such as model χ^2 . Model χ^2 suggested a good model fit.

The two ROC analyses reported similar findings. The measure of predictive accuracy provided by a ROC analysis is called the area under the curve which corresponds to the shape of the ROC curve. As explained by Swets (1996), a ROC curve which follows the positive diagonal of the graph from left to right would possess no discrimination between linked and unlinked crime pairs, whereas a curve which follows the left and upper border of the plot, and thus has a greater area under the curve, represents excellent predictive accuracy. The former example would equate with an area under the curve of 0.5 which corresponds to chance level prediction, whereas the latter would equate with an area under the curve of 1.0 denoting perfect prediction (Swets, 1996). The area under the curve (A_z) for the linked vs. independent-unlinked comparison was 0.78 whereas the area under the curve for the linked vs. dependent-unlinked comparison was 0.73 (see Figure 2D). According to published guidelines, these two values indicate an acceptable level of predictive accuracy (Hosmer & Lemeshow, 2000), with slightly better predictive accuracy being found for the linked vs. independent-unlinked crime pairs comparison.

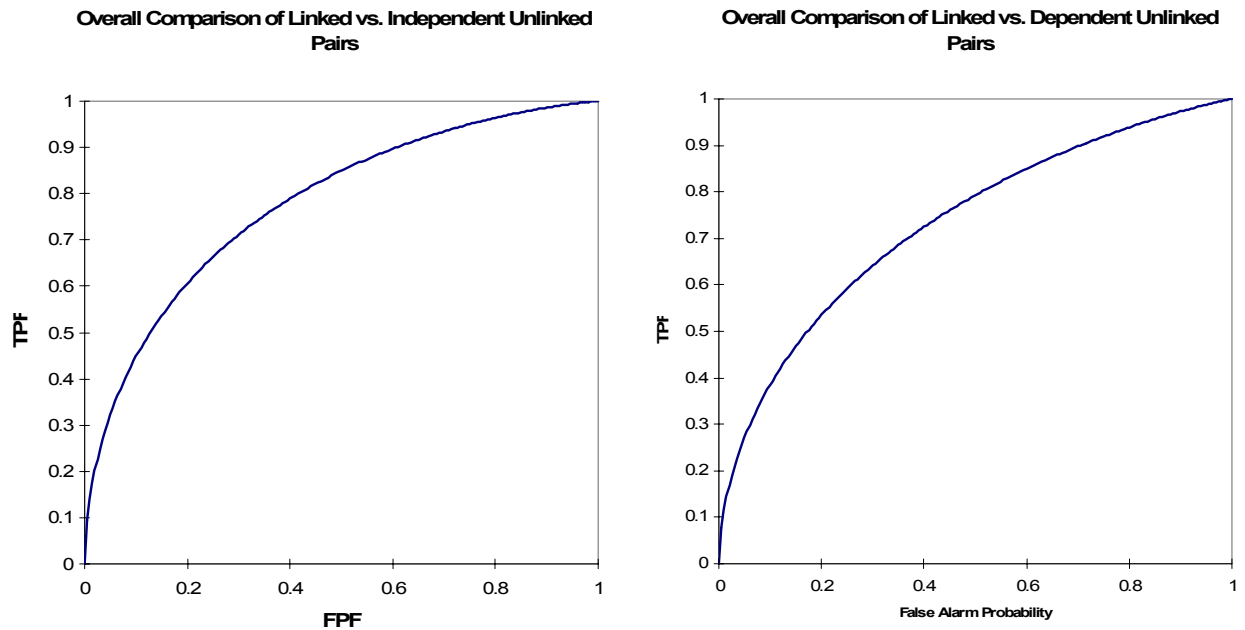


Figure 2D: ROC curves for the overall comparison between linked pairs and (a) independent-unlinked pairs and (b) dependent-unlinked pairs. TPF = True Positive Fraction and FPF = False Positive Fraction.

The results of these various analyses suggest it is more robust to compare linked pairs with a matched independent sample of unlinked pairs. Not only does this avoid violating the assumption of independence of outcome categories but the distribution of the Jaccard's coefficients for the dependent-unlinked pairs precluded the use of parametric tests, at least with this dataset. Collecting a matched independent sample of unlinked pairs is, however, very time-consuming. Researchers, therefore, may choose to continue with the methodology of Bennell and colleagues (Bennell & Canter, 2002; Bennell & Jones, 2005) whilst mindful of the limitations. With such an approach, future researchers might also wish to use an equal number of dependent-unlinked pairs and linked pairs to avoid violating the assumption of equal samples sizes required for some tests of difference.

In relation to the current study, the results of these two analyses suggested that, at least with the current dataset, any further analyses should be conducted using the linked sub-sample and the independent-unlinked sub-sample.

2.4.3. The relative predictive accuracy of behavioural domains with a full sample of offence behaviours

The next stage in developing this research was to group the 148 offender behaviours, identified through the qualitative analysis of the victim narratives, into behavioural domains. As noted above, some studies of linkage analysis have assessed how offence behaviours group using multi-dimensional scaling (e.g. Salfati & Bateman, 2005 with homicide, Santtila et al., 2005, with sexual assaults). The difficulty with using techniques such as MDS and hierarchical cluster analysis is that rather than grouping behaviours together which are qualitatively similar in function, behaviours are grouped together which correlate/co-occur (Canter, 2000). Instead, the 148 offender behaviours were grouped into the four domains identified by Grubin et al. (2001) using the reasoning reported in Grubin et al.'s paper and theoretical literature (Douglas & Munn, 1992; Hazelwood & Warren, 2003). A similar approach has been taken with other crime types such as burglary, robbery and vehicle theft (Bennell & Canter, 2002; Bennell & Jones, 2005, Tonkin et al., 2008; Woodhams & Toye, 2007). Table 2C displays the 148 behaviours and the domain to which they were allocated. The reasoning behind these allocations is outlined in Appendix 4.

Table 2C: The Domains and the Offence Behaviours Each Domain Contained.

Control		Escape		Sex		Style		
Location-force	Location-con	Hiding	Plan	Breast	Rips clothes	Arousal	Personal Q co-off	Holds hand
Grab	Verbal threat	Don't report	Apologises	Undresses self	Digital vaginal	Clarification	Fulfilled promise	Pushes past
Conditional threat	Binding	Direct-quiet	Lie – protect ID	Fellatio	penetration	Allows action	Discloses intent	Directs re-
Pursues	Directs co-	Direct-stay	Returns home	Ejaculation	Exposure	Contradicts	Offers assistance	dress
Gag-hand	offender	Blindfold	Look out	Direct-undress	Erectile	Refuses request	Negotiation	Complains
Instrumental	Blocks escape	Dir-Don't Look	Innocence	Kiss	dysfunction	Ignores request	Attracts attention	Minimises
violence	Forces entrance	Depart-quick	Cuts wires	Undress victim	Self-mast hand	Releases	Provokes	actions
Physical threat	Takes weapon	Gloves	Fingerprints	Direct-sexual	Simulated sex	Extends time	Compliment	Offers gift
Positions	Direct non-sexual	Prevents look	Leaves weapon	Touch penis	Masturbates self-	Disclose-personal	Requests help	Complies
Lying	Outdoor	Cleans	Accepts guilt	Demonstrates	feet	Disclose-intimate	Can't help	Removes gag
Direct-position	Indoor	Question-	Ceases – put off	Scripting	Feet	Disclose-criminal	Lies – self image	Educates
Seen before	Gag	security	Ceases –	Digital	Sexual noises	Expresses shock	Urinate	Alcohol
Stalks	Broke-in	Departs-calmly	resistance	penetration-	Touched	Question-personal	Hugs	Drugs
Restrains arms	Expressive	Car	On-foot	unknown	stomach	Question-sexual	Sits	Spits
Reassures	violence	Blindfold – hand	Bicycle	Penile vaginal	Masturbates self-	Offenders argued	Re-dressed	Criticises
Weapon	Intrudes	Disguise		penetration	breasts	Returns property	Property	Concern
Restrains body	Con			Penile anal	Touched leg	Refuses answer	Verbal abuse	Lie-upset
Direct-resist	Surprise			penetration	Cunnilingus	Comply co-off	Styled hair	Mocked
				Touch vaginal	Observed	Removes	Excuses	Invitation
				Touch bottom	Erection	blindfold		
33		29		31		55		

2.4.3.1. Behavioural Consistency by Domain with a Full Sample

To compare the relative behavioural consistency shown in each behavioural domain, average Jaccard's coefficients were calculated for each domain for the linked and unlinked subsamples. A mean Jaccard's coefficient could be calculated for behaviours in the Control and Escape domains (see Table 2D), since Kolmogorov Smirnov tests demonstrated that the distributions for linked and unlinked pairs were not significantly different from a normal distribution (Control Linked $Z = .908$, $p > .05$ and Unlinked $Z = .526$, $p > .05$; Escape Linked $Z = 1.242$, $p > .05$ and Unlinked $Z = 1.286$, $p > .05$). The distribution of Jaccard's coefficients for linked and unlinked crime pairs was significantly different to a normal distribution for the Sex domain (Linked $Z = 1.670$, $p < .01$, and Unlinked $Z = 2.270$, $p < .001$) and Style (Linked $Z = 3.208$, $p < .001$, and Unlinked $Z = 2.939$, $p < .001$) domain. For these two domains the median and range were therefore calculated (see Table 2E).

Table 2D: The Means and Standard Deviations for Linked and Unlinked Pairs of Crimes for the Control and Escape Behavioural Domains and the Output from the T-tests.

Domain name	Linked		Unlinked		T-test Output		
	Mean	SD	Mean	SD	t	p	d
Control	.404	.244	.291	.142	-2.93	0.004	0.57
Escape	.458	.266	.255	.240	-4.108	<.001	0.80

Table 2E: The Median and Range for Linked and Unlinked Crime Pairs for the Sex and Style Domains, and the Output from the Mann-Whitney U Test.

Domain name	Linked		Unlinked		Test Output		
	Mdn	Range	Mdn	Range	U	p	r
Sex	0.25	0.00-1.00	0.00	0.00-0.50	990.50	0.006	0.27
Style	0.00	0.00-1.00	0.00	0.00-0.50	1342.50	0.613	0.05

The means for the domains of Control and of Escape indicate that behavioural similarity is greater for linked crime pairs than unlinked crime pairs. A similar pattern is observed for the Sex domain. However, for the Style domain the medians for the two groups are the same whilst there is some variation in the range of Jaccard's coefficients.

The outcomes of the statistical tests reflect the descriptive statistics. For the domains of Control, Escape and Sex, linked crime pairs were significantly more similar than unlinked crime pairs. This supports the research hypothesis and reflects past findings with other crime types committed by adult offenders (Woodhams & Toye, 2007) and corresponds with personality psychology theory. Attempts to normalise the distributions of similarity scores for the Sex and Style domains using various transformations, reported in Tabachnick and Fidell (1996), were unsuccessful. Therefore, Cohen's d could only be calculated for Escape and Control. The effect sizes were large and medium in size, respectively (Cohen, 1988). Pallant (2007) explains that the effect size r can be approximated from the Z statistic reported in the Mann Whitney U test output. The calculation she specifies ($r = Z/\sqrt{N}$) was conducted. The effect size for similarity in Sex behaviour approached a medium effect size. There was no significant difference between the linked and unlinked crime pairs for similarity in Style behaviours and the approximation of effect size r was very small.

2.4.4. Testing case linkage with all offence behaviours

To determine how accurately linkage status (linked vs. unlinked) could be predicted by consistency in the behavioural domains, logistic regression analyses were used. Four direct logistic regression analyses were conducted with the Jaccard's coefficients for each domain to initially assess the prediction of linked and unlinked crime pairs based on similarity in *each* behavioural domain independently. The methodology differed from that of past studies (Bennell & Canter, 2002; Bennell & Jones, 2005; Woodhams & Toye, 2007) in the use of an independent set of unlinked crime pairs. In contrast to these studies, there was not the same difficulty with using logistic regression, because the assumption of independent outcome groups was not violated.

The set of logistic regressions were followed up with four ROC analyses to assess further the predictive accuracy of the four behavioural domains, as has been past practice (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007).

2.4.4.1. Direct Logistic Regression with All Offence Behaviours

As noted in section 2.4.2., the assumption of sufficient cases to variables was met with one predictor and 106 pairs in each direct logistic regression. The residuals for each of the four separate logistic regressions were inspected for the presence of outliers (Pallant, 2007). No outliers were found for the Control, Sex, or Style domains.

Two outliers were identified for the Escape domain. These were two unlinked pairs. Justifications for leaving such outliers within the datasets were outlined in section 2.4.2. The results of the four analyses are presented in Tables 2F and 2G.

The inclusion of the Jaccard's coefficients for the Control domain improved the prediction of category membership only slightly from 50% to 56%. The unlinked pairs were more accurately predicted (62%) than the linked pairs (49%). The non-significant p -value reported for the Hosmer-Lemeshow test and the highly significant model χ^2 suggested that the model fit the data well (Kinnear & Gray, 2000; Pallant, 2007). The Cox and Snell and the Nagelkerke R square statistics indicated that between 8% and 10% of the variability in category membership could be predicted by the Control domain (Kinnear & Gray, 2000). The positive logit coefficient indicated that linked crime pairs were more similar in Control behaviours than unlinked crime pairs. Similarity in control behaviours was a significant predictor of linkage status ($p < .01$).

For the Escape domain, category membership prediction improved from 50% to 65%. Unlinked pairs were more accurately predicted than linked pairs (77% vs. 53%). A significant p -value was produced by the Hosmer-Lemeshow test suggesting that the model did not fit the data well (Kinnear & Gray, 2000) yet the highly significant model χ^2 contradicted this, suggesting a good fit (Pallant, 2007). As discussed in section 2.4.2., this contradiction is likely a result of the different ways these two techniques assess goodness-of-fit (Tabachnick & Fidell, 1996) with model χ^2 being more appropriate in this case again because the contingency table suggested insufficient cell frequencies. The model χ^2 indicated the fit was good. Similarity in Escape behaviours explained between 14% and 19% of the variability in linkage status as reported by the Cox and Snell and the Nagelkerke R square statistics. Linked crime pairs were more similar in Escape behaviours than unlinked crime pairs as indicated by the positive logit coefficient. Similarity in Escape behaviours was a significant predictor of linkage status ($p < .001$).

Table 2F: Predictive Accuracy of the Logistic Regression Models

% correct assignment	Model 1: Control	Model 2: Escape	Model 3: Sex	Model 4: Style
Random	50.0	50.0	50.0	50.0
Model	55.7	65.1	65.1	47.2

Table 2G: Output from the Four Direct Logistic Regressions

Statistical Output	Control	Escape	Sex	Style
Constant				
Logit coefficient	-1.034	-1.136	-0.592	-0.073
SE	0.425	0.372	0.262	0.214
Control				
Logit coefficient	3.019			
SE	1.119			
Escape				
Logit coefficient		3.284		
SE		0.928		
Sex				
Logit coefficient			3.192	
SE			0.999	
Style				
Logit coefficient				0.847
SE				1.056
Model χ^2	8.547	16.09	13.66	0.669
Significance of χ^2	0.003	<0.001	<0.001	0.414
Nagelkerke R^2	0.103	0.188	0.161	0.008
Hosmer & Lemeshow Test				
χ^2	9.489	18.87	6.89	6.49
Significance of χ^2	0.219	0.009	0.142	0.011

A similar improvement in the prediction of category membership was observed for the Sex domain (an improvement of 15% accuracy), but once again the model was more accurate at predicting unlinked pairs than linked pairs (76% vs. 55%). The non-

significant p-value reported for the Hosmer-Lemeshow test and the highly significant model χ^2 suggested that the model fitted the data well (Kinnear & Gray, 2000; Pallant, 2007). Similarity in Sex behaviours did not account for quite as much of the variability in category membership. The Cox and Snell and the Nagelkerke R square statistics indicated that between 12% and 16% of the variability was accounted for by similarity in Sex behaviours. As with the previous analyses, the positive logit coefficient indicated that linked crime pairs were more similar in Sex behaviours than unlinked crime pairs with similarity in Sex behaviours being a significant predictor of category membership ($p=.001$).

This was not however the case for the Style domain. Similarity in Style behaviours was not a significant predictor of category membership. This is reinforced by the Cox and Snell and the Nagelkerke R square statistics, which both indicated that similarity in Style behaviours accounts for less than 1% of the variability in category membership. The accuracy of category prediction actually worsened with the inclusion of similarity in Style behaviours, from 50% to 47%. The prediction of linked crime pairs was particularly poor at 23% whereas the accuracy for unlinked crimes was high at 72%. The non-significant p-value for the model χ^2 and the significant p-value for the Hosmer-Lemeshow test both indicate that the model was a poor fit for the data (Kinnear & Gray, 2000; Pallant, 2007).

In summary, the accuracy with which linked vs. unlinked crime pairs could be predicted was better than chance and improved with the inclusion of the similarity coefficients in the model with all domains except Style behaviours. Initially, the question was raised as to whether the poor performance of the Style domain was caused by the method of calculation for Jaccard's coefficient. However, consideration of the underlying equation indicated that this was not the case. Whilst many of the Style domain behaviours are rarer behaviours in the sample (approximately 29 of the 55 Style behaviours occurred in less than 5% of the offences), if Style behaviours were highly consistent *and* highly distinctive, very high Jaccard's coefficients would be expected for linked crime pairs and very low Jaccard's coefficients for unlinked crime pairs, which would make for accurate prediction.

2.4.4.2. ROC Analysis with All Offence Behaviours

Four ROC analyses were run to compare the predictive accuracy of the four domains independently. The programmes ROCKIT and PlotROC (© University of

Chicago) were used to generate the ROC analysis output and the ROC curves. The ROC curves themselves are displayed in Figure 2E.

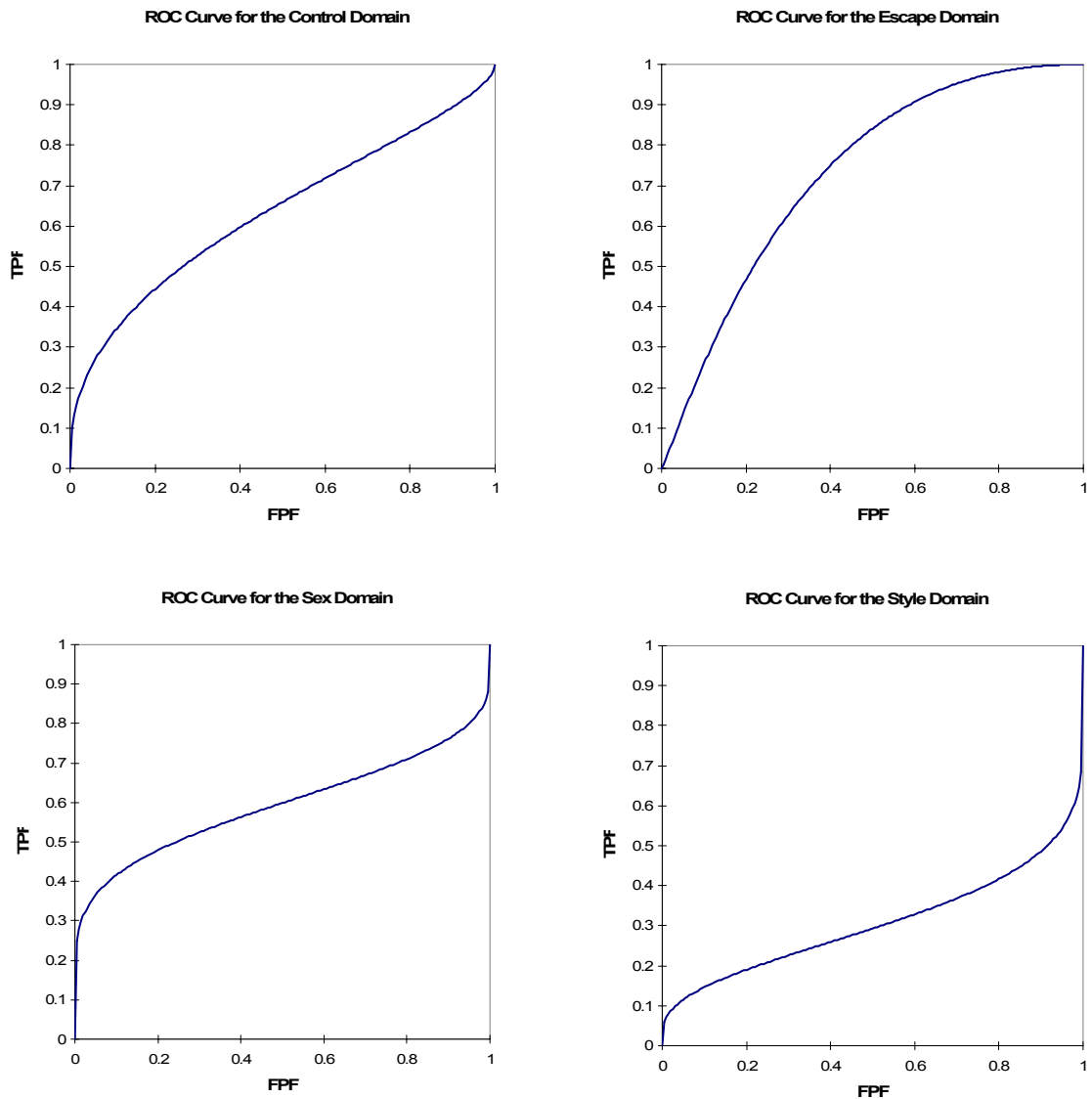


Figure 2E: ROC curves for (a) the Control domain, (b) the Escape domain, (c) the Sex domain and (d) the Style domain. TPF – True Positive Fraction and FPF = False Positive Fraction.

The measure of predictive accuracy, the area under the curve, indicated that the domain with the greatest predictive accuracy was Escape ($A_z = 0.73$), followed by Control ($A_z = 0.63$), Sex ($A_z = 0.59$), and Style ($A_z = 0.31$). The A_z for Escape indicates an acceptable level of predictive accuracy (Hosmer & Lemeshow, 2000) with the A_z for all other domains falling below this cut-off. The A_z for Style indicates a level of prediction

worse than chance alone which would correspond with a value of 0.50 (Bennell & Jones, 2005). These findings are similar to those reported for the logistic regressions. They indicate that, with all the offence behaviours in the analysis, of the single variable models, similarity in Escape domain behaviours is the most accurate predictor of linkage status. The typical shape of a ROC curve denoting greater than chance accuracy is concave (Bennell, 2005), like the curve for the Escape domain. The curves for Control, Sex and Style domains all show varying degrees of departure from this shape, with the Sex and Style curve taking on a more sigmoid-shape. The reasons for this shape are considered in greater detail in section 2.4.5.3.

2.4.5. Evaluating the deletion of rare and frequent offender behaviours

As noted previously, some researchers of case linkage remove rare and frequent behaviours from the dataset prior to statistical analyses (e.g. Grubin et al., 2001; Santtila et al., 2005) whereas others compute the analyses on all offender behaviours (e.g. Bennell & Canter, 2002; Bennell & Jones, 2005). An aim of the study reported in this chapter was to investigate the effect of removing rare and frequent behaviours from the dataset. No behaviours in the dataset occurred in more than 90% of offences. However, 63 offender behaviours occurred in less than 5% of cases. The cut off of 5% was chosen because whilst Grubin et al. (2001) used 10% this was with a sample size of approximately 470 offences. Since the current sample size was at least one quarter of this size, the criterion of 5% was chosen instead. A threshold of 1%, as used by Santtila et al. (2005) was not used since the sample size was less than 100 offences. The removal of the 63 rare behaviours resulted in a sample of 85 offender behaviours with 26 in the Style domain, 27 in the Control domain, 19 in the Sex domain, and 13 in the Escape domain.

2.4.5.1. Behavioural Consistency with 5% Rare Behaviours Removed

The distributions of the Jaccard's coefficients for each of the behavioural domains were examined to determine which descriptive statistics could be calculated. The distributions for the linked and unlinked Jaccard's coefficients for the Control behaviours were not significantly different from a normal distribution as evidenced by the Kolmogorov-Smirnov test output (Linked $Z = .832, p > .05$, Unlinked $Z = .578, p > .05$). The mean similarity score and standard deviation were therefore calculated. The distributions of Jaccard's coefficients for linked and unlinked pairs for Escape behaviours (Linked $Z = 1.448, p < .05$, Unlinked $Z = 1.365, p < .05$), for Sex behaviours (Linked $Z = 1.762, p < .005$, Unlinked $Z = 2.243, p < .001$), and for Style behaviours

(Linked $Z = 3.345$, $p < .001$, Unlinked $Z = 2.979$, $p < .001$), were significantly different from a normal distribution as demonstrated by Kolmogorov-Smirnov tests. The median similarity score and range were therefore calculated for these domains. Due to their non-normal distributions it was not appropriate to use Cohen's d on the Escape, Sex and Style scores in their current state. Attempts to normalise the distributions were unsuccessful preventing the calculation of Cohen's d therefore r was approximated as a measure of effect size as described by Pallant (2007).

Table 2H: The Descriptive Statistics for the Control Domain.

Domain name	Linked		Unlinked		Test Output		
	Mean	SD	Mean	SD	t	p	d
Control	.4095	.2428	.2949	.1452	-2.951	<.005	0.573

Table 2I: The Median and Range for Linked and Unlinked Crime Pairs for the Escape, Sex, and Style Domains, and the Output from the Mann-Whitney U Tests.

Domain name	Linked		Unlinked		Test Output		
	Median	Range	Median	Range	U	p	r
Escape	0.40	0.00-1.00	0.33	0.00-1.00	801.00	<0.001	0.37
Sex	0.25	0.00-1.00	0.00	0.00-0.50	976.00	<0.005	0.28
Style	0.00	0.00-1.00	0.00	0.00-0.50	1321.50	0.493	0.07

The findings in Tables 2H and 2I confirm that linked crime pairs were significantly more similar than unlinked crime pairs in Escape behaviours, Control behaviours, and Sex behaviours. The effect size for Control indicated a medium effect (Cohen, 1988) as did the approximation of r for Escape. The effect size for Sex behaviours approached a medium effect (Pallant, 2007). Once again, the difference in similarity in Style behaviours between linked and unlinked crime pairs was not significant and the effect size was very small (Pallant, 2007).

2.4.5.2. Testing Case Linkage with 5% Rare Behaviours Removed

The four simple direct logistic regressions were repeated with the 5% rare behaviours removed. The assumption of sufficient cases to variables was met for each of the four logistic regressions. The presence of outliers was investigated by examining the residuals (Pallant, 2007). No outliers were identified for the Control, Sex or Style domains. Two outliers in the unlinked pairs were identified in the Escape domain. The justifications given in section 2.4.2 for keeping such outliers in the analysis were also applicable to these analyses. The output from these analyses is presented in Tables 2J and 2K.

A small improvement in category prediction was achieved in the logistic regression for Control. In the previous logistic regression, with all offender behaviours included, 56% of all cases were predicted accurately whereas in this new model this increased by 1% to 57%. This improvement relates specifically to the prediction of the linked crime pairs, which were still predicted less accurately (51%) than the unlinked crime pairs (62%). The model continued to have a good fit with the data as indicated by the significant model χ^2 and the non-significant Hosmer-Lemeshow test (Kinnear & Gray, 2000; Pallant, 2007). A very slight improvement in the amount of variability accounted for in the criterion variable was observed with this increasing to between 8% and 11% (the previous model with all offence behaviours accounted for between 8% and 10%) as indicated by the Cox and Snell and the Nagelkerke R square statistics, respectively. Similarity in Control behaviours was a significant predictor of linkage status ($p < .01$) with the positive logit coefficient showing linked crime pairs to be more similar in Control behaviours than unlinked crime pairs.

Table 2J: Predictive Accuracy of the Models

% correct assignment	Model 1: Control	Model 2: Escape	Model 3: Sex	Model 4: Style
Random	50.0	50.0	50.0	50.0
Model	56.6	65.1	66.0	45.3

Table 2K: Output from the Four Direct Logistic Regressions.

Statistical Output	Control	Escape	Sex	Style
Constant				
Logit coefficient	-1.048	-1.245	-0.625	-0.067
SE	.428	.390	.264	.214
Control				
Logit coefficient	3.018			
SE	1.109			
Escape				
Logit coefficient		3.373		
SE		.927		
Sex				
Logit coefficient			3.086	
SE			.920	
Style				
Logit coefficient				0.733
SE				1.006
Model χ^2	8.661	17.452	14.67	0.545
Significance of χ^2	0.003	<0.001	<0.001	0.460
Nagelkerke R ²	0.105	0.202	0.172	0.007
Hosmer & Lemeshow Test				
χ^2	5.108	10.053	10.765	8.757
Significance of χ^2	.647	.186	.029	0.003

The logistic regression for Escape behaviours indicated that the inclusion of Escape behaviours in the model improved the predictive accuracy from 50% to 65%. This is identical to the accuracy reported for the logistic regression with all offender behaviours included. The non-significant value of the Hosmer-Lemeshow test and the significant model χ^2 both confirmed that the model fitted the data well (Kinnear & Gray, 2000; Pallant, 2007). This is an improvement on the previous logistic regression with Escape behaviours, the results of which were mixed in relation to goodness of fit. The Cox and Snell, and the Nagelkerke R square statistics also showed a slight improvement for the model with the rare behaviours removed. The variability accounted for was

between 15% and 20%, whereas in the prior analysis it was between 14% and 19%. Linked crimes were more similar than unlinked crimes for Escape behaviours as indicated by the positive logit coefficient. In this analysis also, Escape behaviours continued to contribute significantly to the prediction of linkage status ($p < .001$).

The larger Cox and Snell, and Nagelkerke R square statistics for this analysis with the Sex domain, compared to the analysis containing all behaviours, indicates that this model (with the rare behaviours removed) accounts for 1% more variability in the criterion variable (between 13% and 17% compared to between 12% and 16%). Similarly, this model was slightly more accurate at predicting linkage status (66% compared to 65%) than the previous Sex model. Unlinked offences were still more accurately predicted (77%) than linked offences (55%) but this improvement in predictive accuracy relates to more accurate prediction of unlinked offences rather than linked offences. The findings in relation to model fit are conflicting. The model χ^2 is significant suggesting good model fit, yet the Hosmer-Lemeshow test is also significant suggesting poor model fit. Once again this contradiction appears to arise from inadequate cell frequencies in the Hosmer-Lemeshow contingency table. As recommended by Tabachnick and Fidell (1996), the model χ^2 was therefore used to assess the goodness of fit, indicating it to be good. Similarity in Sex domain behaviours continued to be a significant predictor of linkage status ($p < .005$) with linked crime pairs being more similar in Sex behaviours than unlinked crime pairs.

The inclusion of Style behaviours in the analysis worsened predictive accuracy from 50% to 45%, with linked crime pairs being particularly poorly predicted (for linked pairs = 21%, for unlinked pairs = 70%). The non-significant model χ^2 and the significant Hosmer-Lemeshow tests both confirmed that the model had a poor fit to the data (Kinnear & Gray, 2000; Pallant, 2007). Similarly, the Cox and Snell, and the Nagelkerke R square statistics were very small, indicating that similarity in Style behaviours accounted for less than 1% of the variability in the criterion variable. It is therefore unsurprising that similarity in Style behaviours was not a significant predictor of linkage status.

The outcome of the analysis with 5% of the rarest behaviours removed was therefore worse for Style behaviours than the previous analysis using all offender behaviours. For the other three domains, the removal of these behaviours made little or no difference to the outcome of the analyses. In some cases it improved predictive accuracy marginally and resulted in some very small increases in the variability

accounted for by the predictors. In relation to model fit, the removal of the rare behaviours made little difference. The model fit for similarity in Control, Escape and Sex behaviours remained good. Investigation of the effect of removing these rare behaviours continued with the calculation of ROC analyses.

2.4.5.3. ROC Analysis with 5% Rare Behaviours Removed

Using the predicted probabilities generated by the relevant logistic regression analyses, four ROC analyses were calculated with the ROCKIT program and the ROC curves were plotted with PLOTROC. The ROC curves themselves are displayed in Figure 2F. The area under the curve (A_z) for Control was 0.64, for Escape, 0.73, for Sex, 0.60, and for Style, 0.26. The removal of the 5% rarest behaviours therefore resulted in no change in the predictive accuracy of Escape behaviours, a small increase from 0.63 to 0.64 for Control behaviours, a small increase from 0.59 to 0.60 for Sex behaviours and a decrease in predictive accuracy in Style behaviours from 0.31 to 0.26. As was the case with the previous set of ROC analyses, the only A_z of an acceptable level was that for Escape, with the A_z for all other domains falling below this criterion (Hosmer & Lemeshow, 2000). Whilst the predictive accuracy of most domains is greater than 0.50 and therefore better than chance (Bennell & Jones, 2005), the A_z for Style indicates a level of prediction worse than chance.

These findings are slightly different to the simple logistic regressions where the Sex and Escape domains possessed similar predictive accuracy. However, the findings of the ROC analyses should be given greater credence since ROC offers a “More complete description of classification accuracy” (Hosmer & Lemeshow, 2000, p. 160). According to the ROC analyses, Escape behaviours outperformed Sex behaviours quite considerably. From these findings, the decision of past researchers to exclude the rarest of behaviours from their analyses appeared to improve the predictive accuracy of the various models to a small degree. In all subsequent analyses the 5% rarest behaviours were therefore removed.

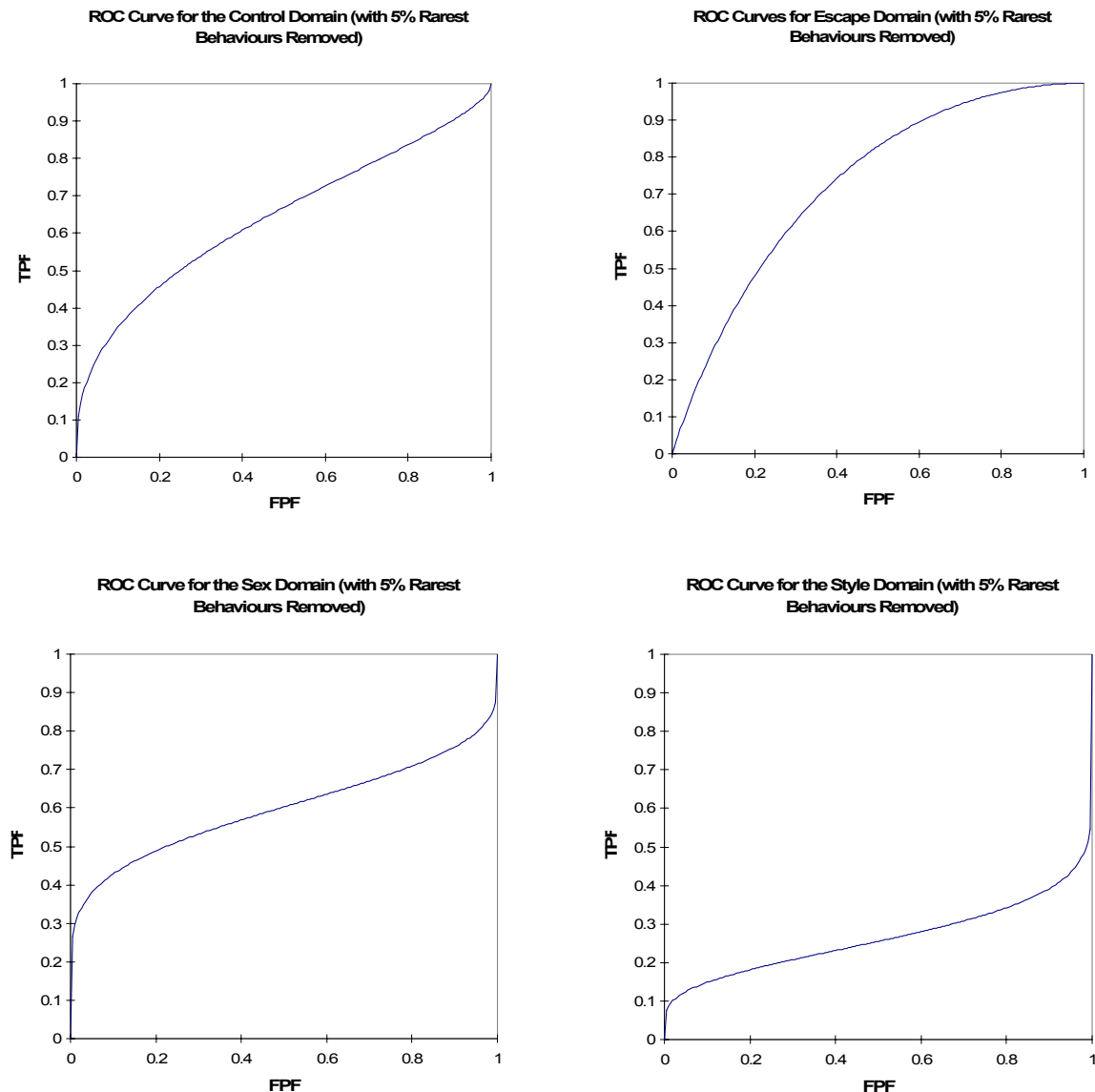


Figure 2F: ROC curves for the domains (a) Control, (b) Escape, (c) Sex, and (d) Style (with the 5% rarest behaviours removed from the analyses).

As can be seen from Figure 2F, the ROC curves for Control, Sex and Style continue to show varying degrees of departure from the typical concave shaped ROC curve and varying degrees of correspondence with what is termed a sigmoid-shaped graph (Parodi, Pistoia & Muselli, 2003), a graph with an S-shaped curve. Such a shape can indicate the presence of subgroups within the data (Parodi et al., 2003). In the present context it was thought this could mean one of two things; first, that similarity in Style, Sex and Control behaviours were only predictive for a subset of offenders, or second, that there were some Style, Sex and Control behaviours which were highly predictive of linkage but others which were not. Since the sigmoid shape was more

pronounced for the Style behaviours these were chosen for further investigation. To investigate the first possibility, the Jaccard's coefficients for Style were examined using histograms to see if there was a subset of linked crime pairs which scored higher for similarity in Style than the rest of the linked pairs (see Figure 2G).

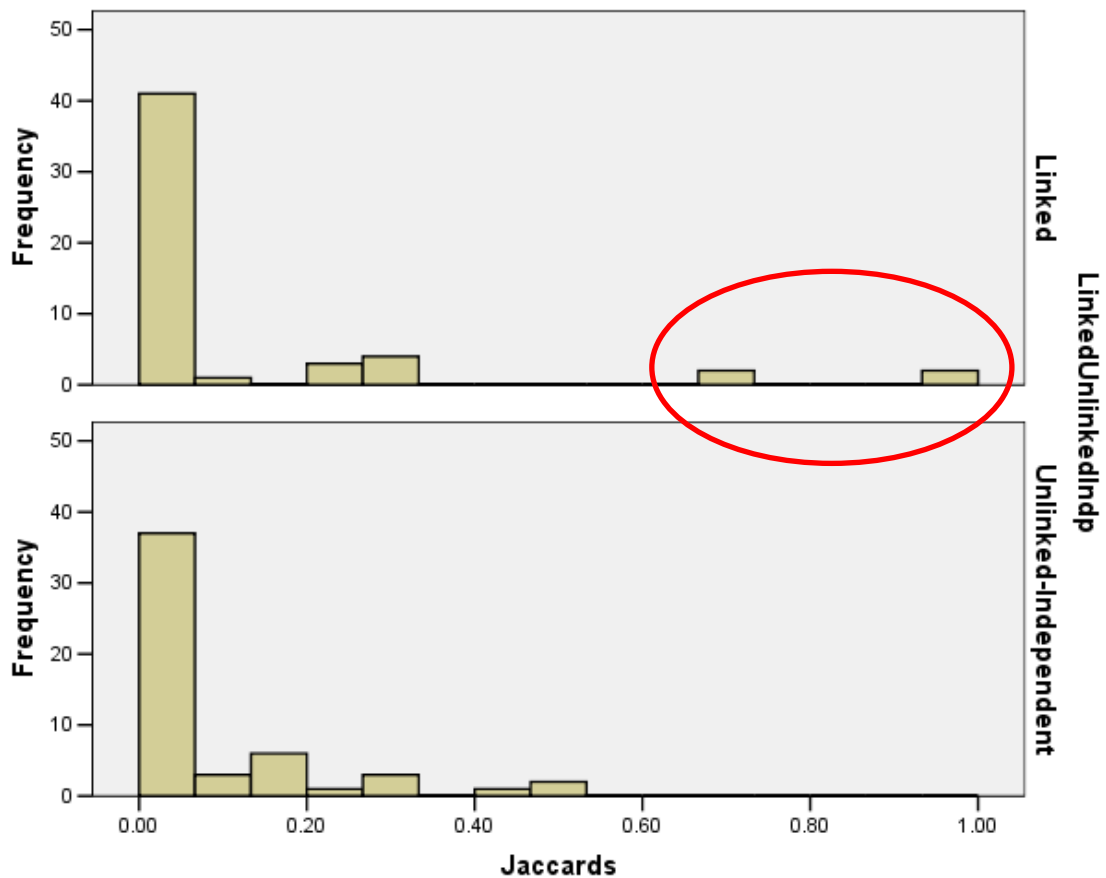


Figure 2G: Histograms of the distributions of Jaccard's coefficients for linked and unlinked crime pairs on the Style domain.

As can be seen from the red-coloured marker on the histogram, there are four linked pairs which lie at a much higher level of similarity than the rest. The effect of removing these four pairs from the dataset was assessed to determine if these four pairs were responsible for the S-shaped curve. Having removed these four pairs, the logistic regression and ROC analysis for the Style domain was re-run. This produced a ROC curve which more closely resembled what would be expected for a poor predictor of linkage, one which from left to right followed the X-axis and then the Y axis. This is displayed in Figure 2H.

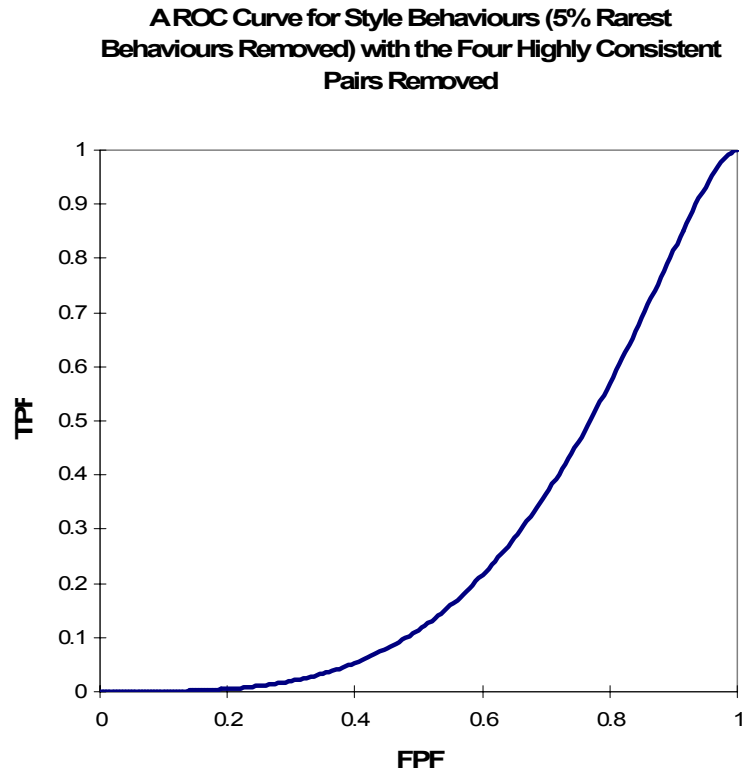


Figure 2H: ROC curve for Style behaviours with the four highly consistent pairs removed.

To investigate the second possible explanation for the sigmoid-shaped curves, for each of the 26 behaviours that constituted the Style domain, a separate Jaccard's matrix was computed. The outputs from these matrices were used for 26 individual logistic regressions to determine whether the sigmoid-shaped graph was a result of the Style domain constituting a mix of good and poor predictors of linkage. In practical terms this was an important point to investigate because on the current research evidence, all Style behaviours would be rejected from predictive analysis. Yet, some Style behaviours might be useful in the accurate identification of linked crimes. Having run the 26 logistic regression analyses, the parameter estimates were examined to determine for which Style behaviours a positive logit coefficient was obtained. The reasoning for this was because case linkage relies on linked crimes displaying greater behavioural similarity (Woodhams, Hollin & Bull, 2007). A positive logit coefficient would suggest that linked pairs display higher levels of consistency on that behaviour (Bennell & Canter, 2002). It was therefore important to identify such predictors. Six Style behaviours were identified with positive logit coefficients. These six behaviours

were Arousal, Extends Time, Question-Sexual, Returns Property, Compliments, and Concern. Using these variables, a Jaccard's matrix was computed and this formed the input for a further logistic regression. The predicted probabilities were used from the logistic regression to produce a ROC curve. This procedure was unsuccessful using the program ROCKIT. However, SPSS was able to produce a ROC curve. This is displayed in Figure 2J alongside the curve produced with the full set of Style behaviours.

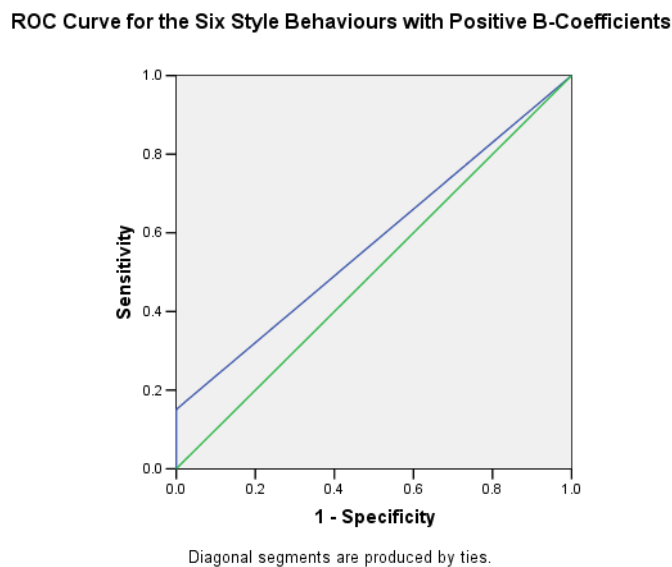
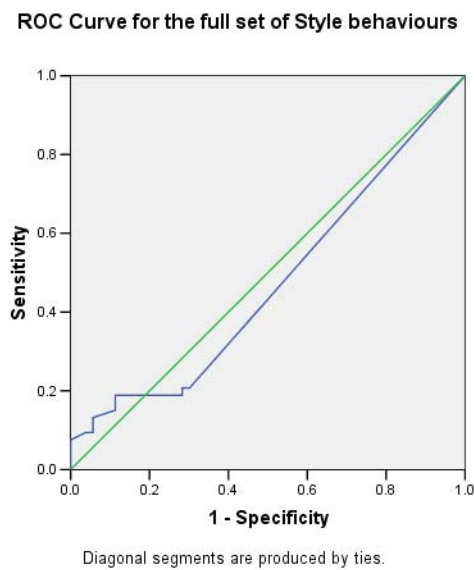


Figure 2J: ROC curves for a) the full set of Style behaviours and b) for the six Style behaviours which had positive logit coefficients.

This, and its associated output, indicates that the predictive accuracy of these six selected Style behaviours is very close to and is not significantly different to a chance level of prediction ($A_z = 0.58, p > .05$). The graph no longer follows the S-shape suggesting that the original S-shaped graph might be a result of the Style domain being a mix of relatively “good” and “poor” predictors. However, the combination of these six Style behaviours should not be considered a “good” predictor since the area under the curve confirms that they perform little better than chance.

In summary, whilst for a small subset of linked crime pairs, Style behaviours appeared to be a good predictor of linkage (as shown in Figure 2G), overall the Style domain is not a reliable predictor of linkage. This means that whilst a crime analyst should still attend to, and consider in their analyses, evidence of high consistency in Style behaviours, Style behaviours would not be appropriate for inclusion in a large scale computerised system employed for the partial automation of case linkage.

2.4.6. Evaluating the inclusion of group serial offences

As outlined previously, research has often limited itself to investigating case linkage with offences committed by lone offenders (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008). Within the current dataset there were six group sexual assaults. The opportunity was therefore taken to calculate two sets of Jaccard’s coefficients, one using a dataset containing the group sexual assaults and one with these offences removed, to determine what effect, if any, the inclusion of group sexual assaults had on the similarity scores for linked and unlinked crime pairs.

The results for the dataset including the group sexual assaults were reported in an earlier section, but are repeated here for convenience. With the group sexual assaults excluded there were 49 linked pairs and 49 unlinked pairs in contrast to the previous analysis of 53 linked and 53 unlinked crime pairs. Descriptive statistics were calculated for the data which excluded the group sexual assaults and the similarities of the linked versus the unlinked crime pairs were compared to see if this difference was significant (see Table 2L). The distributions of the Jaccard’s coefficients were not significantly different from a normal distribution for either dataset, as established by a Kolmogorov-Smirnov test (for the set without the group offences Linked $Z = .623, p > .05$, Unlinked $Z = .487, p > .05$). The mean and standard deviations for both groups could therefore be calculated and compared (Dancey & Reidy, 2002). The differences between the linked and unlinked crime pairs were compared using independent samples t-tests since the assumptions of normality and equal sample sizes were met (Dancey & Reidy, 2002).

Table 2L: Descriptive Statistics and Statistical Output for the Comparison of Linked and Unlinked Crime Pairs with and without Group Sexual Assaults in the Dataset.

Linked			Unlinked		Test Output		
Dataset	Mean	SD	Mean	SD	<i>t</i>	<i>p</i>	<i>d</i>
Groups	0.312	0.122	0.203	0.083	-5.351	<0.001	1.039
No Groups	0.320	0.123	0.207	0.086	-5.269	<0.001	1.065

The exclusion of the group offences from the analysis made little difference to the outcome of the statistical tests. No further analyses were therefore run in relation to this research question.

2.4.7. Linkage accuracy using inter-crime distance

In line with the past research (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007), linkage accuracy was investigated not only with traditional offence behaviours but with geographical distance. However, the current study extended this research by considering not just the location at which the victim was assaulted but also the location at which she was initially approached by the offender. The distance between a pair of offences was calculated using Pythagoras' theorem. Instructions for calculating geographical distance were downloaded on 1st May 2007 from the Ordnance Survey website, <http://www.ordnancesurvey.co.uk/oswebsite/aboutus/reports/misc/calculate.html>. Essentially, the smaller eastings value was subtracted from the larger and this was repeated for the northings values. These two values were then squared and summed. The square root of this value gives the distance in metres between the two offences.

For one serial offence, the approach location was unknown. For the majority of cases the approach location and the offence location were the same. However, for 11 cases they were different. Where there were differences in the datasheet this was checked for accuracy against the offence narrative. For one serial offence, there were two offence locations. The first offence location was the same as the initial contact location and hence the second offence location was used in the analysis of offence locations. For one matched offence, there were three offence locations. Similarly, the first offence location was the same as the approach location and so the second offence location was used in the offence location analysis. For the approach location analysis, 77 cases had valid locations (resulting in 103 pairs for comparison) and 78 cases had

valid locations for the offence location analysis (with all 106 pairs included in the analysis).

Since Personality Psychology theory suggests that greater behavioural consistency will be observed where the offender has greater control over his/her behaviour (Woodhams, Hollin & Bull, 2007), it was hypothesised that the offence location would more likely reflect each offender's personality system rather than the approach location, which could be more influenced by the victim's behaviour (i.e. the approach location is determined by both victim and offender behaviour since it is the location at which the offender's and victim's behaviour brings them into contact with one another). The first analysis assessed the predictive accuracy of the approach locations and the second used the offence locations, enabling their relative use to be assessed.

Descriptive statistics were calculated and tests of difference computed. Kolmogorov-Smirnov tests indicated that whilst the distribution of distances between approach and offence locations were not significantly different to a normal distribution for the unlinked pairs ($Z = .708, p > .05$ and $Z = .635, p > .05$ respectively), they were significantly different for the linked pairs ($Z = 3.176, Z = 2.979$, respectively, $p < .001$ for both variables). The median and range were therefore used for the linked pairs when calculating descriptive statistics, as recommended by Dancey and Reidy (2002), and a Mann-Whitney U test was used as a test of difference. With regards to calculating the effect size, the approach employed in section 2.4.2 of normalising the non-normal distribution through transformation followed by calculation of Cohen's d was unsuccessful with all types of transformation reported in Tabachnick and Fidell (1996). Pallant's (2007) approach to approximating the effect size r , as described in section 2.4.2, was therefore followed. The results are displayed in Table 2M.

Table 2M: Descriptive Statistics and Mann-Whitney U Output for Distance Between Approach Locations and Distance Between Offence Locations (in metres).

Domain name	Linked		Unlinked		Test Output		
	<i>Mdn</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	<i>U</i>	<i>p</i>	<i>r</i>
Approach Location	552.15	0 - 53834.22	283265.30	165083.60	17.00	<0.001	0.81
Offence Location	602.88	0 - 53834.22	283842.10	158482.10	14.00	<0.001	0.85

The distance between both the approach and the offence locations was significantly less for linked pairs than unlinked pairs. This confirms the findings of past studies (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007). The effect sizes for both inter-crime distances were also very large (Pallant, 2007).

Two direct simple logistic regressions (Howitt & Cramer, 2005) were conducted to compare the relative predictive accuracies of distance between approach locations and distance between offence locations. The presence of outliers was checked by calculating and assessing the residuals (Pallant, 2007). The same outlier, an unlinked pair, was identified in both analyses as an outlier. As this was not an error in data entry the outlier was not removed from the analyses. The output for the two logistic regressions can be seen in Tables 2N and 2P.

Table 2N: Predictive Accuracy of the Logistic Regression Models

% correct assignment	Model 1: Approach Locations	Model 2: Offence Locations
Random	51.5	50.0
Model	93.2	94.3

Table 2P: Output from the Two Direct Logistic Regressions for Distance Between Approach and Offence Locations.

Statistical Output	Approach Location	Offence Location
Constant		
Logit coefficient	3.825	3.987
SE	0.939	0.967
Distance between approach locations	-7.11060673374e-005	
Logit coefficient	1.880305476884e-005	
SE		
Distance between offence locations		-7.507034528782e-005
Logit coefficient		2.018181964613e-005
SE		
Model χ^2	118.390	124.490
Significance of χ^2	<0.001	<0.001
Nagelkerke R ²	0.911	0.921
Hosmer & Lemeshow Test		
χ^2	2.238	5.178
Significance of χ^2	0.973	0.738

Distance between *approach* locations was a highly significant predictor of linkage status ($p < 0.001$). The Cox and Snell, and the Nagelkerke R square statistics indicated that geographical distance between approach locations accounted for 68% and 91% of the variability in category membership (linked vs. unlinked). The accuracy of category prediction improved considerably with the inclusion of distance between approach locations, from 51.5% to 93%. The prediction of unlinked crime pairs was marginally better (94%) than the linked pairs (92%). The significant p-value for the model χ^2 and the non-significant p-value for the Hosmer-Lemeshow test both indicate that the model was a good fit for the data (Kinnear & Gray, 2000; Pallant, 2007).

Distance between *offence* locations was also a highly significant predictor of linkage status ($p < 0.001$). This finding was reinforced by the Cox and Snell, and the Nagelkerke R square statistics which showed that between 69% and 92% of the

variability in category membership was accounted for by geographical distance in offence locations. The inclusion of this variable considerably improved predictive accuracy from 50% to 94%, with unlinked pairs being more accurately predicted (96%) than linked pairs (93%). The significant p-value for the model χ and the non-significant Hosmer-Lemeshow test both indicate a good fit between the model and the data (Kinnear & Gray, 2000; Pallant, 2007).

These findings are encouraging, however the $\exp(B)$ of 1.00 for both analyses suggests that with a unit change in distance, the outcomes (of linked and unlinked) are equally likely. This seems in conflict with the high predictive accuracy and the findings from the descriptive statistics and tests of difference, namely, that the unlinked pairs should be more geographically distant than the linked pairs. This prompted further investigation. Histograms were produced to examine the distribution of the two sub-groups (see Figures 2K and 2L).

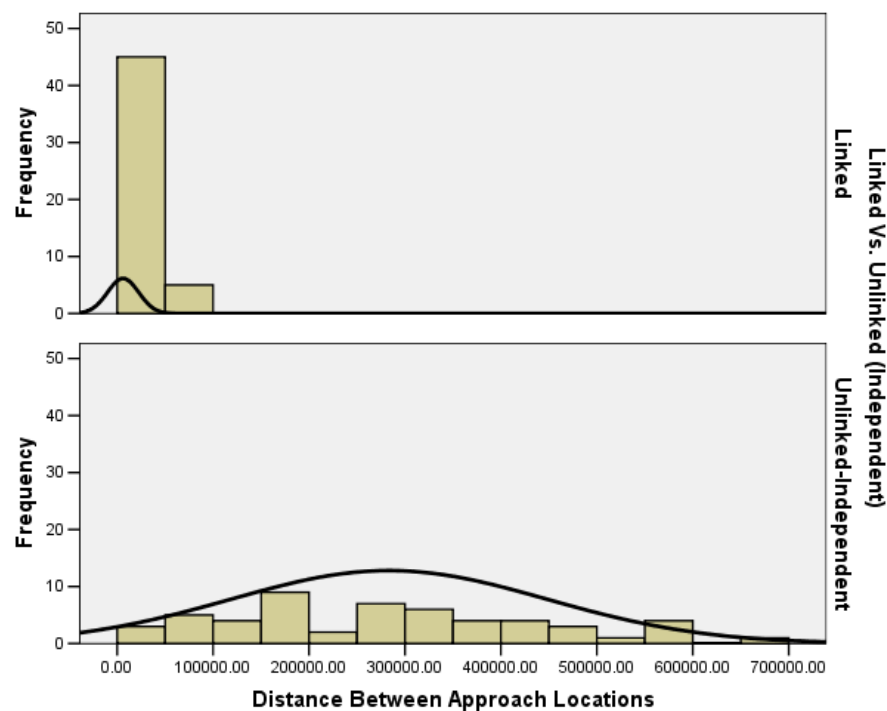


Figure 2K: The distributions of linked and unlinked crime pairs for geographical distance between approach locations.

