UNDERSTANDING THE COGNITIVE PROCESSES ASSOCIATED WITH SEXUAL FANTASIES: TOWARDS A DUAL-PROCESS MODEL

By

Ross Matthew Bartels

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School of Psychology
College of Life and Environmental Sciences
The University of Birmingham
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ABSTRACT

Deviant sexual fantasies are regarded as an important factor in terms of understanding and treating sexual offenders. However, while there is a large amount of research on deviant sexual fantasies, little has been done to understand the cognitive processes underlying and associated with this phenomenon. Thus, in this thesis, a novel theoretical model of deviant sexual thoughts and fantasies is proposed and subjected to empirical testing. In Chapter 1, the literature is examined to ascertain what is currently known about deviant sexual fantasies and what needs to be done. This provides the rationale for the thesis and also contributed to the development of the theoretical model, which is termed the Dual-Process of Sexual Thinking (DPM-ST). Chapter 2 describes the DPM-ST. In brief, the DPM-ST states that associative processes give rise to spontaneous deviant sexual thoughts, whereas controlled processes are responsible for the act of using a deviant sexual fantasy. The subsequent five chapters aimed to test the DPM-ST's main assumptions. In Chapter 3, the