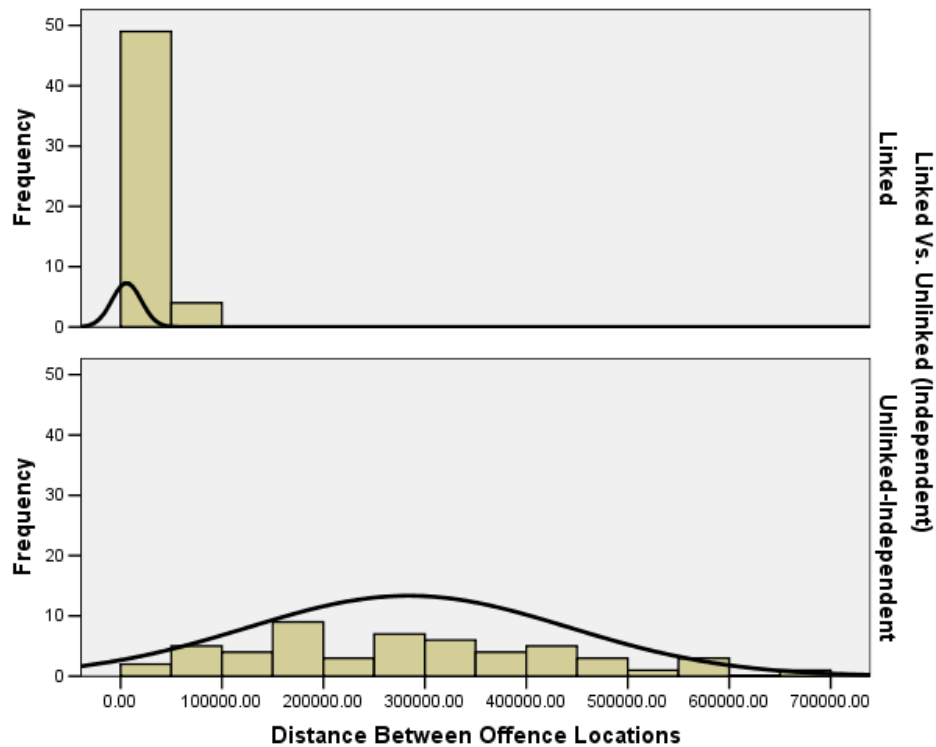


Figure 2L: The distributions of linked and unlinked crime pairs for geographical distance between offence locations.

The histograms confirmed that the distributions of both types of distance for linked and unlinked crime pairs did overlap but that the overlap was slight. It is possible that this relative lack of overlap between the distributions might account for the small B coefficient and $\exp(B)$ of 1.00. Since the $\exp(B)$ represents the change in the predicted odds of linkage for each unit change of distance, it is unsurprising that a change of one metre in distance makes little difference to the likelihood of a crime pair being linked or unlinked since the distances between linked pairs and unlinked pairs are very different (as confirmed by the descriptive statistics and tests of difference).

As in earlier analyses, two ROC analyses were conducted to assess predictive accuracy of distance between approach and offence locations. The predictive probabilities created from the logistic regressions were used to run two ROC analyses using the program ROCKIT. The area under the curve, was 0.9925 for distance between approach locations and 0.9937 for distance between offence locations (see Figure 2M) indicating outstanding predictive accuracy in both cases (Hosmer & Lemeshow, 2000).

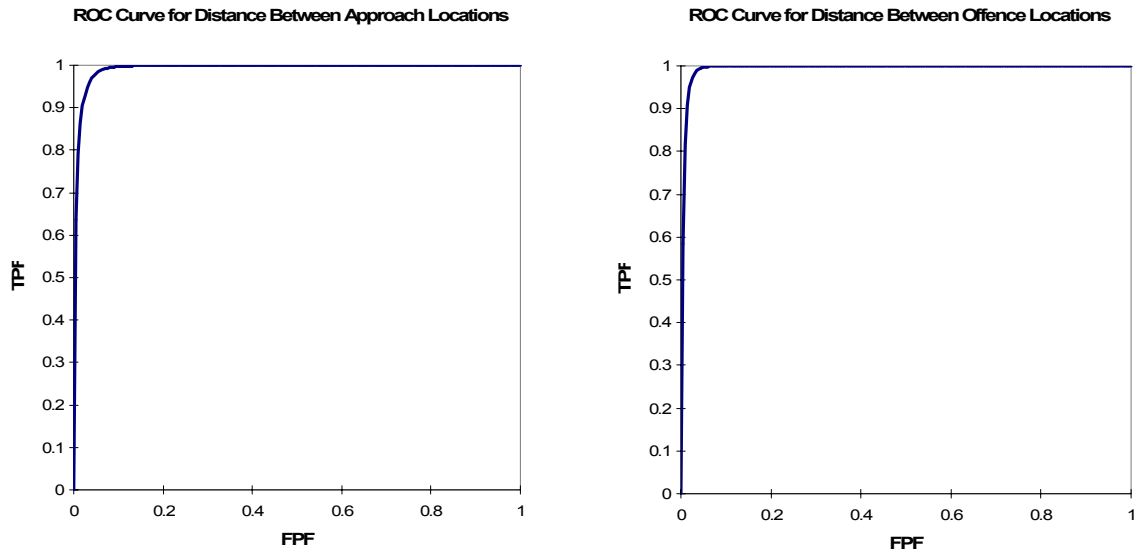


Figure 2M: ROC curves for geographical distance between approach locations, and between offence locations.

The findings from the logistic regressions and the ROC analyses reinforce those of past studies (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007), which reported distance between offences to be a highly accurate predictor of linkage. The logistic regressions and the ROC analyses reveal distance between offence locations to be a marginally better predictor than distance between approach locations. Based on Personality Psychology theory it could be argued that this is because the offender has greater control over where he assaults the victim than where he encounters the victim. Alternatively, offence locations might be more accurately recalled by victims and/or identified by the police than approach locations. Distance between offence locations was therefore used in the subsequent stepwise logistic regression.

2.4.8. Identifying the optimum combination of predictors for linkage

Following past practice, the five separate simple logistic regressions were followed up with a forward stepwise logistic regression to determine the optimal combination of behavioural domains for predicting linkage status. Because of the poor predictive accuracy of Style behaviours it was excluded from the stepwise logistic regression. The distance between offence locations was entered rather than the distance between approach locations due to its marginally superior predictive accuracy. Therefore, the four domains of similarity in Control, Sex, and Escape behaviours, and Distance between Offence Locations were entered into the analysis.

Whilst less stringent ratios of cases to variables have been reported in other studies (Adams & Jarvis, 2006) and statistical textbooks (Howitt & Cramer, 2005), the criteria of at least 20 cases per variable was used. This is because logistic regression simulations using ratios of events-per-variable of less than 10 (where ‘event’ refers to one of the two possible predicted outcomes, e.g., death where the outcomes are death vs. survived), have resulted in biased regression coefficients, over- and under-estimation of the sample variance of the regression coefficients and significance in the wrong direction, amongst other errors (Peduzzi et al., 1996). Four predictor variables were entered into the model with 106 cases (53 linked crime pairs and 53 unlinked crime pairs), thus meeting the requirement of 20 cases per variable (or 10 events, 10 linked crime pairs, per variable).

Multicollinearity was assessed firstly by conducting bivariate correlations between the Jaccard’s scores for the four predictors to ensure they were not highly correlated with one another (Hammond, 2006). As reported in section 2.4.5.1, Kolmogorov-Smirnov tests revealed that the distributions of Jaccard’s coefficients for Distance, Escape, and Sex were significantly different to a normal distribution, whilst the distribution for the Control domain was not significantly different. Spearman’s correlations were therefore conducted to assess whether any of the predictor variables were significantly correlated with one another (Hammond, 2006). The correlations for Escape, Sex and Control were all non-significant and weak. The correlations of these three variables with Distance were also weak (though significant) (Dancey & Reidy, 2002). As recommended by Pallant (2005), collinearity diagnostics were also calculated. These confirmed no evidence of multicollinearity with all tolerance values being considerably larger than 0.1.

The residuals were inspected and two outliers were identified. These were an unlinked and a linked crime pair. These were not removed from the dataset since the confidence with which these cases were allocated to the relevant group (linked or unlinked) is high because they are based on convictions.

The forward stepwise logistic regression included only distance between offence locations in the model. The output from the analysis was identical to that produced for distance between offence locations separately and therefore is not reproduced here. This analysis suggests that linked crime pairs can be most accurately distinguished from unlinked crime pairs using distance between offence locations. Whilst this finding is congruent with past research with other crime types (Bennell & Canter, 2002; Bennell

& Jones, 2005; Tonkin et al., 2008) and to an extent with past research on sexual offences (Grubin et al., 2001), it does not fully follow from the findings of the separate direct logistic regressions where similarity in Escape behaviours was a reliable predictor. Tabachnick and Fidell (1996, p. 592) caution against misinterpreting the exclusion of a predictor from a model. They state “The predictor may be very highly correlated with the outcome but not included in the equation because it was ‘bumped’ by another predictor or combination of predictors”. They explain that Hosmer and Lemeshow (1989) recommend adopting a less stringent criterion for inclusion of a variable in the model, such as 0.20. The analysis was re-run adopting the less stringent criterion of 0.20 for entry which resulted in both similarity in Escape behaviours and similarity in Sex behaviours being included in the model as well as distance between offence locations. The output from this regression is displayed in Table 2Q.

Table 2Q: Statistical Output from the Forward Stepwise Logistic Regression for the Model Containing Similarity in Escape and Sex Behaviours and Inter-Crime Distance.

Statistical Output	Stepwise Model
Constant	
Logit coefficient	1.160
SE	1.515
Escape	
Logit coefficient	5.125
SE	3.727
Sex	
Logit coefficient	10.227
SE	6.044
Distance	
Logit coefficient	0.000
SE	0.000
Model χ^2	130.588
Significance of χ^2	<0.001
Nagelkerke R^2	0.944
Hosmer & Lemeshow Test χ^2	2.052
Significance of χ^2	0.979

Predictive accuracy increased from 50% to 97% with the inclusion of these three variables in the model. Linked crime pairs were predicted more accurately (98%) than the unlinked crime pairs (96%). The highly significant model χ^2 and non-significant Hosmer-Lemeshow test suggested a good fit. A substantial proportion of the variability in the criterion variable was accounted for by the three variables (between 71% and 94%) as indicated by the Cox and Snell, and the Nagelkerke, R square statistics. The positive B coefficient for Escape and Sex behaviours suggests that linked crime pairs were more similar in Escape and Sex behaviours than unlinked crime pairs. Whilst Escape and Sex behaviours were included in the model since they improved overall predictive accuracy and model fit, the significance values associated with the Wald statistics suggested that they were not *significant* predictors of linkage status. However, distance between offence locations did contribute significantly to the prediction of linkage status ($p < 0.01$).

The predicted probabilities generated from the stepwise logistic regression were entered into a ROC analysis. The predictive accuracy of the combination of inter-crime distance, similarity in escape behaviours and similarity in sex behaviours was outstanding (Hosmer & Lemeshow, 2000) with an area under the curve of 0.9958 (see Figure 2N).

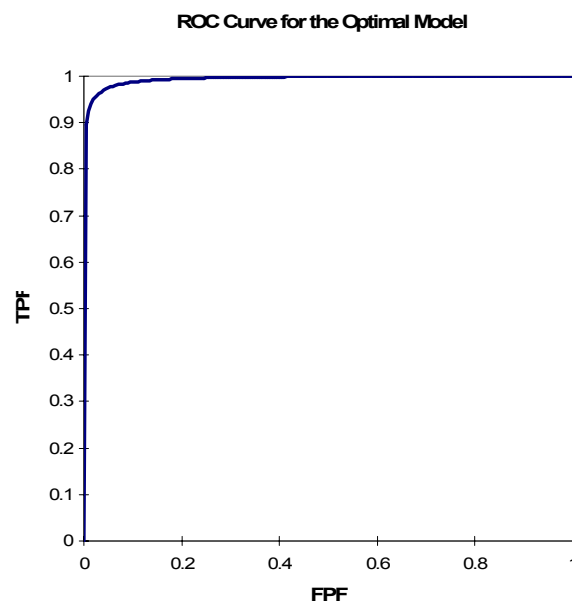


Figure 2N: ROC curve for the optimal model identified from the stepwise logistic regression.

There were some concerns that the methodology of the study, sampling a relatively small set of series which were geographically spread across a national area, might have artificially inflated the performance of inter-crime distance as a predictor. Whilst the generation of the unlinked pairs from a matched set of offences, rather than from the linked series, should mitigate this to an extent, the stepwise logistic regression analysis was re-run without inter-crime distance as a predictor.

2.4.8.1. *The optimal model without inter-crime distance*

As noted previously, there was no evidence of multicollinearity between the three variables of similarity in Control, Escape and Sex behaviours. Three outliers were identified (one unlinked and two linked crime pairs), but for the reasons outlined in previous sections these were not removed from the analysis. The output of this statistical analysis can be found in Table 2R.

Table 2R: Statistical Output from the Forward Stepwise Logistic Regression Using Similarity in Control, Escape, and Sex Behaviours as Predictors.

Statistical Output	Stepwise Model Without Distance
Constant	
Logit coefficient	-3.106
SE	0.703
Control	
Logit coefficient	3.083
SE	1.353
Escape	
Logit coefficient	3.559
SE	1.017
Sex	
Logit coefficient	3.656
SE	1.103
Model χ^2	39.398
Significance of χ^2	<0.001
Nagelkerke R ²	0.414
Hosmer & Lemeshow Test χ^2	3.861
Significance of χ^2	0.869

In contrast to the previous analysis, this stepwise logistic regression included all three types of behavioural similarity, similarity in Control, Escape and Sex behaviours, as predictors in the model. However, its predictive accuracy was not as good as the model including inter-crime distance. The predictive accuracy was improved from 50% to 77% with the inclusion of these three variables. Unlinked crime pairs were predicted more accurately (85%) than the linked pairs (70%). The highly significant model χ^2 and non-significant Hosmer-Lemeshow test confirmed good model fit. A moderate proportion of the variability in the criterion variable was accounted for by the three variables (between 31% and 41%) as indicated by the Cox and Snell, and the Nagelkerke R square statistics. The positive B coefficients for all three variables indicate that linked crime pairs were more similar in Control, Escape and Sex behaviours than unlinked crime pairs. All three predictors contributed significantly to the prediction of linkage status (Control $p < 0.05$; Escape $p < .005$; Sex $p < .005$).

A ROC analysis was conducted using the predicted probabilities generated from the stepwise logistic regression. The predictive accuracy of the combination of Escape, Sex and Control behaviours was excellent (Hosmer & Lemeshow, 2000), with an area under the curve of 0.82 (see Figure 2P). This means that linked and unlinked crime pairs could be identified with a high degree of accuracy when considering the similarity of Escape, Sex and Control behaviours in combination.

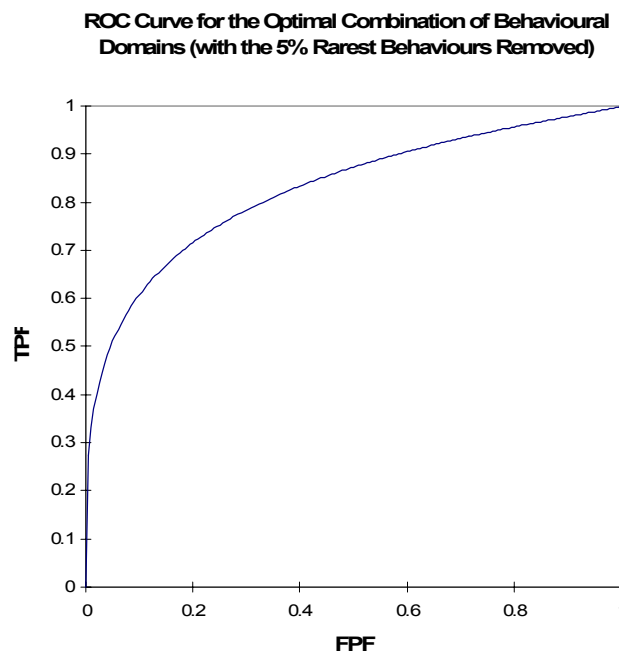


Figure 2P: ROC curve for the optimal model (excluding inter-crime distance as a predictor) identified from the stepwise logistic regression.

2.4.9. Incorporating the situation in linking crimes

This section of the thesis was published in Woodhams, Hollin and Bull (2008a). It reports analyses which extend the past research on linking crimes to investigate the possibility of incorporating knowledge of the situation in the crime linking task. Specifically, whether there was an association between behavioural consistency and situational similarity, and whether there was evidence of consistency in 'if(victim)-then(offender)' contingencies were investigated. To investigate these research questions necessitated several stages of analysis. First, a checklist of victim behaviours was generated. Second, situational similarity (in victim behavioural themes) was calculated between each crime pair and whether an association existed between situational similarity and behavioural consistency was investigated. Third, 'if(victim behaviour)-then(offender behaviour)' contingencies were generated and consistency in if-then contingencies was assessed across crime series.

2.4.9.1. *Victim Behaviours*

As reported in section 2.3.4., 124 victim behaviours were identified from the constant comparison framework analysis. The frequencies of the victim behaviours were calculated for the whole sample and for the subsamples of serial and non-serial offences. These are also reported in Appendix 3, presented in rank order based on each behaviour's occurrence in the whole sample.

The most common behaviour reported in the victims' accounts to police was struggling, followed by giving the suspect an order (e.g. "Get off me"), and seeking help from witnesses through verbal means (e.g. screaming or shouting for help). Such behaviours have previously been recorded in studies of victim resistance and coping (Burgess & Holmstrom, 1976; Greenfield, 1997), but this study's inclusion of all stages of a sexual assault (the approach, maintenance and closure phases) and its qualitative methodology has found a much wider behavioural repertoire reported to be used by victims which goes beyond a simple dichotomy of resistance versus compliance. The behaviour "false response to a personal question" is a good example of this complexity. Through using this behaviour the victim communicates to the offender that she is complying with his demand, however she is in fact resisting him since she has been able to hide personal details about herself.

The emergence of these common behaviours at the top of the table in Appendix 3 could mean that they are the most common behaviours used by victims, however the evidential purpose of a victim's account made to the police should also be remembered.

The purpose of the victim interview is to produce an account for use in the judicial system (Rock, 2001) and therefore the interviewer will be attempting to demonstrate that the sexual encounter was not consensual and is quite likely to therefore focus on how the victim *resisted* the offender's advances. The complexities of these victim strategies are further discussed in the next section.

2.4.9.2. Developing Higher-Level Victim Behavioural Themes

To investigate whether situational similarity and behavioural consistency were associated with one another, the intention was to identify characteristics of the offence situation that were salient. For reasons already noted, victim behaviours were chosen as the defining situational feature. A common approach in measuring behavioural consistency has been to group offender behaviours into categories that shared a similar function (Bennell & Canter, 2002; Bennell & Jones, 2005; Grubin et al., 2001; Tonkin et al., 2008; Woodhams, Grant & Price, 2007; Woodhams & Toye, 2007), for example, offender behaviours intended to control the victim and behaviours intended to facilitate escaping the crime-scene undetected (Grubin et al., 2001). This methodological approach led the author to first focus on developing themes of victim behaviours possessing common function. During the initial constant comparison framework analysis, it was observed that a number of different victim behaviours appeared to share a common function. In other words, victims were trying to achieve similar outcomes but adopted different strategies in their attempts to achieve this end. The process of constant comparison framework analysis was therefore revisited to determine if it were possible to identify higher level victim behavioural themes that differed in function and psychologically salient qualities.

Through constant comparison framework analysis (Ritchie & Spencer, 1994) twenty-one overarching functional themes were identified by examining the narratives to ascertain what the victim was trying to achieve or the outcome of her behaviour. These functional themes are displayed in Appendix 5, with an accompanying definition, and the victim behaviours which were included within each theme. If one is considering the function of behaviours or the victim's intention the behaviours analysed must be under the victim's control. Within the current dataset there were six behaviours which the author considered beyond the victim's control. These included physiological reactions, such as vomiting and gagging, which are automatic behaviours. One possibility would have been to discard such behaviours from the analysis, however it was possible that whilst these behaviours might be beyond the victim's control, the

offender may not perceive it in this way and hence the decision was made to keep these behaviours within the analysis. Each of these themes is now described in turn.

The theme 'seeking help' captured the victim's intention to try to obtain assistance from others. This theme included preparatory behaviours, such as suggesting a change of location and therefore increasing the victim's chances of coming across witnesses or locating their mobile phone, and active behaviours, such as trying physically to attract the attention of witnesses or screaming and shouting.

Canter (2000) and Holmstrom and Burgess (1980) have noted that some offenders appear to regard their victim as an object or treat them as a target for their anger. Holmstrom and Burgess (1979) and Davies (1992) have also noted that some offenders attempt to dehumanise their victims. In the theme 'humanisation' the victim appeared to be trying to force the offender to see her as a person and for him to feel empathy for her so that he would choose to change his behaviour. The victim was therefore trying to influence the offender's behaviour but in an indirect manner and in a manner which recognised his greater power. She achieved this through verbal behaviours which informed him of her fears, her discomfort, and which reminded him of his obligations to her.

In robbery, the victim and offender are reported to cognitively appraise one another and the situation when deciding how to act next (Luckenbill, 1981). It is likely this is also the case for sexual assault. Such behaviours appeared to be present in the dataset and this theme was labelled 'information gathering'. This theme included physical behaviours, such as trying to see whether the offender had a weapon or appraising his physical strength. Alternatively, the victim entered into a dialogue with the offender to ascertain his intentions and how committed he was to his course of action. Gathering information may also reduce anxiety. If the victim knows the offender's intentions she may feel less powerless. Several victims reported making the conscious decision to comply with the offender's demands so they might survive the assault. However, they concentrated their efforts on remembering as much about the offender as possible so that this information might be used to apprehend him.

Some victims appeared to try to make the offender see reason or 'brings the offender to reality'. They tried to get the offender to share the same reality as them and recognise the inappropriateness of his behaviour. The theme 'brings the offender to reality' differed from the 'humanisation' theme, in that the victim was not trying to gain empathy from the offender. However, it was similar to 'humanisation' in that the

victim was trying to get the offender to decide himself to cease the behaviour. She was therefore attending to the power imbalance implicit in the sexual assault situation.

The theme 'put-off' represented behaviours which served to dissuade the offender from continuing his behaviour. It differed from "Brings the offender to reality" because the victim was not trying to get the offender to see the inappropriateness of his behaviour. Instead she tried to put him off by highlighting the negative consequences of his intended actions (such as him being apprehended) or by trying to make herself less desirable to the offender.

'Non-compliance' was a theme that occurred frequently in the victims' accounts that formed the dataset for this particularly study. This theme captured behaviours where the victim did not comply with the offender's wishes. These were physical or verbal behaviours. In some cases the victim ignored the offender's request and in others she informed him that she would not comply. Yet in others she was more indirect and pretended she could not comply or she gave the impression that she had complied when she had not. In relation to verbal behaviours, whilst the underlying goal was the same, the way in which the victim achieved this goal varied with regards to observing rules of politeness. Some victims were very direct in their verbal communications of non-compliance, whereas others were much more subtle. This seems to be related to a phenomenon in linguistics called face-saving. The term 'face' relates to an individual's self-image with communications being face-threatening, or threatening to the hearer's self image, or face-saving, and protecting of the hearer's self-image (Thomas, 1995). More subtle non-compliance might reflect the victim trying to achieve her desired outcome whilst avoiding threats to the offender's self-image. As explained by Thomas (1995), forms of indirectness such as giving hints, being vague and ambiguous are methods of face-saving. This phenomenon might also be related to the power imbalance in place whereby the victim wishes to refuse the offender fully or partially but does so in a polite manner thus recognising the offender's authority and avoiding angering him.

The theme 'resists' was also frequently observed in the dataset for the study reported in this chapter. It was similar to non-compliance in that the victim does not comply with the offender's wishes but in the theme 'resists' the victim was very direct in communicating this intention to the offender. She physically resisted the offender or prepared to physically resist him. This resistance tended to occur when the victim was

experiencing unwanted physical contact from the offender and her goal was to end this unwanted contact.

The theme 'physical violence' also shared similarities with the themes 'non-compliance' and 'resistance' since the victim was again not complying with the offender's wishes. However, the behaviours within the theme 'physical violence' involved the victim attempting to physically harm the offender. In addition, some victims reported the additional intended goal of trying to implicate the offender in the attack through scratching or biting the offender and thus creating physical evidence.

Behaviours within the theme 'creates physical distance' shared the function of putting physical distance between the offender and victim and hence preventing the offender from assaulting the victim. A number of victims engaged in behaviours within this theme. Some behaviours were active whereas others were preparatory. The use of politeness could again be seen in this theme. Prior to trying to physically distance themselves from offenders, some victims entered into a dialogue, giving plausible, but false, reasons why they must leave the offender's company.

The function of behaviours within the theme 'disarms offenders' was to remove resources from the offender which were being used to ensure compliance. Some victims took the offenders' weapons to use them against the offenders, whereas others disarmed the offender and discarded the weapon out of the reach of both parties.

The behaviours within the theme 'chases offender' reflected the victim's intention to pursue the offender and potentially to prevent his escape.

The theme 'explaining themselves' captured behaviours where the victims tried to explain their intended or actual behaviour to the offenders. The victims seemed to be obeying social conventions here also. If one is behaving in a manner of which the other party may disapprove, one may try to explain their reasoning to the hearer.

Behaviours within the theme 'maintains/creates interpersonal distance' seemed to serve the purpose of the victim distancing herself interpersonally from the offender. In doing so the victim often violated social niceties by signalling to the offender that she did not want to be interpersonally close to him. How directly this was done varied. Less direct behaviours included not engaging in expected social conventions such as returning smiles or not responding verbally to the offender, whereas other behaviours were very direct, such as name-calling and denigrating the offender.

Some victims appeared to use strategies with the opposite intention which were labelled 'Decreasing interpersonal distance'. They decreased the interpersonal distance

between themselves and the offender by initiating or engaging in social interactions and conversations, or they engaged in communal behaviours, such as drug-taking.

The behaviours within the theme 'Directs offender's behaviour' shared the common function of the victim explicitly trying to direct the offender's behaviour. Again the behaviours within this theme seemed to be arranged on a continuum of directness. Less direct behaviours included the victim encouraging the offender in less severe sexual behaviours, whereas in negotiation the victim was directly communicating to the offender what she wanted from him. The behaviours also seemed to vary on how much the victim was complying with the power imbalance. Where the victim shared the framework of a power imbalance existing between her and the offender she made requests of the offender. In contrast, other victims gave the offender orders and disregarded the power imbalance.

Some victims offered the offenders help and these behaviours are located within the theme 'Helps offender'. The types of help offered included physical assistance and giving advice or directions.

'Compliance' was a common theme in the dataset for the study reported in this chapter. Behaviours in this theme shared the function of complying with the offender's wishes, thereby avoiding angering him and instead appeasing him. Through such behaviours the victim recognised the power imbalance between her and the offender and reinforced this. Often the victim was responding to a demand from the offender, however in some cases the victim was engaging in behaviours which she believed were complying with the offender's wishes without being directed in any way. For example, the behaviour "Spontaneously gives property" was included within this functional theme because the victim was under the impression that the offender's goal was robbery and hence she was complying with what she believed he wanted by referring to the common framework for robbery (Luckenbill, 1981).

The theme 'distraction' involved the victim trying to physically distract the offender from assaulting her by engaging in another behaviour, for example searching for a particular piece of property. 'Distraction' only occurred in one offence in the dataset and therefore was not a common functional theme.

Behaviours in the theme 'emotional coping' appeared to share the function of coping emotionally with the sexual assault. A number of victims in the dataset reported starting to cry during the offence. A smaller number reported asking the offender why they had been targeted. In a literal sense this latter behaviour could be argued to relate

to ‘information seeking’. However, from the narratives the victims engaging in this behaviour do not seem to be looking for an answer to this question. Instead this behaviour seems to have a more expressive function, perhaps with the victim expressing her anger.

The behaviours within the theme ‘Spontaneous’ seemed to be more automatic, physiological responses to the sexual assault, over which the victim had little control. However, whilst this may be the case it is important to remember that the offender may not perceive it in this way. He may, for example, perceive gagging during forced fellatio as a form of non-compliance rather than a reflex behaviour.

Twenty overarching functional themes were therefore identified as a result of the constant comparison framework analysis. As outlined above, it is suggested that the different themes capture the variety of intentions that underlie victim behaviour. However, whilst these themes might differ in terms of what the victim is trying to achieve they did not always share common valence or task demands. For example, the ‘seeking help’ theme contains behaviours that vary in their face-threatening quality. The behaviour of suggesting a change of location is far less face threatening than the behaviour of “physical help-seeking”.

2.4.9.3. Identification of Themes through Quantitative Analysis

A hierarchical cluster analysis was conducted to investigate whether themes would emerge from this that differed in victim intention as well as in valence and task type and demands. Previous studies have used an approximately 4:1 ratio of cases to variables. For example, Långström et al. (2000) conducted a hierarchical cluster analysis with 15 variables and 56 cases and Woodhams and Toye (2007) with 22 variables and 80 cases. In the current study, there were 124 victim behaviours (variables) and 78 cases. To conduct a cluster analysis with 78 cases and 124 variables would violate the usual standard of 4:1 cases to variables. Therefore, the number of victim behaviours (variables) to be included in the cluster analysis had to be reduced from 124 to approximately 20.

In previous studies of offenders’ behaviours, researchers have removed behaviours from their dataset that occurred in less than 10% of cases and more than 90% of cases (Davies, Wittebrood & Jackson, 1998; Grubin et al., 2001; Salfati & Canter, 1999; Woodhams & Toye, 2007). No victim behaviours occurred in more than 90% of cases, however 103 behaviours occurred in less than 10% of the cases. Using

this method of data reduction, the ratio of cases to variables was brought to an acceptable ratio of 78 cases to 21 variables.

An agglomerative hierarchical cluster analysis was conducted because a hierarchical model is deemed appropriate for binary data (Everitt, Landau & Leese, 2001). While Everitt (1980) criticises researchers for failing to validate the findings of a cluster analysis on another dataset, the available sample size of 78 cases meant that it was not possible to divide the sample into two sub-samples to allow for the development and testing of the solution on two separate samples as had been intended. As mentioned above, no more ‘cases’ were available.

Jaccard’s coefficient was used as the measure of similarity, for reasons discussed above. The variables, ‘struggles’, ‘gives an order’, ‘seeks help verbally from witnesses’, ‘obeys wishes’, ‘walks/cycles away’, ‘directly declines’, ‘runs away’, ‘truthful response to a personal question’, ‘justifies behaviour’, ‘requests behaviour from suspect’, ‘moves away’, ‘turns around’, ‘kicks’, ‘cries’, ‘less vulnerable positioning’, ‘punches’, ‘confronts suspect’, ‘indicates can’t help’, ‘physical non-compliance’, ‘re-dress/cover self’, and ‘queries intentions’ were included in the cluster analysis.

The stability of the clustering solution was assessed by varying the clustering method used, as recommended by Everitt et al. (2001). Clustering methods were only used if they were suitable for similarity data (Everitt et al., 2001). The four clustering methods were single linkage (nearest neighbour), complete linkage (furthest neighbour), average within-groups clustering, and average between-groups clustering.

The single linkage method resulted in chaining, which is not uncommon with this method (Everitt et al., 2001). However, dendrograms with similar clusters emerged when using the within-groups clustering method, the average between-groups clustering method, and the complete linkage (furthest neighbour) method. Figure 2Q displays the 7-cluster solution from the average between-groups clustering method, which was chosen as it was the clearest. The dendrogram was cut where the distances between fusion points were at their largest and where relatively clear clusters emerged (Everitt et al., 2001). Victim behaviours that formed each cluster are highlighted in the same colour. The dashed arrow represents where the dendrogram was “cut” to determine the clusters.

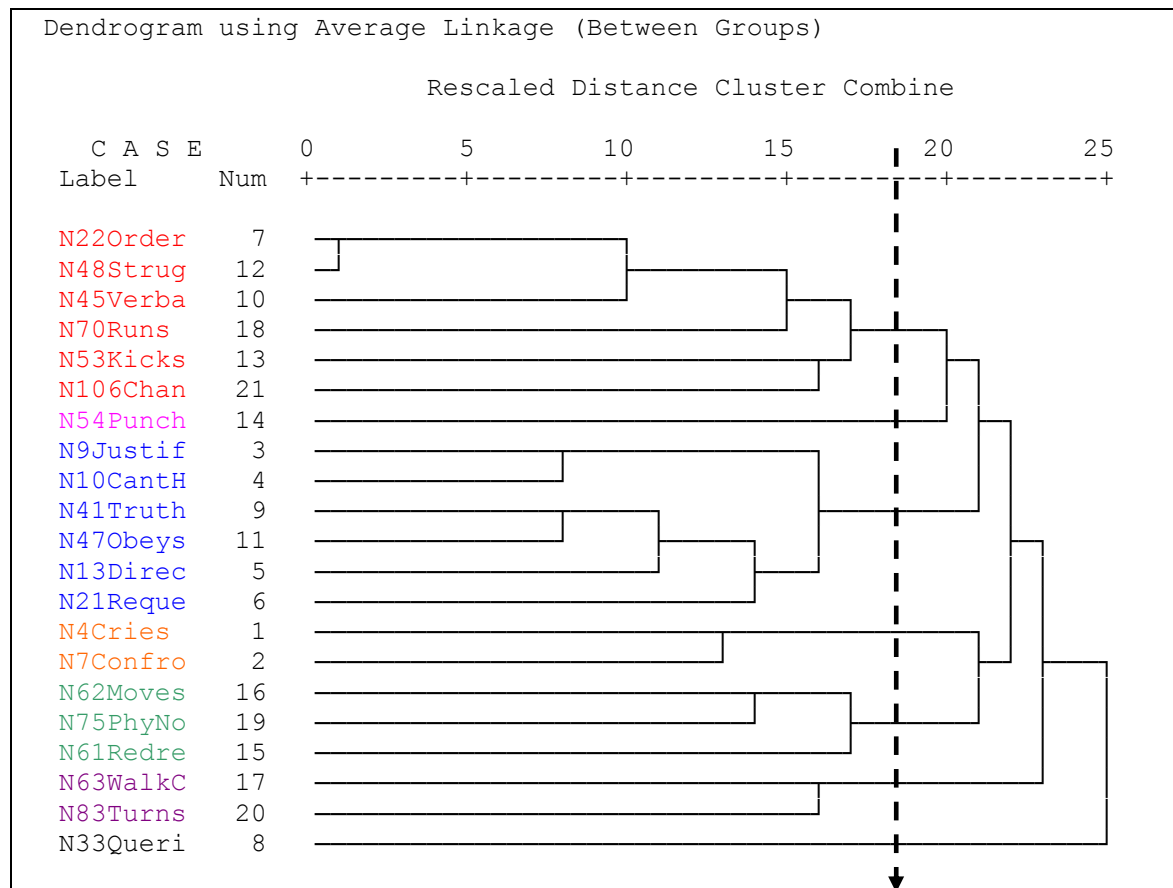


Figure 2Q: Dendrogram of the agglomerative hierarchical cluster analysis for victim behaviours using the average between-groups clustering method.

That similar clusters emerged with the within-groups clustering method and the complete linkage clustering method suggests we can have some confidence in the seven cluster structure produced by the average between-groups clustering method. The seven clusters are now described each in turn.

2.4.9.3.1. Cluster 1 and 2 – Active resistance

The behaviours of giving the offender an order, such as “Get off me”, struggling, verbal help-seeking (e.g. screaming), running, kicking, and moving into a less vulnerable position, formed one cluster (cluster 1). This cluster represented the more typical resistant behaviours, where the victim is clearly communicating her lack of consent, or, by moving herself into a less vulnerable position, is preparing to act in a resistant way. The second cluster represented a single behaviour, which was punching the suspect. It is surprising that this forms a separate cluster since, like some behaviours in cluster 1, it represents an act of physical violence, and is linked to cluster 1 higher up the dendrogram. In both of these clusters, the victim resists the power imbalance

between herself and the offender. These two clusters together could be labelled “Active Resistance”.

2.4.9.3.2. Cluster 3 – Role compliance

The third cluster contained mainly verbal behaviours. These were “justifies behaviour”, “indicates can’t help”, “truthful response to a personal question”, “directly declines” and “requests behaviour from suspect”. The cluster also contained the behaviour “obeys wishes”. Some of the behaviours in this cluster indicate a degree of compliance, such as where the victim is obeying the offender’s wishes and where she gives a truthful response to his questions. Others recognise the power imbalance between suspect and victim, such as where she requests a behaviour from the suspect, or where she declines the suspect (“directly declines”) but engages in face-saving by explaining her behaviour (“justifies behaviour”). Her rebuffs are polite rather than abusive e.g. “indicates can’t help”. In this cluster it is proposed that the victim is recognising the power imbalance and obeying social conventions for interacting with someone more powerful or in authority. She communicates to the offender that she is obeying social conventions and his expectation of her as the victim. This cluster was therefore labelled “Role Compliance”.

2.4.9.3.3. Cluster 4 – Invoking social conventions

The fourth cluster contained two behaviours, crying and confronting the suspect, which it could be argued are more emotional responses to the assault situation. The types of behaviours reported under the label confronting the suspect were relatively spontaneous outbursts where the victim is shocked and upset by the offender’s behaviour and points out to him its inappropriateness. Crying can also be argued to be of a spontaneous nature. It can fulfil the purpose of relieving emotional arousal and can elicit positive responses from the social environment (Hendriks & Vingerhoets, 2002). Since the purpose of categorising the victim’s behaviours is to consider their subsequent impact on the offender, it is important to consider whether these behaviours share a communicative purpose. Whilst the behaviours differ in how directly the victim is communicating to the offender, they both signal to the suspect that his behaviour is wrong and unwanted and perhaps contain the expectation that the offender will respond by ceasing his behaviour due to empathy or embarrassment. This cluster was therefore labelled “Invoking Social Conventions”.

2.4.9.3.4. Cluster 5 – Non compliance

The fifth cluster contains the behaviours of physical non-compliance, re-dressing/covering oneself, and moving away from the offender. If one considers a continuum of resistance which varies in how directly a victim communicates to the offender, this cluster would fall between compliance and resistance. It is suggested that the victim is trying to communicate to the offender her unwillingness to engage in sexual behaviours with him but is also trying to avoid angering him and therefore is doing this in a less face-threatening manner than other more direct communications. This cluster was therefore labelled “Non-compliance”.

2.4.9.3.5. Cluster 6

The sixth cluster contains two behaviours which do not seem related. The first “turns around” usually occurs at the beginning of an offence where the victim is wary or aware of the offender’s presence. Initially, when reading the label ‘walks/cycles away’ one expects this behaviour to occur at the end of an offence, in the closure stage, however it does also occur at the start, usually where the victim is trying to avoid any interaction or any further interaction with the offender. These two behaviours therefore might both stem from an underlying wariness on the part of the victim where she is assessing the situation and in some cases then deciding to put distance between herself and the offender without openly communicating this desire in a direct manner. No clear label could be found for this cluster.

2.4.9.3.6. Cluster 7 – Information seeking

The final cluster represented just one behaviour, that of the victim seeking clarification regarding the offender’s intentions. This is an information seeking behaviour and therefore this cluster was labelled “Information Seeking”.

2.4.9.3.7. Summary of quantitative analysis

The cluster analysis did not result fully in an obvious structure of clusters which were all easily labelled. The clusters also did not completely mirror the results of the qualitative analysis. However, in relation to the latter point, this was unlikely to occur from the start because only a proportion of the victim behaviours could be included in the cluster analysis. Further studies with larger datasets might find clearer structures of victim behaviours and could divide their sample in half, using the first half to investigate clustering and the second half to cross-validate any findings. Some of the groupings revealed by the quantitative analysis better reflected commonalities in valence and task demands and thus the results of both forms of analysis were compared

and contrasted to develop a final set of victim behavioural themes that not only reflected common functions but also captured variations in valence and task demand.

2.4.9.4. Amalgamation of the Qualitative and Quantitative Analyses of Victim Behavioural Themes

In both the qualitative and quantitative analysis of the victim behaviours themes of non-compliance, active resistance, and information gathering were found. In the qualitative analysis, the themes ‘humanisation’, and ‘bringing the suspect to reality’ could both be argued to represent the victim attempting to invoke social conventions and therefore could be collapsed into one category “Invoking Social Conventions”.

The results of the cluster analysis would suggest that the theme ‘non-compliance’, identified in the qualitative analysis, should be merged with the theme ‘explaining themselves’, with this super-ordinate category being divided into two themes. The first theme would represent victim behaviours which suggest to the offender that the victim is conforming with the power imbalance between her and him, and with social conventions. The second theme would represent behaviours where these rules are broken. By adopting this approach, a broader view is taken of non-compliance, where compliance with the offenders’ wishes and expectations of ‘his victim’ are included as well as conforming with social conventions. Likewise, the cluster analysis suggests the need for a broader view of compliance. This would result in the themes from the qualitative analysis, ‘Compliance’, ‘Helps suspect’ and some behaviours from the “Decreasing interpersonal space” theme being collapsed into one overall theme.

The themes/clusters from the qualitative and quantitative analysis were therefore amalgamated to form eight categories (see Appendix 6). These were 1) active resistance, 2) invoking social conventions, 3) information-gathering, 4) put-off, 5) face-threatening non-compliance, 6) face-saving non-compliance, 7) compliance, and 8) spontaneous behaviours. These categories differ from the qualitative analysis in that they encapsulate both how the offender might construe the victim’s behaviour as well as the goal the victim is seeking to achieve. Some categories are more face-threatening (e.g. active resistance) than others (e.g. compliance) and thus there is variation in valence. Active resistance by the victim is very face-threatening, thus possessing negative valence, whereas compliance is face-saving and therefore possesses positive valence. Related to this, there is variation between themes in how directly the victim communicates her meaning. In some categories (e.g. invoking social conventions) the

victim is behaving in a particular way with the assumption that the offender will correctly interpret the underlying meaning of her communication and respond accordingly. Since all victims will have the goal that they want the assault to end, behaviours in this category represent a less direct way of communicating this. This also relates to variation in valence between the themes. Studies of victim behaviours in group rape have similarly made observations that victim behaviours vary in how dominant or submissive they are (Porter & Alison, 2004). There is variation between themes in how much victims comply with social conventions. Non-compliance with social conventions can also result in negative valence (Thomas, 1995). There is variation between the themes in relation to the task type they represent. Compliance, for example, represents more a co-operative task whereas the various forms of non-compliance represent a competitive task. Finally, there is variation between the themes in the types of demand they place on the offender. Many of the behaviours within the theme active resistance will place physical and motor-control demands on the offender whereas invoking social conventions will place more social and cognitive demands on the offender. As well as capturing variations in valence, task type and task demands, the different themes accommodate variations in the expectations that the victim has of the offender. For example, victims may be expecting the offender to behave in a logical and reasonable way or they may perceive them as out of control. As reported in robbery (Luckenbill, 1981), changes in expectations of the offender result in changes in victim behaviour. Such flexibility within the themes is important because, similarly, a victim may change her expectations or perceptions of the offender during a sexual assault and hence change her behaviour.

It is tentatively suggested that each of the eight groupings represent a collection of victim behaviours of particular psychological meaning that is distinct from that of the other groupings. It would follow that similarity between crimes in these victim behavioural themes would represent situations of greater situational similarity.

It is important to note that each victim behaviour was only present in one theme. A second test of inter-rater reliability at this level was not, therefore, conducted since allocation to a victim behavioural theme was based on the presence of victim behaviours which had already been assessed for inter-rater reliability and demonstrated to be sufficiently reliable. Each offence was therefore binary coded for the presence and absence of each behavioural theme.

2.4.9.5. Quantifying Situational Similarity

As noted in section 2.2.7. the decision had been taken to measure both situational similarity (in victim behavioural themes) and behavioural consistency between pairs of offences using Jaccard's coefficient. Jaccard's coefficients had already been calculated for the 53 linked pairs for behavioural similarity. Jaccard's coefficients were also calculated for the 53 linked pairs for situational similarity using the binary coding of victim behavioural themes using SPSS.

The distributions of behavioural consistency and situational similarity were assessed for normality using Kolmogorov-Smirnov tests. Neither distribution was significantly different to a normal distribution ($Z = .552, p=.92$; $Z = .994, p=.28$, respectively). Means and standard deviations were therefore calculated and are presented in Table 2S. As can be seen from Table 2S, the degree of situational similarity between the 53 offence pairs was quite low when it is considered that it could range from 0-1.

Table 2S. Means and Standard Deviations for Behavioural Consistency and Situational Similarity for the 53 Linked Pairs Created from the 13 Series of Juvenile Stranger Sex Offences

	Mean	Standard deviation
Behavioural consistency	0.34	0.15
Situational similarity	0.40	0.27

2.4.9.6. Assessing the Overall Relationship between Situational Similarity and Behavioural Consistency

A correlation of behavioural similarity and situational similarity was computed on the subset of 53 linked crime pairs. Personality psychologists have reported that greater time between observations can reduce behavioural consistency (Pervin, 2002). It was therefore important to determine if time (in days) between offences was correlated with behavioural consistency. The distribution of time between offences was assessed for normality using a Kolmogorov-Smirnov test. The distribution was significantly different to a normal distribution ($Z = 2.66, p<.001$) therefore a Spearman's correlation was computed between 'time between offence pair' and behavioural consistency. Time between offences was not found to be correlated with behavioural consistency ($r = -0.07, n = 53, p>.05$), therefore, it was not necessary to control for time in the correlation

between behavioural consistency and situational similarity. A Pearson's correlation was conducted between behavioural consistency (as measured between each of the 53 offence pairs using Jaccard's coefficient) and situational similarity (as measured in the same manner). Contrary to expectation, no correlation was found between these two variables ($r = -0.06$, $n = 53$, $p > .05$).

2.4.9.7. Assessing the Relationship between Situational Similarity and Behavioural Consistency within Individual Series

The small numbers of offence pairs within each series in the dataset precluded the use of inferential statistics to investigate correlations between situational similarity and behavioural consistency for each series. Instead, for series with a length greater than two offences, a scatterplot was drawn to tentatively investigate whether this suggested that there was an association between situational similarity and behavioural consistency. Of the 13 series in the dataset, only five series constituted more than two offences in length. The five scatterplots can be seen in Figure 2R.

The degree and direction of correlation between situational similarity and behavioural consistency varies considerably by series. Only the scatter plot for the second series approximates a positive correlation, as would be hypothesised were greater behavioural consistency observed in situations of greater similarity within a series. The expectation that situational similarity would be positively correlated with behavioural consistency within a series was not supported in the majority of the five series amenable to preliminary investigation.

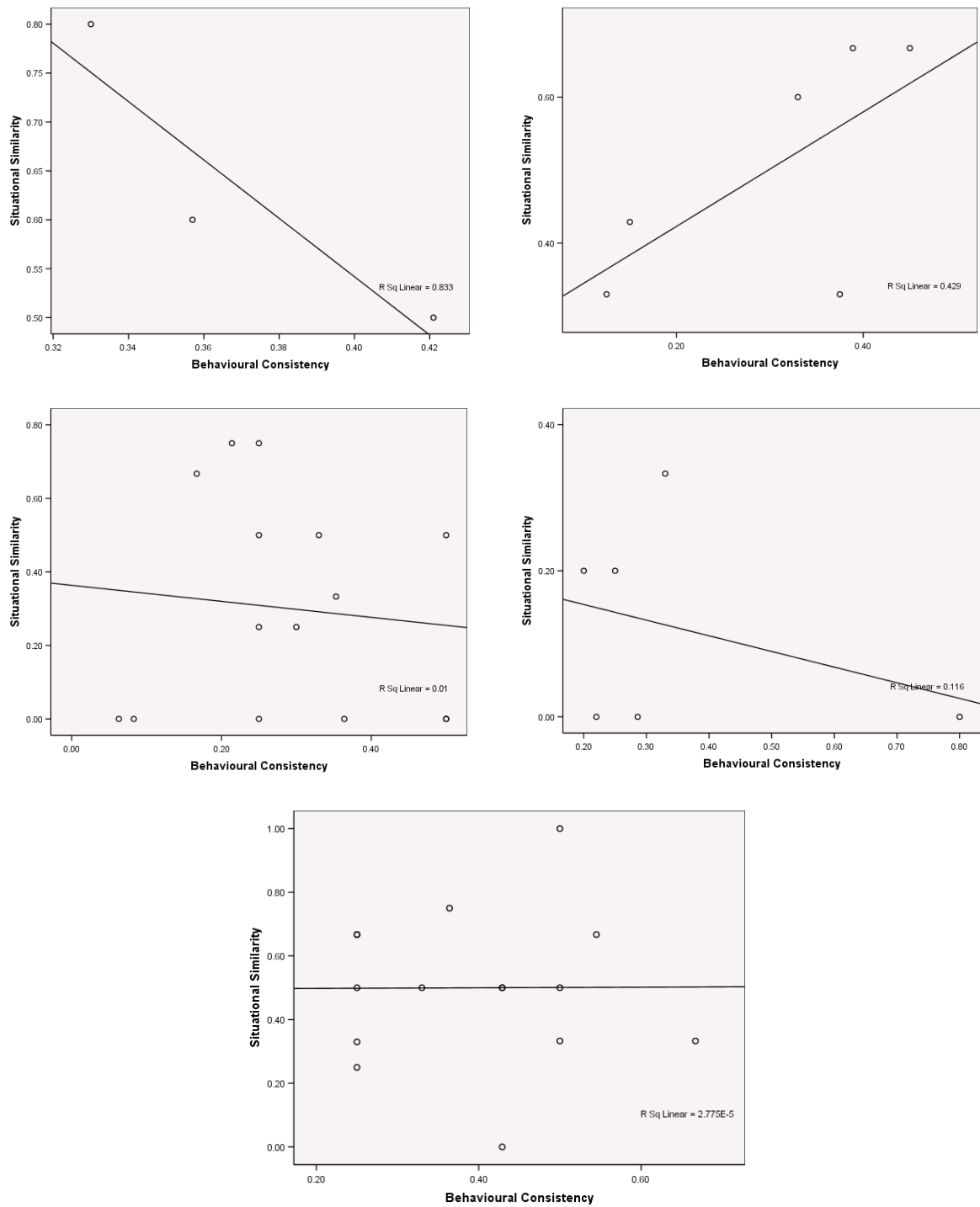


Figure 2R: Scatter plots of behavioural consistency and situational similarity for the five series of juvenile stranger sexual assault

2.4.9.8. Developing 'If(Victim Behaviour)-Then(Offender Behaviour)' Contingencies

As the study reported in this chapter represents a preliminary investigation of 'if(victim behaviour)-then(offender behaviour)' contingencies, only the three most frequent victim behaviours were selected for investigation. These were "victim struggles", "victim gives the suspect an order", and "victim verbally seeks help". These behaviours occurred in 56, 36, and 31% of the offences that composed the 13 series, respectively. As this represented the first study to use collocation software for this purpose, the span was maintained at 0:1. In other words, the program only considered the offender behaviour immediately following the victim behaviour of interest.

Tables 2T to 2V display the various offender behaviours that were found to follow the three victim behaviours chosen for investigation. Their respective frequencies in the 13 series are also reported.

Table 2T: Frequencies of 'If (Victim Struggles)-Then(Offender X)' Contingencies

If-Then Contingency	Frequency
Victim Struggles – Offender Positions the Victim	3
Victim Struggles – Offender Bodily Restrains the Victim	3
Victim Struggles – Offender Forcefully Moves Location	2
Victim Struggles – Offender Makes Intimate Disclosure	2
Victim Struggles – Offender Grabs the Victim	2
Victim Struggles – Offender Undresses Victim	2
Victim Struggles – Offender Directs the Victim into a Position	1
Victim Struggles – Offender Blindfolds the Victim	1
Victim Struggles – Offender Stalks the Victim	1
Victim Struggles – Offender Directs the Victim in a Sexual Behaviour	1
Victim Struggles – Offender Gags Victim with Hand	1
Victim Struggles – Offender Uses Instrumental Violence	1
Victim Struggles – Offender Kisses Victim	1
Victim Struggles – Offender Discloses his Intent	1
Victim Struggles – Offender Touches Victim's Vaginal Area	1
Victim Struggles – Offender Touches Victim's Breast	1
Victim Struggles – Offender Makes Conditional Threat	1

Table 2U: Frequencies of 'If (Victim Gives Suspect Order)-Then(Offender X)' Contingencies

If-Then Contingency	Frequency
Victim Gives Order – Offender Kisses Victim	2
Victim Gives Order – Offender Uses Instrumental Violence	2
Victim Gives Order – Offender Tells Victim He Has Weapon	1
Victim Gives Order – Offender Reassures Victim	1
Victim Gives Order – Offender Ceases Assault	1
Victim Gives Order – Offender Asks Victim Sexual Question	1
Victim Gives Order – Offender Mocks Victim	1
Victim Gives Order – Offender Makes a Conditional Threat	1

Table 2V: Frequencies of 'If (Victim Verbally Seeks Help)-Then(Offender X)' Contingencies

If-Then Contingency	Frequency
Victim Verbally Seeks Help – Offender Uses Instrumental Violence	4
Victim Verbally Seeks Help – Offender Gags Victim with Hand	4
Victim Verbally Seeks Help – Offender Makes Conditional Threat	3
Victim Verbally Seeks Help – Offender Ceases Assault	3
Victim Verbally Seeks Help – Offender Tells Victim He Has Weapon	2
Victim Verbally Seeks Help – Offender Orders Victim To Be Quiet	2
Victim Verbally Seeks Help – Offender Undresses Victim	1
Victim Verbally Seeks Help – Offender Forcefully Moves Location	1
Victim Verbally Seeks Help – Offender Positions the Victim	1
Victim Verbally Seeks Help – Offender Redressed Himself	1
Victim Verbally Seeks Help – Offender Grabs the Victim	1

As can be seen from the tables, many if-then contingencies were unique to a particular offence in a series. These low frequencies prevented the investigation of consistency and distinctiveness in if-then contingencies using inferential statistics. This was instead limited to descriptive statistics. Tables 2W to 2Y display the frequencies of each contingency for each serial offender.

Table 2W: Distribution of 'If (Victim Struggles)-Then(Offender X)' Contingencies Across Series

If-Then Contingency	Total	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
Struggles – Positions	3/25	-	-	-	1	-	-	-	-	2*	-	-	-	-
Struggles – Restrains	3/25	-	-	1	-	-	1	-	-	-	-	1	-	-
Struggles – MoveLocation	2/25	-	-	1	-	-	-	-	-	-	-	1	-	-
Struggles –Int.Disclosure	2/25	-	-	-	-	-	-	-	-	-	-	2*	-	-
Struggles –Grabs V	2/25	1	-	-	-	-	1	-	-	-	-	-	-	-
Struggles –Undresses V	2/25	-	-	-	-	1	-	-	-	-	-	1	-	-
Struggles – Direct Position	1/25	1	-	-	-	-	-	-	-	-	-	-	-	-
Struggles – Blindfold	1/25	1	-	-	-	-	-	-	-	-	-	-	-	-
Struggles – Stalks	1/25	-	-	-	-	-	-	-	-	-	-	-	-	1
Struggles – Directs Sexual	1/25	1	-	-	-	-	-	-	-	-	-	-	-	-
Struggles – Gags Hand	1/25	-	-	1	-	-	-	-	-	-	-	-	-	-
Struggles – Ins. Violence	1/25	-	-	-	-	-	1	-	-	-	-	-	-	-
Struggles – Kisses	1/25	-	-	-	-	1	-	-	-	-	-	-	-	-
Struggles – Dis. Intent	1/25	-	-	-	-	1	-	-	-	-	-	-	-	-
Struggles – Touch Vaginal	1/25	-	-	-	-	-	-	-	-	-	-	1	-	-
Struggles – Touch Breast	1/25	-	-	-	-	-	-	-	-	1	-	-	-	-
Struggles – C. Threat	1/25	-	-	-	-	-	-	1	-	-	-	-	-	-

S = Series, V = Victim

*Consistency only within the same offence in the series.

Table 2X: Distribution of ‘If (Victim Gives Order)-Then(Offender X)’ Contingencies Across Series

If-Then Contingency	Total	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
Gives Order – Kisses	2/10	-	-	-	-	-	-	-	1	-	-	-	-	1
Gives Order – Ins.Viol	2/10	-	-	1	-	-	-	-	-	1	-	-	-	-
Gives Order – Weapon	1/10	-	-	-	-	-	-	-	-	1	-	-	-	-
Gives Order - Reassure	1/10	1	-	-	-	-	-	-	-	-	-	-	-	-
Gives Order – Ceases	1/10	-	-	-	-	-	-	-	1	-	-	-	-	-
Gives Order – Sex Q	1/10	-	-	-	-	-	-	-	-	-	-	-	-	1
Gives Order – Mocks	1/10	-	-	-	-	-	-	-	-	-	1	-	-	-
Gives Order –C.Threat	1/10	-	-	-	-	-	-	1	-	-	-	-	-	-

S = Series

Table 2Y: Distribution of ‘If (Victim Verbally Seeks Help)-Then(Offender X)’ Contingencies Across Series

If-Then Contingency	Total	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
Seeks Help – Ins.Viol	4/23	-	-	3*	-	-	1	-	-	-	-	-	-	-
Seeks Help – Gags	4/23	-	-	-	-	1	-	-	-	-	-	3*	-	-
Seeks Help – C.Threat	3/23	-	-	1	-	-	-	-	-	2*	-	-	-	-
Seeks Help – Ceases	3/23	-	-	-	-	-	1	-	-	-	-	1	-	1
Seeks Help – Weapon	2/23	-	-	2*	-	-	-	-	-	-	-	-	-	-
Seeks Help – Quiet	2/23	-	-	1	-	-	1	-	-	-	-	-	-	-
Seeks Help –	1/23	-	-	1	-	-	-	-	-	-	-	-	-	-
Undresses V	1/23	-	-	-	-	1	-	-	-	-	-	-	-	-
Seeks Help-	1/23	-	-	1	-	-	-	-	-	-	-	-	-	-
MoveLocation	1/23	-	-	-	1	-	-	-	-	-	-	-	-	-
Seeks Help - Positions	1/23	-	-	-	-	-	1	-	-	-	-	-	-	-
Seeks Help - Redressed														
Seeks Help – Grabs V														

S = Series, V = Victim

*Consistency only within the same offence in the series.

From examining these tables, it becomes apparent that whilst some offenders do repeat the same ‘if(victim behaviour)-then(offender behaviour)’ contingency within their series, this was only within the *same* offence.

2.4.9.9. Summary

As reported in this section of Chapter 2, initial steps to investigate whether the situation could be incorporated into the case linkage task were taken. This was investigated at the individual crime level and the victim-offender interaction level. No evidence was found for a positive association between situational similarity and behavioural consistency, as would have been predicted from research in Personality Psychology. This was the case for an overall correlation incorporating 53 linked crime pairs, and largely the case for each of the five series that contained more than two offences. Only one series showed any indication of a positive association between situational similarity and behavioural consistency. Reasons for these unexpected findings are proposed in section 2.5.

Linguists use statistical programs to study collocation, and it was suggested that the same method could be applied to develop ‘if(victim behaviour)—then(offender behaviour)’ contingencies. The program performed well, and if–then contingencies were identified for three frequent victim behaviours. In principle, this therefore appears to be a relatively straightforward task; however, the question arises of whether one should only consider the victim behaviour/theme immediately preceding an offender behaviour, as was the case in this study. It would seem likely that offenders do not just consider the immediately preceding victim behaviour when deciding how to act. To account for this would require a more complex if–then contingency, e.g. ‘if victim struggles and verbally seeks help—then offender gags the victim’.

The investigation of consistency in if–then contingencies within the series was based on descriptive statistics, and was therefore a very crude measure. On inspection of the frequency data, it appeared that whilst offenders, on occasion, responded to the same victim behaviour in the same way, this was limited to a degree of consistency within the *same* offence rather than across offences within the same series. The fact that the three victim behaviours studied only occurred in between 31 and 56% of offences highlights that not all offences within a series will necessarily contain the same victim behaviours. This may partly explain why consistency within the same series was not found. To investigate this further would require studies sampling only offences in a series that contained the same victim behaviour ‘if’. The frequencies in the current data set were too low to pursue this. Larger samples may offer more scope to investigate this in a more sophisticated manner.

2.5 Chapter Conclusion

The analyses reported in this chapter have added to our knowledge of sexual offending behaviour with regards to increasing knowledge of the behaviours displayed by offenders and victims and the frequency with which they are displayed in both serial and non-serial sex offences. The frequencies of offender behaviours, reported in this chapter, can be used to inform the process of case linkage with juvenile stranger sex offenders since they represent base rates, indicating the relative rarity of an offender behaviour. The relative frequencies of victim behaviours could also be of practical use. They could feed into the criminal justice system, informing expert testimony as to how a “typical” victim might behave during a juvenile stranger sexual assault. Permitting such testimony was suggested in recent calls for reform (Ellison, 2005). The qualitative analysis yielded a much larger number of offender behaviours than has been the case in past research. For example, sixty eight offender behaviours were identified by Santilla et al. (2005) compared to 148 in the study reported here. There was surprising variation between the behaviours reported in past studies and the behaviours found in the current study. This might be a result of differences in the data used (victim accounts versus police database entries) or the adoption of constant comparison framework analysis, which encourages the re-visiting and refinement of themes (Ritchie & Spencer, 1994), rather than content analysis which was used by Santilla et al. (2005).

These advances in knowledge about offender and victim behaviours should be considered in light of methodological limitations. Victim accounts of sexual assault were chosen to improve past research which has sampled media and court reports, or which had extracted data directly from police databases. These accounts had been made to the police and had resulted in the conviction of an offender. The select nature of victim accounts reported to police and those that go on to be prosecuted is well documented (Fisher et al., 2003; Harris & Grace, 1999; Myhill & Allen, 2002). This means the findings reported in this chapter will not necessarily generalise to all cases of juvenile stranger sexual assault. In addition, the nature of the data meant that, at times, it was difficult to determine the intention of the victim. In some cases this was impossible and hence the behaviour remained uncoded. In other cases, the author was required to make a subjective decision as to the likely intention behind the victim’s behaviour. This is not a desirable situation but could not be overcome. To approach victims to clarify what they meant in their account to the police would have been unethical because some accounts were several years old and because of the likely

psychological trauma such an approach might cause. Instead, the author attempted to minimise this limitation by testing inter-rater reliability.

The analyses have also advanced theories of behavioural consistency by investigating whether principles from Personality Psychology, developed from non-criminal behaviour, also apply to criminal behaviour. Evidence of both behavioural consistency and distinctiveness was found in respect of the significant difference between Jaccard's coefficients for the linked crime pairs and the unlinked crime pairs. Behavioural similarity was significantly greater for linked crime pairs than unlinked crime pairs.

The analyses have advanced the empirical research on case linkage, investigating for the first time whether juvenile offenders show sufficient consistency and distinctiveness in their offending behaviour for their crimes to be behaviourally linked. Research from Personality Psychology had suggested that we might need to be cautious in assuming that case linkage could be as accurately used with juvenile crime as adult crime (Woodhams, Hollin & Bull, 2007). The findings indicate that juvenile stranger sex offenders are not highly consistent in their offending behaviour. However, they were sufficiently consistent and distinctive in their offending behaviour overall for linked crime pairs to be differentiated from unlinked crime pairs at an acceptable level of predictive accuracy. It should, however, be remembered that the design of the study necessitated a sample of solved serial stranger sex offences. As noted by Bennell and Canter (2002), one reason why these offences might have been solved in the first place is their high behavioural similarity and distinctiveness. This limitation applies to all case linkage research that samples convicted offenders and their offences. The only way to overcome this limitation would be to sample offences that are linked by physical means (such as through DNA) but that remain unsolved. The author has approached the gatekeepers to the National DNA database to discuss gaining access to the scene-to-scene hits in the database for unsolved sexual crimes. These discussions are ongoing at present.

Assessing the predictive accuracy of different behavioural domains for case linkage revealed similar findings to those found with other crime types (Bennell & Canter, 2002; Bennell & Jones, 2005; Tonkin et al., 2008; Woodhams & Toye, 2007) and with adult serial stranger sex offenders (Grubin et al., 2001). Escape behaviours and the distance between crime pairs were reliable predictors of linkage status. In the absence of information about distance, the combination of similarity in Control, Escape

and Sex behaviours predicted linkage accuracy to an excellent level. This contrasts with previous claims by other researchers that MO behaviours are not useful for case linkage (Goodwill & Alison, 2006) and concur with the findings of Woodhams and Toye (2007) and Grubin et al. (2001). That inter-crime distance, escape and sex behaviours were selected in the stepwise logistic regression and because they have been consistently supported as reliable predictors of linkage, would suggest that at present these variables should be prioritised in conducting case linkage and developing and maintaining databases which assist with this task. However, control behaviours also appear to be a reliable predictor when used in combination with escape and sex behaviours. In addition, there are practical reasons why one would not want to ignore other MO behaviours when conducting case linkage and in the maintenance of databases. For some types of sexual offence the victim may find it particularly difficult to locate the offence site (for example, rapes that occur in unlicensed minicabs or where the victim was intoxicated or was drugged). In such scenarios the crime analyst may not be able to rely on geographical distance between offence sites to identify potentially linked crimes. When conducting case linkage on such crimes, similarity in MO behaviours could be used instead. In addition, there is a question as to whether the superior performance of inter-crime distance as a predictor was artificially inflated in this study. To have sufficient cases to investigate case linkage with juvenile stranger sex offenders a national sample of crimes had to be sampled. The small sample size of 106 pairs in combination with the geographical spread associated with a national sample is likely to have made the linking task when using inter-crime distance easier than in reality, despite a set of non-serial matched offences being included in the sample. It is important for future research to investigate the utility of these findings in practice where the databases being searched will contain many more offences, both solved and unsolved. Such research will reveal how useful these predictors of linkage are when trying to identify linked pairs in much larger samples. Studies of sexual offences which utilise local rather than national datasets are also needed.

It should be remembered that the methods used to conduct case linkage in practice do not necessarily reflect the methodology used in this study and past studies. It is relatively uncommon that statistical measures of similarity between offences are used to assist in the identification of possible linked pairs. However, this is an approach which practitioners might wish to adopt, and which would assist in the standardisation of case linkage (Woodhams & Toye, 2007). There have been recent, successful,

attempts to create a computerised system for linking a query sexual crime to a known sex offender (Yokota, Fujita, Watanabe, Yoshimoto & Wachi, 2007). Such systems rank order the known offenders in the database in order of similarity in behaviour to the query crime. However, this project did not investigate whether any of the behavioural domains mentioned in this chapter are more effective at this task than others. This would be an area for future research.

Such studies are also still assessing the effectiveness of linking crimes using behavioural similarity in a retrospective manner. In other words, the offences have already been linked and solved. An ambitious but important future study could investigate the usefulness of prioritising offences for case linkage using behavioural similarity between crime pairs, in a prospective manner.

The opportunity was taken to assess the relative merits of different methodological techniques for studying case linkage. The findings suggest that it is more valid to assess case linkage principles using an independent matched set of unlinked crime pairs rather than generating the unlinked crime pairs from the linked crime pairs. The removal of behaviours occurring in less than 5% of cases appeared to improve predictive accuracy. Such a finding also has implications for the development of statistical programmes for assisting with the linkage process.

The inclusion of group offences within the dataset appeared to make little difference to the predictive accuracy of the models, suggesting that group offences could be accommodated within statistical programs for linkage in a similar manner to lone offences. With the current dataset and in her past work experience, it was the author's experience that victim accounts often contained insufficient detail to always be sure which offender perpetrated which action in offences involving multiple offenders. This was not necessarily a result of poor police interviewing, rather the victim could not always remember which offender was responsible for an act. This was at times exacerbated by the effects of alcohol and drugs on the victim's memory, or the nature of the group rape (i.e., depending on whether the offenders assaulted the victim sequentially or concurrently). Coding sexual offences involving multiple perpetrators in the same manner as those involving single perpetrators therefore seems particularly appropriate because the confidence with which a behaviour can be attributed to a particular offender varies between offences. The scarcity of juvenile group serial sex offenders precluded the intended investigation of consistency in roles. Future studies with larger samples of group serial sexual offences could investigate this.

For some time, personality psychologists have urged researchers of behavioural consistency to investigate behaviour using if-then contingencies. To date, this recommendation has not been considered in assessing consistency of criminal behaviour. To address this, two initial investigations were undertaken. Whether behavioural consistency and situational similarity were significantly and strongly associated was investigated. Contrary to what Personality Psychology would predict, no evidence of such a relationship was found.

There are several reasons that might explain why little evidence of an association was observed. It is possible that the conceptualisation of situational similarity and psychological salience in this study was inappropriate. In which case, a positive association between behavioural consistency and situational similarity might be found if more appropriate means of measuring situational similarity were developed. There will be factors other than the victim's behaviour that will affect the psychological meaning of a situation for an offender. For example, Davies (1992) reports how the physical appearance of a victim can affect offender behaviour. She gives the example of a serial rapist who was typically both verbally and physically aggressive towards his victims. In contrast, with one victim, who was young and middle class, he was complimentary and considerate. This reported variation in behaviour does not seem to be related to task type, task demands, or valence as they have been discussed in the personality psychology literature. Hazelwood and Warren (2003) and Santtila et al. (2008) also report how an offender's mood, mental state, and the external circumstances of a crime can affect the consistency of offending behaviour. It is possible that mood and mental state affect the perceived valence of a situation and the external circumstances affect task demands.

Mischel and Shoda (1995) observe that participants may not agree with the researcher's interpretation of psychological similarity. This is an important point and one that suggests a potentially valuable avenue for further research. Studies could investigate how offenders construe the psychological similarity of situations by asking them to rate offences for similarity. This would be a similar approach to that taken by Furr and Funder (2004), where they asked participants to rate situations subjectively for similarity. One method of achieving this would be to use a card-sorting task, asking offenders to group together offences that they consider to be similar and explaining what qualities these offences possess that make them similar. Interviews with offenders may be productive in further understanding what characteristics of an offence situation

are salient. Just such an approach was suggested by Grubin et al. (2001). Forensic psychologists working with offenders would be well-placed to pursue research in this area.

Future studies could also take a similar approach to the current study and apply the same or different analytical techniques to samples of victim behaviours to determine if there are alternative ways of categorising such behaviour in terms of valence, and the demands victim behaviour places on offenders. For example, whilst the hierarchical cluster analysis suggested that the victim behaviour of giving orders should be located in the theme ‘active resistance’, unlike other behaviours in this theme, this behaviour does not place a physical demand on the offender.

It might also be the case that the conceptualisation of situational similarity was appropriate, but its measurement between situations was inaccurate because the information about victim behaviour from the police files contained omissions or distortions. In the current study, a victim account of the offence was not always available, and instead, a report produced for the courts or by a crime analyst had to be used instead. The limitations of using police data for psychological research have been discussed elsewhere (Alison et al., 2001; Canter, 2000).

In personality psychology research, situations have been rated on a 1–7 scale for the degree of demand they placed on the individual, and situations have been correlated for their similarities (Shoda et al., 1993). In the current study, situations were coded for their qualities in a binary fashion and their similarity was assessed using the similarity coefficient—Jaccard’s coefficient. Future studies may wish to investigate other means of assessing situational demands and measuring situational similarity.

It is possible that there is greater opportunity for the situation, as defined by victim behaviour, to impact on offenders’ behaviour in some crimes than others. Santtila et al. (2008) recently observed in their study of murders that the immediate murder of the victim meant that the victim’s behaviour had little effect on the offender’s behaviour. They explain ‘in some of the murders included in the present study the victim was shot immediately at the beginning of the event, leaving the offender free to express his personality and psychological needs with the body of the victim without any behavioural inference from the victim’ (p. 19). In relation to sexual offences, surprise-approach style offences, where the victim is physically dominated from the start, would be similar, with con-approach style offences perhaps allowing greater opportunity for

victim behavioural influence. If offenders are consistent in their approach styles, some offenders might, therefore, experience greater situational variation than others.

Preliminary investigations of whether serial offenders were consistent in if-then contingencies demonstrated the use of programs, such as WordSmith. That the span can be manipulated with ease within this program is advantageous and would allow for the study of more complex contingencies in the future. Despite WordSmith proving to be a useful tool in investigating this research question, the investigation only revealed some evidence of consistency in terms of if-then contingencies *within the same offence* rather than across offences within the same series.

Whilst considerable effort was made to preserve the temporal ordering of victim and offender behaviours in the current study, this was not always clear from the victim accounts. Educating interviewing officers to be mindful when interviewing victims to establish the ordering of behaviours and accurately recording this might help address this lack of detail. However, even with such improvements in interviewing techniques, police records of crime might still lack sufficient information to determine the “if” part of the if-then contingency and to establish temporal ordering due to the victim struggling to recall the exact sequencing of behaviours. Therefore, even if future research found the inclusion of context in linking crimes to be beneficial, a lack of detail might prevent this. If victim accounts are not sufficiently detailed to accurately code for if-then contingencies, research that improves the accuracy of linkage decisions based solely on the then-part of the contingency will be important.

Alternatively, a hierarchical system of linking crimes might help overcome the problem of missing details (Woodhams, Grant & Price, 2007). A lower level in the hierarchy could represent the ‘if(victim behaviour)–then(offender behaviour)’ contingencies with the next level up the hierarchy representing just the offender behaviours. If information were missing at the if-then contingency level, similarity could still be measured at the offender behaviour level. This proposition needs testing.

In analysing the data, it was observed that offender behaviours were not always preceded by a victim behaviour. As noted above, the victim is not the only factor within sexual assaults that might affect the psychological meaning of the situation for the offender. People’s personality systems can be activated by internal processing, such as fantasising and planning (Mischel & Shoda, 1995), producing ‘if fantasy – then offender behaviour’ contingencies. Future studies may wish to investigate the effect of witness and offender “ifs” on behavioural consistency.

It is possible that case linkage research has already accounted for situational similarity through its investigation of behavioural consistency across specific crime types (e.g., rapes, burglaries, homicides, and robberies). That serial offences appear to be sufficiently similar and distinctive in some behavioural domains for the accurate differentiation of linked and unlinked crime pairs when focusing solely on the 'then(behaviour)' part of the if-then contingency suggests this might be an appropriate interpretation. Such findings suggest that the more cumbersome task of coding if-then contingencies for case linkage databases might be unnecessary. However, it is certainly too early to conclude this.

In this chapter, research has been presented which is starting to suggest how crime analysts might refine the practice of case linkage. However, even where improvements in case linkage can be made, it is likely that the crime analyst will still have more case linkage requests from police officers than they have time to complete. The following chapter considers ways in which crime analysts might be able to prioritise requests for case linkage.

CHAPTER 3

INVESTIGATIVE RISK ASSESSMENT AND JUVENILE SERIAL STRANGER SEX OFFENDERS

3.1. Introduction

3.1.1. Investigating stranger sex offending: Prioritising offences

From my past employment as a crime analyst I am aware that crime analysts can have heavy caseloads and unavoidably some cases have to be prioritised over others. There are two possible rationales on which crimes could be prioritised for investigation. The first is to prioritise offences that appear to be committed by offenders who are escalating in their use of physical aggression. Such offenders would be argued to present greater danger to the public and have the propensity to inflict greater harm on their victims. The second is to prioritise offences that appear to have been committed by serial offenders. Such offenders would be prioritised because their offending behaviour impacts on numerous victims.

The ability to identify stranger sex offenders who, compared to others, are more dangerous and/or persistent in their offending is a process that is analogous to types of risk assessment conducted by psychologists with incarcerated sex offenders. A crime analyst who prioritises one crime over another, based on the likely dangerousness and/or persistence of an unknown offender, is engaging in a form of *investigative risk assessment*. The development of reliable techniques for prioritising offences in such ways would help crime analysts prioritise their workloads more efficiently and would support the shift in policing style to be more intelligence-led (Innes, et al., 2005). Some studies have begun to investigate whether this is possible.

3.1.2. Prioritising offences indicative of escalating violence

Despite evidence that serial sex offenders display a degree of consistency in their offending behaviour (Grubin et al., 2001; Santtila et al., 2005; see also Chapter 2 of this thesis), there is also some evidence of variability in serial offenders' behaviour. Namely, that some serial offenders escalate in their use of violence in sexual offences (Grubin & Gunn, 1990; Hazelwood et al., 1989; Warren et al., 1991; 1999). The psychological and psychiatric literature suggests two reasons why a serial sex offender might increase in their use of physical violence over a series. The first is that such violence is necessary to achieve more elaborate sexual offences. Gee and Belofastov

(2007) describe how sexual fantasy evolves with time, becoming more complex. With this, the completion of a sexual offence becomes more difficult, necessitating greater control of the victim which is achieved through physical aggression. Some research evidence for this has been reported. With their sample of adolescent child abusers, Leclerc and Tremblay (2007) found violence use to be associated with the increasing intrusiveness of the sexual behaviour desired by the adolescent. Based on their observations when working with and researching serial adult sex offenders, Hazelwood and Warren (2000) propose that ritualistic offenders, whose offences are fantasy-driven, are likely to escalate in their use of violence across their series whereas impulsive offenders, whose offences are proposed not to be fantasy-driven and who are instead more opportunistic, are proposed to remain consistent in their use of physical violence. This suggests that not all serial sex offenders will increase in their use of physical violence across a series but the potential exists for escalation with serial sex offenders who are motivated by a pervasive sexual fantasy.

The second explanation, which is related to the first, is that the presence of sexual sadism might result in increasing violence throughout a series. Sadistic sexual offenders are sexually aroused by the psychological and/or physical suffering of a victim (American Psychiatric Association, 1994). Arrigo and Purcell (2001) have reported that sadistic sexual fantasies have the potential to become more violent over time. Previous research with serial sadistic sexual murderers has found an escalation in violence with time that culminated in murder (Burgess, Hartman, Ressler, Douglas, & McCormack, 1986 as cited in Kirsch & Becker, 2007). However, it is important to note this research was based on a select sample of FBI serial killers (Kirsch & Becker, 2007). In terms of *juvenile* sex offenders, Myers (2004) describes six case studies of serial juvenile sexually sadistic homicide offenders. These include examples of children who escalated in their use of physical violence. Their behaviour commenced with physically violent sexual assaults which later progressed to sexual murders. Despite, again being a small sample of extreme sexual offenders, this suggests that juvenile sadistic sex offenders might be at risk of violence escalation. Sadism has been noted to be rare in juvenile sex offenders (Hunter, 2001), however serial sadistic juvenile sex offenders could pose a particular danger to the public.

Research has commenced to better understand the number of serial sex offenders who escalate in their use of physical violence and to investigate whether it is possible to identify such offenders from their crime scene behaviour. Hazelwood et al. (1989)

investigated whether adult serial rapists increased in their use of violence over their series. Of their sample of 41 serial rapists, 85% had attacked strangers. The degree of violence used by an offender was measured using the Blunt Force Scale. This allocates an offence with a score for level of force based on the following criteria:

- 1 = no force
- 2 = victim struck primarily to intimidate
- 3 = victim struck repeatedly in a painful manner
- 4 = victim seriously beaten
- 5 = victim severely beaten or killed

Whilst the majority of their sample did not escalate in their use of violence with time, a small minority did. Hazelwood et al. (1989) termed these individuals “increasers”. Whether the increasers differed in their offending behaviour from the rest of the sample was investigated. Increasers were significantly more likely to have committed sadistic acts in the last offence of their series, they had committed significantly more offences, and demonstrated a significantly higher intensity in their sexual offending. Whilst these findings are interesting, a crime analyst is unlikely to be able to use such information because it would only come to light once the offender was apprehended and his/her crimes were known.

A further study (Warren et al., 1991) was conducted using what appears to have been the same sample of adult rapists as the 1989 study. This 1991 study investigated whether the offence behaviours of the increasers in their (known) first rape (as described by the victim) differed to those of the non-increasers. It was found that increasers were more likely to use bindings, transport their victims, and were less likely to negotiate with their victims, or reassure them. Such findings are more useful to the crime analyst providing they can access the victim’s account of the crime.

This 1991 study was replicated eight years later with a sample of 108 adult serial rapists (Warren et al., 1999). As was found in the prior study, increasers committed significantly more rapes. They were more likely to target victims aged over 40 years, and showed a preference for raping their victims indoors. At the time of the (known) first rape, increasers were more hostile, expressed more profanities and humiliated their victims more. They were more likely to request verbal scripting and penetrate their victim with a foreign object. They also used more force and inflicted more injuries,

perpetrated longer-lasting and more planned assaults, and were more selective in their choice of victim. The predictive ability of these factors was examined by Warren et al. (1999) using logistic regression. Three variables were found to predict increaser status: the offender's ethnicity, the duration of the assault, and the use of profanities. Increasers were more likely to be White, assaulted their victims for a longer period of time, and used more profanities.

Grubin and Gunn (1990) also investigated whether adult serial rapists who escalated in their use of violence differed from those that did not. Their findings contrast with Warren and colleagues'. Increasers were younger, tended to ejaculate prematurely, and were less likely to use gratuitous violence. (Gratuitous violence was defined as "force used in excess of that needed to gain victim compliance" (p. 181)). Grubin and Gunn explained these differences as arising from differences in the types of offender sampled in their study compared to those sampled in the research by Warren and colleagues. Grubin and Gunn claimed that their sample was more representative of general imprisoned rapists and proposed that the Warren and colleagues' studies sampled a rarer and more sadistic type of offender. This claim receives some support from Gratzner and Bradford (1995) who observed differences in modus operandi behaviour between sadistic and non-sadistic sex offenders detained in a special hospital and sadistic offenders who had been submitted to the FBI's National Center for the Analysis of Violent Crime (NCAVC), the data source used by Hazelwood et al. (1989) and Warren et al. (1991). The NCAVC sample appeared to show more severe sexually sadistic behaviour. However, Warren et al. (1999) rejected Grubin and Gunn's explanation and claimed that their earlier findings had now been replicated with a more general sample of sex offenders. They explained the differences in findings as resulting from variations in data coding.

3.1.3. Prioritising offences indicative of serial offending

As reported in Chapter 1, research has suggested that juveniles that re-offend are more likely to use verbal and physical violence in their offences, have a deviant interest in children, and have a more extensive sex offending history (Caldwell, 2002; Miner, 2002; Worling & Långström, 2003). Crime analysts will not possess direct information about an offender's state of mind (e.g. sexual deviance), but they would have information about the offender's behaviour during the offence, as reported by the victim. Any indications of previous sex offending in an offender's behaviour or the use

of verbal and physical violence in an offence might therefore suggest a propensity for future serial offending.

However, recidivism research samples apprehended offenders. It is quite possible that apprehended offenders differ in offence behaviour and characteristics compared to those still at large (Bennell & Jones, 2005; Woodhams, 2004). Recidivism studies are also concerned with how factors predict re-offending *after a period of detention* during which offenders may have undergone psychological treatment. The findings generated from such studies will not necessarily generalise to serial offenders as they are offenders who are still at large.

Knowledge of offence behaviours which tend to emerge later in crime series could indicate to the analyst when an offence is likely to be part of a series. If finding such behaviours in an offence the analyst can justify a search for similar offences that may form part of the series. Although such offenders by definition are showing variation in some behaviours, they may still show consistency in their behaviours in domains such as the Escape domain. A study by Grubin et al. (2001) investigated whether the offence behaviours displayed by an individual towards the end of a series differed to those displayed at the start. Grubin et al. initially conducted a cluster analysis to determine whether “singleton” (or apparently one-off offenders) and serial offenders’ first offence behaviours clustered differently to serial offenders’ later offence behaviours. Whilst one cluster did appear to contain more singleton and first serial offences than later serial offences, there was no clear clustering of the data. Salfati and Bateman (2005) took a similar approach but sampled serial murderers. They compared the behaviours displayed in single homicides with the behaviours in serial homicide to identify behaviours indicative of serial offending. They found behaviours relating to fantasy-fulfilment, theft and sexual offending behaviours to be more characteristic of the serial murders.

In addition, Grubin et al. (2001) took a within-subjects approach and categorised each serial rapists’ offence behaviour into four types based on the domains of Control, Sex, Style, and Escape. So for example, Offender A in his early rapes may have used Escape type 1 but later showed a preference for Escape type 2. Using a sample of serial offenders with five or more offences they assessed whether there were significant changes in the percentages for domain typologies across the five offences. Only one significant finding emerged, that Control type 4 behaviour became more common the more series progressed. An offence containing Control type 4 behaviour would be

planned, more likely to happen indoors and involve the use of a weapon. Non-significant trends suggested that Control type 1 and Style type 3 became less common as series progressed. Control type 1 was characterised by an opportunistic attack, a vehicle being used, the victim being moved from one location to another and a weapon potentially being used. Style type 3 represented an offender who is inquisitive and compliments the victim. Sex behaviour type 4 became more common as series progressed. This domain type is characterised by behaviours where the offender forces the victim to participate in the offence and demeans her. That demeaning the victim and using a weapon might be indicative of serial offending is similar to the findings of verbal and physical violence being associated with sexual recidivism (Worling & Långström, 2003), as reported in Chapter 1.

3.1.4. Rationale and research questions

Thus far, only one study has addressed the issue of whether the behaviour displayed by an offender earlier in a rape series is different to that displayed later in the series (Grubin et al., 2001). Grubin et al.'s (2001) sample comprised adult stranger rapists. This research question remains to be applied to juvenile stranger sex offenders. The current study therefore aimed to:

- Investigate the offence characteristics (of juvenile stranger sex offenders) that occur later in a series compared to those that occur earlier to determine whether consistent patterns can be identified.

As stated above, an additional means of prioritizing crimes for analysis would be to select those where an offender is likely to escalate in their use of physical violence. Previous research studies (Hazelwood et al., 1989; Warren et al., 1991; Warren et al., 1999) with adult stranger sex offenders have indicated that the minority of offenders are “increasers” and that increasers differ to non-increasers on some offence and offender characteristics. It remains to be tested whether these findings generalize to juvenile stranger sex offenders.

The current study therefore aimed to:

- Investigate whether some juvenile stranger sex offenders escalate in their use of physical violence (termed increasers).
- Investigate the offence characteristics that distinguish between juvenile increasers from non-increasers.

3.2. Methodological Review

The methodologies used in past research were evaluated. Justifications for the methodologies adopted in the current study are reported below.

3.2.1. Data type

As in Chapter 2, the data for this study were victims' accounts of serial sexual assault. The advantages and disadvantages of this type of data source have already been discussed in Chapter 2. An important consideration with regards to the specific aim of the current study is that offenders may have committed other offences that have not been detected. This means that the records of an individual's offending held on police databases may not be complete. The first offence held on a police database will not necessarily be the first offence an individual committed (Grubin et al., 2001). As reported in Chapter 2, the dataset consists of offence series of varying lengths. This means that "The development of patterns will be at different stages for different offenders" and hence findings should be interpreted with caution (Grubin et al., 2001, p. 9).

3.2.2. Behaviours indicative of serial offending

As noted earlier only Grubin et al. (2001) have investigated whether there are offence behaviours indicative of a serial sex offender. The way they coded the offence behaviours in their sample was described in Chapter 2. They investigated whether some behaviours are indicative of serial offending in two ways. Initially, using the 30 offence behaviours which composed the domain types, a cluster analysis was used to determine whether "singleton" offences would cluster differently to serial offenders' "first", "second", etc. offences. (Salfati and Bateman [2005] used a similar methodology with their sample of murderers.) Grubin et al.'s method suffers from a fundamental flaw. There is no definitive means of identifying a "singleton" or "one-off" offender, a problem recognized by Grubin et al. (2001). It is quite possible that an apprehended "one-off" offender might have committed previous homicides but these have not been detected. Any apparent differences between one-off offenders and serial offenders, such as the impulsive behaviours of Salfati and Bateman's (2005) one-off murderers, might just reflect the ease with which the offenders were apprehended rather than differences in actual characteristics. This approach is therefore far from satisfactory. Thus, whilst Appendix 2, referred to in Chapter 2, suggests some differences in behaviour seen in serial and apparent one-off offenders, no statistical tests were conducted on these data due to this problem.

In addition, Grubin et al. (2001) adopted a within-subjects methodology which overcomes some of these methodological problems. As outlined earlier, they conducted a cluster analysis using the whole sample of sex offences to determine typologies *within* each of the four domains (Control, Sex, Style and Escape). For sex offenders, within their sample, who had committed a series of five offences, Grubin et al. compared the actual frequency for each domain type (e.g. Escape type 3) at each stage in the series, for example, at offence 1, 2 etc., to the expected frequency, as calculated from the whole sample. The finer details of the statistical analysis are missing from the paper making replication difficult, however the current study aimed to follow Grubin et al.'s principles. The distribution of domain types across series were investigated graphically and it is most likely that Grubin et al. followed this up with Chi-square analyses to determine if the observed frequencies for domain types were significantly different to the expected frequencies.

The findings of the current study as proposed would not enable an analyst to state if one offender is more likely to be a serial offender than another. This is because there is no methodologically sound means of identifying non-serial offenders. However, by following Grubin et al.'s, (2001) within-subjects methodology, knowledge could be gained about what behaviours offenders are more likely to display later in the offence series. Through the analysis of offender behaviours displayed within a given offence, using such findings, an analyst would be able to predict whether it is likely that the given offender had offended previously, allowing the prioritisation of such offences.

3.2.3. Escalation in physical aggression

To categorise offenders into increasers or non-increasers, the level of aggression used by each offender in each offence needs to be quantified. From searching the literature for measures of aggression it became apparent that, whilst many measures have been designed, they tend to measure specific types of violence. For example, measures were identified that assess violence against children by parents (Mesure de la Justification de la Violence Envers L'Enfant, Fortin, 1995) or domestic violence (e.g. Revised Conflict Tactics Scales, Straus, Hamby, Boney-McCoy & Sugarman, 1996). Of the four previous studies which have examined whether escalation in violence can be predicted from offence behaviour (Grubin & Gunn, 1990; Hazelwood et al., 1989, Warren et al., 1991; Warren et al., 1999), all but one (Grubin & Gunn, 1990) have measured escalation using the Blunt Force Scale (Warren et al., 1999).

Assessments suggest that the Blunt Force Scale's reliability is adequate (J. Warren, personal communication, 18/11/2003). However, this scale focuses solely on the use of blunt force by an offender and fails to capture other types of aggressive behaviour used by offenders. The Expressive Aggression scale, Instrumental Aggression scale, Unsocialised Aggression scale and the Sexual Aggression scale (Prentky et al., 1986) were also identified. Unfortunately, for the purposes of the current study aggression related to anger (expressive) and aggression associated with controlling the victim (instrumental) needed to be captured within the same scale therefore the former two scales were not appropriate. The Unsocialised Aggression scale related to aggression that a suspect would show throughout his/her life and was therefore not appropriate. The Sexual Aggression scale related to sexual acts rather than acts of physical aggression and was also inappropriate for the needs of this study. In addition, none of these scales would capture aggression directed at sources other than the victim, e.g. other people or at inanimate objects. This was also the case with the Severity of Violence subscale of the Violent Incident Coding Guide (Cornell et al., 1996), which focused on the harm caused to the victim. Violence directed towards others and even at inanimate objects still holds the potential for intimidating or frightening a victim and thus ensuring compliance in a sexual assault. Therefore, whilst previous measures of violence and aggression already exist in the literature it was decided that, rather than using existing measures, a Likert scale of 0-6 (0 = not at all physically aggressive to 6 = very physically aggressive) would be used to rate offender behaviours to ensure that all types of physical aggression could be coded. The term "aggression" was chosen rather than violence. As discussed in Chapter 1, violence has been defined as threatened or actual use of physical force (Dahlberg & Potter, 2001; Hollin, 1989). By rating violence in an offence there was the potential to miss other behaviours which might be termed aggressive or coercive. Such behaviours might be considered indicative of an offender's propensity to use violence and hence it was important to capture these in the analysis.

Consideration was given to the best means of scoring each offence for its degree of physical aggression. Calculating a total aggression score could be misleading in that a poorer victim interview (with few offender behaviours recorded) would result in a lower score compared to a more thorough victim interview about the same offence. However, a mean aggression score could also be misleading because an offence with few behaviours but some behaviours that were very brutal could receive the same score

as an offence with multiple lower level acts of aggression. For example, in offence A where there are just two physically aggressive behaviours, one which is very severe (repeatedly punching the victim in the face) is given a score of 6, and one which is more minor is given a score of 1. In this case, the mean score would be 3.5. In offence B the suspect receives four scores of 4, representing four more minor acts of physical aggression, yet his mean score would be 4. It was therefore decided to rate the offences for degree of physical aggression using the highest score awarded to a behaviour within an offence. In this scenario, offence A would receive a score of 6 and offence B a score of 4, reflecting their relative severity.

To determine whether an offender has escalated in their use of violence several different methods have been used in past studies. Hazelwood et al. (1989) and Warren et al. (1991) subtracted the score allocated to the first rape from the score of the last rape to indicate whether the offender's violence had escalated. However, Warren et al., (1999) recognised the potential confound of number of offences in a series and instead calculated a regression for blunt force from first to last rape. Offenders were classified as an 'increaser', (someone who increases in their use of blunt force), if the graph revealed a positive slope. An offender with a horizontal or negative slope was categorised as a non-increaser. A difficulty with this approach is that some increasers may escalate in violence at a faster rate. Such offenders would warrant more investigative attention. As an illustration, the mean blunt force score for increasers' last rapes in Warren et al.'s (1999) study was just 2.3 out of a possible score of 5. Also because of the data being used, some offences in a series might be missing from the data set. Findings based on such modeling could, therefore, be inaccurate. It was decided that the current study would follow the methodology of Warren et al., (1999), and use the slope of a scatterplot to allocate an offender to the increaser or non-increaser group. It is, however, important to be mindful of the limitations of this methodology.

Following the allocation of serial sex offenders to the increaser or non-increaser groups, Warren et al., (1999) investigated whether differences existed between the two groups in offence and offender characteristics, and behaviours displayed during offences. There were, however, problems with some of the variables investigated by Warren et al. (1999). Some related to characteristics spanning an entire series, whereas others would only be known once the offender was apprehended. Such variables would be incompatible with the intended practical aim of the research, to identify predictors of escalation which a crime analyst could recognise at the start of a series. Other variables

were created through rating the offenders' first offences on scales devised by the researchers, however these scales were not published. It was not therefore possible to exactly replicate the methodology of Warren et al. (1999).

Warren et al. (1999) went on to conduct a logistic regression with increaser/non-increaser as the dependent variable and offence and offender characteristics as predictor variables. It was the intention of the current study to replicate this analysis. To prevent a small ratio of case-to-variables, it was intended that chi-square analyses would initially be calculated to determine for which variables there were significant associations with increasers/non-increaser status. Davies et al. (1998) took such an approach and selected variables with a p-value less than 0.10 for inclusion in a logistic regression. As an extension to Warren et al. (1999), and in a similar vein to Bennell and Canter (2002), if sufficient data were available, it was intended that the sample of serial sex offenders would be halved creating an experimental sample and a test sample. Direct logistic regressions followed by a forward stepwise logistic regression were to be used to identify the optimal combination of predictor variables for escalation. Since the statistical independence of the observations composing the dependent variable could be assumed, a second direct logistic regression was planned, applying the variables identified from the experimental sample to the test sample. These analyses were to be followed up with ROC analyses.

3.3. Predicting Escalation of Physical Aggression

3.3.1. Method

The available dataset comprised 39 sexual offences committed by 13 juvenile serial stranger sex offenders. The dataset was obtained from the Serious Crime Analysis Section (SCAS) and represented all known juvenile serial stranger sex offenders notified to SCAS and their offences. Further details about the dataset can be found in section 2.3.1. The 39 serial offences were rated for their degree of physical aggression on a scale of 0-6 where a score of 0 represented a behaviour which was "not at all aggressive" and 6 represented brutal acts of physical aggression. An explanation was presented alongside the scale which informed the rater that the victim did not have to be recipient of physical aggression to be the intended target. For example, physical aggression inflicted on others or on property could still be aimed at intimidating the victim. In line with past studies, the accompanying explanation detailed that higher scores represented more extreme and brutal acts of aggression. The inter-rater

reliability of this coding was assessed using 6 of the 39 offences (representing approximately 15% of the dataset). Cronbach's alpha was 0.88. This was sufficiently reliable for analyses to proceed (Hammond, 2006).

Based on the highest score awarded to any act of physical aggression in each offence, an overall physical aggression score was allocated to each offence. For each of the 13 offenders, the physical aggression scores for their collection of offences were plotted on a scatterplot with offence number along the X axis and score on the Y axis. The dates of the offences were checked to ensure events of increasing number reflected events occurring later in time. If the slope of the fit line was positive the offender was labelled an "increaser" since his level of physical aggression had increased with time. If the fit line was horizontal or negative the offender was labelled a "non-increaser".

In addition, several possible predictor variables were coded for each offender. These were modelled on the variables investigated by Warren et al. (1999), where possible. Where Warren et al. (1999) had used unpublished scales to rate offence characteristics, these variables were adapted to form categorical variables relating to the presence/absence of a behaviour. This was advantageous because many studies have reported binary coding to be reliable (e.g. Bennell & Canter, 2002; Canter et al., 2003; Canter & Heritage, 1990; Sturidsson et al., 2006). In addition, because the current study had extended the measurement of aggression from blunt force to all forms of physical aggression, some predictors used by Warren et al. (1999) were no longer appropriate, e.g. use of bindings. This was because their use would have introduced circularity into the analyses since they would have contributed to the aggression score which was used to classify an offender as an increaser/non-increaser, as well as being a predictor. The possible predictors investigated related to characteristics of the first offence in a series only, for reasons outlined above.

The following variables were adopted from Warren et al. (1999) for potential investigation as predictors of escalation in aggression:

1. Offender age (continuous)
2. Offender ethnicity (White, Not-White)
3. Contact site (victim's residence/workplace, other)
4. Location (indoors, outdoors)
5. Approach method (surprise, con)
7. Articles taken (yes, no)
8. Transportation used (yes, no)

9. Victim age (continuous)
10. Offender volunteers personal information (yes, no)
11. Offender discloses intimate information (yes, no)
12. Offender discloses criminal information (yes, no)
13. Offender makes excuses (yes, no)
14. Offender apologises (yes, no)
15. Offender shows concern for the victim (yes, no)
16. Offender asks the victim personal question (yes, no)
17. Offender asks the victim sexual question (yes, no)
18. Offender compliments the victim (yes, no)
19. Verbal scripting (yes, no)
20. Offender makes conditional threats (yes, no)
21. Offender makes unconditional threats (yes, no)
22. Offender verbally abuses victim (yes, no)
23. Offender mocked victim (yes, no)
24. Offender negotiates with victim (yes, no)
25. Physical aggression appears expressive in purpose (yes, no)
26. Forensic awareness (yes, no)
27. Offender kisses the victim (yes, no)
28. Offender hugs the victim (yes, no)
29. Offender fondles the victim (yes, no)
30. Offender forces fellatio (yes, no)
31. Offender performs cunnilingus on the victim (yes, no)
32. Offender vaginally penetrates victim (yes, no)
33. Offender anally penetrates victim (yes, no)
34. Offender digitally penetrates victim (yes, no)
35. Offender experiences sexual dysfunction (yes, no)

3.3.2. Results

Table 3A displays the outcome of categorising offenders as increasers or non-increasers. Eight of the 13 offenders were categorised as non-increasers with five categorised as increasers.

Table 3A: The Allocation of the 13 Serial Offenders to the Increaser or Non-Increaser Group.

Series Number	Number of Offences	Status
1	3	Non-Increaser
2	2	Non-Increaser
3	4	Increaser
4	2	Non-Increaser
5	2	Non-Increaser
6	6	Non-Increaser
7	2	Non-Increaser
8	2	Increaser
9	2	Increaser
10	4	Increaser
11	2	Non-Increaser
12	2	Increaser
13	6	Non-Increaser

Of the 35 variables adapted from Warren et al. (1999), only 26 were used due to the remainder not featuring at all within the first offences of the 13 series which composed the current dataset. Chi-square analyses and tests of difference were conducted to identify any significant associations between increaser status and each variable. Whilst it was the initial intention to follow the tests of difference and association with logistic regression and ROC analyses, the small number of serial offenders in the sample prevented this.

When a number of tests are conducted on the same dependent variable this can increase the possibility of making a type I error, in other words, rejecting the null hypothesis when it should be accepted. A Bonferroni correction can be made to reduce the likelihood of this occurring. This involves dividing the error rate (of 0.05) by the number of tests being conducted on the same dependent variable (Kinnear & Gray, 2000). The value of 0.05 was divided by 26 resulting in the adjusted significance criterion of 0.0019.

Two independent samples t-tests were conducted on victim and offender age since Kolmogorov-Smirnov tests confirmed that neither distribution was significant to a

normal distribution (increasers: $Z = .449, p > .05$ and $Z = .551, p > .05$, respectively; non-increasers: $Z = .363, p > .05$ and $Z = .803, p > .05$, respectively). The results are presented in Table 3B.

Table 3B: Descriptive Statistics and T-Test Output for Increaser Status and Offender and Victim Age.

Variable	Increasers		Non-Increasers		Test Output		
	Mean	SD	Mean	SD	<i>t</i>	<i>p</i>	<i>d</i>
Victim Age	25.60	10.19	20.13	6.06	-1.229	0.245	0.65
Offender Age	14.80	1.48	14.75	1.83	-0.051	0.960	0.03

An examination of the descriptive statistics suggested a difference between increasers and non-increasers on offender age was unlikely but that a difference might exist for victim age. The results of the t-test confirmed that the differences between increasers and non-increasers on victim and offender age at first offence were not significant. However, the effect size for victim age was of a medium-large size (Cohen, 1988).

As a result of the small sample size, all Chi-square tests violated the assumption of having no more than 25% of cells with an expected frequency of less than five. The appropriate statistical test was therefore Fisher's Exact Probability test (Brace et al., 2003; Dancey & Reidy, 2002). The output is displayed in Table 3C.

Table 3C: Frequencies, Fisher's Exact Probability Output, Effect Size (phi) and % of Variation in Frequency Counts of Each Variable Explained by Increaser Status ($N=13$).

Test Variable	Increasers	Non-Increasers	Fisher's Exact Probability (p)*	phi (% variation)
Offender	White: 20%	White: 75%	0.103	0.537
Ethnicity	Non-White: 80%	Non-White: 25%		(29%)
Contact Site	Victim-Related: 80%	Victim-Related: 88%	1.00	0.101
	Other: 20%	Other: 12%		(1%)
Offence	Indoor: 20%	Indoor: 0%	0.385	0.365
Location	Outdoor: 80%	Outdoor: 100%		(13%)
Approach	Con: 40%	Con: 38%	1.00	0.025
Method	Surprise: 60%	Surprise: 62%		(<1%)
Articles Taken	Yes: 20%	Yes: 12%	1.00	0.101
	No: 80%	No: 88%		(1%)
Transport	Yes: 20%	Yes: 0%	0.385	0.365
Used	No: 80%	No: 100%		(13%)
Discloses	Yes: 40%	Yes: 12%	0.510	0.318
Personal	No: 60%	No: 88%		(10%)
Information				
Discloses	Yes: 20%	Yes: 0%	0.385	0.365
Intimate	No: 80%	No: 100%		(13%)
Information				
Shows	Yes: 40%	Yes: 0%	0.128	0.539
Concern for	No: 60%	No: 100%		(29%)
Victim				
Asks Victim	Yes: 40%	Yes: 25%	1.00	0.158
Personal	No: 60%	No: 75%		(2%)
Question				
Asks Victim	Yes: 0%	Yes: 25%	0.487	0.337
Sexual	No: 100%	No: 75%		(11%)
Question				
Compliments	Yes: 0%	Yes: 12%	1.00	0.228
Victim**	No: 100%	No: 88%		(5%)
Use Verbal	Yes: 0%	Yes: 12%	1.00	0.228
Scripting	No: 100%	No: 88%		(5%)
Use	Yes: 40%	Yes: 25%	0.293	0.350
Conditional	No: 60%	No: 75%		(12%)
Threats				

Use	Yes: 20%	Yes: 0%	0.385	0.365
Unconditional	No: 80%	No: 100%		(13%)
Threats				
Displays	Yes: 0%	Yes: 12%	1.00	0.228
Forensic	No: 100%	No: 88%		(5%)
Awareness				
Kisses Victim	Yes: 0%	Yes: 38%	0.231	0.433
	No: 100%	No: 62%		(19%)
Fondles	Yes: 60%	Yes: 50%	1.00	0.098
Victim	No: 40%	No: 50%		(1%)
Fellatio	Yes: 20%	Yes: 0%	0.385	0.365
	No: 80%	No: 100%		(13%)
Vaginal Penile	Yes: 20%	Yes: 12%	1.00	0.101
Penetration	No: 80%	No: 88%		(1%)
Anal Penile	Yes: 0%	Yes: 25%	0.487	0.337
Penetration	No: 100%	No: 75%		(11%)
Digital	Yes: 0%	Yes: 12%	1.00	0.228
Penetration	No: 100%	No: 88%		(5%)
Sexual	Yes: 20%	Yes: 0%	0.385	0.365
Dysfunction	No: 80%	No: 100%		(13%)

* None of these associations were significant.

**With this dataset, compliments were often made in relation to the victim's physical attributes and therefore were sexual in nature.)

Although none of the associations were significant, the measures of effect size, phi, hint at some possible relationships which might be uncovered in future studies with larger samples and greater power. Increase status accounted for approximately 30% of the variation in frequencies in 'offender ethnicity' and 'offender shows concern for the victim' with phi values indicating a large effect size (Pallant, 2007).

As noted previously, the small sample size of 13 serial offenders precluded further statistical interrogation of the data using logistic regression as the assumption of sufficient cases to variables (Peduzzi et al., 1996) would have been violated. However, consideration was given to the escalation of aggression from a more qualitative perspective. Thus, the individual offender's use of violence and how this changed across their series was evaluated. From re-visiting the offences of the 13 offenders it seemed that escalation in violence might be associated with a) growing confidence and b) learning from past offences. With regards to growing confidence an illustrative case

study is offender 10. The earlier offences in his series involved him quickly approaching his victims who were walking outdoors, suddenly groping them and then quickly departing the scene. His later offence occurred indoors. The sexual behaviours in his later offence were greater in number and more serious. He also spent relatively more time with the victim. To achieve these additional sexual behaviours it is possible that he needed to control the victim more successfully and therefore needed to display a higher level of physical aggression to ensure compliance.

An illustrative case study of escalating aggression which seems to be a result of learning is offender 12. This offender committed the two offences in his series less than a week apart. In the first offence of his series he assaulted the victim indoors, blindfolding her and using verbal threats to maintain compliance. However, during the offence the offender lost control of the victim when she removed her blindfold and tried to flee the premises. She was successful and he was unable to complete his assault. His second, later, offence also occurred indoors but on this occasion the offender brought a knife with him. He showed the weapon to the victim from the start of the offence. By displaying the knife from the start, the victim appears to take his subsequent threats seriously and complies with his demands enabling him to complete his sexual assault.

A similar pattern is observed with offender 3's offending behaviour. This offender committed his four offences outdoors. In his first offence, his aggression is limited to physically dragging the victim to a more secluded area and using verbal threats to maintain control of the victim. However, the victim physically resists him and manages to attract the attention of a third party. His first offence was therefore interrupted by the victim attracting the attention of witnesses. In the second and third sexual assaults in his series he increases his use of physical aggression, punching the victims once in the face each time they resist. However, one victim continues to resist his attempts to gain compliance and attracts the attention of a passer-by. This offence is also curtailed due to the intervention of witnesses. In his final offence, the suspect appears to have learnt from his past experiences and renders the victim immobile using repeated and extreme aggression from the start of the offence. He is then able to complete the assault without being disturbed.

Whilst very aggressive, both of these examples appear to represent instrumental forms of physical aggression since only aggression sufficient to control the victim was used by the offenders.

3.3.3. Summary

Despite some consistency being observed in juvenile serial sex offenders' Control domain behaviours, as reported in Chapter 2, some evidence was found of escalation in aggressive behaviour across series. That some offenders appeared to escalate in their use of aggressive behaviour may in part explain why the average Jaccard coefficient for linked crime pairs for Control behaviours was 0.40 rather than it approaching 1.0, which represents perfect consistency. Five of the 13 serial offenders were classified as increasers. With their sample of 41 adult serial rapists, Hazelwood et al. (1989) similarly found few offenders who escalated in their use of violence.

In the current study, measures of effect size suggested that, with larger samples and more power, future studies might identify offender ethnicity, showing concern for the victim, and victim age as variables associated with increaser status. Offender ethnicity was identified as a predictor of escalation by Warren et al. (1999). However, for Warren et al.'s sample it was White offenders who were more likely to escalate their violence than Black offenders. In the study reported in this chapter, non-White offenders were more likely to escalate their physical aggression than White offenders. The effect size for victim age suggested offenders who choose older victims in their first offence would be more likely to escalate in their use of physical aggression in later offences. The effect size for 'shows concerns for the victim' also suggested that offenders who show concern for their victim in their first offence were more likely to be increasers. It would not be appropriate, however, to use any of these variables as filters for offence prioritisation until more research was conducted.

Past studies (Hazelwood et al., 1989; Warren et al., 1999) have also reported associations between increaser status and offender behaviours (potentially) indicative of sadism and a wish to humiliate the victim (e.g. use of profanities and foreign object penetration). This was not found in the current study and has not been found in other studies (Grubin & Gunn, 1990). A qualitative analysis of the use of physical aggression across each series suggested two reasons for escalation in aggression. First, increasing aggression appeared to be related to growing confidence. The commission of more elaborate sexual assaults with time necessitated greater aggression for control purposes. This might be particularly characteristic of juvenile sex offenders who may be undergoing a period of sexual development and exploration. Second, increased aggression seemed to result from the offender learning from past mistakes where victim resistance has been successful resulting in the premature curtailment of the offence.

Davies (1992) reported similar learning behaviour in her sample of stranger rapists. She states “There are several instances in series in the database, where a previously unarmed rapist used a knife for the first time in an offence immediately following one where a victim resisted successfully” (p. 190). The use of more aggression by offenders therefore appeared to be associated with enabling sexual behaviour with the victim. This would suggest that offenders’ aggression was instrumental in nature, rather than it serving an expressive purpose.

Some characteristics of the current sample might also account for the findings. Although all known sexual offences by each serial offender were sampled, several series were of short length. Such short series make it difficult confidently to allocate offenders to the increaser or non-increaser group. In some cases, an increase in aggression between two offences appeared more to be related to differences in victim resistance.

3.4 Identifying Serial Offences

As well as using knowledge of escalation in aggression by offenders as a means of prioritising crimes for analysis, crime analysts might also wish to prioritise offences that appear to have been committed by a serial offender. The purpose of the current study was to determine if certain behavioural domain types were more prevalent in the latter stages of a crime series.

3.4.1 Method

3.4.1.1. *Data*

The dataset used for this part of Chapter 3 is the same dataset as was used in Chapter 2. Rather than repeat the characteristics of the dataset here, the reader is referred to section 2.3.1 of this thesis.

3.4.1.2. *Procedure*

In Chapter 2, each of the 78 offences was binary coded against a checklist of offender behaviours, which was constructed from a qualitative analysis of the 78 victim accounts. These behaviours were subsequently arranged into four behavioural domains, Control, Escape, Sex and Style. Each domain contained a different set of offender behaviours. As part of the analysis in Chapter 2, following the methodology of past researchers, including Grubin et al. (2001), rarer behaviours (those occurring in less than 5% of offences) were removed from these four datasets. The Control domain

therefore contained 27 behaviours, the Escape domain, 13, the Sex domain, 19, and the Style domain, 26.

As outlined in section 2.4.9.3., previous cluster analyses have ensured a variable-to-case ratio of approximately 1:4. As the intention was to conduct a cluster analysis with the behaviours from each domain type as the data for the analysis, to maintain a sufficient ratio of variables-to-cases the number of behaviours in the Control and Style domains had to be reduced to 20 because there were 78 offences (cases). This was achieved by removing the next rarest behaviours from these domains only. Subsequently, there were 20 behaviours in the Control domain, 13 in the Escape domain, 19 in the Sex domain and 20 in the Style domain. It is these four datasets which formed the basis for the subsequent analyses in this part of Chapter 3.

3.4.2 Results

The purpose of the analysis was to determine if certain domain types were more prevalent in the latter stages of a series. To investigate this question the domain types needed to be developed. An agglomerative hierarchical cluster analysis was conducted for each behavioural domain using data for all the 78 offenders in the sample. Whilst this element of the thesis focuses on the prediction of serial offences, it was important to use both serial and matched (non-serial) offences since this represents more closely the reality of the crime analysts' task, i.e. crime analysts will be searching datasets containing both serial and non-serial offences. Jaccard's coefficient was used as the measure of similarity in the cluster analysis because of its suitability for crime data (Bennell & Canter, 2002). The variables, rather than the cases, were clustered together in an attempt to identify types within the domains, e.g. types of Control behaviours, types of Escape behaviours. This was in contrast to Grubin et al. (2001) who clustered the offences (cases) rather than the variables, but was similar to analyses by Canter and colleagues who have used MDS (e.g. Canter et al., 2003). This approach was adopted because an offender might change his control style, for example, during an offence. The four clustering methods used in Chapter 2 were used to assess the stability of the data structures. The single linkage method of clustering produced chaining with all of the behavioural domains. This means that it produced no distinct groupings. This is not uncommon with this type of clustering method (Everitt, 1980).

3.4.2.1. *Forms of Control Behaviour*

Similar structures were observed for the Control domain when using the three other clustering methods. The average-linkage between-groups method produced a

three cluster solution. With the furthest neighbour analysis a five cluster solution emerged. However, the four cluster solution, produced using the average linkage within-groups method, appeared to be the clearest and shared some similarities with styles previously mentioned in the forensic psychological literature. The dendrogram for this analysis is displayed in Figure 3A.

The dendrogram was cut where the distances between fusion points were at their largest and where relatively clear clusters emerged (Everitt et al., 2001). Offender behaviours that formed each cluster are highlighted in the same colour on the left hand side of the figure. The dashed arrow represents where the dendrogram was “cut” to determine the clusters.

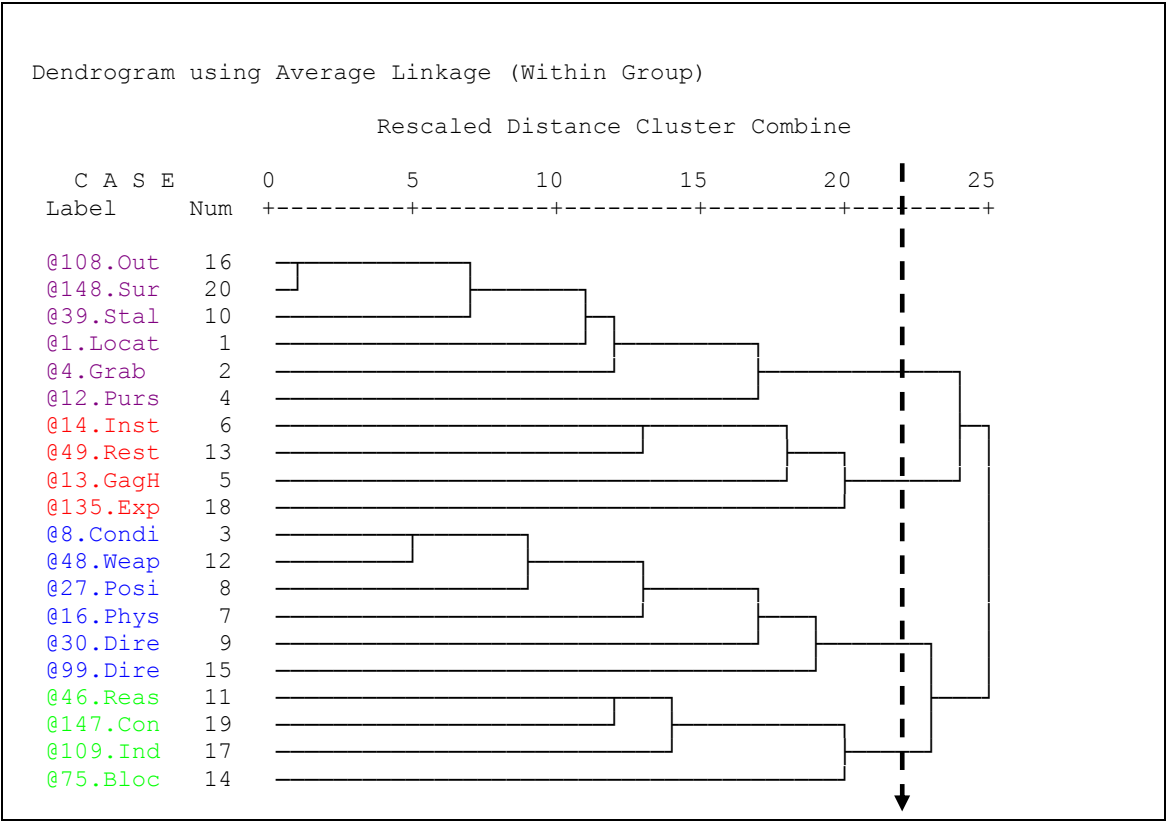


Figure 3A: Dendrogram for the cluster analysis of the behaviours within the Control domain.

The first cluster shared similarities with Rossmo’s (2000, p. 140) “stalker approach”, “An offender who first follows a victim upon encounter, and then attacks”. The cluster contains behaviours that represent the offence occurring in an outdoor location, the offender stalking the victim and then using a surprise approach, grabbing

her, the offender moving the victim to another location by force, and pursuing her if she broke free. This cluster was labelled “stalking”.

The second cluster was, in contrast, characterised by physically violent behaviours. The behaviours in the cluster represented the offender using instrumental violence, restraining the victim, gagging her using his hand and also using expressive violence (that was not related to controlling the victim). These behaviours encapsulate two themes reported in Canter et al.’s (2003) study of sexual assault behaviour, ‘hostility’ and ‘control’. This cluster was labelled “physical violence”.

The third cluster contained no physically violent behaviours. Instead behaviours in this cluster included the offender making physical and verbal threats to ensure compliance (potentially implying or showing he possessed a weapon) and subsequently giving the victim orders. This cluster was labelled “instructing and threatening”.

The final cluster of behaviours was also characterised by an absence of violence. Instead non-threatening verbal strategies were used to gain control of the victim, such as the offender hiding his true intent from the victim, and (falsely) reassuring her, as well as the victim’s escape being physically blocked. This cluster was therefore labelled “conning and containing”.

3.4.2.2. Forms of Escape Behaviour

Three similar structures were observed for the Escape domain using the three different clustering methods. The average linkage between-groups clustering method produced a dendrogram with four clusters. The average linkage within-groups clustering method produced a dendrogram with three clusters. However, the clearest structure emerged from the complete linkage (furthest neighbour) method. The dendrogram can be seen in Figure 3B. As with previous dendrograms, the behaviours forming each cluster are highlighted in the same colour on the left hand side of the figure. The dotted arrow represents where the dendrogram was cut to form the distinct clusters.

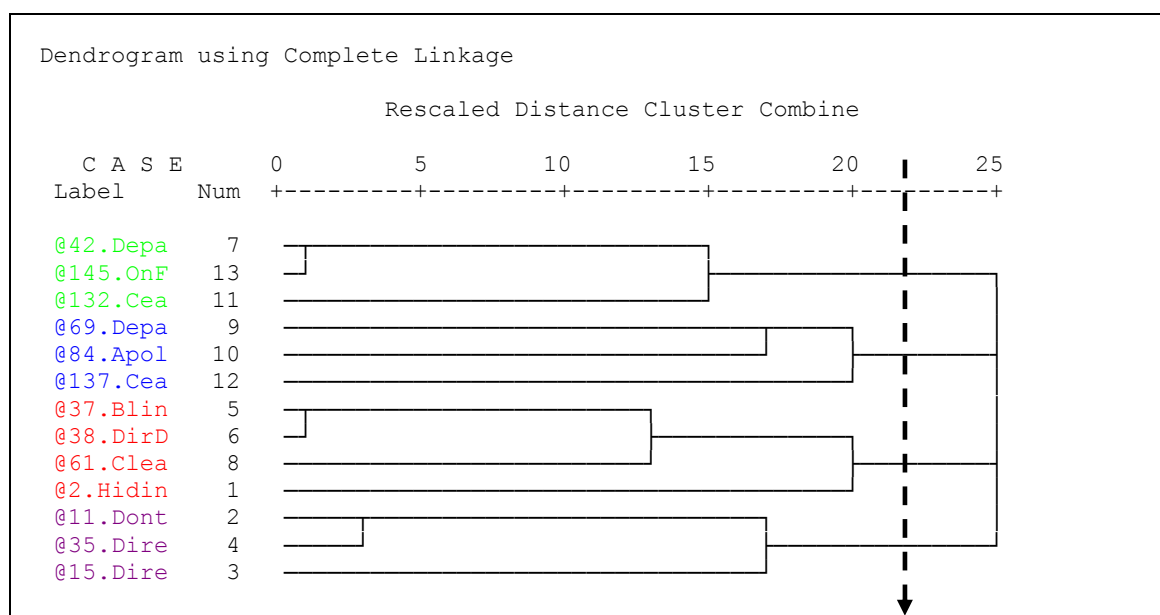


Figure 3B: Dendrogram for the Escape domain containing four clusters of behaviours.

The dendrogram contained four clusters. The first cluster was characterised by an offender who quickly departed the scene on-foot having been put off by something other than the victim’s resistance (e.g. arrival of a witness). There was little evidence of planning in this cluster compared to other clusters. It was therefore labelled “spooked escape”.

The second cluster contained behaviours representing a calmer departure. The offender ceased the assault as a result of victim resistance. He apologised for the assault, potentially in an effort to dissuade the victim from reporting the offence and calmly departed the scene. The label “calm con escape” was given to this cluster. The behaviours in this cluster are similar to Holmstrom and Burgess’ (1979) “soft-sell” whereby the offender tries to appeal to the victim’s sympathies by apologising or showing superficial concern for the victim’s wellbeing.

The third cluster contained escape behaviours indicative of planning and criminal awareness. The offender was careful to dispose of any forensic evidence. In addition, he avoided future identification by blindfolding the victim, instructing her to not look at him, and by keeping himself hidden from view. This cluster was labelled “criminally aware escape”.

The fourth cluster suggested an instructional style. The offender ensured a safe departure by ordering the victim to be quiet, to stay where she is, and to not report the offence. Holmstrom and Burgess (1979) reported a very similar style, the “tough approach”, which was associated with the offender making threats to the victim not go

to the police, not to tell anyone, and giving orders to stay at the location for a specified period of time, allowing sufficient time for the offender to escape undetected. The label “instructional escape” was given to this cluster.

3.4.2.3. Forms of Sexual Behaviour

The Sex domain behaviours grouped into many more clusters than the previous two domains. Whilst more clusters emerged from the analyses, the structure was relatively stable across the three clustering methods. The average linkage between-groups method produced a dendrogram with nine clusters. The average linkage within-groups method produced a dendrogram with eight clusters. The complete linkage method yielded the clearest solution. The dendrogram and the nine clusters can be seen in Figure 3C. As with previous dendrograms, the behaviours forming each cluster are highlighted in the same colour on the left hand side of the figure. The dotted arrow represents where the dendrogram was cut to form the distinct clusters.

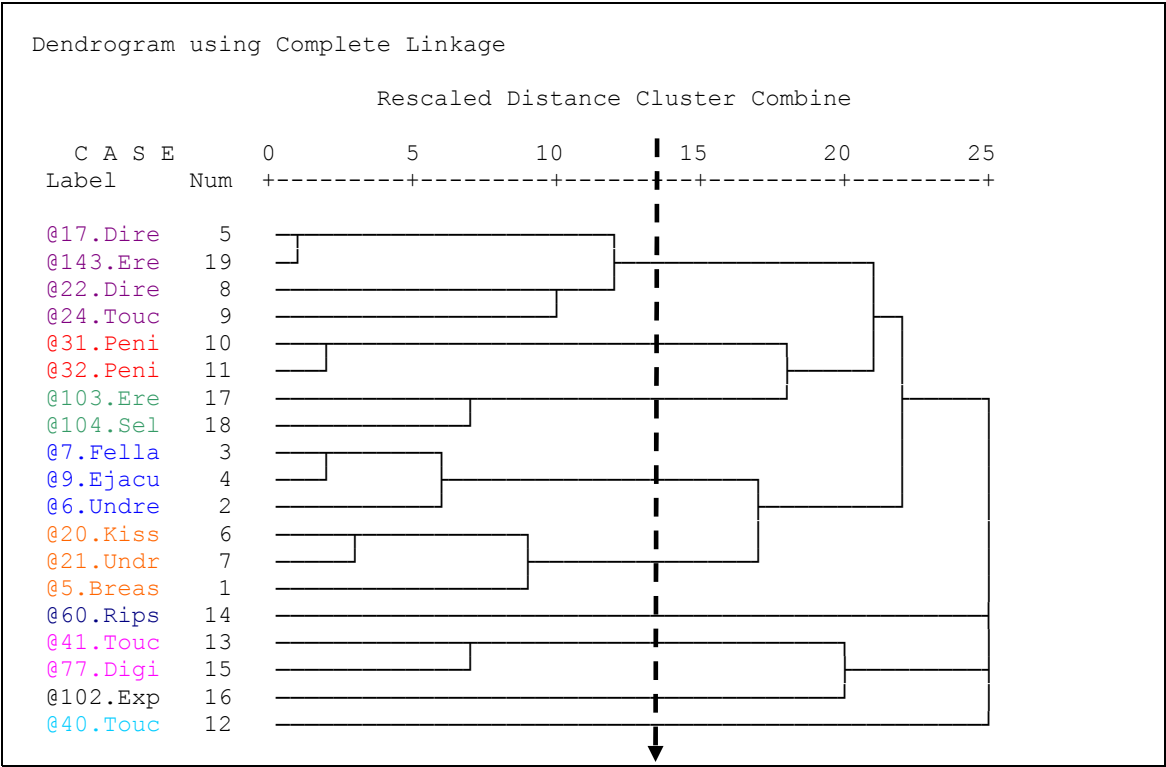


Figure 3C: Dendrogram for the Sex domain behaviours displaying nine clusters.

The first cluster reflected an instructional style. The offender directs the victim to undress and engage in sexual behaviours, such as touching his erect penis. This cluster therefore relates to non-penetrative sexual acts requiring victim participation. It was labelled “non-penetrative victim participation”.

The second cluster contained penetrative sexual behaviours, namely penile penetration of the victim's anus or vagina. In contrast to the first cluster these behaviours do not require victim participation. The cluster was labelled "penile penetration".

The third cluster was characterised by erectile dysfunction, which the offender attempts to rectify through self-masturbation. It is therefore labelled by "erectile dysfunction and self-masturbation".

The fourth cluster relates to the victim being forced to perform fellatio on the offender, who had undressed himself, resulting in ejaculation. Like cluster 1, this style is about seeking victim participation but the behaviours in this cluster are penetrative rather than non-penetrative. This cluster was labelled "penetrative victim participation".

The fifth cluster is characterised by what Canter et al. (2003) have referred to as involvement (or pseudo-intimate) behaviours. The offender engages in behaviours more characteristic of consensual encounters, such as undressing the victim, kissing her and touching her breast or chest area. It was therefore labelled "non-penetrative pseudo-intimacy".

The sixth cluster was a single behaviour where the offender rips the victim's clothing. This behaviour was observed by Canter et al. (2003) to fall within the hostility theme. It was therefore labelled "sexual hostility".

The seventh cluster constituted two behaviours which tended to co-occur. These were the acts of touching the victim's vagina area and digitally penetrating the victim's vagina. The former behaviour tended to precede the latter behaviour. This cluster was therefore labelled "digital vaginal penetration".

The eighth and ninth clusters were single behaviours (exposure and touch bottom). Both tended to occur in offences of short duration, for example where the offender grabs the victim's bottom in the street. The sampling of a range of sexual offences in the current study (rather than solely rapes) has likely resulted in such single clusters for the Sexual domain.

3.4.2.4. Forms of Style Behaviour

For the Style domain, three different clustering techniques again produced dendrograms of similar clusters for the majority of behaviours. The dendrogram for the complete linkage (furthest neighbour) clustering method contained seven clusters as did the dendrogram for the average linkage between-groups method. These were not as stable as the previous three domains, although some core clusters were repeated each

time. The five-cluster solution using the average-linkage within-groups method was the clearest. The dendrogram for this clustering method can be seen in Figure 3D.

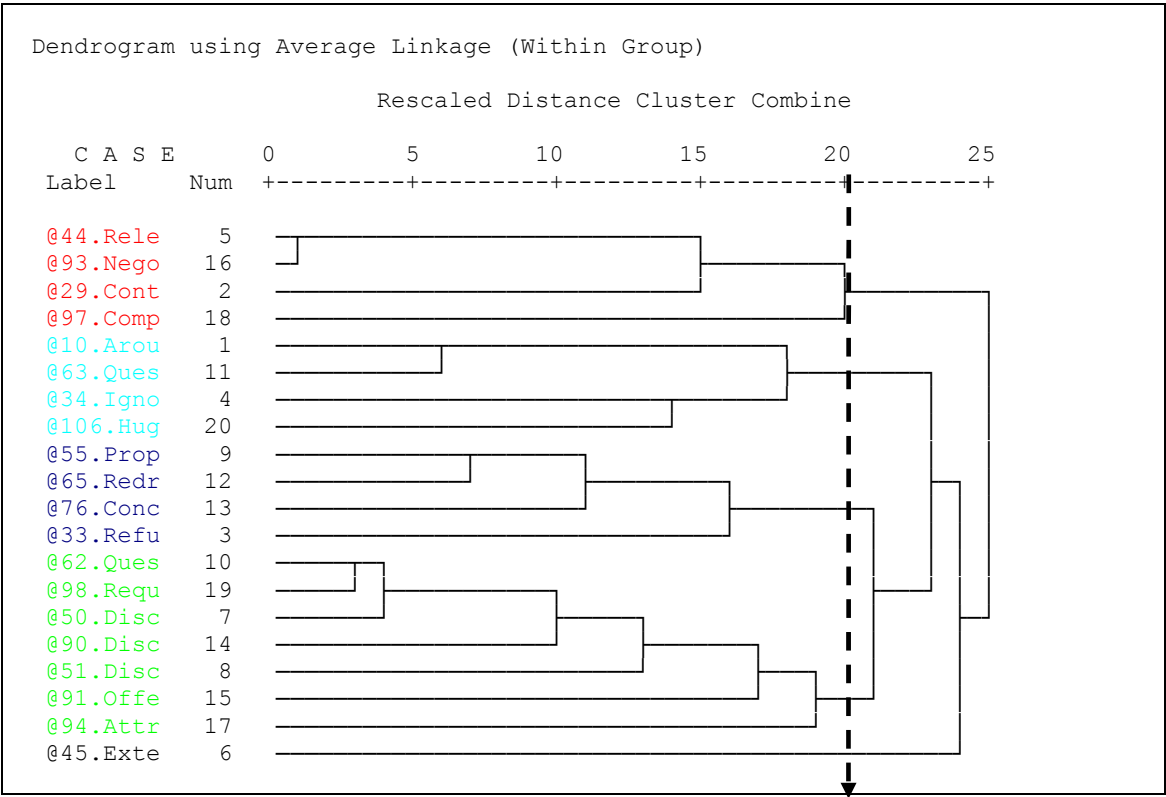


Figure 3D: Dendrogram of the Style behaviours consisting of five Style types.

With the exception of the behaviour “contradicts”, the first cluster was characterised by behaviours showing flexibility on the part of the offender and his perception of the victim as a person. The offender *chooses* to release the victim, he negotiates with her to achieve his goals, and he is prepared to comply with her wishes.

The second cluster includes behaviours which Canter et al. (2003) would describe as pseudo-intimate. Although “ignores request” does not seem immediately to fit with this style, Fossi et al. (2005), in their study of bedroom rapes, noted this as a characteristic of an offender adopting the pseudo-intimate style. The offender treats the victim as a person but is more focused on sexual matters. He enquires as to her arousal, asks her sexual questions and hugs her.

The third cluster contained the behaviours “refuses request”, “steals property”, “redressed” and “shows concern for victim”. This cluster was difficult to interpret because it did not correspond with any themes that have been discussed in the past literature and the behaviours did not seem to have a common relationship.

In the fourth cluster the offender is also viewing the victim as a person and behaves in a manner similar to a first date. He asks the victim questions about herself and volunteers personal information. He requests help from the victim and offers it in return. He discloses his intentions to the victim. He is therefore very open with the victim, at least on the face of things, and potentially expects the same from her, in that he asks her personal questions. The first, second and fourth cluster all seem to contain behaviours which are normally reported as forming a distinct cluster representing pseudo-intimacy.

The final cluster constituted a single behaviour of extending time with the victim. This related to offences where the offender remained with the victim, or nearby, after the assault when by doing so increased the risk of apprehension. The motivation for this behaviour was often unclear from the victim's accounts.

The cluster analyses therefore produced four types of Control and Escape behaviours, nine types of Sexual behaviours and five types of Style behaviours. The outcomes for the first three domain types were similar to findings reported in previous studies. These domain types were used in the subsequent analyses. The types of Style behaviours were not used because less distinct clusters emerged.

Grubin et al. (2001), in their study of adult stranger serial sex offenders, investigated the distribution of domain types over series only if they contained five or more offences. In the current study there were only two series which contained five or more offences (series 6 and 13, both containing six offences each). This was insufficient for the intended chi-square analyses. The occurrences of the behavioural domain types across these two series were, therefore, explored in a series of histograms.

The types of Control domains showed some variation across each of the two series. The stalking domain seemed to be a consistent element of both offenders' modus operandi in that it had a frequency of two across the histogram. In contrast, the physical hostility domain type tended to be more prevalent in later offences as indicated by its presence in offence 3, 4 and 6 (see Figure 3E).

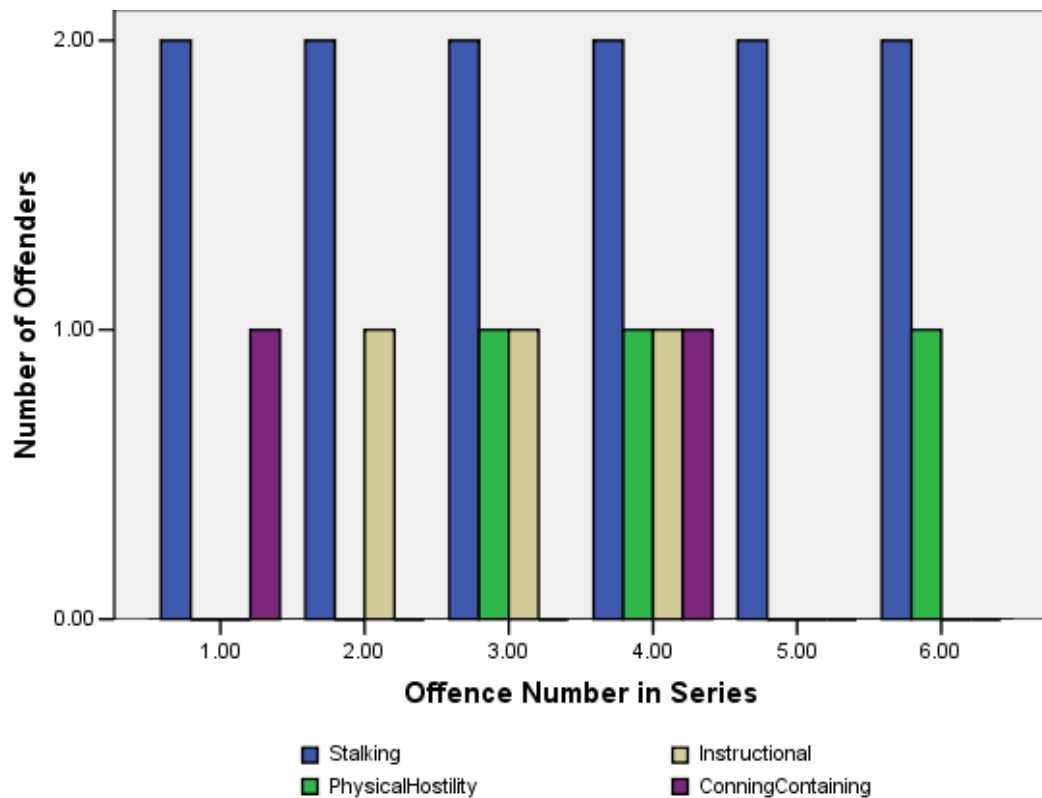


Figure 3E: The frequency of each Control domain type across the two series.

The incidence of different Escape domain types can be seen in Figure 3F. As with the Control domain it was difficult to draw any conclusions. The Spooked Escape domain type was a relatively consistent feature in both series. In relation to developments in behaviour across the series, Figure 3F suggests that the Instructional – Threat domain type is more common towards the start of a series with the Calm-Con domain type becoming more prevalent with experience. This might be explained by offenders developing greater confidence with experience.

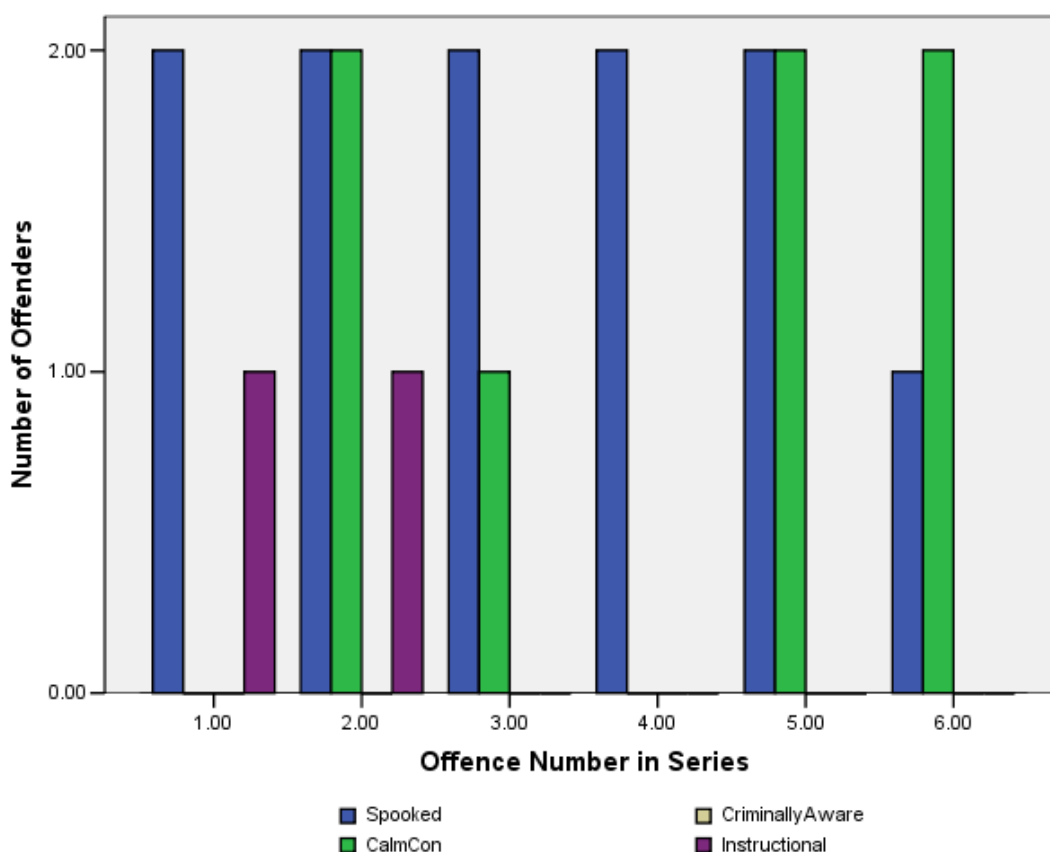


Figure 3F: The frequency of each Escape domain type across the two series.

The frequencies of each Sex domain type can be seen in Figure 3G. As with the other two behavioural domains, the offenders appeared to show both behavioural consistency and variability. Non-penetrative pseudo-intimacy seemed to be a consistent element of their offending. The severity of the sexual behaviours appeared to increase with digital penetration becoming more frequent in later offences. By returning to the offence narratives, it became apparent that the increase in the frequency of digital penetration was occurring in series 13 rather than series 6, which was instead characterised by consistently minor sexual behaviours. That there appeared to be an increase in the digital penetration domain type for one series but not the other was not attributable to differences in time span of each series, i.e. it was not that series 13 occurred over a longer period of time than series 6, allowing for more sexual development. In fact, series 6 spanned five years, whereas series 13 spanned just five months. The occurrence of the ‘penetrative victim participation’ domain type at offence 1 on Figure 3G represents the relatively minor sexual behaviour of “undressing self” rather than a penetrative act and occurred in series 13.

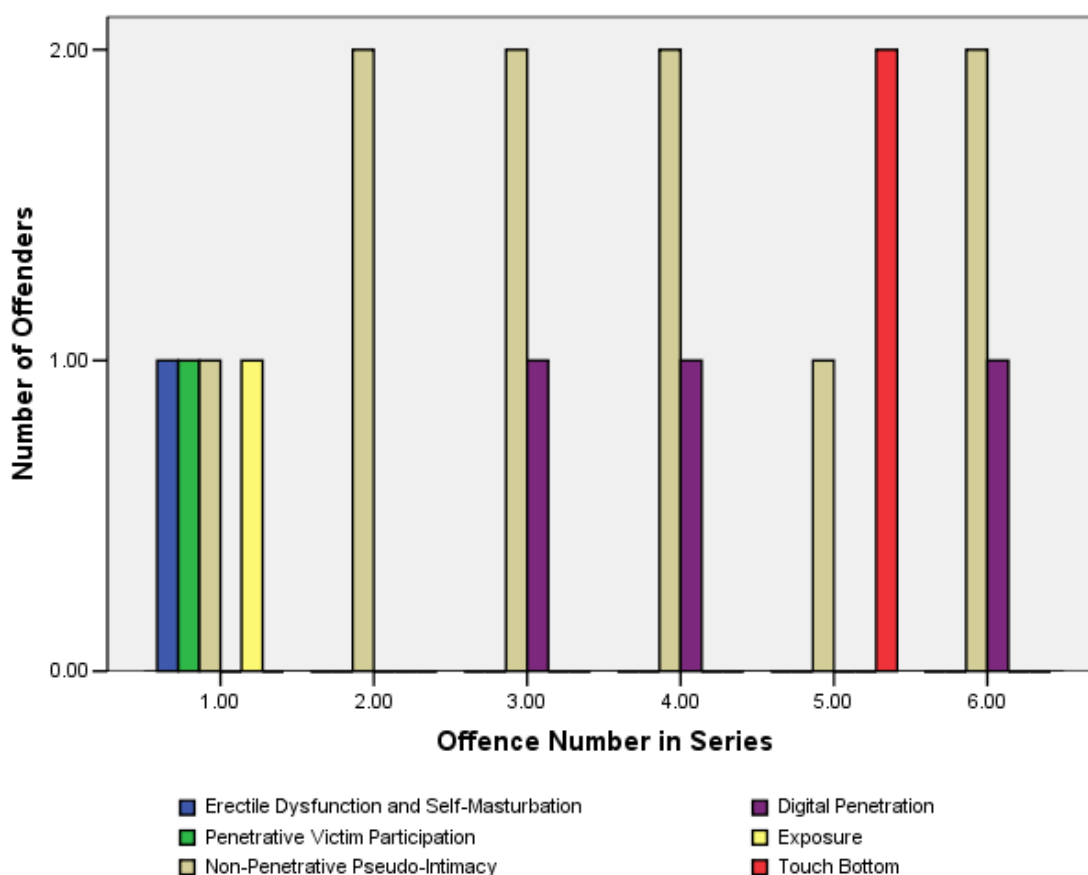


Figure 3G: The frequency of each Sex domain type across the two series.

3.4.3. Summary

The small sample size of serial offenders ($N=13$) meant that only two offenders had series of sufficient length to investigate progression in behavioural domain types. The histograms of the frequencies of domain types suggest that physically violent forms of control and the calm-con escape are more common later in a series. No patterns were apparent in the sexual behaviour domain. Evidence of physical violence and a calm departure from the crime scene might therefore suggest to the analyst that this offence could have been committed by a serial offender. An increase in physical hostility in later offences has some similarities with findings of recidivism research in that repeat offenders are more likely to have committed physically violent offences (Worling & Långström, 2003). The findings share very few similarities with Grubin et al.'s (2001) study of adult serial stranger sex offenders. Clearly it would be unwise to make any generalisations based on these findings. Instead future research is needed with alternative (and hopefully larger) samples of juvenile and adult serial stranger sex offenders. Due to the relatively scarcity of data in Britain on the offences of serial

stranger sex offenders, researchers might need to collaborate with police in a variety of countries to further this research. I have recently submitted a research funding proposal to develop an international network of practitioners and academics with a professional interest in serial crime. Such a network would ease international collaborations that are essential with rarer crime types.

There are a number of limitations with this study which should be recognised. Several of these have already been discussed in this and previous chapters, for example, the problems of generalising findings from a sample of apprehended offenders to all serial sex offenders, and that offences will be missing from police records of crime series. An additional limitation relates to the development of the domain types. All 78 offences were used in the cluster analysis which formed these domain types. This means that multiple offences committed by the same offender were included in the same analysis. In Chapter 2, it was established that the serial offenders who committed the 39 serial offences were consistent enough in their offence behaviours for their crimes to be accurately linked. Clusters might, therefore, have emerged partly because of the serial offenders consistently displaying particular clusters of behaviours across their series. An alternative approach would have been randomly to choose one offence per serial offender for inclusion in the cluster analysis. However, this would have resulted in a sample size of 52 offences which, when needing to ensure a cases to variable ratio of 4:1, would have reduced the number of behaviours that could be entered into the cluster analyses considerably. Grubin et al. (2001) similarly used *all* offences in their sample (committed by both serial and apparent one-off offenders) for their cluster analyses conducted to determine domain types.

3.5. Chapter Conclusion

This chapter investigated whether investigative risk assessment tools could be developed to assist crime analysts in the prioritisation of offences for analysis. Two premises on which crimes could be prioritised were investigated. The first premise was that offences committed by offenders who will escalate in their use of physical aggression should be prioritised due to the danger such offenders pose to the public and the harm inflicted on their victims. The second premise was that offences by serial offenders should be prioritised since the offending behaviour of such individuals impacts on numerous victims.

Offence and offender characteristics that might predict escalation in violence were investigated. Few offenders escalated in their use of physical aggression. The small sample size precluded tests of predictive accuracy. However, tests of association identified no significant associations between increaser/non-increaser status and offender characteristics and crime scene behaviours. However, effect size calculations suggested possible associations with offender ethnicity, showing concern for the victim and victim age. A qualitative analysis of the offence series suggested that offenders increased their use of physical aggression if a previous victim had successfully resisted them, and where greater aggression was needed to complete a more elaborate sexual assault. Warren et al.'s (1999) argument that differences in findings between their previous studies and the study by Grubin and Gunn (1990) were due to differences in coding do not apply in this case. This is because Warren et al.'s coding was used in this study. Despite this, similar associations were not found. Warren et al. (1999) rejected Grubin and Gunn's (1990) claim that their failure to replicate Warren and colleague's findings was due to differences in the samples of sex offenders used on the grounds that their 1999 study sampled more general sex offenders, rather than a population more characterised by sadism. However, their sampling strategy for the 1999 study was to ask police officers attending a training workshop to submit serial rape cases for the research project. It is possible that the police officers remembered cases that were more sadistic, severe and/or unusual in behaviour and thus submitted series with these characteristics to Warren and colleagues. Differences between the samples used by Warren and colleagues, and those used by Grubin and Gunn (1990) and in this chapter may still explain why consistent findings of variables associated with increaser status are not found.

The small sample size also precluded any statistical tests in the second part of the study reported in this chapter. Examinations of the two series that comprised six offences using histograms suggested that physical violence and a calm departure from the crime scene were more common in the later stages of a series. A crime analyst noting such behaviours being reported in an offence might wish to prioritise such an offence for further analysis since this might suggest that the offender has committed previous sexual offences. However, replication of these findings would be required before any such recommendations could be made.

CHAPTER 4

THE SEXUAL OFFENDING OF GROUPS

4.1. Introduction

4.1.1. Investigating sex offending: The nature of group rape

A group is “Two of more individuals who are connected to one another by social relationships” (Forsyth, 2006, p. 3). Group rape has been defined as “A rape in which one or more victims are subjected against their consent to sexual intercourse with two or more offenders” (Amir, 1971, p.182) and is commonly operationalised as a rape involving two or more offenders/suspects (e.g., Grubin & Gunn, 1990; Kjellgren et al., 2006; Porter & Alison, 2006). Similarly, criminological definitions of delinquent groups define a ‘group’ as two or more offenders (Warr, 1996).

As stated earlier in this thesis, groups account for the minority of sexual assaults. Seven per cent of the sexual assaults sampled by Feist et al. (2007) were committed by groups and 23% of the rapes sampled by Grubin and Gunn (1990) involved multiple offenders. Group rape is thought to predominantly be an adolescent crime (Amir, 1971) with studies of group rape reporting the majority of the offenders to be aged less than 21 years (e.g. Porter & Alison, 2006; Wright & West, 1981) or reporting group rapists to be significantly younger than single rapists (Grubin & Gunn, 1990). Approximately 40% of the stranger sex offences allegedly committed by juveniles in London in 2001 were committed by groups of suspects (Woodhams, 2004).

As reported in Chapter 1, group sex offences, whether committed by adults or juveniles, are more likely to involve penetration and physical violence against the victim than those committed by lone offenders (e.g. Gidycz & Koss, 1990; Woodhams, 2004). Physical violence in a sex offence is reported to result in greater psychological trauma to the victim (Smallbone & Milne, 2000). Group rape is therefore relatively predominant when considering the population of juvenile sex offenders and potentially carries considerable human cost because of the nature of such attacks. Yet, surprisingly little has been written about this phenomenon in the last two decades (Porter & Alison, 2006). The current study sought to address this, by extending the research reported in the few recent publications on violence within group rape (Woodhams, 2004; Woodhams, Gillett & Grant, 2007), and role adoption in group rape (Porter & Alison, 2001).

4.1.2. Roles within criminal and non-criminal groups

Because of the scarcity of recent empirical literature on roles within group rape, the literature on role-taking in non-criminal groups and non-sexual criminal groups was consulted.

4.1.2.1. Roles within Non-Criminal Groups

A role has been defined as a “Coherent set of behaviours expected of people in specific positions within a group” (Forsyth, 2006, p. 176). Roles can emerge in groups informally or they can be deliberately created to organise the group’s behaviour (Forsyth, 2006). Social psychologists have investigated the roles people adopt within non-criminal groups. The role of “leader” is one commonly discussed. Psychologists have explained that leaders assign tasks to group members and co-ordinate the activities of the group. They direct and define the goals of the group. In addition, they regulate group behaviour through support and motivation (Forsyth, 2006).

A number of other functional roles that emerge within groups have been identified (Beene & Sheets, 1948 as cited in Goldstein, 2002), which may generalise to group rape. These are presented in Table 4A, alongside examples of how they might emerge in the group rape setting.

These functional roles are purported to represent three overarching role types: task roles, which facilitate and co-ordinate the group’s efforts; maintenance roles, which strengthen and regulate the group’s attitudes, and individual roles which, in the context of successful group workings, are considered dysfunctional (Mudrack & Farrell, 1995).

Table 4A: Application of Functional Roles from Social Psychology to Group Rape (Goldstein, 2002; Mudrack & Farrell, 1995).

Role	Function	Group rape example
Initiator contributor	Recommends novel ideas about the problem at hand	Suggests ways of disposing of victim without getting caught
Information seeker	Calls for background information from others	Requests information from other members or from victim
Opinion seeker	Seeks attitudes, values and feelings of others	Asks other group members' opinions on obtaining victim
Information giver	Provides information for forming decisions, expertise	Offers information about known victim
Opinion giver	Provides opinions, values and feelings	Offers opinion on the best way to control the victim
Elaborator	Gives additional information	Explains implications of a course of action
Co-ordinator	Shows the relevance of each idea and its relationship to the overall problem	Explains the pros and cons of two different methods of approaching victim
Orienter	Refocuses discussion on the topic whenever necessary	When planning rape ensures maintain focus.
Evaluator-critic	Appraises the quality of the group's efforts.	Tells others that not controlling the victim enough.
Energiser	Stimulates the group's efforts	Encouragement of group members behaviours
Procedural	Cares for operational details e.g. materials	Provision of weapon, restraints, transportation
Encourager	Rewards others through praise	Encouragement of offenders who appear anxious
Gatekeeper and expediter	Sets up procedures and ensures equal participation	Obtains victim and directs others' participation in the rape
Follower	Accepts the ideas of the others	Involved in rape but perhaps not planning
Harmonizer	Reconciles disagreements among group members	Reconciles disagreements between the group members.
Aggressor	Expresses disapproval of the group's acts, jokes aggressively.	Expresses disapproval of the ideas for attacking the victim.
Blocker	Resists the direction the group is headed in.	Resists the way the group is behaving towards the victim.
Dominator	Asserts authority over the group members, gives directions, interrupts the contributions of others.	Directs the actions of other members during the group rape.

Social psychology studies have examined the functional roles played by individuals during bullying. A number of functional roles have been identified that may generalise to group rape. Salmivalli, Lagerspetz, Bjorkqvist, Osterman and Kaukiainen (1996) identified five roles. The first, the Bully role, encapsulates active, initiative-taking, leader-like bullying behaviour. Purely by its definition, this role would seem to have parallels with some of the behaviours ascribed to leaders in group rape. The second, the Assistant role, would represent an individual who actively participates in the bullying of the victim but who follows the actions of others rather than initiating the bullying. The role of Reinforcer includes behaviours that reinforce the bullying behaviour such as encouragement, laughing, inciting the bully, and providing an audience. The fourth role identified is the Defender. An individual adopting this role will defend the victim, take the victim's side, support or console them. The final role identified by Salmivalli et al. (1996) is the Outsider. The Outsider is not involved in the bullying behaviour. Salmivalli et al.'s (1996) roles have been observed in children aged 7-10 years (Sutton & Smith, 1999). Whether they will be observed in a sample containing older juveniles engaged in a different antisocial activity remains to be investigated.

4.1.2.2. Roles within Organised Criminal Groups

Some research has examined the roles adopted by members of organised, non-sexual, criminal groups, for example, ram-raiders and armed robbers (Donald & Wilson, 1999; McCluskey & Wardle, 1999). In Donald and Wilson's study six roles were identified within their dataset. These were leader/planner, handler, heavy, driver, apprentice and extra. The leader is described as choosing group members and the target, and arranging the disposal of gains from the offence. The heavy's role is related to physical prowess. He/she forces entry to the premises, presents a physical threat and can act as the look-out. The driver's role is self-explanatory. Extras are not key members of the group but might be employed in an assistant role. Apprentices are described as assisting in gaining entry to the premises and in removing the goods/money. The Handler is not involved in the offence itself and therefore is not a direct member of the group. Their role is to dispose of the stolen property, potentially converting it into cash.

McCluskey and Wardle (1999) also identified some similar common roles, these being planner, driver and the violent member. The violent member's role was again related to physical threat and maintaining order or intimidating witnesses/victims. The

driver's role was again self-explanatory. The planner was often identified as being a leadership role. The individual taking up this role would plan the offence, organise weapons for the group, and consider what could go wrong in advance. In both cases there was some suggestion that group members are selected for the crime because of their specific skills, probably linked to previous offending. That specific individuals are chosen to fulfil a role suggests a degree of planning in such offending.

4.1.2.3. Roles within Juvenile Delinquent Groups

Delinquent groups are reportedly small in size and transitory in nature, with a constant influx of new members and established members leaving the groups (Warr, 1996). Juvenile delinquents are thought to be versatile in their offending and members of several different groups (Warr, 1996). However, this does not preclude the existence of offence-specific juvenile delinquent groups (Warr, 1996). Whilst juvenile delinquent groups are thought to be transitory, it is quite typical for juveniles to commit the same type of offence with the same companions (Warr, 1996). This raises the question of whether group members consistently take the same roles. Warr (1996) suggests not, presenting evidence that the roles within such groups are "Unclear and unstable" (p. 17). However, Warr's own research found some roles to be clear and consistently adopted. In most acts of delinquency an instigator is easily identified and role stability was observed where offenders committed offences with the same group.

4.1.2.4. Roles within Group Rape

A small number of studies have addressed the question of whether there are distinct roles played by members in group rapes. Much of this discussion has focused on the distinction between leaders and followers (Blanchard, 1959; Groth & Birnbaum, 1990; Porter & Alison, 2001). Blanchard interviewed the members of two groups who had committed group rape. A clear leader was identified in each group. The leaders reportedly played a significant role in finalising and mobilising the group's intent. In a group situation, Blanchard remarks that the sexual feeling in the leader seems to be stimulated by the presence of the followers with the leader subsequently directing the group's attention onto sexual matters. Blanchard proposed that without the presence of the leaders neither rape would have occurred. Amir (1971) and Groth and Birnbaum (1990) also stress the importance of the leader for creating and sharing the group's goals within a rape and initiating the offence. Groth and Birnbaum (1990) argue that it is unusual for groups to reach a mutual decision to rape.

Porter and Alison (2001) have more recently investigated leadership within group rape. They devised a scale, the Scale of Influence, and labelled offenders the “leader” if they were the group member who scored highest on the scale. The scale measures influence through the decisions, actions and orders made/given by an offender during the offence. For example, an offender will score higher on the scale if he/she decided to commit the offence and if he/she selected the target. A higher score is also given where an offender instructs another member of the group to engage in an action rather than engage in the action him/herself. For example, a higher score is given if the offender orders another person to commit the first sexual assault on the victim compared to if the offender him/herself commits the first sexual assault on the victim. The various stages of a sexual offence are all represented in the scale (the approach, maintenance and closure stages), however more behavioural acts are associated with the approach stage. The scores for all offenders in each group were compared and leader status was allocated to those offenders who scored the highest in their group. The remainder were labelled as followers. Porter and Alison found that leaders demonstrated significantly higher influence than their followers and in most cases (37 out of 39) a clear leader was identifiable.

Amir (1971) has suggested that three other types of offender can be present in a group rape. The first are the core members who participate immediately. Amir explains that they will be “Aggressive towards the victim, subject her to humiliating practices, and he, rather than the leader, may be the initiator of the actual attack” (p.192). If a group continues sexually to offend, it is suggested that these core members will be present more frequently. The second type of offender is “The reluctant participant”. Such individuals participate in the sexual assault but only after encouragement or due to diffusion of responsibility. Diffusion of responsibility, or losing one’s sense of personal responsibility for one’s actions, is part of the deindividuation process (Goldstein, 2002). “Deindividuation is the process of losing one’s sense of individuality or separateness from others and becoming submerged in a group” (Goldstein, 2002, p. 30). The reluctant participant’s involvement will only occur after other members have already raped the victim because of their hesitation (Amir, 1971). A third type of offender is “The non-participant” (Amir, 1971). This individual is present during the sexual assault but does not participate. Whilst not suggested by Amir it is possible that this individual fulfils another role, for example they might act as a lookout.

In relation to how a group rape unfolds, whilst a victim might be sexually assaulted by different members at the same time, Groth and Birnbaum (1990) explain it is more likely for group members to take turns. It is hypothesised that directed turn-taking results in feelings of control and power in the leader due to his control not just over the victim but also over his peers. The follower's involvement is purported to be aided by feelings of diminished responsibility through the authority of the leader. The role of followers could also include physically restraining the victim. These authors therefore suggest that within a group rape, members might take different roles with the distinction between leader and followers being potentially the most clear.

4.1.2.5. Summary of Previous Research

There are some consistent research findings in relation to roles within group rape. The small number of available studies outlined above have identified a clear leader within group rapes and a number of followers. This current study will therefore also investigate the presence of a leader-follower distinction. Few studies of group rape have gone beyond the leader-follower dichotomy to consider the functional roles that group members might play. Social psychologists have identified additional roles that might emerge in group rape. The Assistant and Reinforcer role identified in social psychology studies of bullying (Salmivalli et al., 1996) share some similarities with behaviours reported to be displayed by followers in group rape (Amir, 1971). The role of Outsider also shares similarities with what Amir (1971) has termed the "non-participant" in group rape. Whether the role of Defender will be present in group rapes is questionable. Behaviours such as reassuring the victim have reportedly been displayed by lone rapists (Dale, Davies & Wei, 1997). It remains to be established whether such a role exists in group sex offences. The dynamics of criminal groups of juveniles, such as group cohesion and peer pressure (Goldstein, 2002), may discourage such behaviour.

Roles in groups responsible for non-sexual organised crime appear to be allocated to members in a pre-planned manner (Donald & Wilson, 1999; McCluskey & Wardle, 1999). However, it is unclear whether such planning occurs prior to group sex offences. There are, however, some similarities between these studies and studies of group rape. For example, McCluskey and Wardle (1999) propose that the role of planner is reportedly a leadership role which parallels previous researchers' observations about the roles of leaders within group rape (Amir, 1971; Groth & Birnbaum, 1990; Porter & Alison, 2001). There is also some correspondence between

the roles observed in organised criminal groups and sexual offending behaviours reported in studies of sex offences. For example, Grubin et al. (2001) identified types of behaviour in rape that included escape and control behaviours. The role of driver reported in organised criminal groups involves taking the responsibility for escape. Also some elements of the planner and the heavy roles share similarities with control behaviours. It is quite possible that because of group dynamics or the potentially more opportunistic nature of group rapes, such roles will not emerge, however it is important to determine whether or not this is the case.

4.1.3. The use of violence within group rapes

A higher incidence of physical violence in group offences compared to offences committed by a single offender is consistently reported for sex offending (Cordner, Ainley & Schneider, 1979; Gidycz & Koss, 1990; Porter & Alison, 2006; Woodhams, 2004) and non-sex offending (e.g. Conway & McCord, 1995 as cited in Conway & McCord, 2002). Only two studies have reported the opposite (Grubin & Gunn, 1990; Lloyd & Walmsley, 1989). A number of theories from social psychology have been used to explain the difference in violence used by single and multiple sexual offenders (Woodhams, Gillett & Grant, 2007).

4.1.3.1. *Social Psychological Theories of Violence*

Goldstein (2002) proposes that group violence can occur through “deindividuation”. This is an “experiential state caused by...anonymity, that is characterised by the loss of self-awareness, altered experiencing and atypical behaviour” (Forsyth, 2006, p. 576). Group members experience a loss of individual responsibility and a weakening of their inhibitions which results in impulsive, irrational and potentially violent behaviour. In group rape, these factors combined with heightened sexual and physical arousal could explain why individuals are more violent towards the victim in a group sexual assault. Heightened levels of arousal and a reduced sense of responsibility have been reported in studies of group non-sex and sex offending (Cromwell, Marks, Olson & Avery, 1991; Groth & Birnbaum, 1990). Amir (1971) proposes that whilst an individual might want to engage in deviant (sexual) behaviour, when alone their inhibitions prevent its expression. However, when in a group their inhibitions are reduced because of deindividuation. This might be particularly likely in the presence of a dominant leader (Forsyth, 2006). High emotional arousal (including sexual arousal) is proposed to affect the processing of information by an individual resulting in an inability to perceive another person’s pain or fear

(Carmichael & Piquero, 2004). As a result individuals fail fully to consider the negative consequences of their actions and perceive the benefits as outweighing the costs (Carmichael & Piquero, 2004). These findings are also relevant to understanding violence in group sexual assaults.

Violent behaviour is also thought to occur because group members fail to question the use of violent behaviour due to their need to maintain group agreement and cohesiveness (Forsyth, 2006), a process called “group-think” (Goldstein, 2002). If a group has a clear leader, it is possible that their violent behaviour will be imitated by the other group members. The accounts of followers in Groth and Birnbaum’s (1990) study seem to support these theories. The followers explained that they admired the leader and were concerned to remain part of the group. The importance of the peer group for older juveniles has been documented (Lipsey & Derzon, 1998; Loeber & Stouthamer-Loeber, 1996), therefore it is quite likely that these influences would have a powerful effect on the followers in a group. The immediate presence of companions within delinquent groups has been argued to have a catalytic effect for offending behaviour (Warr, 1996). The group situation is argued to provide an opportunity for juveniles to display their loyalty and ability, therefore the presence of respected peers could increase the likelihood of offending behaviour in this way for this population. In addition, it has been argued that the delinquent group can create an “atmosphere of excitement” and “moral support” thereby increasing the likelihood of delinquency (Warr, 1996). Group members might also be concerned to maintain their social image, or face (Forsyth, 2006). Researchers of group rape have suggested that the higher levels of violence in group rape compared to rape by lone offenders are a result of camaraderie and experiences of power within this group situation (Groth & Birnbaum, 1979; Leuw, 1985, as cited in Biljeveld & Hendriks, 2003; Scully & Marolla, 1985).

The theories of deindividuation and “group-think” would propose that violence in group sexual offences arises from group dynamics. However, other theories suggest violence is instead a result of like-minded individuals converging together. This is called “convergence theory” (Goldstein, 2002). Rather than the incidence of violence in groups being a result of group dynamics, it is proposed to stem from the convergence of individuals who *already* have a propensity to be violent. Some evidence for these theories comes from a study by Werner and Crick (2004). Aggressive children were found to choose aggressive friends. However, Thornberry (1998) found that juveniles’

involvement in youth violence increased following entry to a gang and decreased after departure. This suggests that convergence cannot explain all group violence.

Norm-enhancement theory extends convergence theory. It proposes that when violent individuals come together they perceive their pro-violence attitudes as more legitimate, which results in violent behaviour (Goldstein, 2002). This would account for Thornberry's (1998) findings. Meier and Hinsz (2004) conducted an experimental study, which has some relevance to this discussion. They found that individuals who had the propensity to be violent showed greater violence when within a group. They propose that this was because of the group-polarisation effect, which strengthened the participants' intent to be violent. Group polarisation is particularly likely to occur if the group members want to make a good impression, which might be particularly relevant for juvenile sex offenders.

Peer pressure and the need for group cohesion are also likely to be involved in retaining the group membership of individuals (Amir, 1971). Failure to participate in group sex offending can result in ostracism and humiliation (Groth & Birnbaum, 1990). In addition, having engaged in deviant behaviour the individual might experience rejection from pro-social peers (Coie, Lochman, Terry & Hyman, 1992).

Some studies have addressed the question of whether physical violence in rape is a result of victim behaviour in terms of victim resistance. Some studies have found no evidence for a relationship between victim resistance and offender violence with lone (Hazelwood et al., 1989) and group sex offenders (Wright & West, 1981). Whereas other studies (Hunter et al., 2000) have found physical violence in juvenile sexual assaults to be related to how difficult the victim was to control. This suggests that physical violence is instrumental in nature, i.e., it is displayed in order to control the victim. However, Hunter et al. (2000) also found evidence of more gratuitous violence in their sample of juvenile sexual assaults. Interestingly, whilst they did not investigate it, gratuitous violence seemed to be associated with a subgroup of offenders, a number of whom were group offenders.

For victim resistance to account for the higher levels of physical violence in group sexual assaults, the victims of group sexual assaults would have to be more physically resistant than victims of lone sexual assaults. Meier and Hinsz (2004) propose that the concept of group is associated with an expectation of hostility. If this is the case, a victim may be more likely to fight and may fight more vigorously when faced with the possibility of being group raped because they anticipate greater hostility.

However, even if this were the case, it would seem unlikely that a group of offenders would *need* to use greater violence to overcome a victim than a single offender (Woodhams, Gillett & Grant, 2007). The proposition that victims of group rape may be more resistant therefore seems to be an insufficient explanation. The empirical evidence also suggests this is unlikely. Amir (1971) and Wright and West (1981) found less victim resistance in group rapes. However, Block and Skogan (1986) found the opposite. That the lone offenders in Block and Skogan's study were more likely to use a weapon in their offences might explain this contradictory finding since weapon use was associated with less victim resistance.

As suggested by Hunter et al.'s (2000) study, it is most likely that physical violence in group sex offences is a product of both instrumental and expressive aggression. However, to date, the antecedents to acts of violence in group sexual assaults have not been investigated, making it impossible to assess the explanatory power of these theories. It is possible that all explanations are correct. Group members might share sexually deviant and violent norms which, through convergence, modelling, deindividuation, and norm-enhancement, become more salient and are more likely to find expression in a group setting. Resistance by the victim may present the necessary trigger for violence to be expressed. Such a combination of causal factors is suggested by Amir (1971). Haynie and Osgood (2005) found some supporting evidence that a combination of causal factors is implicated in group delinquent behaviour. They found the normative influence of peers to have an effect beyond that explained by the selection of similar (delinquent) friends.

4.1.4. Victim resistance

As mentioned above, victim resistance has been proposed as one explanation for offender violence in sexual assaults. However, as the following discussion reveals, victim behaviour during sexual assaults is not limited to verbal and physical resistance. The incidence of victim resistance in rape reportedly ranges from 6% - 49% (Amir, 1971; Block & Skogan, 1986; Greenfield, 1997). The exact figure varies with the type of resistance and the type of rape (lone versus group rape). Physical resistance is less common than verbal resistance. For example, Block and Skogan (1986) categorised resistance as non-forceful, which included verbal resistance or running away, and forceful resistance, which related to physical fighting. They found non-forceful resistance in 49% of rapes and forceful resistance in 33% of rapes. Similar patterns emerge for group rape specifically. Greenfield (1997) found that 20% of victims

resisted in some way, but only 6% physically fought their attackers. Similarly, Amir (1971) found 34% of victims resisted during group rape and 14% of victims fought their offenders. That victims of group rape are more likely to make verbal protests (Wright & West, 1981) seems unsurprising considering that the greater number of offenders in a group rape would make physical resistance more difficult with the victim perhaps perceiving success using physical resistance as unlikely.

Burgess and Holmstrom (1976) took a broader view of victim behaviour during sexual assaults and investigated the various verbal and physical coping strategies used. These included acts of resistance. Like studies of offender behaviour, they divided the offence into three stages. The first stage 'threat of attack' corresponded with the time at which the victim realised that they were in danger. This is similar to the end of the approach stage, which was referred to earlier, which represents the stage of the offence where the offender gains control over the victim (Dale et al., 1997). The next stage corresponded to the sexual assault itself. This overlaps to some degree with the maintenance stage, where the offender must maintain control over the victim to enable a sexual assault to take place (Dale et al., 1997). The final stage, "after the attack", is similar to the closure stage whereby the offender must quit the scene without detection (Dale et al., 1997).

During the first stage, some victims reported feeling paralysed and hence did not act, whereas others used verbal coping strategies. These included indirect tactics, such as stalling for time and flattering the offender, and are similar to victim behaviours reported in Chapter 2. Other verbal behaviours were more direct, such as verbal aggression. Some victims physically resisted by trying to escape or by fighting the offender. During the attack itself, victims reported using similar strategies. For example, some tried indirect verbal strategies, for example telling the offender someone else was returning home soon. Others used direct verbal strategies, such as shouting and screaming. Again, physical forms of resistance were reported, which included struggling with and fighting the offender. Few behaviours in the final stage equated with resistance. Instead, they included bargaining with the offender for freedom, reassuring him that they will not report the offence, and the victim freeing herself from blindfolds or bindings.

In relation to group rape in particular, similar victim behavioural strategies to the above have been found (Greenfield, 1997; Porter & Alison, 2006). Victims were most likely to struggle and scream, however they also pleaded with offenders, cried, used a

story to dissuade the offenders, refused to co-operate, physically fought, and threatened and insulted the offenders. Porter and Alison (2004) investigated whether victim behaviours displayed during group rape clustered into the categories of hostility, co-operation, submission and dominance. Whilst the clustering was not clear cut (for example, running away was found within behaviours labelled as submissive), there does appear to be some grouping of variables in terms of how active the form of resistance is and how explicitly the victim communicates their intent to resist.

Some studies have gone beyond descriptions of victim behaviours and have investigated how (lone) offenders react to victim resistance. Victimization surveys have typically been used. Bachman and Carmody (1994) found victim resistance (either verbal or physical) to significantly predict victim injury in cases of physical assault against female victims. Block and Skogan (1986) found non-forceful resistance predicted uncompleted rapes. Forceful resistance did not predict uncompleted rapes but it did predict victim injury. Similarly, Cohen (1984) found verbal resistance to predict penetration avoidance and physical resistance was significantly associated with the offender becoming angry and violent. There are a number of difficulties in using data from victimization surveys which should be noted. Whilst the sample sizes are large, the temporal sequencing of events cannot reliably be determined. Whether an occurrence of forceful resistance caused an increase in violence by the offender and thus victim injury, or whether the victim reacted to offender violence and inflicted injury with forceful resistance, cannot be established. Victimization surveys involve asking victims of crime about the offences they have experienced over the previous year (Bolling, Grant & Sinclair, 2008). Their accuracy is, therefore, questionable because research has shown that memory decays with time (Catal & Fitzgerald, 2004). Whilst victim allegations of rape made to the police are also retrospective in nature, the majority are reported on the same day (46%) with nearly 70% of rapes being reported within one week of occurrence (Feist et al., 2007). This increases to 95% of rapes being reported within one week if only stranger rapes are considered (Feist et al., 2007). Victim allegations made to the police therefore should be more reliable in terms of accurate recall than victimization surveys. Block and Skogan (1986) also note the inability sometimes to determine whether a rape was attempted but not completed due to the victim's behaviour or due to third party intervention.

Prentky et al. (1986) also investigated the effect of victim resistance on rapist violence and victim injury. The majority of their sample of rapists had been strangers to

their victims. Resistance was divided into two types: combative and non-combative. (Combative involved the victim using physical resistance.) Based on the previous literature and their own clinical experience, Prentky et al. categorised victim behaviours into four types: escape, verbal resistance, non-confrontative resistance (fainting, gagging) and confrontative resistance. Rapists were rated on their use of expressive aggression using an eight point scale where 0 equalled no expressive aggression to 7 where expressive aggression resulted in victim mutilation or death. The rapists used more brutal force before and during the offence when the victim used combative resistance compared to non-combative resistance. All rapists used less brutal force once the rape had occurred. Whether this was because their aggression served an instrumental purpose or whether, due to the degree of force used the victim, was no longer able to resist is unclear. Again, the nature of the data prevented Prentky et al. (1986) from establishing causality.

Other researchers report no association between victim resistance and offender violence (e.g. Hazelwood et al., 1989; Ullman & Knight, 1993). However, these studies did find resistance to result in an uncompleted rape or, in the case of Hazelwood et al. (1989), rapes of longer duration.

Fritzon and Ridgway (2001) examined the effect of victim resistance in attempted homicides. Unfortunately, once again, due to the nature of the data, causality could not be established. However, it was tentatively suggested that different murderers react differently to victim resistance. Some react by changing their behaviour, whereas others responded with increased violence. Fritzon and Ridgway suggest that the reaction depends on the offender's motive for their attack (e.g. whether they perceive the victim as a person or as an object).

Studies of other crime types have suggested additional factors that could affect the outcome of victim resistance. Luckenbill (1981) examined the reported temporal sequencing of victim and offender behaviours in robberies. Victim resistance occurred when the victim did not recognise the seriousness of the offender's intent to commit the crime or did not perceive the robber as possessing sufficient resources for coercion. Victim resistance might therefore vary depending on offender age, perhaps with younger offenders being perceived as having fewer resources. For example, younger offenders may be physically weaker than adult offenders and may be perceived as less experienced than adult offenders. Luckenbill's findings could also explain differences in victim resistance between group and lone rapes.

If a victim resisted the offender, Luckenbill argued that the offender's next behaviour would depend on how much they valued the victim. If the victim was perceived as valuable, the offender was less likely to incapacitate them. Luckenbill also argued that if an offender possessed a weapon this affected their reaction. When in possession of a weapon, an offender was more likely to issue a threat. If the offender was relying on blunt force, they were more likely to incapacitate the victim. These different factors are proposed to interact in determining the outcome of victim resistance. Luckenbill also examined the effect of violence on further victim resistance. If the victim perceived the offender's use of violence as illogical and indiscriminate, the victim fought fiercely. Whilst Luckenbill studied robbery, his findings may also be relevant to rape.

Fossi et al. (2005) analysed 14 stranger rapes which occurred in victims' bedrooms. Unlike previous studies, the sequence of victim and offender behaviours was preserved and relationships between them were investigated. (Please note that the publication of this paper post-dates the commencement of the current thesis, which commenced in 2003.) Like Luckenbill (1981), they found different offenders responded to victim resistance in different ways. Some offenders ignored the victim's resistance, whereas others reacted with physical aggression. If the victim claimed that a third party's arrival was imminent, some offenders ceased the assault whereas others physically controlled the victim. Like Fritzson and Ridgeway (2001), Fossi et al. (2005) interpreted the offender's likely motive for the assault from the behaviours displayed. Offenders motivated to establish intimacy with the victim were less likely to react aggressively to victim resistance. In contrast, offenders who viewed the victim as an object reacted aggressively to victim resistance. These observations share similarities with Luckenbill's (1981) theories of offender behaviour and the victim's perceived value.

Whilst Fossi et al.'s efforts to preserve the sequential ordering of victim and offender behaviours are important in advancing the knowledge of offender-victim interactions, their findings are limited to a particular type of sexual offence; those occurring in the victim's residence, committed by lone offenders against lone victims. It was however, the first study of sexual assault to attempt to preserve the reported temporal sequencing of behaviours. The current study aimed to address the limitation of past research into *group rape* by also trying to preserve the reported temporal sequencing of offender and victim behaviours.

4.1.5. Rationale and research questions

Little has been written about group rape since the early 1980s (Porter & Alison, 2006). Porter and Alison have gone some way to addressing this. The juvenile and adult group rapes sampled in Porter and Alison's (2001) study were obtained from newspaper reports and court reports. The current study also sampled both juvenile (those aged less than 18 years) and adult suspects, however it sought to determine if the findings of Porter and Alison (2001) replicated to a sample obtained from police records. The current study also aimed to investigate the validity of Porter and Alison's (2001) findings for leadership in group rape with a new sample. This study, in part, represents a validation study.

As well as replicating the work of Porter and Alison (2001) with a new sample, the current study investigated some novel questions. It investigated the roles reported to have been adopted by group members within a group sex offence, beyond the commonly studied roles of leader and follower. Additional roles have been found in research of non-sexual criminal groups and non-criminal groups.

Few studies have addressed the behaviour of the victim in sex offences and only two investigated victim behaviour in the context of a group rape (Greenfield, 1997; Porter & Alison, 2006). Therefore, the victims' reported behaviours during the group sexual assaults were analysed. The focus of academic research on "victim resistance" parallels the media and judicial system's problematic focus on such behaviours. A broader view was taken in this study. The strategies used by the victim to "manage" the offender were investigated.

As mentioned above, group sexual assaults are reportedly more violent than offences committed by a lone offender. The study investigated the use of violence within group sexual assaults. Analysing offenders' behaviours in the absence of the victims' behaviours precludes a comprehensive understanding of why violence permeates this type of sexual assault. Several theories from social psychology have been put forward as explanations for this. By attempting to preserve the temporal ordering of victim and offender behaviours, this study was designed to overcome some of the limitations of past research. It was able to examine the antecedents for violence within a group sexual offence and determine whether this appeared to be related to group dynamics, the characteristics of individual offenders, or victim resistance.

Some studies have considered whether victim and offender characteristics affect the level of violence used (Cordner et al., 1979; Gidycz & Koss, 1990; Porter & Alison,

2006; Woodhams, 2004; Woodhams, Gillett & Grant, 2007). The current study extended this research by investigating the relationships between victim and suspect characteristics and suspect aggression *and victim resistance* within group sex offences. In particular, by sampling both adults and juvenile group sex offenders comparisons between adult and juvenile group rapists could be made.

Investigating the types of victim behaviour displayed in group rape expands the limited current knowledge in this area, most of which is dated. It also has the potential to assist in the recovery of victims. Victims who resist less actively during a sexual offence can be seen by professionals and their own support network as being less of a victim, resulting in self-blame (Galliano, Noble, Travis & Puechl, 1993). More accurate research on how a “typical” victim does or does not behave during a sexual assault has the potential to address such misconceptions and inform the judicial system, as recently proposed by the Government (Office of Criminal Justice Reform, 2006). If victim resistance is found to result in increased offender aggression, some non-resisting victims might feel more justified in their choice of behavioural strategies. By helping victims who resist less actively to understand that they are not an anomaly might assist their recovery.

The research questions were therefore:

- What behavioural strategies do victims report using in group rape?
- What roles are reportedly adopted by perpetrators during group rape?
- Does the leader-follower distinction reported in Porter and Alison (2001) replicate to a sample of group sex offences reported to the police?
- Do relationships exist between victim and perpetrator characteristics and the use of aggression and resistance in group rape?
- Which psychological theories can explain perpetrator aggression in group rape?

4.2. Methodological Review

4.2.1. Data type and coding victim and suspect behaviours

Justifications for the type of data chosen for these analyses can be found in section 2.2.1. As in Chapter 2, the approach of generating checklists of suspect and victim behaviours and coding the offences against these was adopted. This approach has been used before in studies of group rape and victim resistance (e.g. Fritzson & Ridgeway, 2001; Porter & Alison, 2004).

4.2.2. Roles of group members

As in Chapter 2, qualitative analysis was chosen to investigate the existence of any discernible roles within group rape. Constant comparison framework analysis was employed for these purposes. In addition, it was decided to replicate Porter and Alison's (2001) study with a new type of data, police records. It was intended that their Scale of Influence for identifying leadership within group rapes would be applied to this new dataset. A total score of influence would be calculated for each offender, and the offender within a group that scored the highest would be labelled the leader and the remainder the followers. It was decided that a test of difference would be calculated to determine whether leaders scored significantly higher on influence than followers, as conducted in Porter and Alison (2001).

If leadership is evidenced in criminal groups by the degree of influence an offender has over his/her co-offenders (Porter & Alison, 2001) and possibly also by his direction of the victim's behaviour, an alternative method of identifying leadership within group sexual assaults could be to measure each offender's use of directives. Directives are a speech act through which the speaker tries to influence the behaviour of the hearer (Leech, 1983). Their use by offenders to influence the behaviour of victims in sexual offences has been studied (Woodhams & Grant, 2006). Porter and Alison (2005) cite two studies which have associated leadership with the amount of speech produced by an individual during a task. It was therefore intended that this alternative means of measuring leadership would be tested on the sample in a similar manner to the Scale of Influence. Each offender's reported use of directives in an offence would be quantified. The number of directives uttered overall would be broken down further into directives targeted at co-offenders and those targeted at victims. As with the Scale of Influence, for each offence it would be determined whether a particular member of the group uttered more directives than the other group members. This individual would be labelled the 'leader'. Statistical tests would be conducted to determine whether leaders scored higher on their use of directives than followers.

4.2.3. Rating severity of suspect aggression

A similar scale as to that used in Chapter 3 was chosen for rating the severity of violence in group rapes for the reasons outlined in section 3.2.3. Each behaviour in an offence committed by each individual offender would therefore have a score of 0-6 attached to it. In addition, a score for aggression could be allocated to each offence.

The aggression score for each offence was calculated in the same manner as outlined in Chapter 3, section 3.2.3.

4.2.4. Rating degree of victim resistance

A search of the literature failed to identify a measure of victim resistance. It was therefore decided to use a seven-point Likert scale much like the aggression scale. Victim behaviours would therefore be rated based on how resistant they appeared. Previous studies have tended to focus on more explicit communications of resistance. For example, Block and Skogan (1986) investigated verbal resistance, running away and fighting. These are quite active forms of resistance and it is possible more subtle forms are being missed. It was intended that a 0-6 scale of victim resistance would be used with a score of 0 indicating no resistance and a score of 6 indicating that a behaviour was very resistant. In a similar way to the rating of aggression, each victim behaviour displayed could be coded based on this measure and a total resistance score for each offence could be produced.

4.2.5. Relationships between offence, suspect and victim characteristics, and resistance and aggression

To determine whether the mean age for the group of suspects, victim age, number of suspects, type of victim-offender relationship, and victim resistance score were associated with suspect aggression score a multiple regression analysis was considered appropriate. Dancey and Reidy (2002) explain that this technique determines “The ways in which several variables (called independent or predictor variables) are related to another (called the dependent or criterion variable)”. This requires a continuous criterion variable, which in this case would be suspect aggression score. The predictor variables can also be continuous or categorical data, which would be the case. A further multiple regression with victim resistance as the criterion variable was also decided upon to determine if the predictors of mean suspect age, victim age, type of victim-suspect relationship and number of suspects were predictive of level of resistance.

4.2.6. Investigating explanations of aggression in group rape

It was intended that, providing the data assumptions could be met, Pearson’s correlations would be used to assess the relationship between suspect aggression and victim resistance using the scores for each offence. However, correlations cannot establish causality because the temporal ordering of victim and suspect behaviours is not preserved. An alternative method that was considered was time series analysis.

However, whilst changes in an individual's behaviour over time can be statistically examined using time series analysis, a fundamental assumption of this form of analysis could not be met with the type of data that was to be used. Namely, single-case time series analyses require that observations occur at equal intervals across time (Borckardt & Nash, 2002). Acts of aggression and resistance within group sexual assaults are naturally occurring events, therefore they do not occur at equal intervals. It was not therefore possible to use this statistical technique. Instead, graphical representations of levels of victim resistance and suspect aggression were considered. Providing the victim and suspect behaviours were recorded in the order in which they reportedly occurred and each suspect behaviour and each victim behaviour could be rated for their degree of aggression and resistance, respectively, line graphs could be used to examine their co-occurrence across each offence. In such graphs, one line could represent victim resistance (score for each behaviour) and a separate line could be used to represent each suspect's aggression (score for each behaviour). This approach was therefore adopted.

4.3. Method

4.3.1. Data

The sample for this study was obtained from a large urban UK Police force. A sample of 200 *allegations* of group rape was requested on behalf of the author by force employees. This means the crimes in the sample had not resulted in a conviction. A group rape was defined as a rape involving two or more suspects in at least one stage of the offence (e.g. the approach, the maintenance or the closure stage). Files on each allegation were requested from the central record store. These files contain all information relating to an allegation. Of those requested and received, 14 allegations were identified that contained sufficient detail to allow for analysis. This information was either in the form of an interview transcript, a victim statement or the detailed notes taken during the victim interview. Since the study was investigating the sequencing of behaviours within a group rape, chronological accounts of each rape were needed.

All of the allegations requested related to sexual assaults committed by two or more *male* offenders against *one female victim*. In one case, two victims were assaulted but separately. One offence randomly was chosen from these two offences rather than including two in the sample which could potentially skew any findings by giving more emphasis to one group of offenders. This study focused on these victim and suspect demographics because other compositions, such as a male victim, or a mixed gender

group of suspects, would have likely had an effect on the use of aggression (e.g. Kimerling, Rellini, Kelly, Judson & Learman, 2002; Pino & Meier, 1999) and potentially the group dynamics.

Rather than sample only stranger group rapes, it was intended that a sample would be obtained which consisted of approximately 50% stranger rapes and 50% acquaintance rapes. The relationship between victims and suspects has been noted to effect the level of violence used by an offender (Bownes, O’Gorman & Sayers, 1991), therefore a mix of relationships was chosen to allow this factor to be investigated. It was also considered important to try to sample both completed and attempted rapes since victim resistance can prevent a rape being completed (Ullman & Knight, 1993). By sampling only completed rapes the level of victim resistance could be underestimated.

Series of offences committed by the same offenders were not knowingly included in the sample. Using a sample of serial offences would limit the generalisability of the findings (Bennell & Canter, 2002). Also, any clusters of roles identified with such a sample could be a product of the consistency of offenders’ behaviours across crimes rather than the existence of distinct roles within group rapes. There is, of course, the possibility that unsolved serial offences could have been unwittingly included in the sample. This limitation cannot be overcome unless the sample was limited to solved offences. Limiting the sample to solved offences to be confident that serial offences had been excluded would introduce a further limitation to the generalisability of the findings, therefore this sampling method was not adopted.

4.3.2. Procedure

On notification from the Police force that the requested dockets (i.e. case files) had been received, the author visited the Police headquarters to review the files and identify those which could be used in the study. A number of allegations could not be used because the victim had withdrawn their statement before an account of the offence could be taken by the police. Others had to be discounted because, on receiving the files, it became clear that these were not allegations of group rape but of lone rapes. The victims’ accounts of the 14 offences suitable for analysis were extracted from files which met the study’s criteria and were sanitised. This involved the author manually trawling through each account and “blacking out” any person (victim, suspect, witness names), date or place (e.g. name of town, road) identifiers. Only once this had been completed were the victims’ accounts taken off the secure site. Once off site, the

statements were stored securely in locked filing cabinets. The accounts of the victims were typed up into electronic documents which were password protected. In the electronic documents, blacked out information was replaced with bracketed text describing the nature of the text missing. For example, where a victim's name had been removed the following would be typed "[victim's name]". This ensured that the meaning of the accounts were not lost through sanitation.

Offence narratives were created from the victims' accounts, as described in Chapter 2, section 2.3.2. The creation of such narratives was particularly important for two crimes where each victim had given two separate accounts of their assault. In these cases both accounts had to be combined to form one narrative. The 14 offence narratives were subjected to a constant comparison framework analysis, as was conducted in Chapter 2. The steps followed are described in more detail in Chapter 2, section 2.3.3 but, in summary, comprised familiarisation with the data, identification of a thematic framework, indexing, and charting (Ritchie & Spencer, 1994). The frameworks for victim behaviours and offender behaviours created in Chapter 2 were used as a basis, with new identified behaviours being added to the frameworks and behaviours not occurring in the group rapes being removed from the frameworks. This resulted in the creation of two new frameworks, one of offender behaviours and one of victim behaviours.

Following this, each offence was coded against the two frameworks. If a victim or offender behaviour occurred a 1 was recorded for "present" and if a behaviour did not appear to occur a 0 was recorded for "absent". The sample size of 14 group rapes precluded the use of any quantitative analyses, such as cluster analysis. The variables were therefore solely subject to a further constant comparison framework analysis (Ritchie & Spencer, 1994; Swallow & Jacoby, 2001) to identify higher level roles, encapsulating multiple offender behaviours. The same steps were followed for the analysis as were outlined in Chapter 2, section 2.4.9.2.

The inter-rater reliability of two very similar checklists had already been assessed and found to be sufficient in Chapter 2 (see sections 2.3.3. and 2.3.4.), and since no analyses were being conducted on these lower level codes, inter-rater reliability checks were conducted on the higher level offender codes only (see section 4.4.5.).

The offenders' behaviours were rated for level of aggression using a Likert scale from 0 (no aggression) to 6 (extreme aggression). As was the case in Chapter 3, an explanation accompanied the scale. This explained to the raters that when coding a

behaviour for its level of aggression, they should consider that aggression can be communicated both verbally, physically and sexually. The accompanying explanation also detailed that higher scores should represent more extreme and brutal forms of aggression.

The victim behaviours were rated for level of resistance in a similar manner. The accompanying explanation reminded the raters that resistant behaviours could be verbal, physical, or could involve no action (for example, where the offender has requested a sexual act and the victim ignored the request). In relation to conceptualising degree of resistance, the raters were told, “The more forcefully and directly the victim communicates her intention to not comply with the offender’s wishes, the higher the score the behaviour should be given. As with the offender behaviours, a victim’s act of resistance might not be successful, however it should still be coded as if it were. It is therefore the intended act that is again important”.

Rather than using Cohen’s kappa to test inter-rater reliability of aggression and resistance coding, which would not be appropriate in this case as the data was not categorical, inter-rater reliability was tested using Cronbach’s alpha (Woodhams & Grant, 2006). This was conducted with three of the 14 offences (representing approximately 20% of the data). The resulting alphas of 0.89 were considered sufficiently reliable (Hammond, 2006) to pursue the statistical analyses.

Porter and Alison’s (2001) Scale of Influence was also applied. Each offender in each group was measured against this scale for the degree of influence the individual had over the other group members encompassing the various stages of the sexual offence. A high score represented a greater degree of influence. Using this scale, Porter and Alison (2001) categorised the individual that scored the highest as the leader and investigated whether this individual scored significantly higher than the other group members. The 32 offenders in the present sample of 14 group rapes were each coded against the scale. The inter-rater reliability of the coding was checked with three of the cases (representing 20% of the data) using percentage agreement and Cohen’s kappa. Kappa was found to be 0.75, which represents an excellent level of agreement by published standards (Cicchetti, 1994) and was significantly better than a chance level of agreement ($p < 0.001$). The percentage agreement was relatively high at 87.65%. The coding was therefore sufficiently reliable to conduct the analyses.

The alternative method of investigating leadership through the use of directives was applied to the data. The number of directives uttered by each group member was

calculated, as was the number targeted at the victim and at co-offenders. The inter-rater reliability of the coding was checked with three of the cases (representing 20% of the data) using percentage agreement and Cohen's kappa. Kappa was found to be 0.80, which represents an excellent level of agreement (Cicchetti, 1994) and was significantly better than a chance level of agreement ($p < .001$). The percentage agreement was high at 93%. Since the coding was sufficiently reliable to conduct further analyses, the total number of directives was used to allocate the offender to the role of leader or follower. A higher score indicated more influence, thus the group member with the highest score was identified as the leader.

4.4 Results

4.4.1 Descriptive statistics

All victims were female. The victims' ages ranged from 13 to 60 years ($M = 25.8$, $SD = 11.92$). Most victims in the sample were White European (64%, $n = 9$) followed by African Caribbean (21%, $n = 3$), Asian/Indian (7%, $n = 1$) and Dark European (7%, $n = 1$). (These ethnicity codes are those used by the Police force where the research took place.) All suspects were male. The sample contained 30 suspects. Most offences were committed by two suspects (86%, $n = 12$) with the remaining offences committed by three suspects. With regard to suspects' ages, for ten offenders these were not known because the offender had not been apprehended. In these cases the victims had estimated the suspects' ages. When discussing suspect age it should therefore be remembered that in some cases these are estimates. In two allegations, the victims described the suspects' ages as lying within a range. In such cases, the median of the age range was used in calculating any group means. For one allegation, the victim did not provide an estimated age for her two attackers who also were not apprehended. The suspects' ages ranged from 7-41 years ($M = 20.11$, $SD = 5.73$). The majority of suspects were aged in their late teens to early twenties. The majority of offenders were described as African Caribbean (37%, $n = 11$), followed by White European (20%, $n = 6$), Arabian (20%, $n = 6$), Dark European (13%, $n = 4$), Asian/Indian (7%, $n = 2$), and Mixed Race (3%, $n = 1$).

Of the 30 suspects, 73% ($n = 22$) were strangers to their victims. Two offenders (7%) were considered to be casual acquaintances to their victims. In such relationships the victim may have met the suspect once and perhaps had only telephone contact since then. A further four offenders (13%) were acquaintances, usually friends. Two

offenders (7%) had previous sexual relations with their victim. In the majority of cases, there was therefore some degree of acquaintance between the victim and at least one suspect (57%, $n = 8$).

Most victims were approached by the suspects outdoors (29%, $n = 4$) or at an entertainment venue (29%, $n = 4$) such as a bar. Twenty nine per cent ($n = 4$) of victims were approached at their own dwelling or at a friend's, for example with the offender knocking at the door or gate-crashing a party. Two suspects contacted their victim by mobile telephone (14%). For half of the allegations (50%, $n = 7$), the victim was approached at a different venue to where the offence occurred. With regard to offence locations, the most common was the suspect's dwelling (43%, $n = 6$), followed by the victim's or a friend's private dwelling (29%, $n = 4$), outdoors (21%, $n = 3$) and an entertainment venue (7%, $n = 1$). Most suspects used a con-style approach (93%, $n = 13$) whereas one group of suspects used a surprise approach (7%).

In 57% ($n = 8$) of offences all group members sexually assaulted the victim. In the remainder, some co-offenders watched, acted as a lookout, or encouraged the other members. The roles taken by group members are discussed in more detail in section 4.4.3 below. In all but one case (93%, $n = 13$), the victim suffered a penetrative assault, and in all of these cases penetration was vaginal. One victim was also anally penetrated by her attackers (7%), and another victim was digitally penetrated by her attackers. It was common for a victim to experience both forced fellatio and vaginal penetration (71%, $n = 10$). Other sexual acts including kissing the victim and touching the victims' breasts (both 36%, $n = 5$).

4.4.2. Sequential versus simultaneous sexual assaults

The offences were also coded as to their type. Two types emerged. The first was labelled "simultaneous sexual assault" where the victim was assaulted with more than one offender present, or "sequential sexual assault", where the victim had only one offender with her at any one time. Eleven groups assaulted the victim simultaneously whereas in three offences the victim was assaulted by one offender at a time (sequentially). This contrasts with findings by Groth and Birnbaum (1990) that sequential group rapes are more common. If cultural differences between the U.S. and the U.K. exist in the commission of group rapes this might in part explain these different findings. However, it is more likely that the difference in frequency of sequential vs. simultaneous rapes is a result of differences in how simultaneous rapes were defined. Groth and Birnbaum (1990) define a simultaneous group rape as one

where the victim is sexually assaulted by more than one offender simultaneously which clearly differs to the definition being used here. Much of the writing on group rape has discussed the role of camaraderie, and bonding associated with the watching and encouragement of group sexual assaults by group members (e.g. Holmstrom & Burgess, 1980; Scully & Marolla, 1985), which better reflects the characteristics of the simultaneous rapes in the current sample.

The vast majority of the group offences in the current data set occurred indoors, at a location of the offenders' choosing where the victim could more easily be contained. The ease with which the victim can be contained at such a location means that the presence of others to physically overpower her whilst she is sexually assaulted by another offender is not as necessary. In the sequential style rapes, having sexually assaulted the victim privately, the group member could then return to the rest of the group who were waiting in another room and experience the camaraderie in this way rather than sexually assaulting the victim together. The sequential type of group rape was often initiated by one group member who "conned" the victim to a location, sometimes on the pretence of a date, where she was confronted by the group and sexually assaulted. Scully and Marolla (1985) reported similar sexual assaults which they termed "group date rapes".

4.4.3. Behaviours displayed by suspects

The offender behaviour framework comprised 110 behaviours (see Appendix 7). Twelve of these behaviours were additions to the behaviours in the offender behaviour framework reported in Chapter 2. The new behaviours (e.g. "pornography", "condom") are highlighted in red font. Appendix 7 also shows the frequency of each offender behaviour.

Previous research on the behaviours displayed by offenders during group sexual assaults has identified the existence of three higher level behavioural themes (Porter & Alison, 2004). These are dominance, co-operation, and hostility. The Dominance theme refers to behaviours such as Control type behaviours of binding and gagging, and the use of a weapon, and some Style behaviours such as stealing property. The Co-operation theme refers to the offender seeking some form of co-operation and involvement from the victim in her sexual assault. This has been termed by others as an intimate or involving theme (Canter et al., 2003; Canter, Hughes & Kirby, 1998) and includes behaviours such as kissing the victim, complimenting the victim, and asking the victim questions. Finally, the Hostility theme reflects behaviours which are violent

and aggressive (Porter & Alison, 2004), such as insulting the victim, physical violence and the ripping of clothing. A fourth theme is thought to exist which is termed 'Submission' but which has not typically been observed in past studies of sexually violent behaviour (Porter & Alison, 2004). Submission is described as the offender giving control to the victim (Porter & Alison, 2004). Similar to previous research on offender behaviours during sexual assault, Porter and Alison (2004) failed to identify particular "submissive" behaviours by the offender yet they considered the con-approach to be a behaviour which allowed the victim more control in deciding whether to accompany an offender or not. Porter and Alison (2004) examined the occurrence of these themes using the technique of multi-dimensional scaling. The current small sample size of 14 precluded the use of this technique or hierarchical cluster analysis. Instead the table of behaviours identified through the constant comparison framework analysis was examined to ascertain whether similar behaviours were present in the current dataset which would suggest the presence of these themes.

4.4.3.1. Dominance

Behaviours which Porter and Alison (2004) associated with the theme of dominance were observed in the current dataset. These included stealing property from the victim, threatening the victim with a weapon, and the offender gagging the victim using his hand.

4.4.3.2. Hostility

The theme of hostility was also observed in behaviours such as expressive violence and mocking the victim, which are similar to Porter and Alison's (2004) variables of 'multiple violence' and 'demeaning'.

4.4.3.3. Co-operation

Behaviours indicative of the offender seeking co-operation and involvement from the victim were apparent but perhaps less common. Examples of such behaviours include kissing, hugging, sexual questions, reference to the victim's sexual arousal, directives to undress, and personal and intimate disclosures on the part of the offender.

4.4.3.4. Submission

Whilst Porter and Alison (2004) did not find evidence of submissive behaviours within their sample of group rapes, some evidence was found in the current dataset. Behaviours indicative of control being given to the victim included negotiation, compliance on behalf of the offender to the victim's wishes/directives, and the offender releasing the victim.

In summary, whilst it was not possible to conduct inferential statistical analyses to examine the presence of these four overarching themes the descriptive data do seem to suggest that all four themes were present in the dataset.

4.4.4. Strategies used by victims

The framework of victim behaviours can be seen in Appendix 8. Five new behaviours (e.g. witness-put off and argues) are highlighted in red font. Appendix 8 also displays the frequencies for each behaviour. From Appendix 8, it is clear that the most common behaviours shown by the victims of these 14 group rapes represented forms of compliance and also forms of what has, in the past, been termed verbal and physical resistance or non-compliance. However, that 54 different victim behaviours were recorded within these 14 group rapes testifies to the various forms of coping and of management that victims employ within these experiences. The variety of techniques used is apparent when moving down the table. The behaviours located towards the bottom of the table in Appendix 8 have been less commonly reported in the academic literature, namely the victim confronting the suspect about his behaviour, and criticising him. The contents of the table illustrate that the strategies employed by victims in group rapes go beyond complying and resisting.

With regards to the similarity in victim behaviours in offences committed by group and lone offenders, 49 of the 124 behaviours identified in the 78 offences reported in Chapter 2 were also found in this sample. This might suggest that the victim behaviours displayed in lone rapes differ to those displayed in group rapes. Alternatively, this difference may be a result of the smaller sample of group rapes. Five new victim behaviours were found in the group rapes that were not present in the lone rapes (125. Personal Question to Co-Offender, 126. Witness-Put Off, 127. Cleans, 128. Blocks Nostrils, and 129. Argues).

Comparisons were made between the ten most common victim behaviours found in the 78 offences reported in Chapter 2 and the 14 offences by groups. These are displayed in Table 4A. Behaviours present within both “top-ten” lists are highlighted with an asterisk. There is considerable agreement in these behaviours between the two samples, although the relative frequency with which they occur, and hence their ranked order, varies.

Table 4A: The Ten Most Common Victim Behaviours Reported in the 78 Offences in Chapter 2 and the 14 Group Sexual Assaults.

78 Sexual Offences	14 Group Sexual Assaults
1. Struggles*	1. Gives an order*
2. Gives an order*	2. Obeys wishes*
3. Seeks help verbally from witnesses*	3. Directly declines*
4. Obeys wishes*	4. Struggles*
5. Walks/cycles away*	5. Requests behaviour from offender*
6. Directly declines*	6. Walks/cycles away*
7. Runs away	7. Truthful response to personal question*
8. Truthful response to personal question*	8. Justifies behaviour*
9. Justifies behaviour*	9. Seeks help verbally from witnesses*
10. Requests behaviour from offender*	10. Re-dresses/covers self

In Chapter 2, eight higher-level victim behavioural themes were developed through qualitative and quantitative analysis. Before adopting the same eight themes in the current study, it was determined whether the victim behaviours observed in the 14 group rapes also fitted into these themes. The outcome is displayed in Table 4B.

Table 4B: Victim Behaviour Types as Identified in Chapter 2, their Descriptions and the Discrete Behaviours Which Were Included Within Each Theme.

Theme	Description	Behaviours	
1. Active resistance	The victim actively resists the offender's assault. She engages in behaviours which directly communicate her lack of consent to the suspect and others or engages in behaviours which prepare her for this.	Seeks help verbally from witnesses (45)	Struggles (48)
		Reports suspect's behaviour to witness (95)	Hits/slaps with open hand (90)
		Elbows (50)	Gives an order (22)
		Punches (54)	Runs away (70)
		Blocks nostrils (128)*	Bites (59)
		Tries to get out of enclosed space (69)	Safe location (123)
2. Invoking social convention	Behaviours which signal to the offender that his behaviour is wrong and unwanted and perhaps contain the expectation that the offender will respond by ceasing his behaviour due to empathy for the victim or embarrassment for breaking social conventions.	Gags/chokes (71)	Confronts suspect (7)
		Cries out in pain (87)	Cries (4)
		Indicates don't like what suspect doing (18)	Tells suspect it hurts (25)
3. Information gathering	Behaviours with the intention of gathering information sometimes with the aim of using this as evidence at a future date.	Queries route (31)	Turns around (83)
		Personal question co-offender (125)*	Queries intentions (33) Seeks clarification (94)
4. Put off	Behaviours with the intention of dissuading the suspect from his actions.	Witness – put off (126)*	
5. Face-threatening non-compliance	Behaviours through which the victim either completely or partially does not comply with the suspect's wishes or social conventions which could threaten his self-image.	Physical non-compliance (75)	Denigrates suspect (3)
		Refuses to speak (46)	Name-calling (6)
		Directly declines (13)	Lips/mouth closed (77)
		Expresses indifference (108)	Pursues/prevents escape (60)
		Walks/Cycles away (63)	Moves away (62)
		Argues (129)*	Says farewell (17)
		Re-dress/Covers self (61)	Escorts suspect out (119)

		Expresses intention to do something (121)	Gathers belongings (82)
6. Face saving non-compliance	Behaviours which are designed to disguise the victim's true intent of non-compliance from the suspect and instead give the impression of compliance or a willingness to comply with the suspect thereby maintaining social conventions. The method of communication adopted by the victim recognises the power imbalance between the two actors.	False disclosure after question (42) Justifies behaviour (9)	Indirectly declines (14) Partial compliance (78) Lies – reason to leave (16)
7. Compliance	The victim complies with the offender's wishes or his expectations of her.	Requests behaviour from suspect (21) Apologies for non-compliance (20) Truthful response to question (41) Comments on conversation topic (93) Responds to greeting (92)	Obeys wishes (47) Didn't scream (86) Stays still (97) Helps suspect (96)
8. Spontaneous	Spontaneous behaviours which appear to be produced automatically rather than intentionally and from viewing the accounts were unlikely to be misinterpreted as a form of non-compliance.	No behaviours were found within the sample representing this theme.	

*Behaviours identified in the group rape sample only.

As can be seen from Table 4B, seven of the eight themes were also present in the group rapes. No evidence of spontaneous behaviours was found in this dataset. Again, this could represent a difference in victim behaviour in group versus lone rapes or, alternatively, this might result from the much smaller dataset of group rapes. One behaviour observed within the group rapes could not be accounted for within the eight higher-order themes. This was the behaviour of the victim cleaning herself after the offence. This did not appear to be a behaviour through which the victim was trying to manage or communicate with the offender but is perhaps a behaviour which serves a more emotional purpose. As it was a post-offence behaviour which did not appear to serve a communicative function between victim and offender, a further higher-level theme was not created. These findings suggest that the behaviours displayed by victims in group rapes and sexual assaults by lone offenders share similarities. However, it would be prudent to replicate this methodology with a larger sample of group sexual assaults.

4.4.5. Development of suspect role-taking themes

As was conducted in Chapter 2 with the victim behaviours, higher level themes were developed from the conceptual codes in the offender behaviour framework. However, an important difference between this practice in Chapter 2 and in the analysis for this chapter was the need to consider how offender behaviours co-occurred within the offences to reflect overarching roles. In other words, it was important not to consider each behaviour in isolation but how behaviours occurred in sequence and hence represented distinct roles. Nine roles were identified and are displayed in Table 4C.

Table 4C: The Nine Roles that Were Identified from the Constant Comparison Framework Analysis.

Role label	Description
1. Procurer	This role involves the offender selecting a victim and procuring her for the group either through a con-approach (where the offender(s) hide their true intentions from the victim and “cons” her into a vulnerable situation) or through a surprise-approach (where the victim is physically overpowered by the offender).
2. Assaulter	The role involved the offender engaging in sexual behaviour with the victim against her will. These sexual acts can vary in severity from kissing to forced penetration.
3. Look-Out	The role of look-out involved the offender keeping watch to ensure the sexual assault was not interrupted by witnesses and/or the offenders were not apprehended.
4. Director	An offender who directs the behaviours of other offenders was considered to take on the role of director. Directives do not have to be orders but can include suggestions and more indirect forms of communication.
5. Passive Observer	The role of passive observer was given to an offender if they were not involved in actively facilitating the sexual assault but were present and watched.
6. Defender	An offender who shows concern for the victim and tries to defend her was considered to be taking on the role of defender.
7. Heavy	The role of the heavy involved an offender verbally and/or physically threatening the victim to ensure her compliance.
8. Facilitator	This role involved facilitating another offender’s assault of the victim. It included behaviours such as restraining the victim, gagging her or masking her screams.
9. Disposer	An offender who takes on the role of removing the victim from the crime scene in order to minimise the likelihood of detection was considered to be taking on the role of “disposer”.

The reliability of the allocation of roles to each offence was assessed using Cohen’s kappa and percentage agreement, measures of inter-rater reliability, for three of the 14 offences (approximately 20% of the data). The dual coding was completed by the author and a second rater. The level of inter-rater agreement, as measured by kappa (0.76), was excellent according to published guidelines (Cicchetti, 1994), and was

significantly better than chance ($p < 0.001$). Similarly, percentage agreement was high at 92.05%. Both statistics suggested that the coding was sufficiently reliable to continue with further analyses.

Some of the roles identified are associated with particular stages of the offence. The association of particular group behaviours with particular stages of an offence has previously been documented (Porter & Alison, 2001). For an offence to occur a victim must first be procured and so the role of procurer is one fulfilled early in the offence, in the approach stage. With regards to the role of procurer, in some offences there was just one offender who was responsible for this role. This tended to be more apparent in group rapes which suggested a level of planning and organisation. In the offences which were more spontaneous or opportunistic, it was more common for several offenders to be involved in procurement.

The roles identified share similarities with those reported in studies of armed robbery and ram-raiding, (Donald & Wilson, 1999; McCluskey & Wardle, 1999), and bullying (Salmivalli et al. 1996). Contrary to expectations that peer pressure and group cohesion (Goldstein, 2002) would discourage the role of Defender emerging in group rape, this role was adopted. This role has been identified in studies of bullying (Salmivalli et al., 1996) but not previously in criminal groups. Donald and Wilson (1999) and McCluskey and Wardle (1999) observed the role of the “Heavy” in armed robberies and ram-raiding, a role which represented the actions of a violent member of the group. A similar role, also labelled “the Heavy”, emerged in this sample of group rapes, too.

According to Amir (1971), Groth and Birnbaum (1990) and Porter and Alison (2001), leadership in a sexual assault can be illustrated by several behaviours. These are the initiation of the offence, selecting and approaching the target, initiating and/or directing the sexual assault of the victim, and the disposal of stolen property. Several of the roles identified from the constant comparison framework analysis, such as procurer, assaulter, director, and disposer, might be more associated with the leader of the group. Whilst Porter and Alison (2001) associate leadership with the disposal of stolen property, this shares similarities with the disposal of the victim since both stolen property and the victim must be disposed of without drawing attention to the actions of the group. Porter and Alison used their Scale of Influence to identify leaders within criminal groups who have committed rape (Porter & Alison, 2001) and robbery (Porter

& Alison, 2006). The next section reports on the application of this measure to the 14 group rapes comprising the current sample.

4.4.6. Leaders and followers in group rape

4.4.6.1. *The Scale of Influence*

The total score of influence for each of the 32 offenders was calculated. The distribution of scores on the Scale of Influence was not significantly different to a normal distribution as assessed by a Kolmogorov-Smirnov test ($Z = 1.092, p > .05$). It was therefore appropriate to calculate a mean and standard deviation (Dancey & Reidy, 2002). The scores on the Scale of Influence ranged from 6 to 12 (out of a possible 16), with a mean of 7.84 and a standard deviation of 1.42. The offender in a group who scored the highest was labelled the leader with the rest labelled followers. This was possible in 13 of the 14 group rapes. This proportion is similar to the 37 of 39 reported in Porter and Alison (2001). There were 15 followers and 13 leaders. Four suspects could not be classified.

The distributions of scores for followers and leaders were assessed using two separate Kolmogorov-Smirnov tests. These indicated that the distributions of scores were not significantly different from a normal distribution in either case (followers' $Z = 1.096, p > .05$, leaders' $Z = .781, p > .05$). It was therefore appropriate to calculate means and standard deviations for leaders and followers (see Table 4D) and to use an independent samples t-test as a test of difference (Dancey & Reidy, 2002). There was a significant difference in scores of influence between the leaders and the followers.

Table 4D: The Means and Standard Deviations for Followers and Leaders on the Scale of Influence.

	Leaders	Followers
Mean	9.08	6.80
Standard Deviation	1.26	0.68

The leaders' scores were significantly higher than those of the followers ($t_{(26)} = -6.089, p < 0.001, d = 2.25$) with a large effect size (Cohen, 1988). Porter and Alison (2001) reported a similar finding with their larger sample of group rapes. However, some difficulties were experienced with Porter and Alison's (2001) Scale of Influence. Both raters noted demonstrations of leadership within the sexual assaults which were not captured by the scale. For example, in offence 1, one suspect demonstrates

leadership by giving orders to his co-offender to mask the victim's screams. In offence 2, one suspect orders another to act as a look-out. In offence 3, one suspect orders the other to swap places with him during the sexual assault.

It was also observed that the yes/no response to some of the scale's questions did not capture degrees of involvement in the different offence stages. For example, in offence 2, one suspect is much more involved in conning the victim to another location than the other offender, however in the scoring there is no distinction between them since they were both involved in the procurement of the victim. A Likert-type scale might better capture these subtleties because an offender's involvement could be rated on a scale of, say, 1-7.

Because the accounts, on which the coding was conducted, were provided by the victim, it was also observed that information about decision-making was missing. This is understandable since a victim will not always be privy to such information. For example, the victim will not necessarily know which offender initially suggested the idea of rape, since this would usually precede his/her involvement. Certain elements of the scale are not therefore as useful when working from victim accounts. The scale was developed from one police interview and a sample of investigative journalism magazine articles detailing offences for which a conviction had been obtained. In contrast, the current study used victim accounts for offences which had not resulted in a conviction. It is quite likely that there will be greater detail about an offence when it has been investigated as fully as would be expected were a conviction obtained. This could mean that in its current form the scale would be of limited use to the police in making decisions about suspects pre-arrest.

Whilst there were therefore some difficulties with the scale and hence an offender was cautiously labelled as a leader, the analysis continued by considering whether the alleged leaders adopted particular roles in comparison to their followers. This was investigated by conducting a series of Chi-square analyses. Whether each suspect adopted a particular role was recorded as Yes or No and this was compared to whether the suspect was identified as the Leader versus a Follower.

Table 4E displays the frequency of each role within the sample of suspects overall, as well as the proportion of leaders and followers adopting each role, and the output for the Chi-square analyses.

Table 4E: The Adoption of the Nine Roles within the Sample of Suspects Overall, within Leaders and Followers and the Output from Tests of Association.

Role Label	% within suspects (N=32)*	% within leaders (n=13)	% within followers (n=15)	Fisher's Exact Test Probability, Phi and % variation (n=28)
Procurer	72%	92%	53%	p<.05, phi = .43, 18%
Assaulter	78%	85%	73%	p>.05, phi = .14, 2%
The Look-Out	6%	8%	7%	p>.05, phi = .02, <1%
The Director	13%	23%	0%	p>.05, phi = .37, 14%
Passive Observer	6%	0%	13%	p>.05, phi = .26, 7%
Defender	3%	8%	0%	p>.05, phi = .21, 4%
The Heavy	22%	39%	13%	p>.05, phi = .29, 8%
Facilitator	13%	23%	7%	p>.05, phi = .23, 5%
Disposer	22%	31%	20%	p>.05, phi = .12, 1%

*The columns do not total 32 because 4 offenders could not be classified as leaders or followers.

It is perhaps unsurprising that the most common roles are those of procurer and assaulter since these two acts are necessary for a sexual assault to take place. Past research (Amir, 1971; Groth & Birnbaum, 1990; Porter & Alison, 2001) has suggested that leaders are more likely to fulfil the tasks of selecting and approaching the target, initiating and/or directing the sexual assault of the victim, and disposing of the victim or stolen property. However, despite some of these tasks featuring in the coding scheme which defined the suspects as a leader or a follower, only one significant association emerged. This was that leaders were more likely to procure the victim for the group. From perusing the percentages, leaders were more likely to direct the behaviours of others, ensure the compliance of the victim through threats and/or violence, were more likely to facilitate the perpetration of sexual assaults against the victim by other group members, and were more likely to dispose of the victim after the assault. These associations did not reach significance however the role of Director has a moderate effect size (Pallant, 2007). The limitations mentioned previously with Porter and Alison's (2001) Scale of Influence with regards to allocating offenders to a category might account for the non-significant findings and small effect sizes. However, anecdotally, there were occasions in the dataset where the victim was procured by a follower, and facilitation, particularly in the case of dyads rather than triads, was often a

shared task. This suggests that leaders in group rapes are unlikely to be identifiable solely from the roles they adopt.

4.4.6.2. Using Pragmatics to Identify Leadership

The number of directives spoken by each suspect was calculated for each offence. These were divided into those directed at the victim and those directed at co-offenders. For each offence it was considered whether there was a member of the group that uttered more directives than others. The number of directives used by each suspect in their offence was used to allocate them the category of leader, follower or neither in a similar manner to the Scale of Influence. In other words, the suspect with the highest score was allocated the classification of 'leader'. The suspects with lower scores were labelled 'followers' and the label of 'neither' was given where there was no difference in total directive score. In three of the 14 offences the leader could not be identified. Where classifications were possible, 11 offenders were labelled as leaders and 14 as followers. The distribution of the number of directives was significantly different to a normal distribution ($Z = 1.45, p < .05$) therefore descriptive statistics for non-parametric data are reported. The median number of directives uttered by offenders was 2.00 with a range of 0-17.

As was the case with the Scale of Influence, comparisons were made between the scores of those suspects labelled as leaders and followers. Kolmogorov-Smirnov tests revealed that the distributions of number of directives for leaders and followers were not significantly different to a normal distribution ($Z = .850, p > .05$ and $Z = 1.242, p > .05$, respectively). An independent samples t-test was therefore used to ascertain if leaders uttered significantly more directives than their followers. From the descriptive statistics it appeared that leaders uttered more directives ($M = 6.27, SD = 5.88$) than their followers ($M = 1.29, SD = 1.82$) and the t-test confirmed that this difference was significant with a large effect size (Cohen, 1988) ($t_{(11.5)} = -2.712, p < .05, d = 1.14$).

The agreement between the two methods of allocating suspects to the roles of leader and follower was considered by determining for how many offences the labels were identical. This revealed that in nine of the 14 cases there was agreement between the two methods as to who constituted the leader and who the follower(s).

As mentioned in section 4.4.6.1, both coders for the Scale of Influence had concerns that this method was resulting in the misclassification of leaders/followers because it did not take into account the variety of incidents in which one offender might direct the behaviour of his co-offenders. The two coders particularly felt that the roles

in offence 1 had been misclassified using the Scale of Influence. Using this method, offender 1 was categorised as the leader and offender 2 as the follower whereas both coders felt the roles were the reverse. The directives method of categorisation did capture this form of influence and hence identified offender 2 as the leader and offender 1 as the follower. With regards to other differences between the classification methods, no leader was identified previously in offence 3. However, using the directives method of classification offender 1 was identified as the leader. This individual was responsible for directing the behaviour of others during the assault but this form of influence was not captured by Porter and Alison's (2001) Scale of Influence. These findings suggest some advantages to considering the use of directives by group members when determining leadership. However, the directives method of classification did not identify suspect 2 in offence 6 as a leader, rather no individual in this offence was considered to be the leader. However, suspect 2 did initiate the assault suggesting that the directives method was not as successful in this case.

Neither method at present seems to satisfactorily classify leaders and followers, therefore it is possible that the Scale of Influence (Porter & Alison, 2001) could be developed to incorporate the use of directives in its classification of leaders and followers. For the present, the classifications obtained from using the Scale of Influence were used in subsequent analyses since this method has been validated in other studies (Porter & Alison, 2006).

4.4.7. Relationships with suspect aggression and victim resistance

As outlined in sections 4.2.3 and 4.2.4., a score of 0-6 was allocated to each victim and offender behaviour in each offence representing the degree of resistance and aggression respectively (with a higher number corresponding with greater aggression or resistance). Using these ratings an overall resistance and aggression score was calculated for each offence. This also provided a sequential record of how the level of aggression and resistance evolved over the course of each group rape.

Several variables have been reported to be related to the levels of violence and resistance in a sexual offence, including mean suspect age, victim age, number of suspects, and type of victim-suspect relationship (Bownes et al., 1991; Cordner et al., 1979; Gidycz & Koss, 1990; Porter & Alison, 2006; Woodhams, 2004; Woodhams, Gillett & Grant, 2007). Prior to data collection it was intended that two multiple regression analysis would be calculated, one with aggression score as the dependent variable and one with resistance score as the dependent variable. According to Dancey

and Reidy (2002) the ratio of observations to variables for multiple regression should be 15:1. Unfortunately, because only 14 allegations could be sampled the ratio of cases to predictor variable was insufficient. As an alternative, tests of difference were calculated for categorical independent variables (type of victim-offender relationship) and overall aggression/resistance score for each offence, and binary correlations were conducted for victim age, mean suspect age, and number of suspects with aggression/resistance score. In addition, a binary correlation was conducted for aggression score and resistance score. A Bonferroni adjustment was made to the significance criterion because of the large number of tests being conducted (Kinnear & Gray, 2000). In this case, eight tests were being conducted on each dependent variable (victim resistance and offender aggression scores). This resulted in a corrected alpha value of 0.0125. The two dependent variables could be considered interval data since according to Dancey and Reidy (2002, p. 211), “For many years now psychologists have used t-tests for the analysis of data from Likert-type scales (where variables have been rated on a scale of, say, 1 to 7)”.

4.4.7.1 *Victim-Suspect Relationship*

The distribution of victim resistance scores was not significantly different from a normal distribution as assessed by two Kolmogorov-Smirnov tests (for stranger subgroup $Z = .868, p > .05$ and for acquaintance subgroup $Z = .449, p > .05$). The means for victim resistance score were 4.50 ($SD = 1.05$) and 3.75 ($SD = 1.75$) for acquaintances and strangers, respectively. This suggested that victims resisted more in acquaintances than stranger sexual assaults. This was tested with an independent samples t-test which found no significant difference ($t_{(12)} = -.926, p > .05, d = 0.52$), but a medium effect size.

The distribution for suspect aggression scores was significantly different to normal for the stranger subgroup ($Z = 1.451, p < .05$) but not for the acquaintance subgroup ($Z = .998, p > .05$). The medians for suspect aggression scores were both 5.00 (stranger range = 4-5, acquaintance range 4-6). This suggested there was little difference in suspect aggression with type of victim-suspect relationship. A Mann-Whitney U test revealed that the difference on suspect aggression scores between offences where the suspects were acquainted with the victim and offences where the suspects and victim were strangers, was not significant ($U = 14.00, p > .05$). As recommended by Pallant (2007), r was approximated from the Z statistic reported as part of the Mann-Whitney U test statistical output. The r value produced was 0.48

which corresponds with a medium to large effect (Pallant, 2007). Using a histogram to explore the distribution of suspect aggression scores by victim-offender relationship type it emerged that the acquaintance rapes were more often more aggressive than the stranger rapes.

4.4.7.2. *Weapon Presence*

Kolmogorov-Smirnov tests indicated that the distribution for suspect aggression and victim resistance scores was not significantly different to a normal distribution when a weapon was present ($Z = .368, p > .05$ for resistance; n/a as the distribution had no variance for aggression), or when a weapon was absent for resistance ($Z = 1.16, p > .05$), but it was when a weapon was absent for aggression ($Z = 1.377, p < .05$). Means and standard deviations were calculated for victim resistance but medians and ranges were calculated for suspect aggression. The mean resistance score for offences where a weapon was present was 5.00 ($SD = 1.41$), and where a weapon was absent was 4.00 ($SD = 1.51$). The aggression score for offences where a weapon was present was a constant at 5.00, and where a weapon was absent the median aggression score was 5.00 (range = 4-6). Although there were 14 cases overall, the number of cases in the weapon-present group was small ($n = 2$). This does not preclude the use of a t-test, however it means any conclusions must be drawn very cautiously (Walker & Maddan, 2005). An independent samples t-test was conducted for victim resistance and a Mann-Whitney U test was conducted for suspect aggression. There were no significant differences in victim resistance or suspect aggression when a weapon was or was not present (for aggression: $U = 11.00, p > .05$; for resistance: $t_{(12)} = -.947, p > .05, d = 0.69$). However, the effect size for victim resistance was moderate in size. The effect size r was approximated from the Mann-Whitney U output for suspect aggression but was very small in size (0.07) (Pallant, 2007).

4.4.7.3. *Drugs and Alcohol-Related Incapacitation*

The distributions for suspect aggression and victim resistance were not significantly different to a normal distribution as determined by Kolmogorov-Smirnov tests. The output for cases where the victim was incapacitated using drugs and/or alcohol was $Z = .667, p > .05$ for resistance. A test could not be calculated for suspect aggression because the scores were constant when the victim was incapacitated. For cases where the victim was not incapacitated the output was $Z = .882, p > .05$ and $Z = 1.277, p > .05$, for resistance and aggression, respectively. The mean resistance score when the victim was incapacitated was 2.67 ($SD = 2.31$). When the victim was not

incapacitated the mean resistance score was 4.55 ($SD = .934$). The aggression score when the victim was incapacitated was constant at 5.00. The mean aggression score was 5.09 ($SD = 0.54$) when the victim was not incapacitated. Two independent samples t-tests were used to assess whether these differences were statistically significant, however these were used cautiously due to the small sample size (Walker & Maddan, 2005). There were no significant differences on suspect aggression ($t_{(12)} = .283, p > .05, d = .24$) or victim resistance scores ($t_{(12)} = 2.18, p > .05, d = 1.07$) when the victim was incapacitated compared to when the victim was not, however the effect size for victim resistance was large (Cohen, 1988).

4.4.7.4. Group Rape Type

The distribution of victim resistance scores was not significantly different to a normal distribution as assessed using Kolmogorov-Smirnov tests (sequential type: $Z = .567, p > .05$; simultaneous type: $Z = 1.03, p > .05$). The mean and standard deviation was therefore calculated for victim resistance. A Kolmogorov-Smirnov test could not be computed for suspect aggression for sequential type rapes as the aggression scores were constant at 5.00. The distribution of suspect aggression scores for simultaneous rapes was not significantly different to a normal distribution ($Z = 1.17, p > .05$). For suspect aggression, the mean score for the simultaneous rapes was slightly higher ($M = 5.10, SD = .568$) than the score of 5.00 for sequential rapes. The mean score for victim resistance for sequential rapes was higher ($M = 4.75, SD = 0.96$) than the mean score for the simultaneous rapes ($M = 3.90, SD = 1.60$).

Two independent samples t-tests were used to assess whether these differences were statistically significant, however these were used cautiously due to the small sample size (Walker & Maddan, 2005). There were no significant differences between simultaneous or sequential rapes on suspect aggression ($t_{(12)} = -.344, p > .05, d = .25$) or victim resistance scores ($t_{(12)} = .983, p > .05, d = .65$). The effect size for victim resistance scores was moderate in size (Cohen, 1988).

4.4.7.5. Suspect Age

The distribution of mean suspect age was not significantly different to a normal distribution, as assessed by a Kolmogorov-Smirnov test ($Z = .644, p > .05$). This was also the case for victim resistance ($Z = 1.19, p > .05$) but not suspect aggression ($Z = 1.56, p < .05$). Two scatterplots confirmed that the relationships between the variables did not represent curvilinear relationships (Dancey & Reidy, 2002). A Pearson's correlation analysis was conducted between mean suspect age and victim resistance,

and a Spearman's correlation was conducted between mean suspect age and suspect aggression (Dancey & Reidy, 2002). Victim resistance and mean suspect age shared a weak to moderate (Dancey & Reidy, 2002), non-significant negative relationship ($r = -.380, p > .05$). Suspect aggression and mean suspect age shared a weak to moderate (Dancey & Reidy, 2002), non-significant positive relationship ($r = .359, p > .05$).

4.4.7.6. *Victim Age*

A Kolmogorov-Smirnov test confirmed that the distribution of victim ages was not significantly different to a normal distribution ($Z = .851, p > .05$). Two scatterplots confirmed that the relationships between the variables did not appear to represent curvilinear relationships (Dancey & Reidy, 2002). A Pearson's correlation analysis was conducted between victim age and victim resistance. There was a non-significant, very weak positive relationship (Dancey & Reidy, 2002) between victim resistance and victim age ($r = .090, p > .05$). A Spearman's correlation was conducted between suspect aggression and victim age (Dancey & Reidy, 2002). There was a non-significant, weak positive relationship (Dancey & Reidy, 2002) between suspect aggression and victim age ($r = 0.119, p > .05$).

4.4.7.7. *Number of Suspects*

A Kolmogorov-Smirnov test found the distribution of number of offenders to be significantly different to a normal distribution ($Z = 1.742, p < .01$). Therefore, it was inappropriate to calculate a Pearson's correlation with this variable and suspect aggression and victim resistance (Dancey & Reidy, 2002). Instead Spearman's correlations were used. Victim resistance and number of offenders shared a weak (Dancey & Reidy, 2002), non-significant negative relationship ($r = -.207, p > .05$). Whilst not significant or strong, this relationship is similar to past studies reporting less forceful resistance in group rapes compared to lone rapes (Wright & West, 1991). Suspect aggression and number of suspects shared a moderate (Dancey & Reidy, 2002) non-significant negative relationship ($r = -.423, p > .05$). The relatively large correlation coefficient suggests that group rapes containing fewer suspects are more aggressive than those committed by a larger number of suspects.

4.4.7.8. *Victim Resistance and Suspect Aggression*

As noted above, the distribution for victim resistance scores was not significantly different to a normal distribution as assessed by a Kolmogorov-Smirnov test but the distribution of suspect aggression scores was. A Spearman's correlation was conducted to examine the relationship between aggression score and resistance

score. A scatterplot showed that the relationship was not curvilinear. The Spearman's correlation analysis revealed a very weak (Dancey & Reidy, 2002), non-significant negative relationship between victim resistance and suspect aggression ($r = -.069$, $p > .05$).

However, a simple bivariate correlation analysis cannot accurately determine whether there is a relationship between victim resistance and suspect aggression since it is calculated on the overall scores. An analysis which considered the sequential ordering of victim and suspect behaviours was needed to investigate further this question.

4.4.8. Explanations of aggression in group rape

To examine how victim resistance and suspect aggression relate to one another it is important to investigate their interactions as they occur throughout an offence. For each allegation, the scores for victim resistance and suspect aggression allocated to each behaviour were plotted as a line graph with time along the x-axis and level of aggression/resistance on the y-axis.

Where possible the scores for suspect aggression were attributed to the relevant suspect, however the limited amount of relevant detail in the victim accounts at times prevented this. Where the majority of suspect behaviours could not be attributed to a particular suspect, the behaviours of all suspects were plotted as *one* line on the graph. Where just the odd behaviour could not be attributed to a suspect, this behaviour was removed from the graph. The line graphs can be found in Appendix 9, however a set of illustrative examples are included below.

Woodhams, Gillett and Grant (2007) posed the question of whether aggression in group rape served an instrumental or an expressive purpose. Aggression would be instrumental if it was being used, for example, to subdue the resistance of the victim. In such a scenario, an increase in victim resistance would be followed by an increase in suspect aggression. In contrast, evidence of expressive aggression would manifest as elevated levels of suspect aggression in the absence of increased victim resistance.

The patterns of victim resistance and suspect aggression in rape 8 suggest that aggression used by suspects in the course of a group rape serves an instrumental purpose. In the section of rape 8, labelled A on Figure 4B, the victim initially tries a form of verbal resistance with the suspect and on realising this is not going to succeed she increases her level of resistance and employs physical behaviours which more clearly communicate her unhappiness and determination. Suspect 1 responds by

increasing his level of aggression. The victim reaches a situation where she is unable to employ further physical resistance and so tries to communicate her resistance in a verbal manner. Suspect 1 responds with verbal aggression. His aggression then tails off because he has completed his assault and no longer needs to use aggression to control the victim. In this scenario, the levels of resistance by the victim and the levels of aggression by Suspect 1 are relatively similar with Suspect 1 tending to employ higher levels of aggression only when the victim increases her levels of resistance.

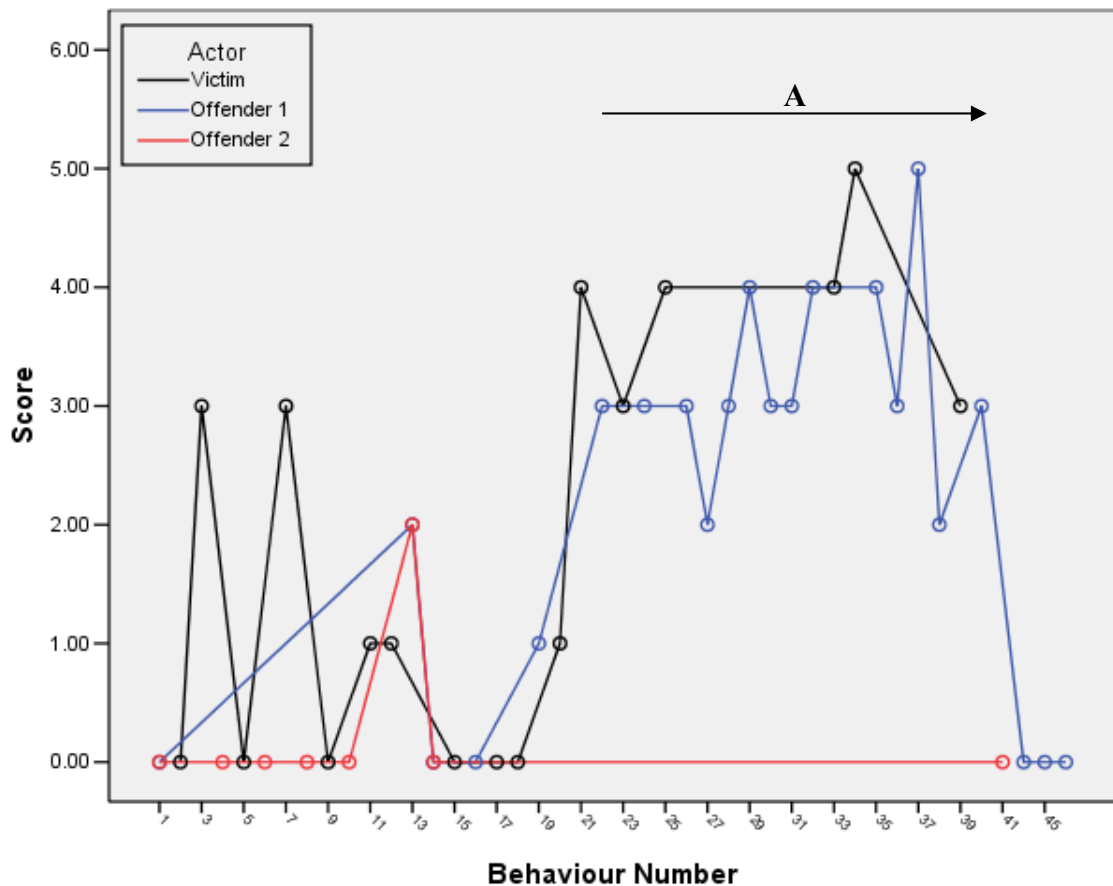


Figure 4B: The sequential occurrence of victim resistance and suspect aggression in rape 8.

Yet, in rape 1, at least, it appears that aggression can serve *both* an expressive and instrumental purpose. The interaction highlighted “A” on Figure 4C represents an example of instrumental violence. In this small segment, the victim indicates to the two suspects that she intends to leave the location and she gathers her belongings. Suspect 2 reacts with physical violence towards the victim. The victim responds with verbal aggression and seeks help from Suspect 1. Suspect 2 responds to this further resistance

with several acts of physical violence perpetrated one after the other. This latter display of aggression is possibly serving an instrumental and expressive purpose, if the interpretation that the offender is angered is correct. Suspect 2's aggression towards the end of rape 1 appears to be solely expressive. This area of the interaction is marked with the label "B". Here the victim is complying with Suspect 2's order in that she now leaves the location. Yet Suspect 2 attempts to inflict an act of considerable physical violence on the victim even in a situation of compliance. This aggression appears to serve no instrumental purpose.

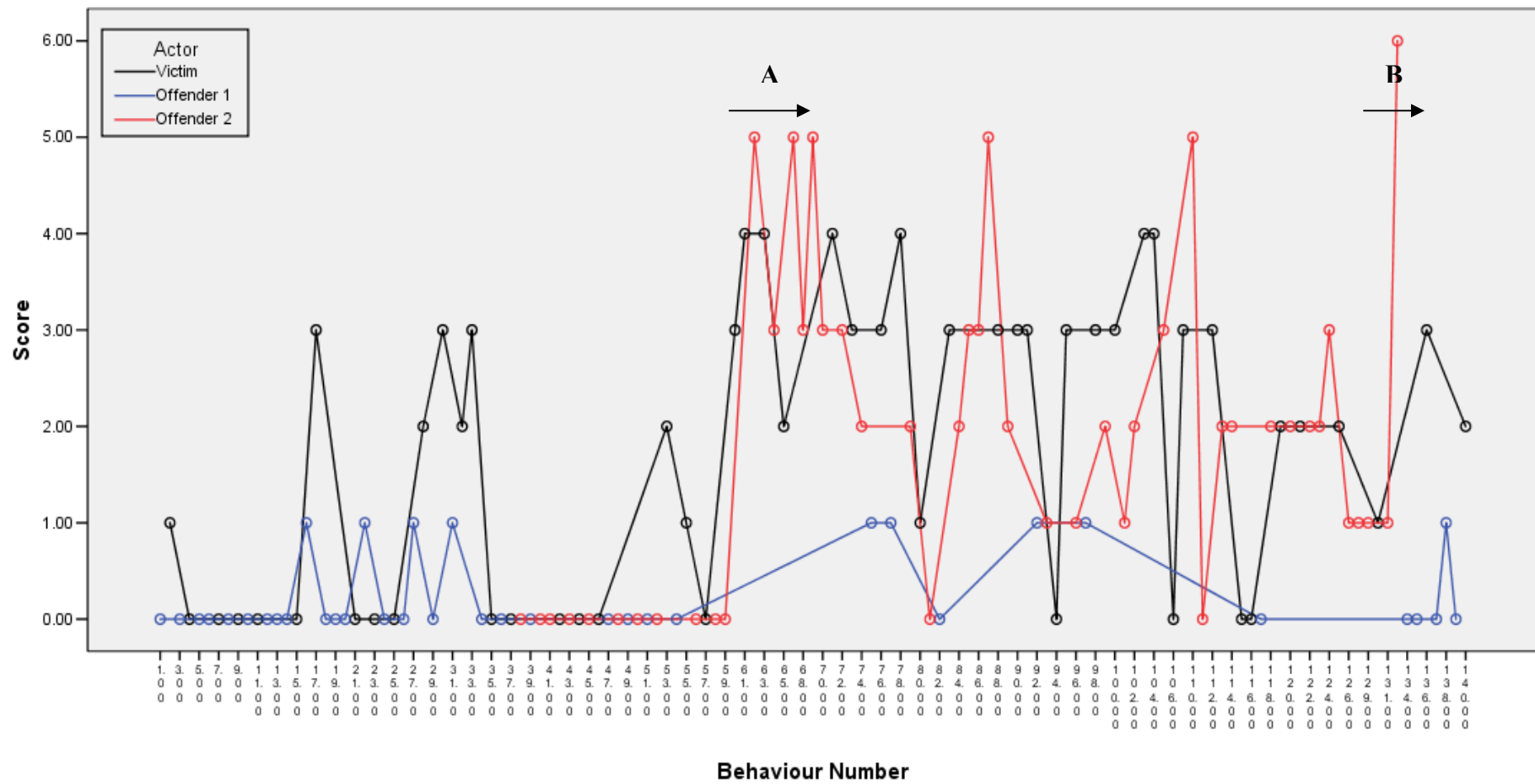


Figure 4C: The sequential occurrence of victim resistance and offender aggression in case 1.

These interactions suggest that suspect aggression can result from victim resistance. However, this is not the only explanation. Whilst some theories suggest that elevated levels of aggression in group rape result from group dynamics (such as modelling processes) these theories do not seem applicable to this particular offence. Rather, much of the aggression seen in this offence permeates directly from Suspect 2 rather than from some interaction between the two offenders. Suspect 2's level of aggression is considerably higher than his co-offender's throughout the offence. Theories that attribute the higher rate of aggression in group rape to aggressive individuals "flocking" together are perhaps more appropriate in this case. However, within the dataset there was some evidence that group dynamics might contribute to aggression in group rape.

In rape 6, it was determined by the current analyses that the leader of the group was Suspect 2 (using Porter and Alison's (2001) Scale of Influence). As Figure 4D shows, Suspect 3 appears to follow the lead of Suspect 2 in behaving in an aggressive manner towards the victim. Similarly, Suspect 2 in rape 11 appeared to follow the lead of Suspect 1 (see Figure 4E).

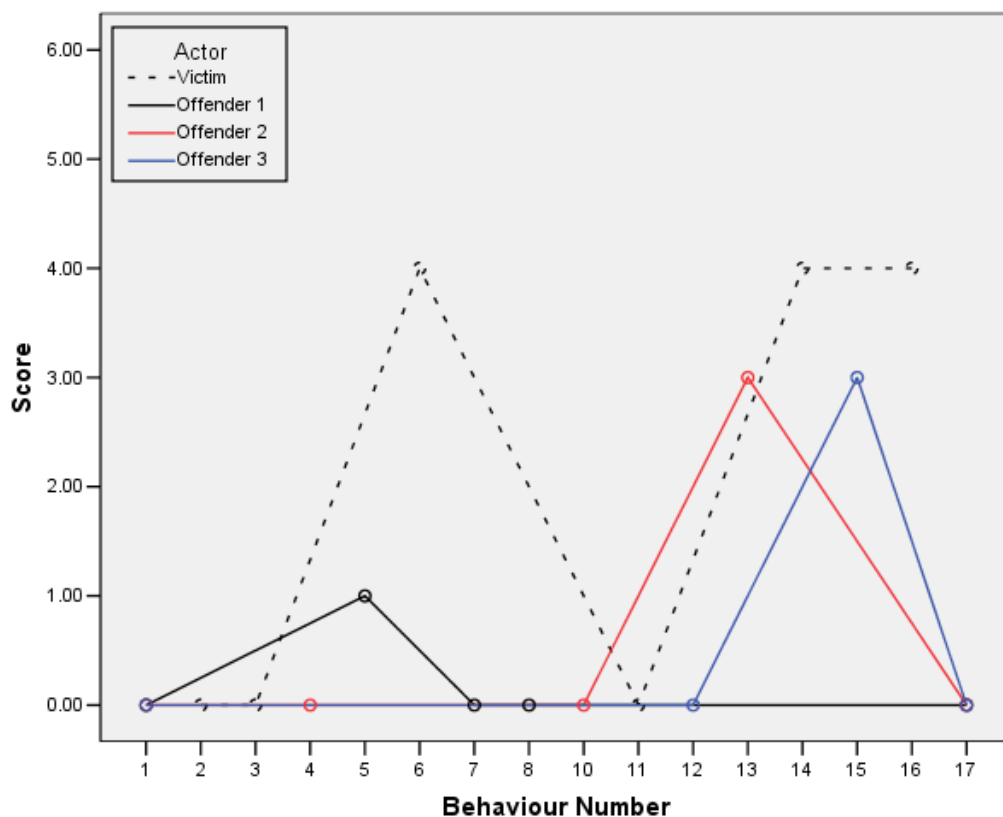


Figure 4D: The sequential occurrence of victim resistance and offender aggression in case 6.

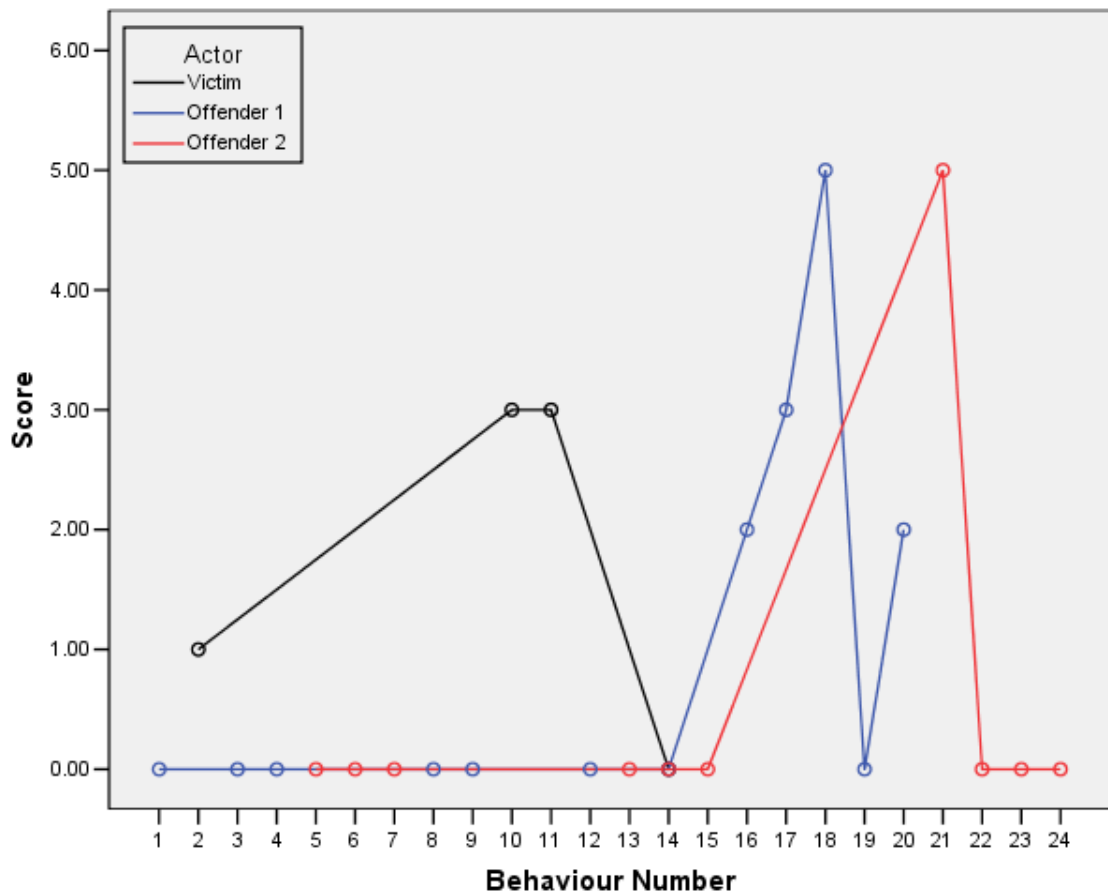


Figure 4E: The sequential occurrence of victim resistance and suspect aggression in rape 11.

With regards to understanding victim resistance, whilst it was observed in section 2.4.9.2 that some victims reported a conscious decision to stop resisting due to the aggression inflicted upon them, the victim was not always subdued by the suspect's display of aggression. In rape 2 (see Figure 4F), the victim maintained her level of resistance throughout. Her resistance is relatively effective in that Suspect 1 fails to achieve all the sexual acts he initially demands and fails to secure her active participation in the assault. Luckenbill (1981) explained that for a robber to be successful he/she must convince the target that 1) he/she has the potential to harm the victim, that 2) he/she is serious about the threat of violence, but 3) that he/she is reasonable, and will only use violence when necessary. Towards the start of rape 2, Suspect 1 makes several demands of the victim to remove items of her clothing and to be actively involved in his assault on her. These demands were accompanied with threats of physical harm. However, the victim verbally refused to comply. Rather than

insisting that she comply, Suspect 1 either removed the items of clothing himself or he abandoned his course of action, moving onto a different request. In both scenarios, Suspect 1 fails to achieve his goal. By not fulfilling his threat and punishing the victim when she refuses to comply, he does not appear to be serious about his threats to harm her and thus she continues to refuse him.

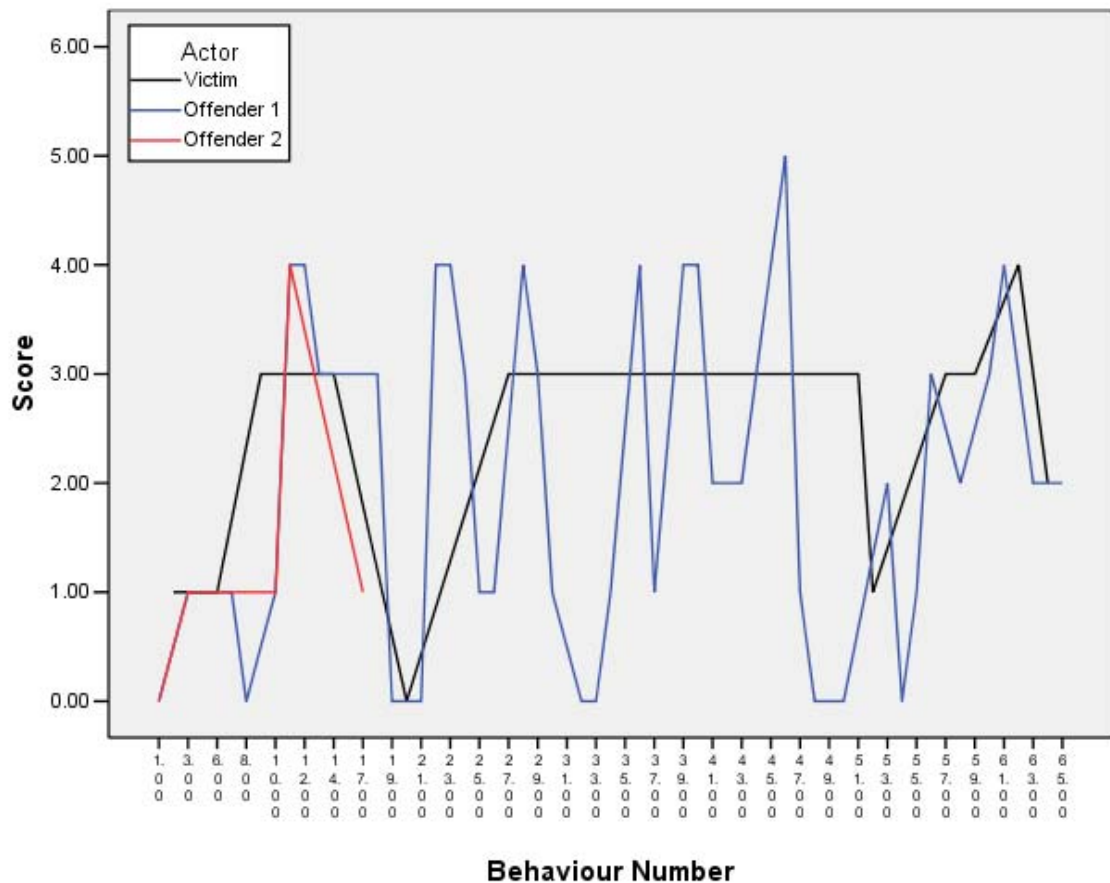


Figure 4F: The sequential occurrence of victim resistance and suspect aggression in rape 2.

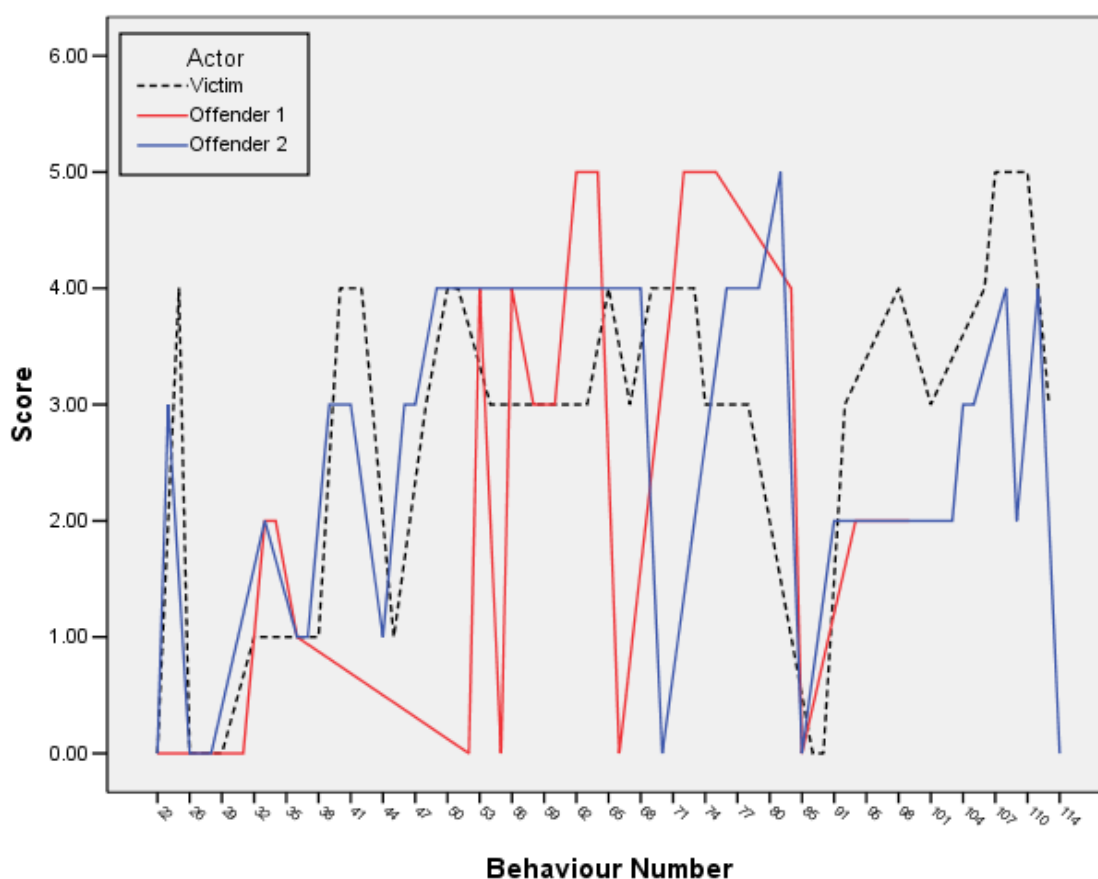


Figure 4G: The sequential occurrence of victim resistance and suspect aggression in rape 14.

In rape 14 (see Figure 4G) the victim persistently resists her attackers verbally and physically until witnesses arrive on the scene (at approximately behaviour 85 on the x-axis), momentarily disturbing the suspects. In this rape the suspects never threaten the victim with physical harm, instead using their superior strength to physically overcome her. This might explain why she persists in her resistance throughout the offence.

In summary, in section 4.1.3.1., the question was posed as to the nature of the relationship between suspect aggression and victim resistance. By preserving the temporal sequencing of suspect and victim behaviours, it has been possible to descriptively consider this question and the resulting patterns suggest that it is not a straightforward relationship. There was some indication that suspects increased their levels of aggression in response to victim resistance. In this situation, as suggested by Woodhams, Gillett and Grant (2007), aggression within group rape would serve an instrumental purpose. However, there were also occasions where aggression appeared

to be more expressive. In addition, whilst some suspects appeared to display either instrumental aggression *or* expressive aggression, others displayed both.

The data seemed to indicate that social psychological theories of aggression related to group dynamics, *and* related to the convergence of aggressively predisposed individuals were applicable to aggressive behaviour displayed in these events. Examination of the cases revealed some evidence of followers modelling the aggressive behaviour of leaders, whereas in other cases the levels of aggression shown by different offenders in the same offence seemed unrelated with one another. These findings suggest that no one theory can explain aggression in group rape or its relationship with victim resistance.

4.4.9. Comparing group rape by adults and juveniles

The sample described in this chapter constitutes group rapes committed by individuals that the law would class as adults, (aged 18 years or older), and some who would be classed as juveniles, (aged under 18 years). This allowed for investigation of differences between adult and juvenile group rapes. Past studies (e.g. Miranda & Corcoran, 2000) have reported differences between sexual assaults perpetrated by adult males and juvenile males, with juveniles being more likely to digitally penetrate their victims and adults being more likely to penetrate them with their penis. Woodhams (2004) also suggested that offenders might target different victims and display different offence behaviours (including aggressive behaviours) depending on their age. The final section of this chapter addresses this question by considering the findings of some statistical analyses comparing juvenile and adult perpetrated group rapes.

Thirteen of the 14 group rapes could be categorised as a juvenile or an adult perpetrated group rape. For one group rape the offenders' ages were not recorded in the police file and their ages were therefore unknown. The mean suspect age for each group was used as the means for categorisation. Four offences were juvenile group rapes and nine were adult group rapes.

The distributions of the variables 'victim age', 'victim resistance', and 'suspect aggression' were assessed by a Kolmogorov-Smirnov test for juvenile (victim age $Z=.86, p>.05$; resistance $Z=.88, p>.05$; aggression $Z=.50, p>.05$) and adult group rapes (victim age $Z=.54, p>.05$; aggression $Z=1.56, p<.05$; resistance $Z=1.09, p>.05$). All except adult group rape scores for aggression were not significantly different to a normal distribution. Independent samples t-tests were therefore used to determine if juvenile and adult group rapes differed significantly on victim age and victim resistance.

A Mann-Whitney U test was used for suspect aggression. Chi-square analyses were used to investigate the associations between juvenile/adult offence and the variables 'type of assault' (sequential vs. simultaneous), 'penile penetration' (yes vs. no) and 'digital penetration' (yes vs. no).

4.4.9.1. Victim Characteristics

Whilst the victims of juvenile group rapes were older ($M=30.25$ years, $SD=19.86$ years) than their adult suspect counterparts ($M=23.11$ years, $SD=7.77$ years), this difference was not significant and the effect size was small to medium ($t_{(11)}=.696$, $p>.05$, $d=0.47$). There was also no significant difference in the level of victim resistance in juvenile-perpetrated compared to adult-perpetrated rapes ($t_{(11)}=.422$, $p>.05$, $d=0.35$) which is unsurprising in light of the descriptive statistics (Juveniles: $M=4.50$, $SD=1.00$; Adults: $M=4.11$, $SD=1.69$). The effect size was again small to medium.

4.4.9.2. Suspect Characteristics

The descriptive statistics for aggression were also similar for juvenile and adult groups. The mean aggression score for juvenile groups was 5.00 ($Mdn = 5.00$; $SD=0.82$; Range =4.00-6.00) and the median for adult groups was 5.00 (Range=5.00-6.00). Unsurprisingly, there was no significant difference in suspect aggression between adult-perpetrated and juvenile-perpetrated rapes and the effect size was very small ($U=16.5$, $p>.05$, $r=0.09$). Although all juvenile offences were simultaneous in nature (100% compared to 67% of adults), Fisher's Exact test revealed there was no significant association between adult vs. juvenile rape and type of sexual assault (simultaneous vs. sequential) ($p>.05$, $\phi = .365$). However, the phi value is of a medium effect size (Pallant, 2007). Therefore, there is perhaps an association between type of offence and whether the suspects are adults or juveniles with juvenile suspects more likely to rape the victim simultaneously. With only one offence (adult-perpetrated) involving digital penetration and all involving penile penetration, no meaningful statistical analyses could be conducted.

4.4.9.3 Summary

The statistical findings suggest that at least with this small sample, the characteristics of juvenile group rapes and adult group rapes are similar. Effect size calculations suggested that there was a difference in the way group rapes are committed by adults and juveniles. Juveniles were more likely to rape the victim in the presence of their co-offenders. A further study with a larger dataset would be advisable to

determine whether differences such as those observed by Miranda and Corcoran (2000) exist between adult and juvenile perpetrators of group rape.

4.5. Chapter Conclusion

This study has added to the limited literature on the phenomenon of group rape. Most suspects were aged between 15 and 25 years, supporting previous reports that group rape is a predominantly adolescent crime (Amir, 1971). Examination of the victim accounts suggested that group rapes could unfold in one of two ways. Suspects either sexually assaulted the victim in the presence of co-offenders (simultaneously) or more privately and one at time (sequentially). The simultaneous group rape seemed more characteristic of juvenile groups, perhaps because the presence of the group in encouraging participation was necessary but less so for the adults. In relation to risk assessment and psychological intervention, previous research has suggested that group rapes would not have occurred without the presence of the leader (Blanchard, 1959). However, the question arises as to whether followers in simultaneous versus sequential group rapes differ in their level of risk. For example, followers in simultaneous group rapes might be less risky individuals in terms of future offending but individuals involved in sequential group rapes might be at greater risk of re-offending. The one series of group rapes reported in Chapter 2, a series involving two offenders, was sequential in nature. This is something that future research could investigate. The types and frequencies of victim and suspect behaviours recorded in the accounts of group rape were very similar to those found in Chapter 2, in a sample of serial and apparent non-serial sexual offences. This suggests that group rapes are not dissimilar to lone sexual assaults with regard to victim and suspect behaviour.

The research into role-taking in group rape was extended to investigate roles beyond 'leader' and 'follower'. Nine functional roles were identified. These share some similarities with roles reported in studies of other forms of criminal (Donald & Wilson, 1999) and antisocial behaviour (Salmivalli et al., 1996). Future research is required to determine if these generalise to other samples of group violence. The Scale of Influence (Porter & Alison, 2001) was applied to a new dataset with some success. A leader and follower(s) were identified in all but one offence. Leaders scored significantly higher on influence than followers. Porter and Alison's (2001) findings were therefore replicated. The Scale's performance at differentiating leaders from followers was compared to the application of pragmatics theory and identifying leaders

through their greater use of directives. Leaders were also found to utter significantly more directives than followers. At present, neither approach seems entirely accurate. The Scale of Influence may benefit from further development to consider the use of directives by suspects, and through replacing the binary coding of influence with a Likert-type scale. With regards to the adoption of other roles taken by those designated leaders and followers, leaders were significantly more likely to procure the victim for the group and a moderate effect size suggests that they might more often adopt the role of Director.

Factors related to aggression and resistance in group rape were investigated. Effect sizes suggested that victims of acquaintance rape resisted more than victims of stranger rape and that acquaintance group rapes were more aggressive than stranger group rapes. This latter finding contrasts with Koss et al.'s (1988) finding that stranger rapes were more violent than acquaintance rapes. Contrary to Block and Skogan's (1986) study, the presence of a weapon was suggested to increase victim resistance rather than decrease it. However, with all these findings it should be remembered that the small sample size means that conclusions are tentative (Walker & Madden, 2005). Although non-significant, a large effect size was associated with differences in victim resistance between offences where the victim was incapacitated with drugs/alcohol compared to when they were not. This is not surprising.

The moderate effect size for the comparison of simultaneous and sequential group rapes on victim resistance suggests that victim resistance was higher in sequential group rapes. In sequential group rapes one offender is assaulting the victim at a time and therefore it will be easier for the victim to resist the assault. Similarly, group rapes with more suspects were found to be less violent.

Weak to moderate relationships were found between suspect age and victim resistance and suspect aggression. The relationship between suspect age and victim resistance was negative, thus older suspects were associated with less victim resistance. Luckenbill (1981) noted how the victim's appraisal of the suspect can affect their resistance in an offence. Older suspects might be appraised as a more threatening attacker than younger suspects and therefore victims of older suspects may choose to limit their resistance. The relationship between suspect aggression and suspect age was positive with older suspects using more aggression. This is similar to past research with juvenile stranger sex offenders which found older suspects to be associated with more violent offences (Woodhams, 2004). However, it is important to note that for some

offences, offender age was estimated rather than known as the offence had not been solved. As with previous research (Woodhams, 2004), no evidence of a relationship between victim age and suspect aggression was found. This was also the case for the relationship between victim age and victim resistance.

No evidence was found of a relationship between victim resistance and suspect aggression. This finding contrasts with Prentky, et al. (1986) who found a relationship between victim resistance and offender violence and Bachman and Carmody (1994) and Block and Skogan (1986) who found victim resistance to be associated with greater risk of injury (suggesting greater violence by the offender(s)). This contradictory finding might result from combining various types of suspect aggression within the one score. If physical and sexual aggression had been separated out the findings might be different.

The temporal examination of suspect aggression and victim resistance suggested that all social psychological explanations of violent group behaviour mentioned in this thesis were valid. Evidence was found that was suggestive of the modelling of violent behaviour, of group dynamics, and of violence being instrumental in reaction to victim resistance. With regards to what this means for risk assessment, identifying treatment needs, and proactive policing, it suggests that these issues will need to be considered on a case-by-case basis rather than there being a general theory which would apply to all cases of group rape.

The temporal examination also revealed some interesting findings in relation to the use of victim resistance. As reported in Luckenbill's (1981) study of robbery, victims appeared to continue or discontinue their use of resistance depending on their assessment of the suspect. The temporal analysis suggested that where suspects did not fulfil their conditional threats to harm the victim the victim continued in her use of resistance. As explained by Luckenbill, if a victim does not believe an offender is serious in his threat, he/she will not comply.

Whilst the study's findings have implications for theories of group violence, and for understanding and intervening with group rape, there were a number of limitations. Of most importance was the small sample size. This undoubtedly affected the power of statistical analyses and limits the generalisability of the findings. That group rapes in just one police force were sampled would also limit the generalisability of the findings.

A combined approach to measuring aggression was adopted since forced sexual behaviour in rape has been argued as not necessarily related to sexual desire but instead related to power or the expression of anger (Groth, 1979) with studies supporting this

with, at least, some offenders (Salfati & Taylor, 2006). In this way sexual aggression is similar to physical and verbal aggression. However, the combined measurement of physical, sexual and verbal aggression may have clouded the findings in that different patterns might be observed for the different types of aggression.

In drawing any conclusions, it should be considered that the sources of information used in this study are victim accounts and that victim accounts are secondary records of what actually occurred during a sexual assault. The limitations associated with using victim accounts as a data source are considered in more detail in Chapter 5.

CHAPTER FIVE

THESIS CONCLUSION

This thesis has attempted to advance our understanding of juvenile sexual offending, to improve the empirical research on this topic through methodological modifications, and to generate findings that would be of practical use to those employed within the criminal justice system.

Chapter 1 critically reviewed and summarised the literature on risk factors for juvenile violent and sexual offending and their persistence. Differences in pathways to offending and offence characteristics for different types of juvenile sex offender were identified. The limited previous literature on juvenile stranger sex offending was explored.

In Chapter 2, whether juvenile stranger sex offenders would show behavioural consistency in their series was investigated. Although the mean Jaccard's coefficient for linked crime pairs did not approach what we would expect for perfect consistency (i.e. a score of 1.0), the sample did show a degree of behavioural consistency. The thesis has therefore contributed to the empirical literature that has tested psychological theories of behavioural consistency, suggesting that some behavioural consistency is observed in this form of juvenile criminal behaviour. A significant difference was found in behavioural similarity when comparing linked crime pairs and unlinked crime pairs. This finding provides further empirical support for the assumptions of behavioural consistency and behavioural distinctiveness which underlie the practice of case linkage. By finding further support for its underlying assumptions, the thesis has contributed to addressing the Daubert criteria for the acceptance of case linkage testimony in legal proceedings (Woodhams, Hollin & Bull, 2007).

As was suggested with non-criminal behaviour in Personality Psychology, variation in the degree of consistency was found depending on the type of behaviour being measured. Significant differences in behavioural similarity were observed between linked and unlinked crime pairs for the domains of Control, Escape and Sex behaviours, but not for the Style behavioural domain. This adds to the empirical research using other crime types which has also shown variation in behavioural consistency between domains (Bennell & Canter, 2002; Bennell & Jones, 2005; Grubin, et al., 2001; Tonkin et al., 2008; Woodhams & Toye, 2007).

The degree of behavioural consistency and distinctiveness in juvenile serial stranger sex offending was sufficient for linked crime pairs to be distinguished from unlinked crime pairs. Using behaviours from all domains (Escape, Control, Sex and Style) this could be achieved with an acceptable level of predictive accuracy. However, predictive accuracy improved considerably when the Style behaviours were not included in the analysis. Using behavioural similarity in Escape, Control and Sex behaviours combined an excellent level of predictive accuracy was achieved. An even higher degree of predictive accuracy could be achieved using inter-crime distance as a single predictor. However, as was outlined in section 2.5, it is suspected that the methodology and sample inflated the performance of this predictor and therefore it needs further investigation before one would want to prioritise inter-crime distance over other predictors in linking crimes. That similarity in Escape, Control and Sex behaviours combined produced an excellent level of predictive accuracy contradicts claims by some researchers that modus operandi variables are unhelpful in linking crimes (Goodwill & Alison, 2006). The study reported in Chapter 2 was the first to consider whether juvenile serial crime could be accurately linked through behaviour. It thus makes an important contribution to the practice of case linkage.

Personality psychologists have argued that when investigating behavioural consistency the situation in which a behaviour is displayed should be considered. This has been conceptualised as ‘if(situation)-then(behaviour)’ contingencies. In Chapter 2, preliminary investigations were conducted to determine whether linguistic software could be used to identify relevant contingencies. This was trialled with the three most common victim behaviours and the software was successfully used to create if-then contingencies for juvenile stranger sex offences. Descriptive statistics suggested that consistency was observed in if-then contingencies but only within the same offence rather than across a series. Personality psychologists have also demonstrated a relationship between behavioural consistency and situational similarity. Situational similarity was measured in terms of victim behavioural themes. However, no such relationship was observed for situational similarity and behavioural consistency as measured by Jaccard’s coefficients for linked crime pairs.

Some methodological questions were investigated in Chapter 2. These related to the methodologies used by researchers in prior studies of linking crimes. The results of various analyses suggested that it was more robust to compare linked crime pairs with a set of unlinked crime pairs that are not created from the serial offences. However, this

finding needs to be weighed against the time-consuming nature of collecting a matched sample of non-serial offences to form the unlinked crime pairs. The exclusion of rare and frequent offender behaviours from the analyses slightly improved the predictive accuracy of behavioural consistency for all domains, suggesting that future researchers may wish to follow this method. Finally, the inclusion of offences by multiple offenders in the analyses made little difference to predictive accuracy. This implies it is not problematic to conduct linkage analysis studies with offences committed by both lone and multiple offenders in the sample.

The focus of Chapter 3 was investigative risk assessment and ways in which crime analysts might prioritise offences for analysis. Two rationales were tested for their utility. These were the rationale that the Police would want to prioritise offences where the offender appeared to be at risk of escalating in their use of aggression towards their victims, and the rationale that the Police would want to prioritise offences that appeared to be the work of serial offenders. In relation to escalation of aggression, a minority of juvenile stranger serial sex offenders increased in their use of aggression across their series. These offenders were labelled “increasers”. Few differences emerged from the data to distinguish the offences of increasers and non-increasers. Effect sizes gave some indication that increasers might more likely be of non-White ethnicity and were more likely to show concern for the victim’s welfare or comfort and assault an older victim in their first (known) offence. By re-visiting the offence narratives for the 13 serial offenders it was suggested that escalation in use of aggression might be associated with a) growing confidence, and b) learning from past offences where victims had been resistant.

The small available sample size limited the investigation of what types of offence behaviour characterised offences occurring later in a series. Only two offenders in the available sample had committed more than five offences. Although some patterns emerged which suggested that some types of offence behaviours were more frequent later in the two series, no recommendations could be made for practice due to the small sample size.

Whilst little was found to assist in the prioritisation of offences on the basis of risk of aggression escalation or on the likelihood that crimes were committed by a serial offender, high behavioural similarity between a pair of offences, as found in Chapter 2, could be used to prioritise offences for further investigation. Attempts have been made by the author to put similar findings for robbery into practice. She was asked by a large

metropolitan police force to assist in creating an offence prioritisation system for unsolved robberies which calculated Jaccard's coefficients between each crime pair in the database so that they could be rank ordered. Other researchers have empirically tested similar systems (e.g. Goodwill & Alison, 2006; Yokota et al., 2007). Such attempts are only likely to be successful, however, if the information going into the linkage system is sufficiently detailed.

Chapter 4 of the thesis investigated the applicability of social psychological theories of group violence to the phenomenon of group rape by examining temporal patterns of offender aggression and victim resistance. Temporal patterns emerged which suggested that both the theories of group dynamics and social convergence could contribute to explaining the emergence of offender aggression in group sexual offences. Evidence was also found suggesting that aggression in this context could be both unrelated (and thus expressive in nature) and related to victim resistance (and thus instrumental in nature). Two different types of group rape were identified in the data. These were simultaneous and sequential group rapes. All group rapes committed by juveniles in the dataset were simultaneous in nature. This may suggest that theories of group dynamics might be more relevant to aggression committed by juvenile group rapists than adults.

With regards to associations between victim and suspect characteristics and suspect aggression and victim resistance, a moderate positive relationship was found for suspect age and aggression, mirroring previous studies that have found older suspects to be reportedly more violent (Woodhams, 2004). A moderate negative relationship was found for number of suspects and suspect aggression, suggesting the group rapes involving fewer suspects were characterised by more aggression towards the victim.

The group rapes were qualitatively analysed to identify functional roles that the offenders played. Nine roles were identified. These were Procurer, Assaulter, Look-Out, Director, Passive Observer, Defender, Heavy, Facilitator and Disposer. These roles shared similarities with those identified in studies of organised crime (Donald & Wilson, 1999; McCluskey & Wardle, 1999) and bullying (Salmivalli et al., 1996). Future research could investigate whether serial group rapists show consistency in the roles they adopt.

In addition, whether a clear leader emerged in each group was investigated using Porter and Alison's (2001) Scale of Influence. A clear leader emerged in nearly all of the group rapes. As Porter and Alison (2001) found, leaders scored significantly higher

than followers on the Scale of Influence. An alternative method of identifying the leader in a group rape was trialled; that of quantifying each group member's use of directives. It was hypothesised that leaders would utter significantly more directives than followers. This was confirmed with a significant result and a large effect size. Leaders were also found to significantly more often adopt the role of procurer; procuring the victim for the group. The two approaches to identifying leaders in group rape were in agreement the majority of the time, however this agreement was not perfect. It was suggested in Chapter 4 that Porter and Alison's (2001) Scale of Influence might warrant further development.

Qualitative analyses conducted in both Chapter 2 and Chapter 4 identified a considerable number of different victim and offender behaviours. With regards to offender behaviours, prior studies have identified the themes of hostility, dominance, and co-operation in group rapes (e.g. Porter & Alison, 2004). Evidence had not previously been found of offenders displaying behaviours that would be characterised as submissive. Evidence suggestive of all four themes was however found in the study of group rape reported in Chapter 4. Considerable similarity was found in the ten most common victim behaviours reported in lone and group sexual assaults. Although the ranking was not identical, nine of the ten most common victim behaviours observed in Chapter 2 were also observed in the top ten most common victim behaviours in Chapter 4. These findings suggest some similarities in the ways victims behave in sexual offences committed by single and multiple offenders.

The research reported in the thesis has implications beyond police practice. The reported frequencies of victim behaviour in Chapters 2 and 4, and the findings in Chapter 4 which relate to reactions of victims to suspect aggression, would be relevant to expert testimony as to behaviour typical of victims during both lone and group sexual assaults. As noted previously, proposals have been considered by the British Government to allow such testimony (Office for Criminal Justice Reform, 2006). These findings might also inform victim counselling, reassuring victims that their reactions were typical. This might be of particular importance considering the myths of a physically resistant rape victim perpetuated by the media (Los & Chamard, 1997) and the selective prosecution of cases within the Criminal Justice System (Fisher et al., 2003; Harris & Grace, 1999). Such findings might also be used to inform those working within the Criminal Justice System.

Despite the advancements made in our understanding of victim and offender behaviour in juvenile sexual offences in the thesis, there are important limitations of the data that need to be recognised. Chapters 2 to 4 all used victim accounts of sexual offences as their data source. By sampling victim allegations to the police it is quite likely that successful examples of victim resistance will be underrepresented in the sample. Such offences are less likely to be reported to the Police (Block & Skogan, 1986). In Chapters 2 and 3 the victims' allegations had been corroborated by a conviction but in Chapter 4 these remained allegations and were unsolved. It could therefore be argued that false allegations might have been included in the analyses in Chapter 4. This is a possibility, however the occurrence of false allegations of sexual assault in reality is very low indeed (Feist et al., 2007; Woodhams & Grant, 2004). In addition, it may be quite difficult for a victim to recall accurately the exact order of behaviours during a sexual assault. This is problematic for some of the analyses reported in Chapter 2 and 4 which rely on accurate temporal ordering of behaviours. As outlined in earlier chapters, victim accounts may suffer from omissions and distortions. However, for the analyses in Chapter 2, these would add noise to the data, reducing the likelihood of finding relationships. The only alternative source of information for what occurs in a sexual assault would be the account of the offender(s). Yet, offender accounts can be just as problematic for the same reasons (Ahlmeyer et al., 2000; Groth & Lorendo, 1981) and potentially more so since the time delay between the event and its recall by a victim in a police interview would be less than would be the case with a convicted offender's account. There is also the consideration of ensuring the findings of the research are relevant and familiar to the user (Canter, 2004). Crime analysts and police officers use victim accounts as the primary source of information about what happened in an offence. In summary, whilst for some reasons it is desirable to use victim accounts as the data for analyses, it is still important to be mindful of their limitations.

In conclusion, the thesis can be considered successful in advancing our understanding of juvenile sex offenders from an investigative perspective. In relation to the future for research in this area, there are several unanswered questions that require investigation. These have been identified at the end of each chapter. Furthermore, the new studies which form this thesis warrant replication. The difficulties of conducting empirical research with police data have been outlined by past authors (Canter & Alison, 2003) with Jordan (2004, p. 34) noting it to be a "protracted and difficult

undertaking”. Conducting research with police data was in this case, and will continue to be, a time consuming process, however the use of such data ensures that the findings produced by applied, real-life research are of relevance, not only to academia, but to practitioners and to victims of crime.

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APPENDICES

Appendix 1: Narrative Proforma

Behaviour Number	Stage (1-5)	Actor	Event Description	Thematic Analysis Code
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Appendix 2: Frequency of Offence Behaviour Checklist Items within the Total Offender Dataset and Broken Down into the Subgroups of Serial and Non-Serial Matched Offenders.

Behaviour	Definition	Serial Offenders		Non-Serial	All Offenders	
		% of offences (n=39)	% of offenders (n=13)	% of offences (n=39)	% of offences (n=78)	% of offenders (n=52)
1. On Foot	Offender was on-foot.	89.7	92.3	64.1	76.9	71.2
2. Outdoor	Offender sexually assaults victim outdoors.	87.2	92.3	69.2	78.2	75.0
3. Surprise	Offender approached the victim suddenly and without any verbal interaction.	59.0	69.2	59.0	59.0	61.5
4. Stalks	Offender follows, surveils or watches victim.	46.2	76.9	46.2	46.2	53.8
5. Location – force	Offender moves the victim’s location using force or the threat of force.	38.5	76.9	53.8	46.2	59.6
6. Depart Quick	Offender departs the scene quickly.	41.0	61.5	48.7	44.9	51.9
7. Breast	Offender touches or kisses the victim’s breast or chest area.	56.4	69.2	30.8	43.6	40.4
8. Grab	Offender grabs the victim with the purpose of controlling her.	41.0	61.5	43.6	42.3	48.1
9. Con	Offender approached the victim using verbal interaction.	41.0	69.2	41.0	41.0	48.1
10. Positions	Offender forces the victim into a desired position.	25.6	38.5	51.3	38.5	48.1

11. Undresses Victim	Offender undresses the victim or interferes with her clothing.	25.6	61.5	51.3	38.5	53.8
12. Reassures	Offender reassures the victim: includes minimisation and commitments.	38.5	84.6	30.8	34.6	44.2
13. Direct Sexual	Offender directs the victim to perform a sexual behaviour.	30.8	69.2	35.9	33.3	44.2
14. Undresses self	Offender undresses himself.	20.5	53.8	43.6	32.1	46.2
15. Restrain Body	Offender uses his body weight to restrain the victim.	20.5	30.8	43.6	32.1	40.4
16. Departs Calmly	Offender calmly departs scene.	28.2	46.2	33.3	30.8	36.5
17. Conditional Threat	Offender implies his aggression is conditional on the victim's behaviour.	28.2	53.8	33.3	30.8	38.5
18. Kiss	Offender tries to kiss or does kiss the victim's face or neck.	25.6	61.5	35.9	30.8	42.3
19. Weapon	Offender implies having or has a weapon in his possession.	25.6	53.8	28.2	26.9	34.6
20. Discloses Intent	Offender discloses his intentions for subsequent behaviours.	20.5	53.8	30.8	25.6	36.5
21. Indoor	Offender sexually assaults the victim indoors.	17.9	38.5	30.8	24.4	32.7
22. Question – Personal	Offender asks victim for personal information.	20.5	30.8	25.6	23.1	26.9

23.	Instrumental violence	Offender is violent towards the victim to control her.	20.5	30.8	25.6	23.1	26.9
24.	Ceases – Put Off	Offender stops assault as he is put off by something other than the victim.	15.4	30.8	28.2	21.8	28.8
25.	Touch Vaginal	Offender touches victim's vaginal area.	12.8	30.8	30.8	21.8	30.8
26.	Physical Threat	Offender physically threatens the victim.	12.8	30.8	30.8	21.8	30.8
27.	Property	Offender takes the victim's property.	15.4	30.8	25.6	20.5	26.9
28.	Requests Help	Offender requests assistance from the victim.	20.5	46.2	20.5	20.5	26.9
29.	Disclose Personal	Offender discloses personal characteristics/information to the victim.	15.4	30.8	25.6	20.5	26.9
30.	Attracts Attention	Offender tries to attract the victim's attention.	12.8	38.5	25.6	19.2	28.8
31.	Ceases Resistance	Offender gives up trying to assault the victim due to resistance.	20.5	30.8	17.9	19.2	21.2
32.	Gag Hand	Offender gags the victim with his hand/arm.	15.4	46.2	20.5	17.9	26.9
33.	Direct Quiet	Offender directs the victim to be quiet.	15.4	38.5	20.5	17.9	25.0
34.	Direct Position	Offender directs the victim to position herself in a particular way.	17.9	46.2	15.4	16.7	23.1
35.	Direct Non-Sexual	Offender directs the victim/witness to engage in a non-sexual behaviour.	5.1	15.4	25.6	15.4	23.1
36.	Pursues	Offender pursues the victim in a concerted manner.	10.3	30.8	20.5	15.4	23.1

37.	Question – Sexual	Offender asks victim sexual question (not about enjoyment/arousal).	17.9	30.8	12.8	15.4	17.3
38.	Blocks Escape	Offender blocks escape of victim.	17.9	38.5	10.3	14.1	17.3
39.	Expressive Violence	Offender is spontaneously violent towards the victim..	10.3	23.1	17.9	14.1	19.2
40.	Erection	Offender has an erection.	10.3	30.8	17.9	14.1	21.2
41.	Re-Dressed	Offender redressed himself.	10.3	23.1	15.4	12.8	17.3
42.	Verbal Threat	Offender implies he will use physical violence (unconditional).	10.3	30.8	15.4	12.8	19.2
43.	Penile Vag. Pen	Offender attempts or penetrates the victim's vagina with his penis.	12.8	38.5	12.8	12.8	19.2
44.	Restrains Arms	Offender restrains victim's arms or hands.	12.8	38.5	12.8	12.8	19.2
45.	Releases	Offender releases the victim.	7.7	15.4	17.9	12.8	17.3
46.	Offers Assistance	Offender offers to assist the victim or does assist her.	12.8	30.8	12.8	12.8	17.3
47.	Fellatio	Offender forces victim or attempts to force victim to perform fellatio.	5.1	23.1	20.5	12.8	21.2
48.	Intrudes	Offender intrudes into the victim's house.	10.3	15.4	12.8	11.5	13.5
49.	Hug	Offender hugged the victim (not for restraint).	10.3	30.8	12.8	11.5	17.3
50.	Ejaculation	Offender ejaculates.	10.3	38.5	12.8	11.5	19.2

51. Disclose Intimate	Offender discloses something intimate to the victim.	7.7	23.1	12.8	10.3	15.4
52. Don't Report	Offender directs victim not to report the assault.	5.1	23.1	15.4	10.3	17.3
53. Touch Bottom	Offender touches victim's buttocks or bottom area.	12.8	30.8	5.1	9.0	11.5
54. Direct Undress	Offender directs the victim to undress.	7.7	23.1	10.3	9.0	13.5
55. Concern	Offender shows concern for victim's comfort/security or safety.	12.8	23.1	5.1	9.0	9.6
56. Digital Vag. Pen	Offender digitally penetrates the victim's vagina.	2.6	7.7	12.8	7.7	11.5
57. Touch Penis	Offender forces victim to touch his penis/masturbate him.	5.1	15.4	10.3	7.7	11.5
58. Contradicts	Offender contradicts or argues with victim.	2.6	7.7	12.8	7.7	11.5
59. Apologies	Offender apologises to the victim.	5.1	15.4	10.3	7.7	11.5
60. Clean	Offender concerned with cleaning away semen.	7.7	15.4	7.7	7.7	9.6
61. Direct Stay	Offender directs victim to stay put.	7.7	23.1	7.7	7.7	11.5
62. Exposure	Offender exposes his penis (not for purposes of further sexual assault).	5.1	15.4	10.3	7.7	11.5
63. Compliment	Offender compliments victim.	5.1	7.7	10.3	7.7	9.6
64. Negotiation	Offender tries to or does negotiate with the victim.	2.6	7.7	12.8	7.7	11.5
65. Arousal	Offender refers to victim's arousal or enjoyment of sexual acts.	10.3	30.8	5.1	7.7	11.5
66. Penile Anal Pen.	Offender attempts or penetrates the victim's anus with his penis.	7.7	23.1	5.1	6.4	9.6

67. Extends Time	Offender doesn't quit the scene but stays in the vicinity unnecessarily.	12.8	30.8	0	6.4	7.7
68. Refuses Request	Offender refuses victim's request	2.6	15.4	10.3	6.4	11.5
69. Ignores Request	Offender ignores victim's request	0	0	12.8	6.4	9.6
70. Location – Con	Offender moves the victim's location through a con.	10.3	38.5	2.6	6.4	11.5
71. Blindfold	Offender blindfolds victim with an item.	10.3	30.8	2.6	6.4	9.6
72. Complies	Offender complies with victim's directive.	0	0	12.8	6.4	9.6
73. Self Mast Hand	Offender masturbates himself with his hand.	5.1	15.4	7.7	6.4	9.6
74. Direct Don't Look	Offender directs the victim not to look at him.	10.3	30.8	2.6	6.4	9.6
75. Hiding	Offender hides himself from the victim/others.	5.1	23.1	7.7	6.4	11.5
76. Mocked	Offender laughed at/mockered the victim.	2.6	15.4	5.1	5.1	7.7
77. Verbal Abuse	Offender swears at the victim or verbally abuses her.	2.6	7.7	7.7	5.1	7.7
78. Disclose Criminal	Offender discloses his criminal behaviour to the victim.	2.6	7.7	7.7	5.1	7.7
79. Lying	Offender communicates that he believes the victim is lying.	5.1	23.1	5.1	5.1	9.6

80.	Invitation	Offender invites the victim to go somewhere with him at a later date.	2.6	7.7	7.7	5.1	7.7
81.	Rips Clothes	Offender intentionally rips victim's clothing.	5.1	15.4	5.1	5.1	7.7
82.	Direct Co-Offender	Offender directs the behaviour of his co-offender.	5.1	7.7	5.1	5.1	5.8
83.	Returns Property	Offender returns taken property taken/or where has stolen other items.	5.1	7.7	5.1	5.1	5.8
84.	Erectile Dysfunction	Offender has difficulty gaining or maintaining an erection.	2.6	7.7	7.7	5.1	7.7
85.	Forces Entrance	Offender forces his way into a building/room.	5.1	7.7	5.1	5.1	5.8
86.	Excuses	Offender excuses/justifies his actions.	2.6	7.7	5.1	3.8	5.8
87.	Removes Blindfold	Offender removes blindfold/hands from victim's eyes	2.6	7.7	5.1	3.8	5.8
88.	Disguise	Offender tries to disguise his features from the victim.	2.6	7.7	5.1	3.8	5.8
89.	Refuses Answer	Offender refuses to answer victim's question.	2.6	7.7	5.1	3.8	5.8
90.	Direct Resist	Offender directs the victim to stop physically resisting	2.6	7.7	5.1	3.8	5.8
91.	Question - Security	Offender asks victim question to ensure his security/escape.	5.1	15.4	2.6	3.8	5.8
92.	Expresses Shock	Offender expresses his shock.	7.7	23.1	0	3.8	5.8

93. Sits	Offender sits/lies next to victim.	2.6	7.7	5.1	3.8	5.8
94. Simulated Intercourse	Offender simulated intercourse with victim.	2.6	7.7	5.1	3.8	5.8
95. Broke In	Offender broke into the victim's house.	0	0	7.7	3.8	5.8
96. Bicycle	Offender was on a bicycle.	2.6	7.7	5.1	3.8	5.8
97. Pushes Past	Offender pushes past the victim.	0	0	5.1	2.6	3.8
98. Touch Stomach	Offender touched victim's stomach area.	0	0	5.1	2.6	3.8
99. Direct Re-dress	Offender directed the victim to redress.	0	0	5.1	2.6	3.8
100. Binding	Offender restrains victim using binding.	2.6	7.7	2.6	2.6	3.9
101. Gloves	Offender was wearing gloves.	2.6	7.7	2.6	2.6	3.8
102. Offenders Argued	Offenders argued with one another.	5.1	7.7	0	2.6	1.9
103. Seen Before	Offender implies he's seen victim before.	2.6	15.4	2.6	2.6	5.8
104. Allows Action	Offender allows the victim/witness to engage in a behaviour.	5.1	23.1	0	2.6	5.8
105. Blindfold Hand	Offender blindfolds the victim using his hands.	2.6	7.7	2.6	2.6	3.8
106. Takes Weapon	Offender tries to take weapon from victim	2.6	7.7	2.6	2.6	3.8
107. Provokes	Offender tries to provoke the victim into action.	5.1	7.7	0	2.6	1.9
108. Innocence	Offender protests his innocence.	2.6	7.7	2.6	2.6	3.8

109. Self Mast Feet	Offender masturbates himself using the victim's feet.	5.1	7.7	0	2.6	1.9
110. Lies - Self Image	Offender lies to protect his self image.	5.1	15.4	0	2.6	3.8
111. Self Mast Breasts	Offender masturbates himself using victim's breasts.	0	0	5.1	2.6	3.8
112. Complies with Co-Off	Offender complies with co-offender's wishes.	2.6	7.7	2.6	2.6	3.8
113. Clarification	Offender seeks clarification from the victim about what she means.	2.6	15.4	0	1.3	3.8
114. Demonstrates	Offender demonstrates to the victim the act he wants her to perform.	2.6	15.4	0	1.3	3.8
115. Scripting	Offender forces victim to say specific phrases.	2.6	15.4	0	1.3	3.8
116. Digital Pen. NK	Offender attempts or digitally penetrates the victim (orifice unknown).	2.6	15.4	0	1.3	3.8
117. Prevents Look	Offender restrains victim in a manner so she can't see him.	2.6	7.7	0	1.3	1.9
118. Car	Offender uses a car.	2.6	7.7	0	1.3	1.9
119. Lie Upset	Offender tells the victim lies to upset her.	2.6	7.7	0	1.3	1.9
120. Styled Hair	Offender styled victim's hair.	2.6	7.7	0	1.3	1.9
121. Plan	Co-offenders develop plan together.	2.6	7.7	0	1.3	1.9
122. Lie – Protect Identity	Offender tells victim lies to protect identity.	2.6	7.7	0	1.3	1.9

123. Personal Q Co-Off	Offender asks co-offender a personal question.	2.6	7.7	0	1.3	1.9
124. Return Home	Offender returns victim home.	2.6	7.7	0	1.3	1.9
125. Can't Help	Offender indicates he can't help the victim.	2.6	7.7	0	1.3	1.9
126. Fulfilled Promise	Offender reminded victim he'd fulfilled his promise.	2.6	7.7	0	1.3	1.9
127. Urinates	Offender urinated.	2.6	7.7	0	1.3	1.9
128. Look Out	Offender acts as look-out.	2.6	7.7	0	1.3	1.9
129. Feet	Offender caressed or kissed victim's feet.	2.6	7.7	0	1.3	1.9
130. Sexual Noises	Offender makes sexual noises at the victim.	2.6	7.7	0	1.3	1.9
131. Hold Hand	Offender holds the victim's hand.	0	0	2.6	1.3	1.9
132. Complain	Offender complains to the victim.	0	0	2.6	1.3	1.9
133. Cut Wires	Offender cut the telephone wires.	0	0	2.6	1.3	1.9
134. Minimises Actions	Offender minimises his actions (but doesn't justify them).	0	0	2.6	1.3	1.9
135. Fingerprints	Offender wipes for fingerprints.	0	0	2.6	1.3	1.9
136. Leaves Weapon	Offender leaves weapon behind on purpose.	0	0	2.6	1.3	1.9
137. Offers Gift	Offender offers the victim something.	0	0	2.6	1.3	1.9
138. Gag	Offender gags the victim with an object (not with hand).	0	0	2.6	1.3	1.9
139. Accepts Guilt	Offender recognises the seriousness of his behaviour.	0	0	2.6	1.3	1.9
140. Removes Gag	Offender removes the victim's gag.	0	0	2.6	1.3	1.9

141. Touched Leg	Offender touched victim's leg or thigh	0	0	2.6	1.3	1.9
142. Cunnilingus	Offender performed oral sex on the victim.	0	0	2.6	1.3	1.9
143. Alcohol	Offender consumed alcohol with victim.	0	0	2.6	1.3	1.9
144. Drugs	Offender consumed drugs with victim.	0	0	2.6	1.3	1.9
145. Observed	Offenders observed the sexual assault.	0	0	2.6	1.3	1.9
146. Spits	Offender spits at the victim.	0	0	2.6	1.3	1.9
147. Criticises	Offender criticises victim.	0	0	2.6	1.3	1.9
148. Educates	Offender educates the victim on a topic.	0	0	2.6	1.3	1.9

Appendix 3: Frequency of Victim Behaviour Checklist Items within the Total Dataset and Broken Down into the Subgroups of Serial and Non-Serial Matched Cases.

Behaviour	Definition	Serial Offences % of offences (n=39)	Non-Serial Offences % of offences (n=39)	All Offences % of offences (n=78)
1. Struggles	Victim physically struggled with the suspect. This includes trying to shake the suspect off and pushing them away.	56.4	59.0	57.7
2. Gives an order.	Victim gives the suspect an order.	35.9	43.6	39.7
3. Seeks help verbally from witnesses	Victim verbally tries to get help from witnesses.	30.8	48.7	39.7
4. Obeys wishes	Victim complies with the suspect's wishes and either engages in or stops a behaviour.	33.3	30.8	32.1
5. Walks/cycles away	Victim walks, cycles away from the suspect.	35.9	23.1	29.5
6. Directly declines	Victim directly declines the suspect's offer, request or suggestion (can also involve a degree of justifying her behaviour but this would be coded separately).	20.5	30.8	25.6
7. Runs away	Victim runs away from the suspect. Not the same as running towards people specifically to get help as this would be physical help-seeking.	23.1	25.6	24.4
8. Truthful response to personal question	Victim discloses something about herself after the suspect has asked her a question. (Often minimal information is given perhaps related to politeness but protecting self).	23.1	25.6	24.4
9. Justifies behaviour	Victim explains or justifies her verbal or physical behaviour to the suspect.	23.1	20.5	21.8
10. Requests behaviour from suspect	Victim requests something of the suspect.	17.9	20.5	19.2

11.	Moves away	Victim tries to put distance between herself and the suspect by moving away from him.	15.4	20.5	17.9
12.	Turns around	Victim tries to or does turn around to see who is behind her.	20.5	15.4	17.9
13.	Kicks	Victim kicks or tries to kick the suspect.	7.7	25.6	16.7
14.	Cries	Victim cries.	12.8	20.5	16.7
15.	Less vulnerable positioning.	Victim moves her body into a position where she is able to be more mobile and less vulnerable.	7.7	25.6	16.7
16.	Punches	Victim punches or tries to punch the suspect.	12.8	12.8	12.8
17.	Confronts suspect.	Victim confronts the suspect about his behaviour indicating that it is inappropriate.	12.8	10.3	11.5
18.	Indicates can't help	Victim informs the suspect that she can't help him.	10.3	12.8	11.5
19.	Physical non-compliance.	Victim does not comply with the suspect's demands.	5.1	17.9	11.5
20.	Re-dress/cover self	Victim tries to redress herself or cover herself.	7.7	12.8	10.3
21.	Queries intentions	Victim queries the suspect's intentions.	7.7	12.8	10.3
22.	Seeks clarification	Victim seeks to clarify what the suspect has said sometimes because they think they have misheard them.	5.1	12.8	9.0
23.	Asks personal question	Victim asks the suspect a personal question about himself.	12.8	5.1	9.0
24.	Makes assurances that won't report.	Victim assures the suspect that she won't report the offence.	7.7	10.3	9.0
25.	Says farewell to suspect/signals end of conversation.	Victim attempts to end the conversation or expresses her intention to leave the suspect, either way signalling an end to their interaction.	7.7	10.3	9.0
26.	Comments on a conversational topic	Victim comments on a neutral conversational topic either initiating or maintaining a neutral conversation.	2.6	12.8	7.7
27.	Physical help-seeking	Victim tries to get help from witnesses through physical means.	7.7	7.7	7.7

28.	Name calling	Victim calls the suspect a name or swears at him.	10.3	5.1	7.7
29.	Freezes	Victim reports freezing and being unable to act.	5.1	10.3	7.7
30.	Pursues/prevents escape	Victim pursues the suspect and/or prevents his escape.	7.7	5.1	6.4
31.	Refuses to speak	Victim does not speak in a situation where she might be expected to respond verbally	5.1	7.7	6.4
32.	False disclosure after question	Victim gives false personal information about herself after the suspect has asked her a question. This is not the same as the victim pretending she can't comply with the suspect's wishes as the focus is on personal information about the victim	10.3	2.6	6.4
33.	Vague disclosure	Victim answers suspect's question in a deliberately vague manner.	5.1	7.7	6.4
34.	Moves to let pass	Victim moved to let the suspect pass by her.	7.7	2.6	5.1
35.	Helps suspect.	Victim helps the suspect.	5.1	5.1	5.1
36.	Stays still	Victim doesn't move but isn't frozen. She is not resisting the suspect.	5.1	5.1	5.1
37.	Hits/slaps (with open hand)	Victim hits/slaps suspect with her open hand.	5.1	5.1	5.1
38.	Takes weapon	Victim takes or tries to take the suspect's weapon away from him.	5.1	5.1	5.1
39.	Throws weapon away.	Victim throws the suspect's weapon a distance away.	5.1	5.1	5.1
40.	Promise reminder	Victim reminds the suspect of what he promised her earlier.	5.1	5.1	5.1
41.	Requests permission to act.	Victim asks permission from the suspect to engage in a behaviour.	10.3	0	5.1
42.	Indirectly declines	Victim indirectly declines the suspect's offer, request or suggestion (can also involve a degree of justifying her behaviour but this would be coded separately).	7.7	2.6	5.1
43.	Blocks access.	Victim tries to block the suspect's access to her.	5.1	5.1	5.1
44.	Walks around	Victim tries to walk around the suspect.	5.1	5.1	5.1

45.	Reports suspect's behaviour to witness	Victim reports the suspect's behaviour to a witness.	2.6	5.1	3.8
46.	Looks at suspect.	Victim looks at the suspect.	5.1	2.6	3.8
47.	Denigrates suspect	Victim denigrates or puts down the suspect's behaviour or his suggestion.	5.1	2.6	3.8
48.	Police – put off	Victim warns suspect that his behaviour will get him in trouble.	0	2.6	3.8
49.	Pretends witness nearby.	Victim lies to the suspect telling him that a witness is nearby or will be arriving shortly.	7.7	0	3.8
50.	Expresses disbelief	Victim expresses her disbelief.	5.1	2.6	3.8
51.	Bites	Victim bites the suspect.	5.1	2.6	3.8
52.	Tells suspect it hurts	Victim tells the suspect that he is hurting her.	7.7	0	3.8
53.	Indicates they don't like what suspect is doing.	Victim tells the suspect that she doesn't like what he is doing.	5.1	2.6	3.8
54.	Negotiation	Victim negotiates with offender to comply with his wishes but in some way on her terms.	0	7.7	3.8
55.	Safe location	Victim tries to get into or does get into a safe location such as her house.	2.6	5.1	3.8
56.	Quickens pace	Victim quickens her walking pace.	5.1	2.6	3.8
57.	Pretends can't comply	Victim pretends that she can't comply with suspect's request.	2.6	2.6	2.6
58.	Indicates child.	Victim refers to the presence of her child.	5.1	0	2.6
59.	Provides way out	Victim tries to give the suspect a way out of the situation.	2.6	2.6	2.6
60.	Lies – reason to leave.	Victim pretends she has to leave the suspect's company and gives a reason why this is.	5.1	0	2.6
61.	Elbows	Victim elbows the suspect.	5.1	0	2.6
62.	Mobile phone.	Victim tries to or does find her mobile phone.	2.6	2.6	2.6
63.	Gags/chokes	Victim gagged or choked.	2.6	2.6	2.6

64.	Hit with object.	Victim hits suspect with an object.	5.1	0	2.6
65.	Tries to get out of enclosed space.	Victim tries to get out an enclosed space.	5.1	0	2.6
66.	Reports frightened	Victim tells the suspect that she is frightened or worried.	5.1	0	2.6
67.	Does not return smile.	Victim does not return the suspect's smile.	5.1	0	2.6
68.	Accepts apology	Victim accepts the suspect's apology.	0	5.1	2.6
69.	Finds house-keys.	Victim finds her house keys.	0	5.1	2.6
70.	Spits semen	Victim spits semen away.	0	5.1	2.6
71.	Makes assurances to comply with wishes.	Victim assures the offender that she will comply with his demands.	0	5.1	2.6
72.	Threatens suspect	Victim threatens the suspect with a consequence if he doesn't comply with her wishes.	0	7.7	2.6
73.	Lips/mouth closed.	Victim does not stop the suspect kissing her but keeps her lips and mouth closed.	2.6	2.6	2.6
74.	Partial compliance	Victim does not fully comply with suspect's demand but does so partially.	5.1	0	2.6
75.	Removes blindfold	Victim removes her blindfold.	5.1	0	2.6
76.	Avoids looking	Victim avoiding looking at the suspect.	2.6	2.6	2.6
77.	Gathers up belongings	Victim gathered up her belongings.	2.6	2.6	2.6
78.	Responds to greeting.	Victim greets the suspect in response to his greeting.	2.6	2.6	2.6
79.	Suggests location change	Victim suggests to the suspect they change their location as a stalling tactic.	2.6	2.6	2.6
80.	Expresses intention to do something.	Victim tells the suspect what she intends to do but she is informing him rather than assuring him.	0	5.1	2.6
81.	Takes drugs	Victim voluntarily takes drugs with suspect.	0	2.6	2.6
82.	Taxi home	Victim took a taxi home.	0	2.6	2.6

83.	Don't believe	Victim indicates to the suspect that she doesn't believe what he has said.	0	5.1	2.6
84.	Escorts suspect out.	Victim escorts suspect out of a property.	0	5.1	2.6
85.	Reports can't breathe	Victim tells the suspect that she can't breathe.	2.6	0	1.3
86.	Disease – put off.	Victim discloses to the suspect that she has a disease which is untrue with the aim of putting the suspect off.	2.6	0	1.3
87.	Agrees action to get rid of suspect.	Victim makes the decision to comply with the suspect's non-sexual request to get rid of him.	2.6	0	1.3
88.	Apologises for non-compliance.	Victim apologises to the suspect for not complying with his wishes.	2.6	0	1.3
89.	Gives advice.	Victim gives the suspect some advice.	2.6	0	1.3
90.	Acknowledges suspect's threat	Victim verbally acknowledges the suspect's threat that has been made.	2.6	0	1.3
91.	Tries to speak to the suspect	Victim tries to talk to the suspect.	2.6	0	1.3
92.	Expresses disgust	Victim expresses her disgust for what the suspect is suggesting.	2.6	0	1.3
93.	Draws parallels.	Victim draws parallels between herself and women within the suspect's life.	2.6	0	1.3
94.	Tells suspect already obeyed order.	Victim tells the suspect she already done what he demanded.	2.6	0	1.3
95.	Queries route.	Victim queries the journey/route that the suspect is taking.	2.6	0	1.3
96.	Recognises	Victim tells the suspect that she recognizes him.	2.6	0	1.3
97.	Asks if finished.	Victim asked suspect if he has finished assaulting her.	2.6	0	1.3
98.	Pretends doesn't understand	Victim pretends that she doesn't understand what the suspect is requesting.	2.6	0	1.3
99.	Verbal non-compliance	Victim continues in her verbal behaviour ignoring the suspect's demand to stop.	2.6	0	1.3

100.	Makes assurances to stay	Makes assurances to the suspect that she'll stay where she is.	2.6	0	1.3
101.	Removes hat	Victim tries to remove the suspect's hat.	2.6	0	1.3
102.	Pulls hair.	Victim pulls the suspect's hair.	2.6	0	1.3
103.	Scratches	Victim scratches the suspect.	2.6	0	1.3
104.	Crosses road	Victim crosses to the other side of the road.	2.6	0	1.3
105.	Fakes unconsciousness	Victim pretended she was unconscious.	2.6	0	1.3
106.	Spontaneously gives property.	Victim spontaneously gives the suspect her property.	2.6	0	1.3
107.	Drops bags/belongings	Victim drops her bags and belongings automatically, not consciously to attract attention and not to position herself less vulnerably.	2.6	0	1.3
108.	Didn't scream	Victim did not scream but this was a conscious and <u>independent</u> decision.	2.6	0	1.3
109.	Cries out in pain	Victim cries out in pain.	2.6	0	1.3
110.	Released the suspect	Victim released the suspect.	2.6	0	1.3
111.	Goes with suspect to place as knows witnesses will be present.	Victim agrees to go with suspect to a place because she knows her friends will be present.	2.6	0	1.3
112.	Refuses to answer question.	Victim refuses to answer the suspect's question. This is different to refusing to speak since the victim does actually speak to inform the offender that she will not answer his question.	0	2.6	1.3
113.	Knees suspect	Victim knees the suspect between the legs.	0	2.6	1.3
114.	Hides property	Victim hides her property from the suspect.	0	2.6	1.3
115.	Encourages offender in a less severe sexual behaviour	Victim tries to encourage offender to continue with a lesser sexual act to avoid a more severe attack.	0	2.6	1.3
116.	Expresses indifference.	Victim expressed her indifference to the suspect's warning.	0	2.6	1.3

117.	Physical distraction	Victim tries to distract the suspect through a physical behaviour.	0	2.6	1.3
118.	Tries to find weapon	Victim tries to find a weapon she can use against the suspect.	0	2.6	1.3
119.	Answers with question	Victim answers the suspects question by posing a question hence not answering the question.	0	5.1	1.3
120.	Tears suspect's clothes	Victim tears suspect's clothes.	0	2.6	1.3
121.	Seeking understanding of why	Victim is asking the offender why they were attacked but this seems more introspective rather than the victim actually looking for an answer.	0	5.1	1.3
122.	Falls asleep	Victim fell asleep through exhaustion.	0	2.6	1.3
123.	Age – put off	Victim tries to put the suspect off by pointing out her age to him.	0	2.6	1.3
124.	Hails bus.	Victim tries to or does hail a bus.	0	2.6	1.3

Appendix 4: Offender Behaviours, Domains and Justifications for Allocation (C = Control, E = Escape, S = Sex, St = Style)

Variable Label	Domain	Justification for Allocation
1. Location-Force	C	Grubin et al (2001) included changes of location within their Control domain.
2. Hiding	E	Behaviours concerned with the offender hiding his identity were included by Grubin et al. (2001) in their Escape domain.
3. Invitation	St	“Asks for date to continue contact” was included by Grubin et al. (2001) in their Escape domain, however in this sample of sexual assaults this behaviour was at no point necessary to conduct the offence and was therefore included in the Style domain.
4. Grab	C	Grubin et al. (2001) included methods of physically restraining the victim in their Control domain.
5. Breast	S	Grubin et al. (2001) included behaviours associated with fondling and touching in their Sex domain.
6. Undresses-self	S	Grubin et al. (2001) included behaviours associated with undressing in the Sex domain.
7. Fellatio	S	Grubin et al. (2001) included fellatio in their Sex domain.
8. Condit- threat	C	Grubin et al. (2001) included the victim being put in fear within their Control domain.
9. Ejaculation	S	Grubin et al. (2001) included ejaculation in their Sex domain.
10. Arousal	St	Grubin et al. (2001) included the behaviour “Mention of victim enjoying” in their Style domain.
11. Don’t report	E	Behaviours associated with ensuring the victim did not report the offence were included by Grubin et al. (2001) in their Escape domain.
12. Pursues	C	Grubin et al. (2001) stated that the control domain includes behaviours directed towards gaining control of the victim. This behaviour was therefore included in the Control domain.
13. Gag-hand	C	Grubin et al. (2001) included gagging within their Control domain.

14. Instrumental violence	C	Grubin et al. (2001) included instrumental physical abuse within their Control domain.
15. Direct-quiet	E	Directing the victim to be quiet was included in the Escape domain because it related to the offender trying to avoid detection, part of Grubin et al.'s (2001) definition for this domain.
16. Physical threat	C	Grubin et al. (2001) included behaviours within this category in their Control domain.
17. Direct-undress	S	Grubin et al. (2001) included the behaviour "Victim asked to undress" within their Sex domain.
18. Clarification	St	This behaviour was included in the Style domain since it reflects a willingness by the offender to interact with the victim as a person.
19. Allows action	St	This behaviour was included in the Style domain since it indicates the offender is viewing the victim as a person.
20. Kiss	S	Grubin et al. (2001) included kissing behaviours in their Sex domain.
21. Undress victim	S	Grubin et al. (2001) included behaviours associated with undressing in the Sex domain.
22. Direct –sexual	S	Grubin et al. (2001) included requests for sexual behaviours in their Sex domain.
23. Lying	C	Grubin et al. (2001) included the victim being put in fear within their Control domain.
24. Touch penis	S	Grubin et al. (2001) included the victim being made to masturbate the offender in their Sex domain.
25. Demonstrates	S	This behaviour was included within the Sex domain since it related to an offender trying to make the victim engage in a sexual behaviour but due to her apparent lack of knowledge it first had to be demonstrated.
26. Scripting	S	Grubin et al. (2001) included the behaviour "Victim required to respond" in their Sex domain.
27. Positions	C	The purpose of control behaviours were, as defined by Grubin et al. (2001), to gain control over the victim so that the sexual assault could take place. Since this behaviour was associated with physically positioning the victim to enable a sexual assault it was placed in the Control domain.

28. Dig-Pen-NK	S	Digital penetration was included by Grubin et al. (2001) in their Sex domain.
29. Contradict	St	This was included in the Style domain because this domain contains a similar behaviour labelled “Arguing” by Grubin et al. (2001).
30. Direct-position	C	The purpose of control behaviours were, as defined by Grubin et al. (2001), to gain control over the victim so that the sexual assault could take place. Since this behaviour was associated with verbally directing the victim into a position to enable a sexual assault to take place it was placed in the Control domain.
31. Penile-Vag-Pen	S	Vaginal penetration was included by Grubin et al. (2001) in the Sex domain.
32. Penile-Anal-Pen	S	Anal penetration was included by Grubin et al. (2001) in their Sex domain.
33. Refuses request	St	This behaviour was included in the Style domain because the opposite behaviour of “Compromises” is located in this domain by Grubin et al. (2001).
34. Ignores request	St	This behaviour was included in the Style domain because the opposite behaviour of “Compromises” is located in this domain by Grubin et al. (2001) and because a similar behaviour “Insistant” is also included by Grubin et al. (2001) in this domain.
35. Direct-stay	E	Behaviours associated with the offender making a safe escape were included by Grubin et al. (2001) within their Escape domain.
36. Seen before	C	Grubin et al. (2001) included the victim being put in fear within their Control domain.
37. Blindfold	E	Whilst Grubin et al. (2001) included using a Blindfold within their Control domain they also included behaviours associated with the offender hiding his identity from the victim in their Escape domain therefore this behaviour was included in the Escape domain.
38. Dir-Don’t Look	E	Grubin et al. (2001) included telling the victim not to look at the offender in their Escape domain.

39. Stalks	C	Grubin et al. (2001) included prowling within their Control domain.
40. Touch bottom	S	Grubin et al. (2001) included behaviours associated with fondling and touching in their Sex domain.
41. Touch vaginal	S	Grubin et al. (2001) included behaviours associated with fondling and touching in their Sex domain.
42. Depart-quick	E	The manner in which the offender departed the crime scene was included in the Escape domain since Grubin et al. (2001) define this domain as being concerned with the offender leaving the crime scene.
43. Restrains arms	C	Grubin et al. (2001) included methods of physically restraining the victim in their Control domain.
44. Releases	St	This behaviour was included in the Style domain because a similar behaviour “Consideration” was included in this domain by Grubin et al. (2001) and again this appears to relate to the victim being viewed by the offender as a person.
45. Extends time	St	This behaviour was included in the Style domain because a similar behaviour “Continues with date request” is included here by Grubin et al. (2001) which relates to the offender seeking to extend time with the victim.
46. Reassures	C	Reassurances made to the victim were included in the Control domain rather than in the Style domain because in this population of offence this behaviour related to the offender trying to maintain control over the victim, part of Grubin et al.’s (2001) definition for this domain.
47. Gloves	E	Use of gloves was included by Grubin et al. (2001) in their Escape domain.
48. Weapon	C	Grubin et al. (2001) included the behaviour “weapon” within their Control domain.
49. Restrains-body	C	Grubin et al. (2001) included methods of physically restraining the victim in their Control domain.
50. Disclose-personal	St	Grubin et al (2001) include a range of disclosures in their Style domain.
51. Disclose-intimate	St	Grubin et al (2001) include a range of disclosures in their Style domain.
52. Disclose-criminal	St	Grubin et al (2001) include a range of disclosures in their Style domain.

53. Direct-resist	C	Directing the victim to stop their resistance was included in the Control domain because it related to the offender trying to maintain control over the victim, part of Grubin et al.'s (2001) definition for this domain.
54. Location-con	C	Grubin et al (2001) included changes of location within their Control domain.
55. Property	St	Grubin et al. (2001) included a similar behaviour "Requests or takes money" in their Style domain.
56. Prevents look	E	Behaviours concerned with the offender hiding his identity were included by Grubin et al. (2001) in their Escape domain.
57. Expresses shock	St	This was included in the Style domain since it was a behaviour which required the offender to engage with the victim and thus view her as a person, and because it was unnecessary for the offence to be committed.
58. Verbal threat	C	Grubin et al. (2001) included the victim being put in fear within their Control domain.
59. Binding	C	Grubin et al. (2001) included binding in their Control domain.
60. Rips clothes	S	Grubin et al. (2001) included deliberate damage to the victim's clothing in their Sex domain.
61. Cleans	E	The destruction of physical evidence or precautions being taken with regards to physical evidence were included by Grubin et al. (2001) in their Escape domain.
62. Question-personal	St	Personal questions were included by Grubin et al. (2001) in their Style domain.
63. Question-sexual	St	Sexual questions were included by Grubin et al. (2001) in their Style domain.
64. Question-security	E	The offender showing concerns about making a safe escape were included within the Escape domain by Grubin et al. (2001).
65. Redressed	St	This behaviour was included in the Style domain since it was not necessary for the offence to have been committed.

66. Offenders argued	St	This behaviour was included in the Style domain since it was not necessary for the offence to have been committed.
67. Directs co-offender	C	Whilst Grubin et al. (2001) didn't consider group offences this behaviour seems to best fit within the Control domain since it relates to the offender exerting control over others.
68. Returns property	St	Behaviours relating to the taking of property were included within Grubin et al.'s (2001) style domain.
69. Departs-calmly	E	The manner in which the offender departed the crime scene was included in the Escape domain since Grubin et al. (2001) define this domain as being concerned with the offender leaving the crime scene.
70. Car	E	This behaviour related to how the offender could escape the scene and therefore was placed within the Escape domain.
71. Refuses answer	St	This behaviour was placed within the Style domain since it was unrelated to the commission of the offence and seemed to reflect the victim being used as a vehicle.
72. Blindfold-hand	E	Whilst Grubin et al. (2001) included using a Blindfold within their Control domain they also included behaviours associated with the offender hiding his identity from the victim in their Escape domain therefore this behaviour was included in the Escape domain.
73. Comply-co-offender	St	This behaviour was placed within the Style domain because it is similar to because such as Compromise, which were included in this domain by Grubin et al. (2001).
74. Remove blindfold	St	This behaviour was included within the Style domain because it related to behaviours such as Consideration which were included in this domain by Grubin et al. (2001).
75. Blocks escape	C	Grubin et al. (2001) stated that the control domain includes behaviours directed towards gaining control of the victim. This behaviour was therefore included in the Control domain.

76. Concern	St	This behaviour was included in the Style domain since it is similar to Consideration which was included in this domain by Grubin et al. (2001).
77. Digital-Vag-Pen	S	Digital penetration was included by Grubin et al. (2001) in their Sex domain.
78. Disguise	E	Wearing a mask was included in Grubin et al.'s (2001) Escape domain.
79. Verbal abuse	St	This was included in the Style domain since it is similar to the behaviour "Swore" included in this domain by Grubin et al. (2001).
80. Lie-upset	St	The telling of lies about his intentions was included in the Style domain by Grubin et al. (2001).
81. Mocked	St	This was included in the Style domain since it was unrelated to the commission of the offence.
82. Styled hair	St	This was included in the Style domain since it was unrelated to the commission of the offence.
83. Plan	E	In the population of offences this behaviour related to avoiding detection and so was included in the Escape domain.
84. Apologises	E	The offender showing some sort of remorse for his actions was included by Grubin et al. (2001) in their Escape domain.
85. Excuses	St	Excuses and justifications were included in the Style domain by Grubin et al. (2001).
86. Lie-protect ID	E	Behaviours concerned with the offender protecting his identity were included by Grubin et al. (2001) in their Escape domain.
87. PersonalQ-co-off	St	Personal questions posed to the victim were included in the Style domain by Grubin et al. (2001) and so this behaviour was also included in this domain.
88. Returns home	E	This behaviour was included in the Escape domain since its apparent purpose was to indicate to the victim that the offender knew where she lived and could find her should she report the offence.

89. Fulfilled promise	St	This behaviour was included in the Style domain since it was unrelated to the commission of the offence.
90. Discloses intent	St	Making announcements of intention was included in the Style domain by Grubin et al. (2001).
91. Offers assistance	St	This behaviour was included in the Style domain because a similar behaviour “Consideration” was included in this domain by Grubin et al. (2001).
92. Forces entrance	C	Grubin et al. (2001) define the control domain as including behaviours associated with how the victim was approached/ targeted. This behaviour was therefore included in the Control domain.
93. Negotiation	St	A similar behaviour “Compromise” was included in the Style domain by Grubin et al. (2001).
94. Attracts attention	St	This behaviour was included in the Style domain because it was unnecessary to the commission of the offence.
95. Take weapon	C	Grubin et al. (2001) included weapon-related behaviours in the Control domain.
96. Provokes	St	A similar behaviour “Arguing” was included in the Style domain by Grubin et al. (2001).
97. Compliment	St	Compliments were included in the Style domain by Grubin et al. (2001).
98. Requests help	St	This behaviour was included in the Style domain because it was unnecessary to the commission of the offence and because this domain also contained other behaviours where the offender was seeking something (non-sexual) from the victim.
99. Direct non-sexual	C	This behaviour was included in the Control domain since this behaviour was related to maintaining control over the victim (as per Grubin et al.’s (2001) definition) in the offences in the dataset.
100. Can’t help	St	This behaviour was included in the Style domain since it occurred when the offender was engaged in conversation with the victim and was unnecessary for the commission of the offence.

101. Lies- self image	St	This behaviour was included in the Style domain since it was related to the offender maintaining his image in a similar manner to Boasting which was included in this domain by Grubin et al. (2001).
102. Exposure	S	Whilst not a behaviour in Grubin et al. (2001) study, this has some similarities with masturbation by the offender which was located in the Sex domain.
103. Erectile dysfunction	S	Grubin et al. (2001) included erectile insufficiency in their Sex domain.
104. Self-mast hand	S	Grubin et al. (2001) included masturbation by the offender in the Sex domain.
105. Urinates	St	This was included in the Style domain since it was unnecessary for the commission of the offence.
106. Hug	St	“Affection shown” is a behaviour included in the Style domain by Grubin et al. (2001).
107. Look-out	E	Grubin et al. (2001) didn’t include group rapes in their study however this behaviour seems most associated with offenders wanting to avoid detection and hence was located within the Escape domain.
108. Outdoor	C	Grubin et al. (2001) included site of approach in their Control domain.
109. Indoor	C	Grubin et al. (2001) included site of approach in their Control domain.
110. Sits	St	This was included in the Style domain since it was unnecessary for the commission of the offence.
111. Holds hand	St	“Affection shown” is a behaviour included in the Style domain by Grubin et al. (2001).
112. Simulated sex	S	Whilst not present in Grubin et al.’s (2001) study, this is a sexual behaviour and so was placed in the Sexual domain.
113. Self Mast-Feet	S	Grubin et al. (2001) included masturbation by the offender in the Sex domain.
114. Feet	S	Grubin et al. (2001) included fondling and kissing in their Sex domain.

115. Innocence	E	This behaviour has not been recorded before but its function seemed to be to avoid apprehension by the offender protesting that he had not been involved in the assault. It was therefore placed within the Escape domain.
116. Sexual noises	S	Whilst not present in Grubin et al.'s (2001) study, this is a sexual behaviour and so was placed in the Sexual domain.
117. Pushes past	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.
118. Touched stomach	S	Grubin et al. (2001) included behaviours associated with fondling and touching in their Sex domain.
119. Direct-redress	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.
120. Complains	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.
121. Cut wires	E	This behaviour has not been recorded before but its function seemed to be to prevent the victim attracting the attention of others either during or after the assault and therefore seemed most associated with the offender trying to avoid detection and making a safe escape. It was therefore placed within the Escape domain.
122. Minimises actions	St	A similar behaviour Excuses/Justifications was included in the Style domain by Grubin et al. (2001).
123. Fingerprints	E	Grubin et al. (2001) included concern about fingerprints in their Escape domain.
124. Leaves weapon	E	This behaviour was placed in the Escape domain since it occurred after the offender had wiped the weapon for fingerprints and seems related to the offender avoiding detection by leaving the weapon behind.
125. Offers gift	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.
126. Self Mast-breasts	S	Grubin et al. (2001) included masturbation by the offender in the Sex domain.
127. Complies	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.

128. Gag	C	Grubin et al. (2001) included gagging within their Control domain.
129. Accepts guilt	E	The offender showing some sort of remorse for his actions was included by Grubin et al. (2001) in their Escape domain.
130. Removes gag	St	This behaviour was placed in the Style domain because it is similar to the behaviour “Consideration” placed in this domain by Grubin et al. (2001).
131. Touched leg	S	Grubin et al. (2001) included behaviours associated with fondling and touching in their Sex domain.
132. Ceases-put off	E	This behaviour was placed in the Escape domain since it relates to the offender ceasing his actions and quitting the scene.
133. Educates	St	This behaviour was placed in the Style domain since it was unnecessary for the offence to be committed.
134. Broke-in	C	Grubin et al. (2001) define the control domain as including behaviours associated with how the victim was approached/ targeted. This behaviour was therefore included in the Control domain.
135. Expressive violence	C	Grubin et al. (2001) included expressive forms of violence in their Control domain.
136. Cunnilingus	S	Grubin et al. (2001) included cunnilingus in their Sex domain.
137. Ceases-resistance	E	This behaviour was placed in the Escape domain since it relates to the offender ceasing his actions and quitting the scene.
138. Alcohol	St	This behaviour was placed in the Style domain since it was unrelated to the commission of the offence.
139. Drugs	St	This behaviour was placed in the Style domain since it was unrelated to the commission of the offence.
140. Observed	S	Whilst this behaviour did not emerge in Grubin et al. (2001) study, a similar behaviour, prowling, was included in the Sex domain.

141. Spits	St	This behaviour wasn't necessary for the offence to be committed and shares similarity with "Swore" included within the Style domain by Grubin et al. (2001).
142. Criticises	St	This behaviour was included in the Style domain since it shares similarities with arguing with the victim and is the opposite to complimenting the victim which was placed here by Grubin et al. (2001).
143. Erection	S	Grubin et al. (2001) included behaviours associated with the offender's erectile state in their Sex domain.
144. Intrudes	C	Grubin et al. (2001) define the control domain as including behaviours associated with how the victim was approached/targeted. This behaviour was therefore included in the Control domain.
145. On-foot	E	This behaviour related to how the offender could escape the scene and therefore was placed within the Escape domain.
146. Bicycle	E	This behaviour related to how the offender could escape the scene and therefore was placed within the Escape domain.
147. Con	C	Grubin et al. (2001) included how the offender approached the victim within their Control domain.
148. Surprise	C	Grubin et al. (2001) included how the offender approached the victim within their Control domain.

Appendix 5: Functional Themes Identified from the Constant Comparison Framework Analysis, their Descriptions and the Discrete Behaviours which were Included within Each Theme.

Theme	Description	Behaviours	
1. Seeking Help	Behaviours designed to obtain help from others. They can be active behaviours or can include preparatory behaviours.	Seeks help verbally from witnesses (45) Physical help-seeking (68) Suggests location change (85) Finds mobile phone (67)	Goes with suspect to place as knows witnesses will be present (91) Reports suspect's behaviour to witness (95)
2. Humanisation	Behaviours with the intention of getting the suspect to see the victim as a human being and in doing so experience guilt or sympathy.	Reports frightened (1) Reports can't breathe (2) Tells suspect it hurts (25) Promise reminder (36)	Indicates don't like what suspect doing (18) Draws parallels with other women (28)
3. Information gathering	Behaviours with the intention of gathering information sometimes with the aim of using this as evidence at a future date.	Queries route (31) Queries intentions (33) Asks if finished (34) Seeks clarification (94)	Turns around (83) Removes blindfold (79) Looks at suspect (80) Asks personal question (35)
4. Brings suspect to reality	Behaviours which try to get the suspect to see reason or bring the suspect to reality (i.e. the victim's reality).	Indicates child (5) Confronts suspect (7)	Provides a way out (12) Expresses disbelief (8)
5. Put off	Behaviours with the intention of dissuading the suspect from his actions.	Disease - put off (11) Police – put off (111) Age – put off (123)	Pretends witness nearby (44) Fakes unconsciousness (73) Recognises (32)

6. Non-compliance	Behaviours through which the victim either completely or partially does not comply with suspect's wishes.	Directly declines (13) Indirectly declines (14) Pretends can't comply (37) Pretends doesn't understand (38) Refuses to answer question (98) Verbal non-compliance (39) Physical non-compliance (75)	Lips/mouth closed (77) Partial compliance (78) False disclosure after question (42) Vague disclosure (43) Hides property (103) Expresses indifference (108)
7. Resists	Behaviours with the intention of physically resisting the suspect.	Struggles (48)	Less vulnerable positioning (106)
8. Physical violence	Behaviours with the intention of physically fighting the suspect or using a weapon against him.	Pulls hair (removes hat) (51,52) Elbows (50) Kicks (53) Punches (54) Scratches (58) Bites (59)	Hit with object (57) Knees suspect (99) Hits/slaps with open hand (90) Tries to find weapon (110) Tears suspect's clothes (114)

9. Creates physical distance	Behaviours with the intention of putting distance between the victim and the suspect or preparatory behaviours for this.	Blocks assess (49) Moves away (62) Walks/cycles away (63) Walks around (64) Crosses road (65) Quickens pace (66) Tries to get out of enclosed space (69) Runs away (70) Redress/cover self (61) Gathers up belongings (82) Released the suspect (88)	Moves to let past (89) Finds house-keys (102) Escorts suspect out (119) Taxi home (117) Safe location (123) Hails bus (124) Agrees action to get rid of suspect (15) Says farewell/indicates end of conversation (17) Lies – reason to leave (16) Less vulnerable positioning (106)
10. Disarms suspect	Behaviours through which the victim attempts to disarm the suspect.	Takes weapon (55)	Throws weapon away (56)
11. Chases suspect	Behaviours with the intention of pursuing the suspect.	Pursues/prevents escape (60)	
12. Explaining themselves	Behaviours through which the victim tries to explain or inform the suspect of her behaviour.	Justifies behaviour (9) Indicates can't help (10)	Expresses intention to do something (121)

13. Maintains or creates interpersonal space	Behaviours with the intention of maintaining or increasing interpersonal space between victim and offender.	Refuses to speak (46) Does not return smile (76) False disclosure after question (42) Vague disclosure (43) Answers with a question (113)	Refuses to answer question (98) Denigrates suspect (3) Name-calling (6) Expresses disgust (27) Don't believe (118)
14. Decreases interpersonal distance	Behaviours through which the victim decreases the interpersonal distance between herself and the suspect.	Comments on conversation topic (93) Responds to greeting (92) Truthful response to question (41)	Accepts apology (100) Takes drugs (115) Asks a personal question (35)
15. Directs suspect's behaviour	Behaviours through which the victim directs the suspect's behaviour in an explicit manner.	Requests behaviour from suspect (21) Gives an order (22) Negotiation (101)	Encourages offender in a less severe sexual behaviour (105) Threatens (112)
16. Helps suspect	Behaviours with the intention of helping the offender.	Gives advice (23)	Helps suspect.(96)

17. Compliance	Behaviours which have the function of complying with the suspect's wishes and reinforcing the power imbalance between suspect and victim.	Obeys wishes (47) Avoids looking (74) Apologies for non-compliance (20) Acknowledges suspect's threat (24) Requests permission to act (30) Tells suspect already obeyed order (29) Didn't scream (86). Spontaneously gives property (81)	Makes assurances to stay (40) Makes assurances that won't report (19) Makes assurances to comply with orders (115) Makes assurances not to scream (107) Truthful response to question (41) Accepts apology (100) Stays still (97)
18. Distraction	Victim tries to distract offender.	Physical distraction (109)	
19. Emotional coping	Victim tries to emotionally cope with the sexual offence.	Seeking understanding of why (116)	
20. Spontaneous	Spontaneous behaviours which appear to be produced automatically rather than intentionally	Gags/chokes (71) Cries out in pain (87) Drops bags/belongings (84) Falls asleep (120)	Spits semen (104) Freezes (72) Cries (4)

* Tries to speak to the suspect (26) was not included as the aim of this behaviour could not be determined.

Appendix 6: Victim Behaviour Themes identified from the Constant Comparison Framework Analysis and the Hierarchical Cluster Analysis, their Descriptions and the Discrete Behaviours which were Included within Each Theme.

Theme	Description	Behaviours	
1. Active resistance	The victim actively resists the offender's assault. She engages in behaviours which directly communicate her lack of consent to the suspect and others or engages in behaviours which prepare her for this.	Seeks help verbally from witnesses (45). Physical help-seeking (68). Verbal non-compliance (39) Takes weapon (55) Throws weapon away (56) Elbows (50) Kicks (53) Punches (54) Scratches (58) Bites (59) Hit with object (57) Blocks access (49) Finds house keys (102)	Reports suspect's behaviour to witness (95). Finds mobile phone (67) Less vulnerable positioning (106) Struggles (48) Pulls hair (removes hat) (51,52) Knees suspect (99) Hits/slaps with open hand (90) Tries to find weapon (110) Tears suspect's clothes (114) Gives an order (22) Threatens (112) Runs away (70) Get out enclosed space (69) Safe location (123)
2. Invoking social convention	Behaviours which signal to the offender that his behaviour is wrong and unwanted and perhaps contain the expectation that the offender will respond by ceasing his behaviour due to empathy for the victim or embarrassment for breaking social conventions.	Reports frightened (1) Reports can't breathe (2) Draws parallels with other women (28) Tells suspect it hurts (25) Gags/chokes (71) Cries out in pain (87) Cries (4)	Indicates child (5) Confronts suspect (7) Expresses disbelief (8) Promise reminder (36) Indicates don't like what suspect doing (18) Provides a way out (12)

3. Information gathering	Behaviours with the intention of gathering information sometimes with the aim of using this as evidence at a future date.	Queries route (31) Queries intentions (33) Asks if finished (34) Seeks clarification (94)	Turns around (83) Removes blindfold (79) Looks at suspect (80) Asks personal question (35) Seeking understanding of why (116)
4. Put off	Behaviours with the intention of dissuading the suspect from his actions.	Disease - put off (11) Police – put off (111) Age – put off (122)	Pretends witness nearby (44) Fakes unconsciousness (73) Recognises (32)
5. Face-threatening non-compliance	Behaviours through which the victim either completely or partially does not comply with the suspect's wishes or social conventions which could threaten his self-image.	Physical non-compliance (75) Refuses to answer question (98) Refuses to speak (46) Does not return smile (76) Answers with a question (113) Spits semen (104) Directly declines (13) Moves away (62) Walks/Cycles away (63) Says farewell (17) Quickens pace (66) Gathers belongings (82) Escorts suspect out (119)	Denigrates suspect (3) Name-calling (6) Expresses disgust (27) Don't believe (118) Lips/mouth closed (77) Expresses indifference (108) Pursues/prevents escape (60) Freezes (72) Expresses intention to do something (121) Re-dress/cover self (61) Walks around (64) Crosses road (65) Hails bus (124)

6. Face saving non-compliance	Behaviours which are designed to disguise the victim's true intent of non-compliance from the suspect and instead give the impression of compliance or a willingness to comply with the suspect thereby maintaining social conventions.	Indirectly declines (14) Justifies behaviour (9) Indicates can't help (10) Negotiation (101) Physical distraction (109)	Partial compliance (78) False disclosure after question (42) Vague disclosure (43) Hides property (103) Encourages offender in a less severe sexual behaviour (105)
7. Compliance	The victim complies with the offender's wishes or his expectations of her.	Obeys wishes (47) Requests behaviour from suspect (21) Gives advice (23) Avoids looking (74) Apologies for non-compliance (20) Acknowledges suspect's threat (24) Comments on conversation topic (93) Responds to greeting (92) Truthful response to question (41) Accepts apology (100) Takes drugs (115)	Requests permission to act (30) Tells suspect already obeyed order (29) Didn't scream (86). Spontaneously gives property (81) Makes assurances to stay (40) Makes assurances that won't report (19) Makes assurances to comply with orders (107) Stays still (97)
8. Spontaneous	Spontaneous behaviours which appear to be produced automatically rather than intentionally and from viewing the accounts were unlikely to be misinterpreted as a form of non-compliance.	Drops bags/belongings (84)	Falls asleep (120)

* Tries to speak to the suspect (26) was not included as the aim of this behaviour could not be determined.

Appendix 7: Offender Behaviour Framework and Respective Frequencies for the Group Rape Sample (N=14).

Behaviour	Definition	Frequency within offences	Frequency within offender*
1. Indoor	Offender sexually assaults the victim indoors.	92.9	65.6
2. Con	Offender approached the victim using verbal interaction.	92.9	59.4
3. Penile-Vag-Pen	Offender penetrated or attempted to penetrate the victim's vagina with his penis.	92.9	53.1
4. Positions	Offender forces the victim into a position he wants.	78.6	46.9
5. Undresses victim	Offender undresses the victim or interferes with her clothing.	71.4	43.8
6. Undresses-self	Offender undresses himself.	64.3	43.8
7. Location – con	Offender moves the victim's location through a con.	64.3	40.6
8. On-foot	Offender was on-foot.	57.1	53.1
9. Direct non-sexual	Offender directs the victim/witness to engage in a non-sexual behaviour.	57.1	37.5
10. Fellatio	Offender forces victim or attempts to force victim to perform fellatio.	57.1	34.4
11. Discloses intent	Offender discloses to the victim/co-offender his intentions.	57.1	31.3
12. Direct co-offender	Offender directs the behaviour of his co-offender.	42.9	28.1
13. Ejaculation	Offender ejaculates.	42.9	25.0
14. Question-personal	Offender asks victim for personal information.	42.9	25.0
15. Complies	Offender complies with victim's directive.	42.9	25.0
16. Reassures	Offender reassures the victim. His reassurance can be truthful or false.	42.9	21.9
17. Mocked	Offender laughed at/mockered the victim.	35.7	25.0
18. Grab	Offender grabs the victim with the purpose of controlling her.	35.7	21.9

19. Kiss	Offender tries to or does kiss the victim on the face or neck.	35.7	21.9
20. Breast	Offender touches or kisses the victim's breast or chest area.	35.7	18.8
21. Condit- threat	Offender implies that his aggression is conditional on the victim's behaviour.	35.7	18.8
22. Restrain-body	Offender uses his body weight to restrain the victim.	35.7	18.8
23. Disclose-intimate	Offender discloses something intimate to the victim about himself or his co-offender.	35.7	18.8
24. Direct-sexual	Offender directs the victim to perform a sexual behaviour.	28.6	21.9
25. Stalks	Offender follows, surveils or watches victim.	28.6	21.9
26. Depart-quick	Offender departs the scene quickly.	28.6	21.9
27. Departs-calmly	Offender calmly departs scene.	28.6	21.9
28. Disclose-personal	Offender discloses information about himself or his co-offenders.	28.6	18.8
29. Location - force	Offender moves the victim's location using force or the fear of force.	28.6	18.8
30. Extends time	Offender doesn't quit the scene but stays in the vicinity unnecessarily.	28.6	18.8
31. Criticises	Offender criticises victim.	28.6	18.8
32. Expressive violence	Offender is spontaneously violent towards the victim..	28.6	15.6
33. Redressed	Offender redressed himself.	28.6	15.6
34. Offers assistance	Offender offers to assist the victim or does assist her.	28.6	15.6
35. Complies with co-offender.	Offender complies with co-offender's wishes.	28.6	15.6
36. Ignores request	Offender ignores victim's request.	28.6	15.6
37. Observed	Offenders observed the sexual assault.	28.6	12.5
38. Blocks escape	Offender blocks escape of victim.	28.6	12.5

39. Contradicts	Offender contradicts or argues with victim.	28.6	12.5
40. Offers gift	Offender offers the victim something.	28.6	6.3
41. Verbal abuse	Offender swears at the victim or verbally abuses her.	21.4	15.6
42. Condom	Offender uses or shows intention to use a condom.	21.4	15.6
43. Erection	Offender has an erection.	21.4	12.5
44. Negotiation	Offender tries to or does negotiate with the victim.	21.4	12.5
45. Provokes	Offender tries to provoke the victim into action.	21.4	12.5
46. Direct-position	Offender directs the victim to position herself in a particular way.	21.4	9.4
47. Verbal threat	Offender threatens the victim implying physical violence (unconditional).	21.4	9.4
48. Question-sexual	Offender asks victim sexual question (not about enjoyment/arousal).	21.4	9.4
49. Alcohol	Offender consumed alcohol with victim.	21.4	6.3
50. Property	Offender takes the victim's property.	21.4	6.3
51. Arousal.	Suspect refers to victim's arousal or enjoyment of sexual acts.	14.3	12.5
52. Touch vaginal	Offender touches victim's vaginal area.	14.3	12.5
53. Instrumental violence	Offender is violent towards the victim to control her.	14.3	9.4
54. Digital-Vag-Pen	Offender digitally penetrates the victim's vagina.	14.3	9.4
55. Attracts attention	Offender tries to attract the victim's attention.	14.3	9.4
56. Plan	Co-offenders develop plan together.	14.3	9.4
57. Hug	Offender hugged the victim.	14.3	9.4
58. Drugs	Offender consumed drugs with victim/co-offender.	14.3	9.4
59. Lying	Offender communicates that he believes the victim is lying.	14.3	6.3

60. Refuses request	Offender refuses victim's request	14.3	6.3
61. Direct-stay	Offender directs victim to stay put.	14.3	6.3
62. Weapon	Offender implies having or has a weapon in his possession.	14.3	6.3
63. Direct-resist	Offender directs the victim not to physically resist.	14.3	6.3
64. Don't report.	Suspect orders the victim not to report his behaviour.	14.3	6.3
65. Direct-undress	Offender directs the victim to undress.	14.3	6.3
66. Outdoor	Offender sexually assaults victim outdoors.	14.3	6.3
67. Sits	Offender sits/lies next to victim.	14.3	6.3
68. Sexual noises	Offender makes noises of sexual pleasure.	14.3	6.3
69. Direct-redress	Offender directed the victim to redress.	14.3	6.3
70. Rips clothes	Offender intentionally rips victim's clothing.	14.3	6.3
71. Introduces	Introduces victim to witnesses/offender.	14.3	3.1
72. Simulated intercourse	Offender simulated intercourse with victim.	7.1	9.4
73. Pursues	Offender pursues the victim in a concerted manner.	7.1	6.3
74. Penile-anal-pen	Offender penetrated or attempted to penetrate the victim's anus with his penis.	7.1	6.3
75. Excuses	Offender excuses/justifies his actions.	7.1	6.3
76. Car	Offender uses a car.	7.1	6.3
77. Requests help	Offender requests assistance from the victim	7.1	6.3
78. Hold hand	Offender holds the victim's hand.	7.1	6.3
79. Ceases - Put off	Offender stops assaulting victim because he is put off by something other than the victim (e.g. arrival of witnesses).	7.1	6.3
80. Spits	Offender spits at the victim.	7.1	6.3

81. Intrudes	Offender intrudes into the victim's dwelling.	7.1	6.3
82. Gag hand	Offender gags the victim with his hand/arm.	7.1	3.1
83. Releases	Offender releases the victim. This is not a result of victim resistance, or third party interruption, it's a conscious choice made by the suspect.	7.1	3.1
84. Touch penis	Offender forces victim to touch his penis/masturbate him.	7.1	3.1
85. Touch bottom	Offender touches victim's buttocks or bottom area.	7.1	3.1
86. Direct-quiet	Offender orders the victim to be quiet.	7.1	3.1
87. Disclose-criminal	Offender discloses something to the victim about his criminal behaviour or that of his co-offender.	7.1	3.1
88. Physical threat	Offender physically threatens the victim.	7.1	3.1
89. Expresses shock	Offender expresses his shock.	7.1	3.1
90. Question-security	Offender asks victim question with goal of maintaining his security/escape.	7.1	3.1
91. Offenders Argued	Offenders argued with one another.	7.1	3.1
92. Returns property	Offender returns previously taken property/or when has stolen other items.	7.1	3.1
93. Refuses answer	Offender refuses to answer victim's question.	7.1	3.1
94. Lie-upset	Offender tells the victim lies to upset her.	7.1	3.1
95. Look-out	Offender acts as look-out.	7.1	3.1
96. Can't help	Offender indicates he can't help the victim.	7.1	3.1
97. Complain	Offender complains to the victim.	7.1	3.1
98. Cut wires	Offender cut the telephone wires or unplugs phone.	7.1	3.1
99. Ceases - resistance	Offender gives up trying to assault the victim due to resistance.	7.1	3.1
100. Surprise	Offender approached the victim suddenly and without any verbal interaction.	7.1	3.1

101. Pornography.	Offender shows the victim pornography.	7.1	3.1
102. Stops co-offender hurting victim.	Offender stops or tries to stop his co-offender from hurting the victim.	7.1	3.1
103. Masked victim's screaming.	Offender masked the victim's screaming.	7.1	3.1
104. Ignores co-offender directive	Offender ignores the directive from his co-offender. This is different from refusing it which would come within Offenders Argued.	7.1	3.1
105. Redressed victim	Offender redressed the victim.	7.1	3.1
106. Boasts	Offender boasts to his co-offender(s).	7.1	3.1
107. Drugged victim	Offender drugged the victim.	7.1	3.1
108. Sexual Q Co-offender	Offender asks his co-offender a sexual question.	7.1	3.1
109. Declines Co-offender's offer	Offender declines the offer of his co-offender.	7.1	3.1
110. Vomits	Offender vomited.	7.1	3.1

*The frequencies for offence and for offender will not correspond since there were some occasions in the victim accounts where a behaviour could not be attributed to a particular offender. In these scenarios, the behaviour will not feature in the final column.

Appendix 8: Victim Behaviour Framework and Respective Frequencies for the Group Rape Sample (N=14).

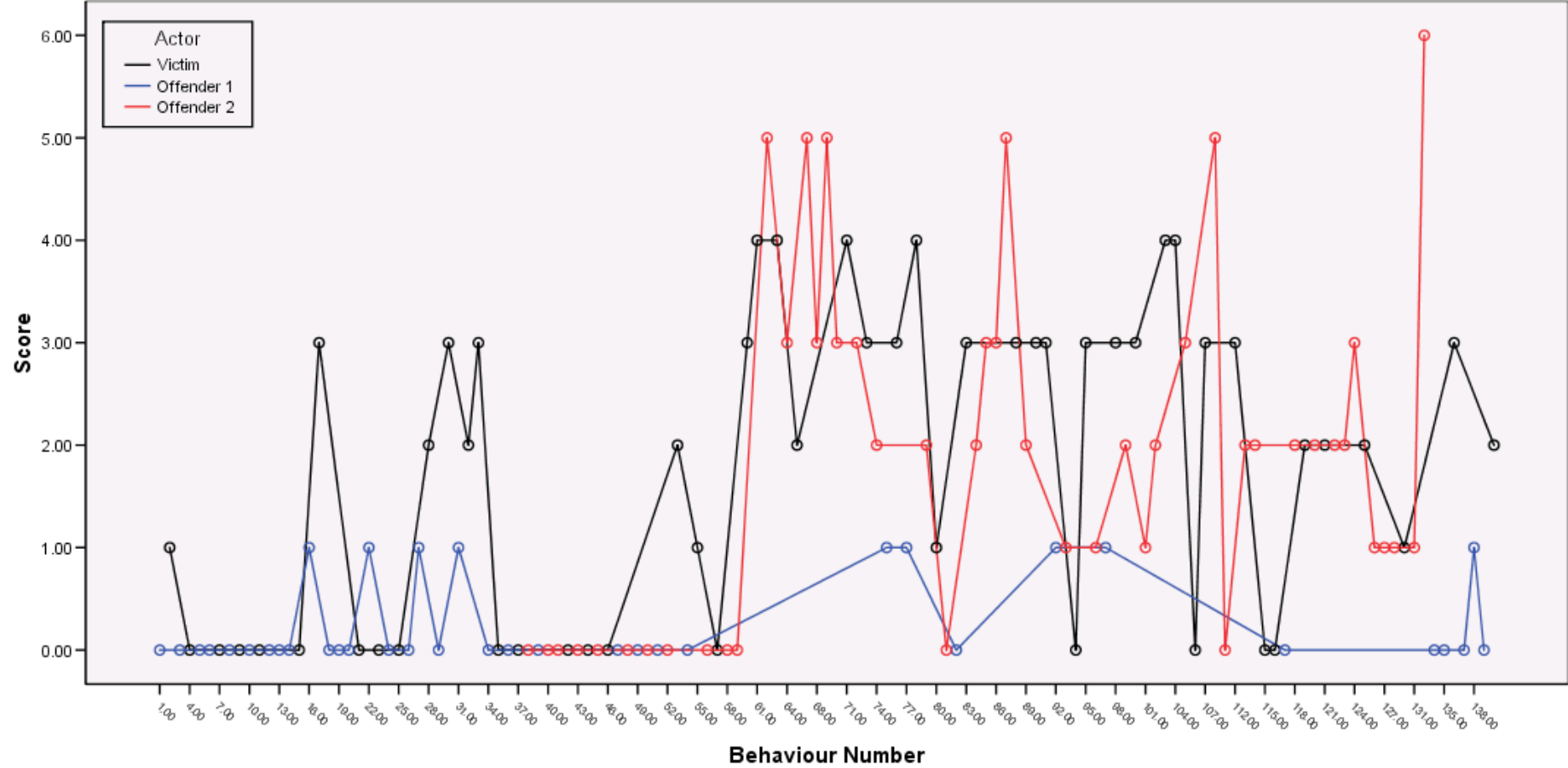
Behaviour	Definition	Frequency Within Offences
1. Gives an order.	Victim gives the suspect an order.	71%
2. Obeys wishes	Victim complies with the suspect's wishes and either engages in or stops a behaviour.	71%
3. Directly declines	Victim directly declines the suspect's offer, request or suggestion (can also involve a degree of justifying her behaviour but this would be coded separately).	64%
4. Struggles	Victim physically struggled with the suspect. This includes trying to shake the suspect off and pushing them away.	57%
5. Requests behaviour from suspect	Victim requests something of the suspect.	50%
6. Walks/cycles away	Victim walks, cycles away from the suspect.	50%
7. Truthful response to personal question	Victim discloses something about herself after the suspect has asked her a question. (Often minimal information is given perhaps related to politeness but protecting self).	43%
8. Justifies behaviour	Victim explains or justifies her verbal or physical behaviour to the suspect.	36%
9. Seeks help verbally from witnesses	Victim verbally tries to get help from witnesses.	36%
10. Re-dress/cover self	Victim tries to redress herself or cover herself.	36%
11. Physical non-compliance.	Victim does not comply with the suspect's demands.	36%
12. Moves away	Victim tries to put distance between herself and the suspect by moving away from him.	29%
13. Cries	Victim cries.	29%
14. Comments on a conversational topic	Victim comments on a neutral conversational topic either initiating or maintaining a neutral conversation.	29%
15. Indicates they don't like what suspect is doing.	Victim tells the suspect that she doesn't like what he is doing.	21%
16. Denigrates suspect	Victim denigrates or puts down the suspect's behaviour or his suggestion.	21%

17. Confronts suspect.	Victim confronts the suspect about his behaviour indicating that it is inappropriate.	21%
18. Indirectly declines	Victim indirectly declines the suspect's offer, request or suggestion (can also involve a degree of justifying her behaviour but this would be coded separately).	21%
19. Lies – reason to leave.	Victim pretends she has to leave the suspect's company and gives a reason why this is.	21%
20. Tries to get out of enclosed space.	Victim tries to get out an enclosed space.	21%
21. Gathers up belongings	Victim gathered up her belongings.	21%
22. Partial compliance	Victim does not fully comply with suspect's demand but does so partially.	14%
23. Tells suspect it hurts	Victim tells the suspect that he is hurting her.	14%
24. Queries intentions	Victim queries the suspect's intentions.	14%
25. Says farewell to suspect/signals end of conversation.	Victim attempts to end the conversation or expresses her intention to leave the suspect, either way signalling an end to their interaction.	14%
26. False disclosure after question	Victim gives false personal information about herself after the suspect has asked her a question. This is not the same as the victim pretending she can't comply with the suspect's wishes as the focus is on personal information about the victim	14%
27. Witness – put off	Victim tries to put the offender off by warning him about a witness and potential discovery.	14%
28. Argues	Victim argues with the suspect or contradicts him.	14%
29. Seeks clarification	Victim seeks to clarify what the suspect has said sometimes because they think they have misheard them.	14%
30. Reports suspect's behaviour to witness	Victim reports the suspect's behaviour to a witness.	14%
31. Stays still	Victim doesn't move but isn't frozen. She is not resisting the suspect.	14%
32. Escorts suspect out.	Victim escorts suspect out of a property.	14%

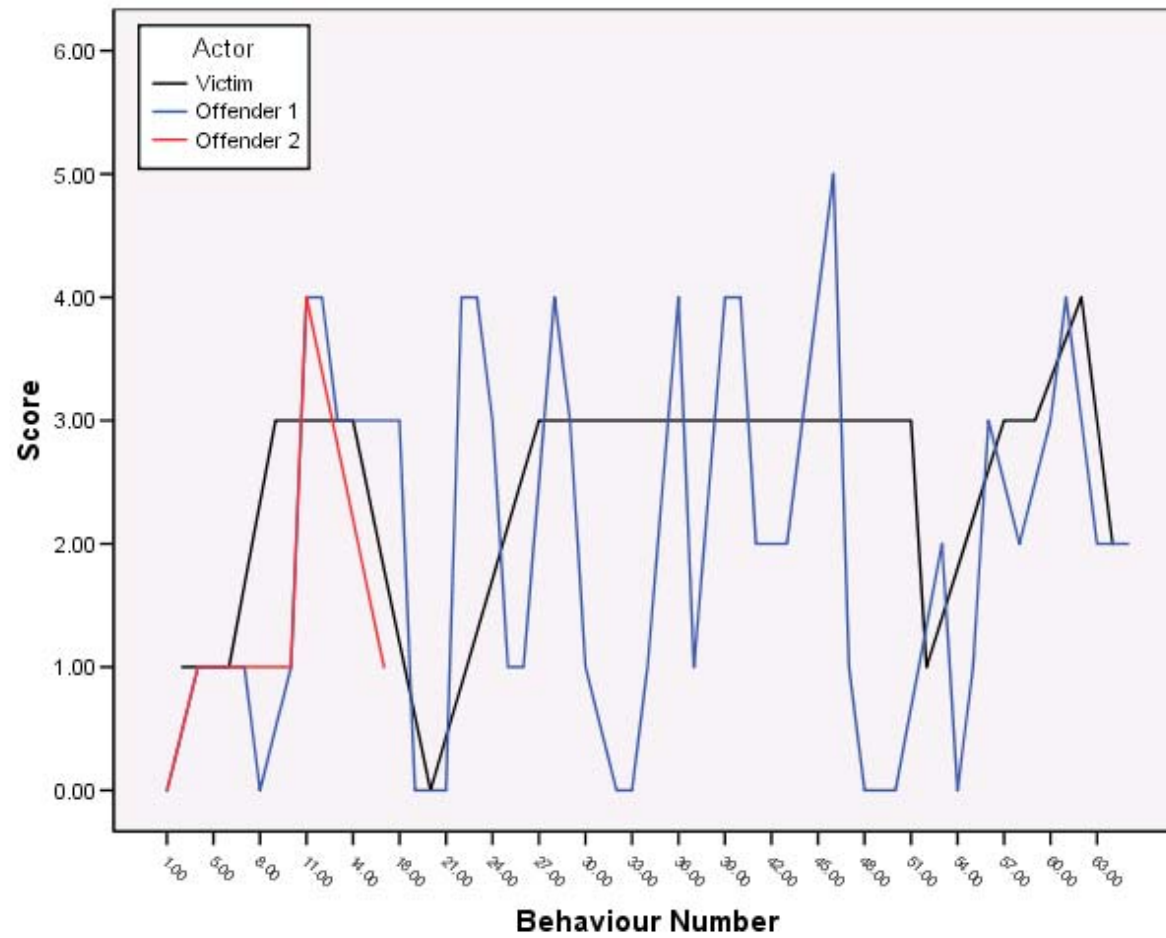
33. Expresses intention to do something.	Victim tells the suspect what she intends to do but she is informing him rather than assuring him.	14%
34. Name calling	Victim calls the suspect a name or insults him.	7%
35. Apologises for non-compliance.	Victim apologises to the suspect for not complying with his wishes.	7%
36. Queries route.	Victim queries the journey/route that the suspect is taking.	7%
37. Refuses to speak	Victim does not speak in a situation where she might be expected to respond verbally.	7%
38. Punches	Victim punches or tries to punch the suspect.	7%
39. Bites	Victim bites the suspect.	7%
40. Pursues/prevents escape	Victim pursues the suspect and/or prevents his escape.	7%
41. Runs away	Victim runs away from the suspect. Not the same as running towards people specifically to get help as this would be physical help-seeking.	7%
42. Gags/chokes	Victim gagged or choked.	7%
43. Lips/mouth closed.	Victim does not stop the suspect kissing her but keeps her lips and mouth closed.	7%
44. Turns around	Victim tries to or does turn around to see who is behind her.	7%
45. Didn't scream	Victim did not scream but this was a conscious and <u>independent</u> decision.	7%
46. Cries out in pain	Victim cries out in pain.	7%
47. Hits/slaps (with open hand)	Victim hits/slaps suspect with her open hand.	7%
48. Responds to greeting.	Victim greets the suspect in response to his greeting.	7%
49. Helps suspect.	Victim helps the suspect.	7%
50. Expresses indifference.	Victim expressed her indifference to the suspect.	7%
51. Safe location	Victim tries to get into or does get into a safe location such as her house.	7%
52. Personal Q co-offender	Victim asks offender a personal question about his co-offender.	7%

53. Cleans	Victim cleans or washes herself.	7%
54. Blocks nostrils	Victim squeezes the suspect's nostrils so he can't breathe.	7%

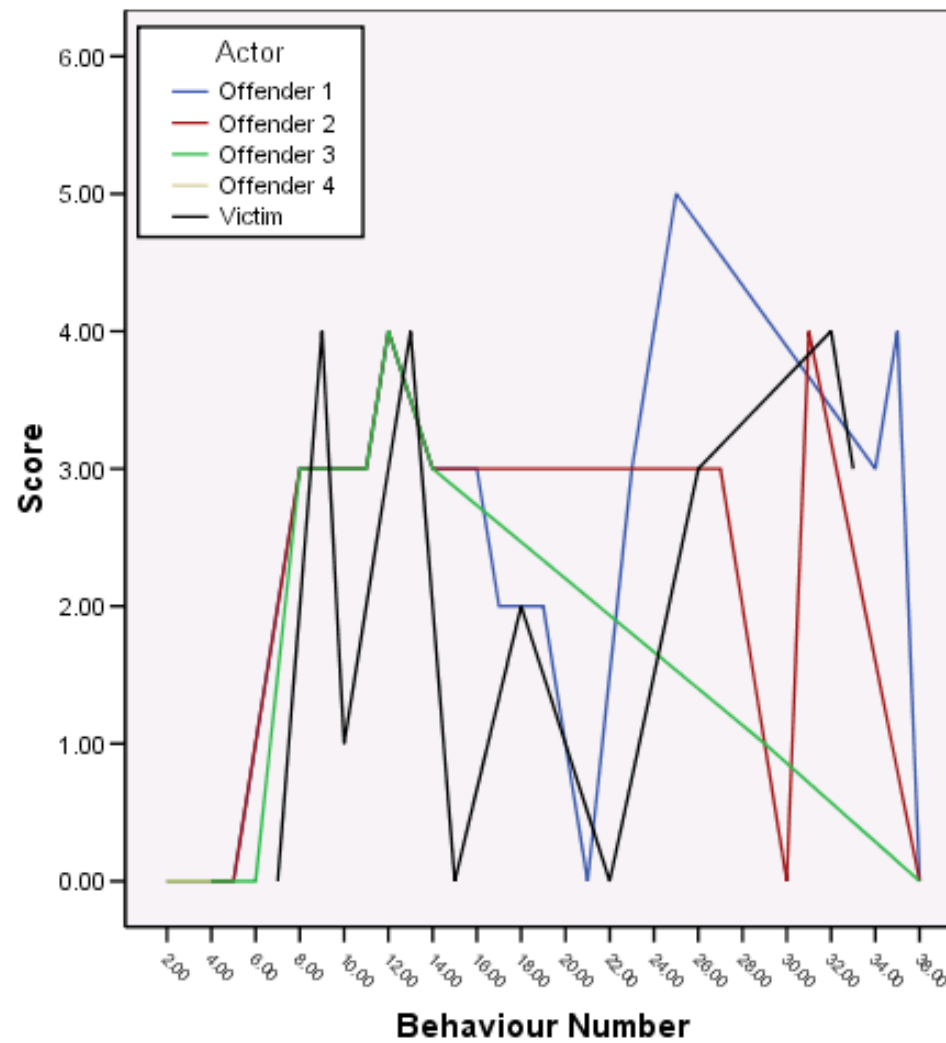
Appendix 9: The Line Graphs for Offender Aggression and Victim Resistance for all 14 Group Rapes



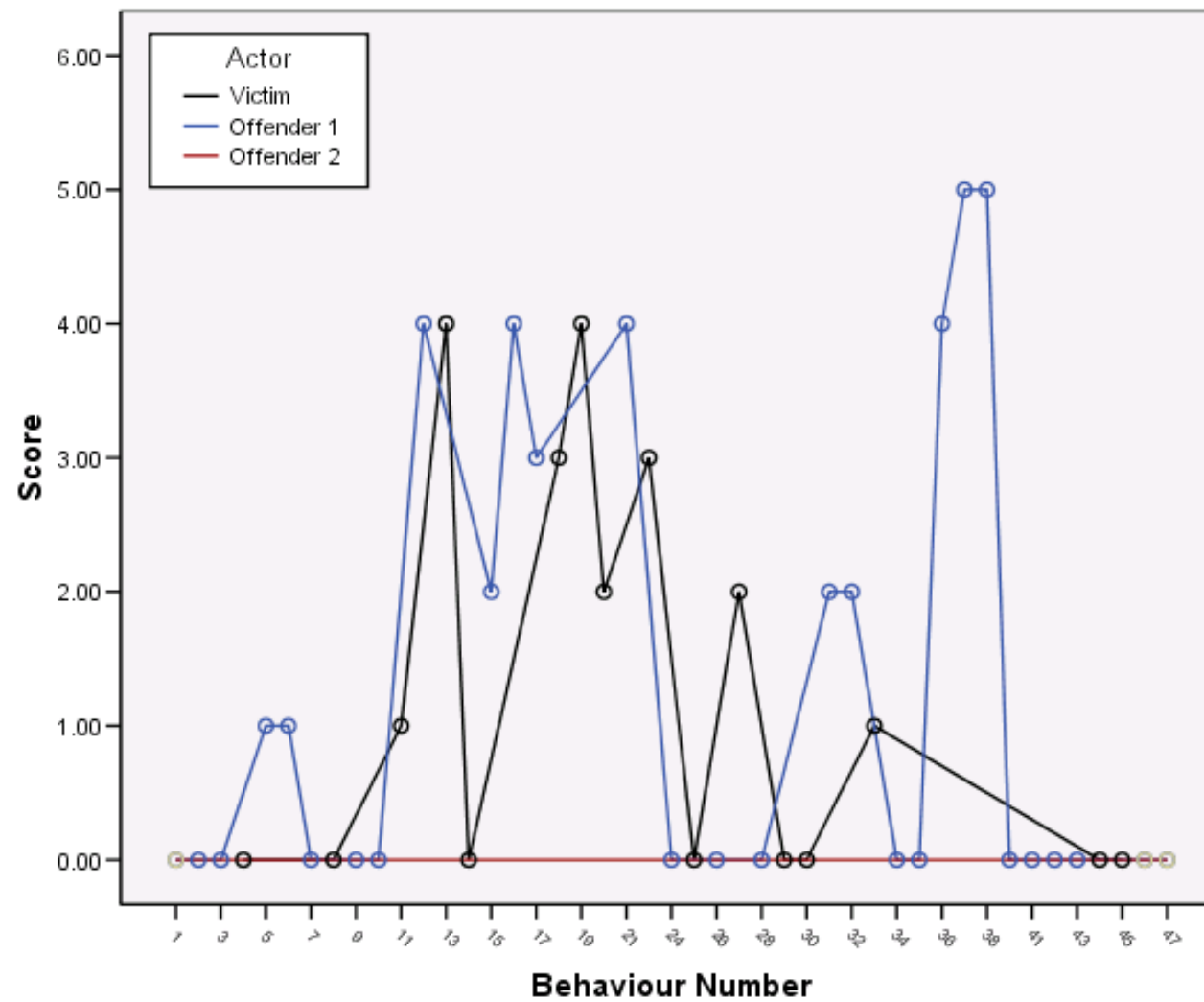
Line Graph for Group Rape 1



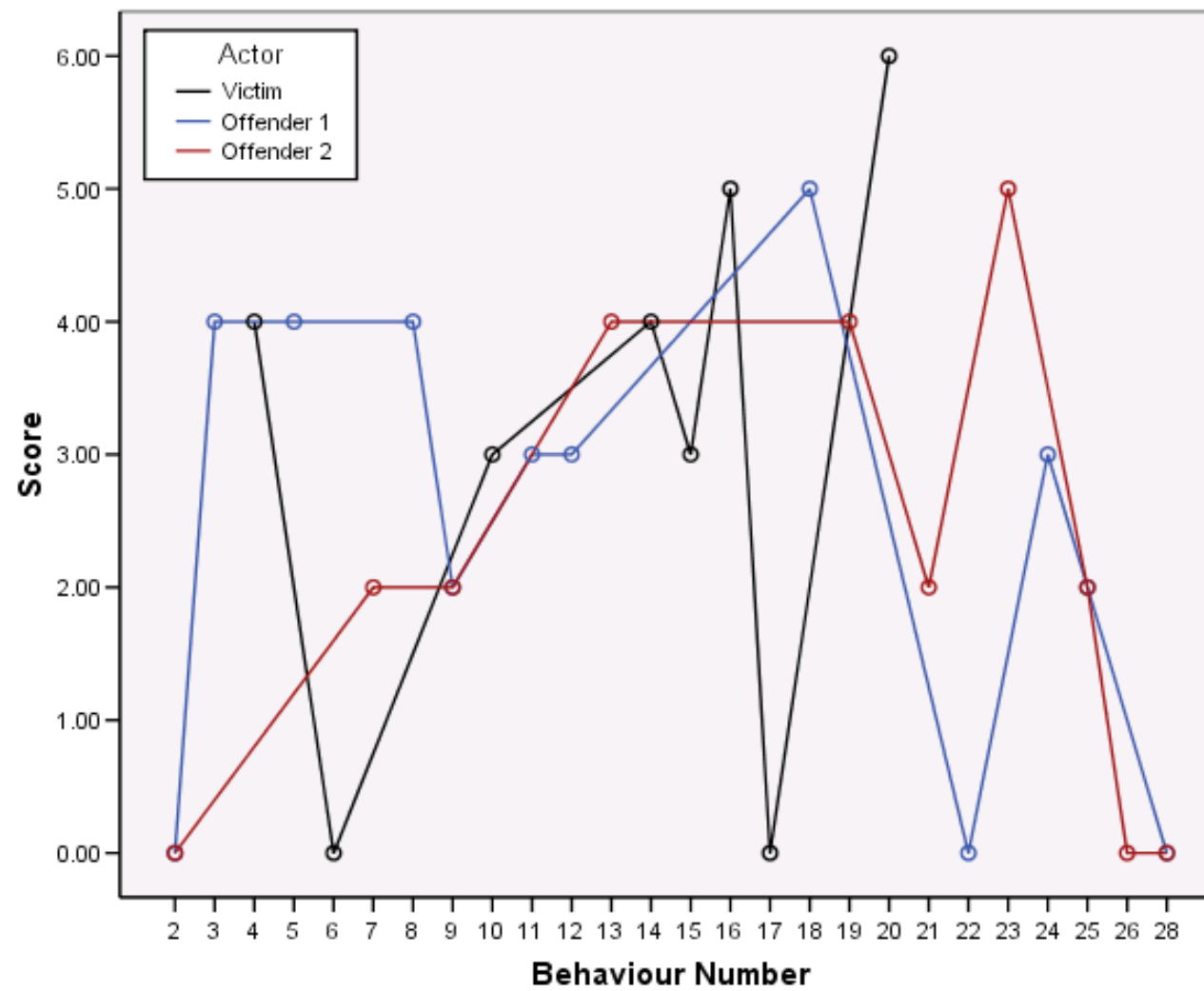
Line Graph for Group Rape 2



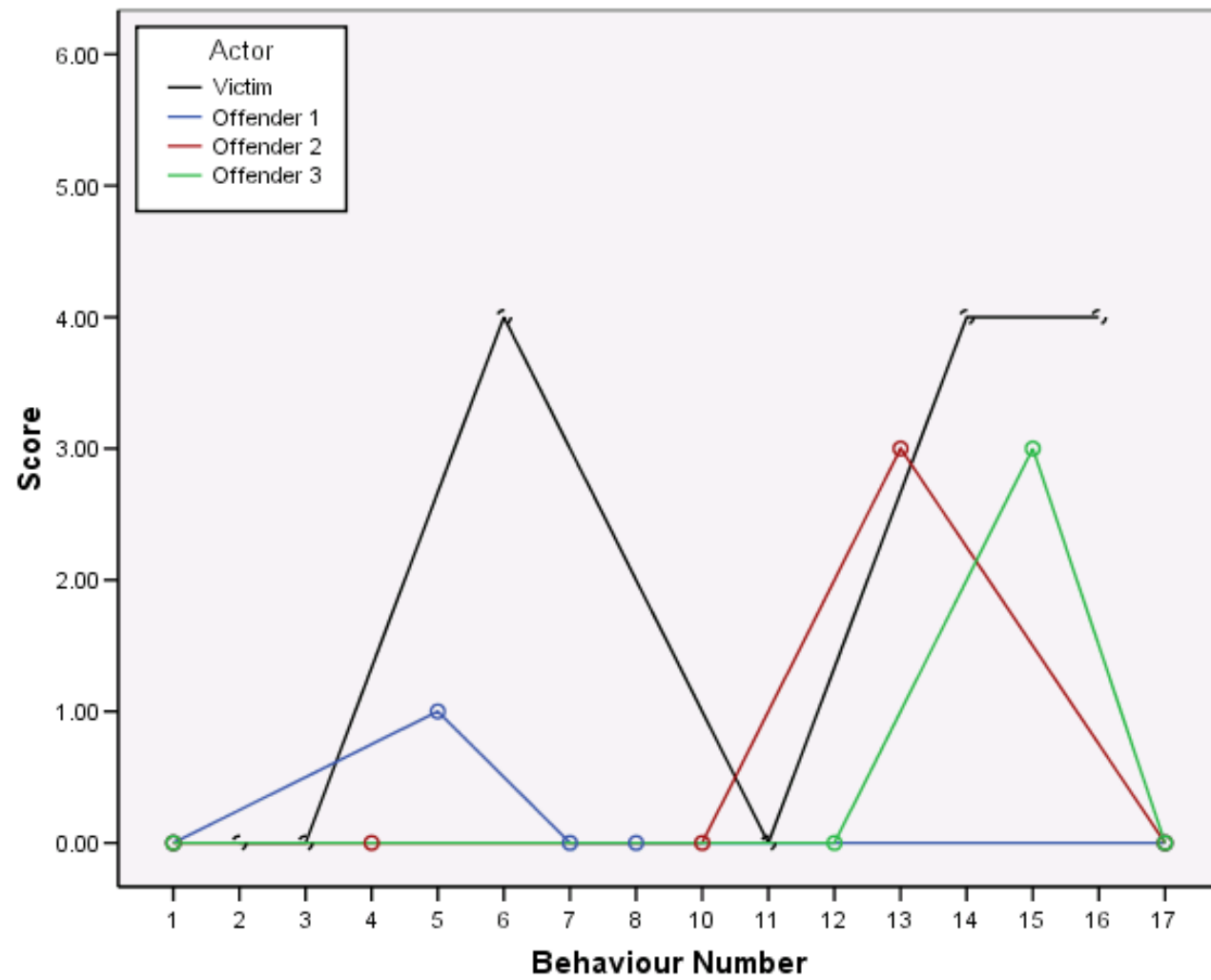
Line Graph for Group Rape 3



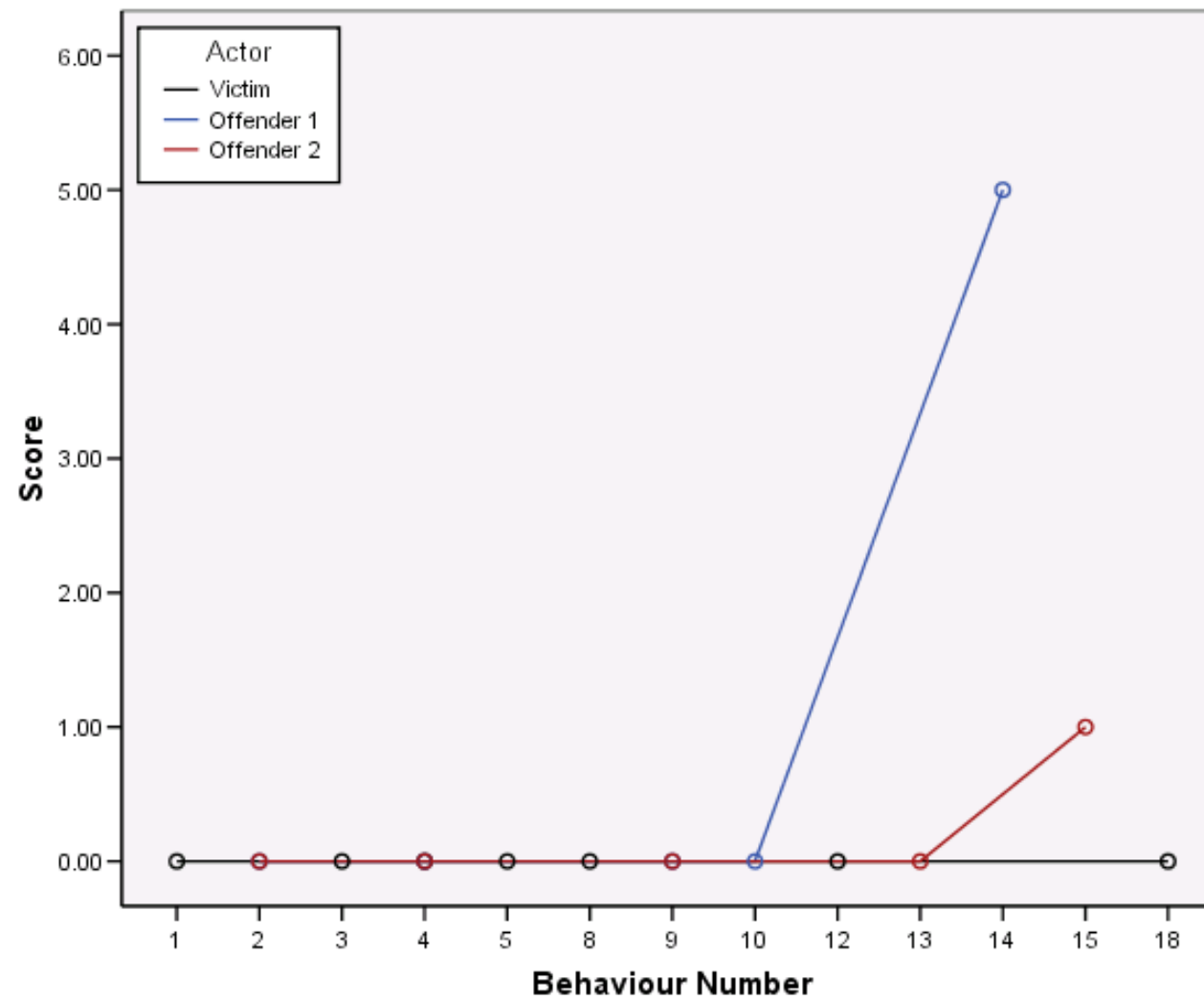
Line Graph for Group Rape 4



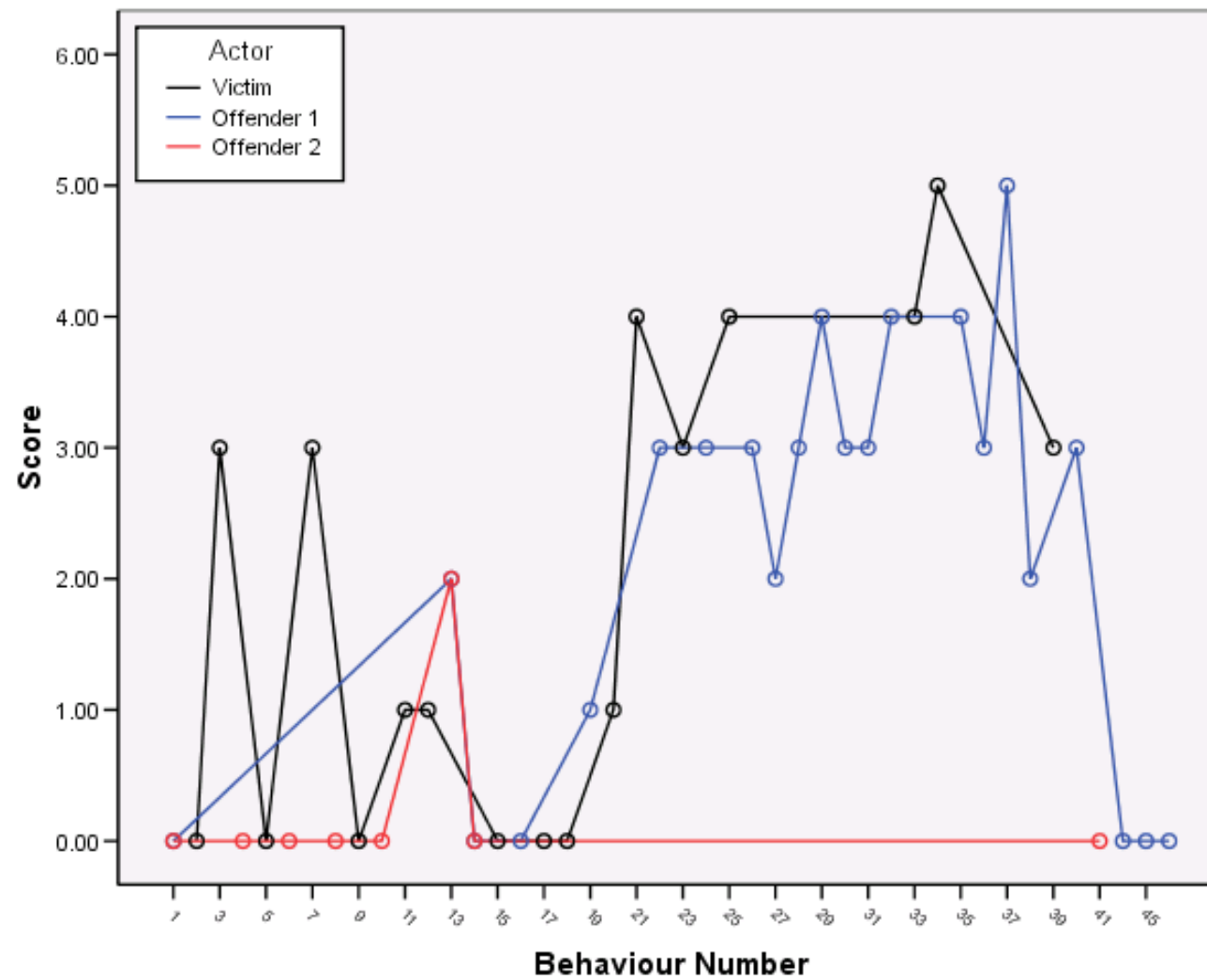
Line Graph for Group Rape 5



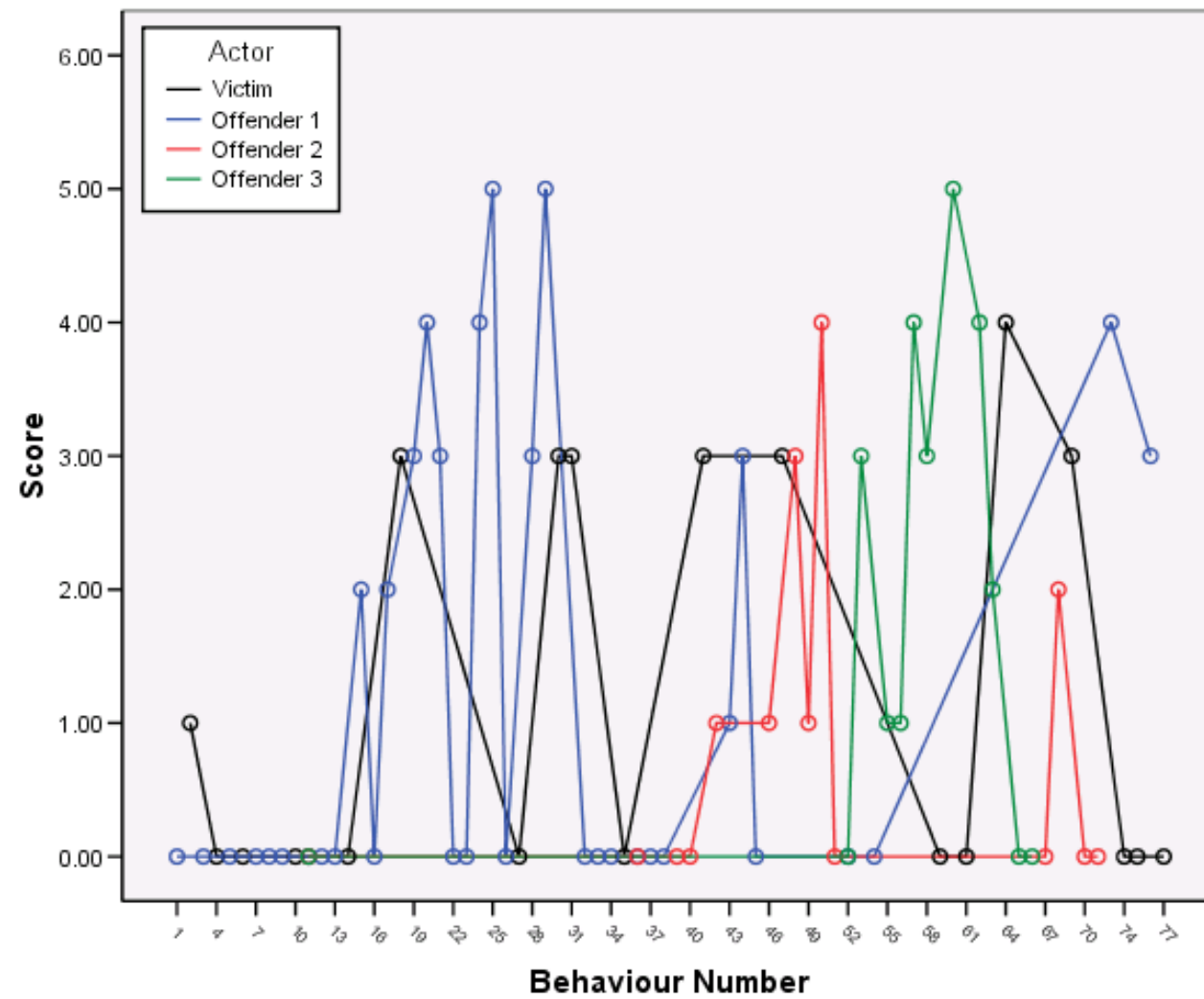
Line Graph for Group Rape 6



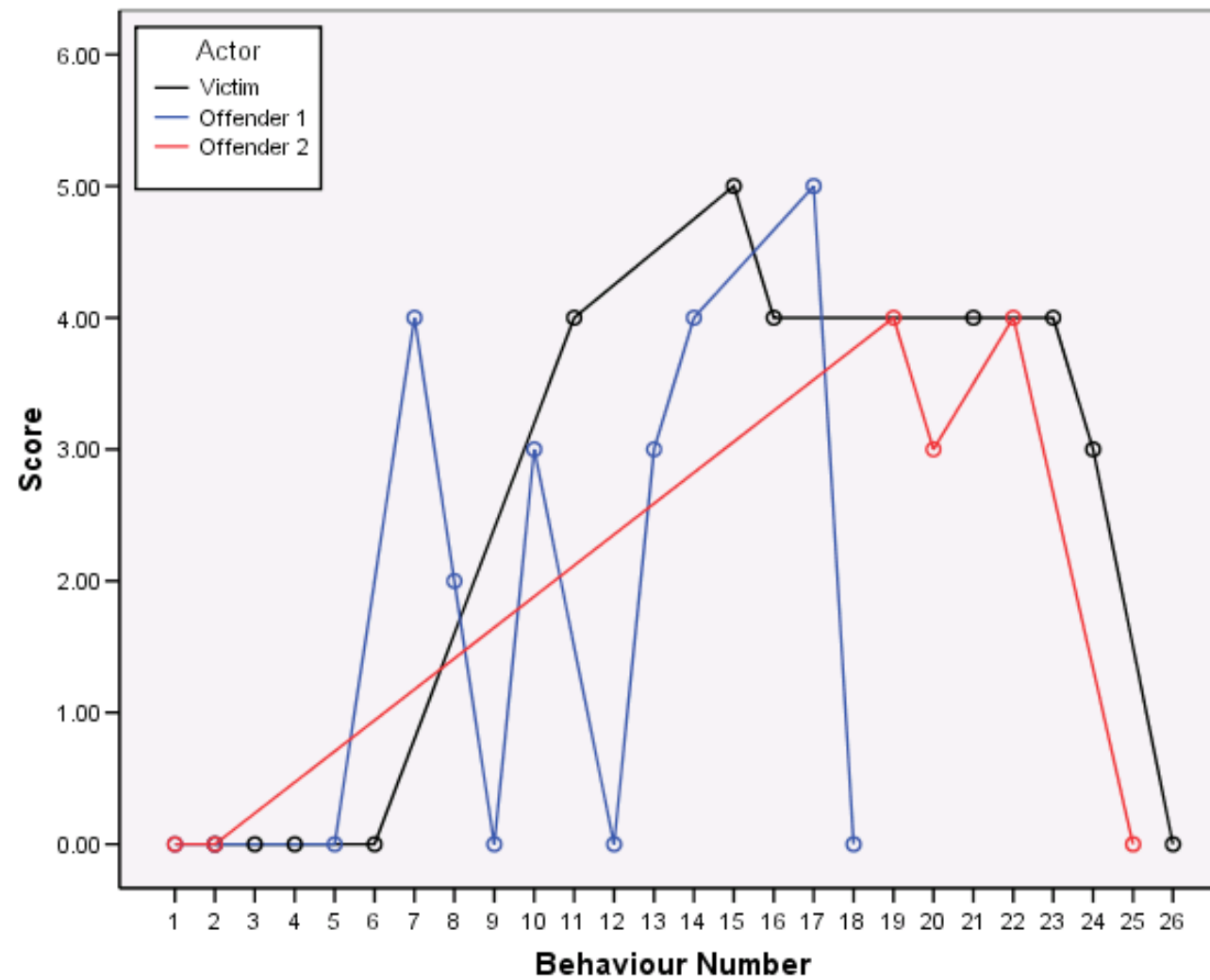
Line Graph for Group Rape 7



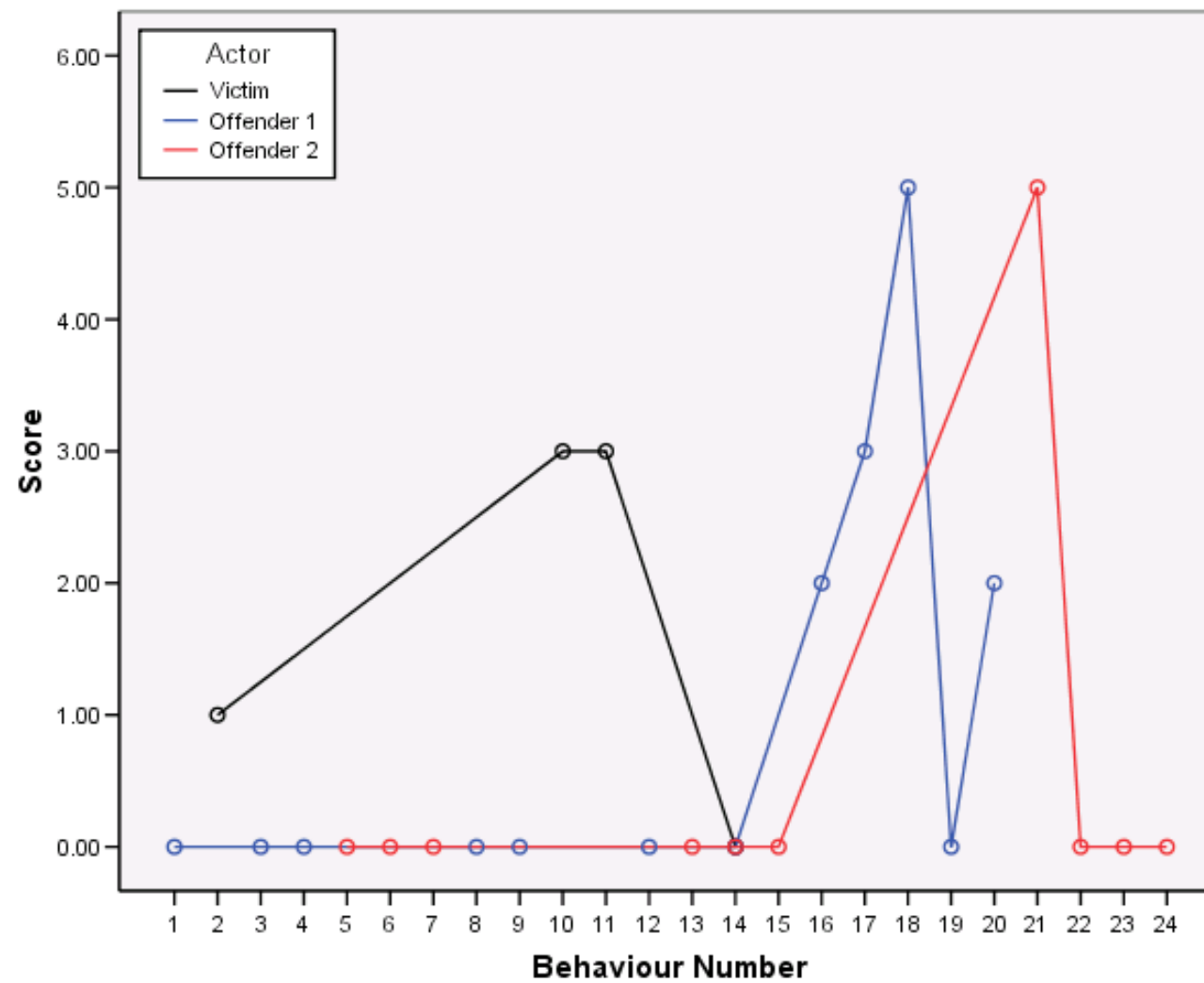
Line Graph for Group Rape 8



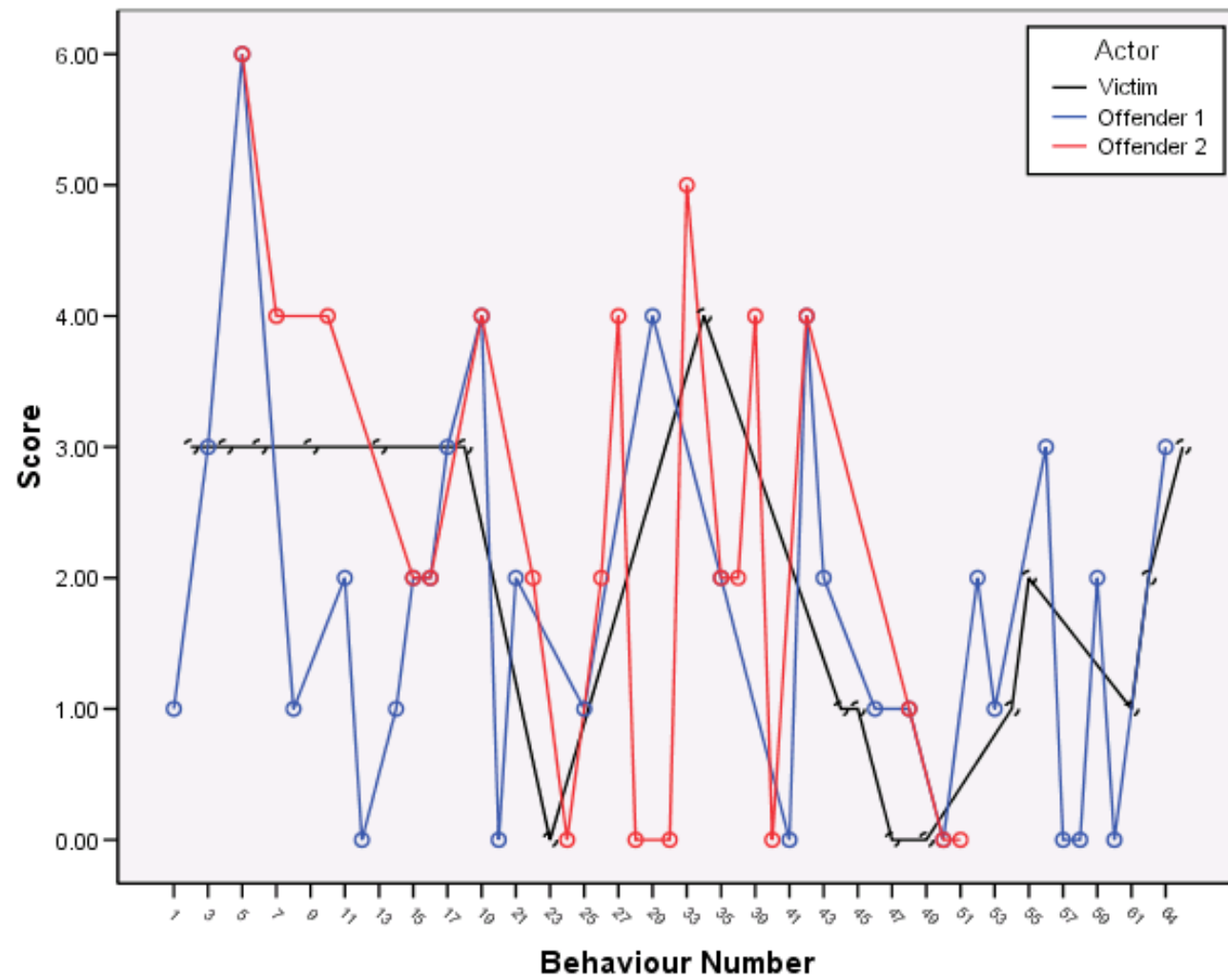
Line Graph for Group Rape 9



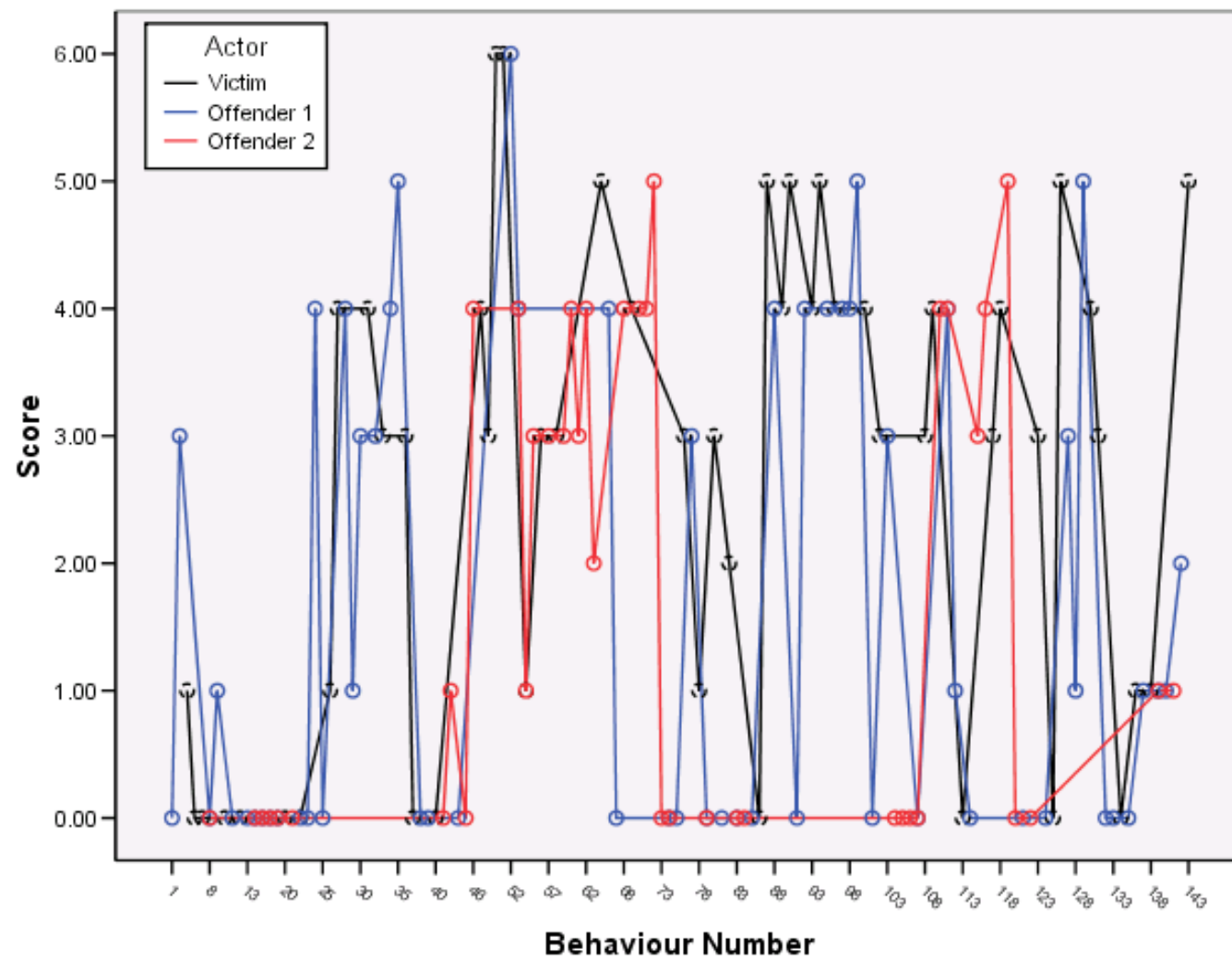
Line Graph for Group Rape 10



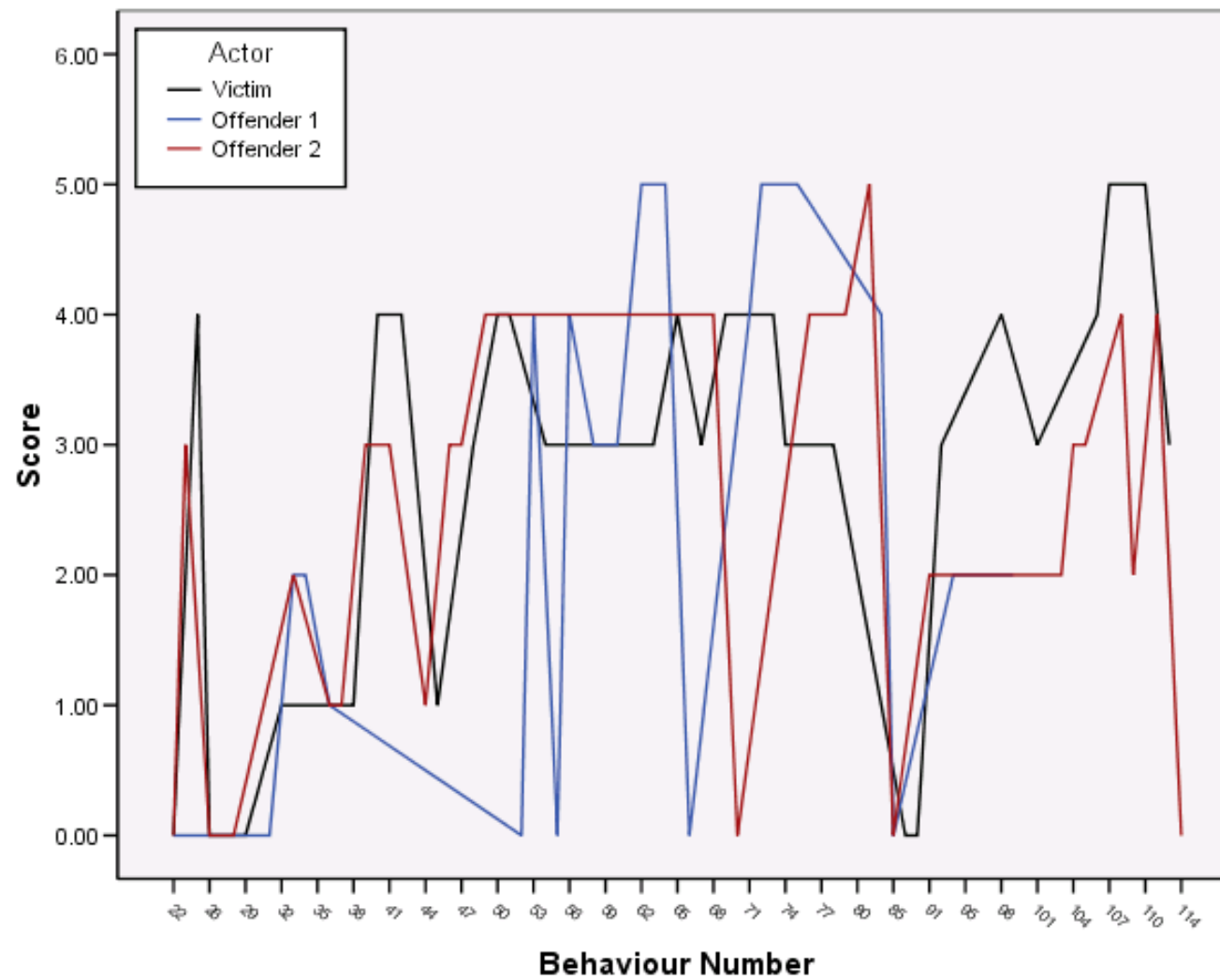
Line Graph for Group Rape 11



Line Graph for Group Rape 12



Line Graph for Group Rape 13



Line Graph for Group Rape 14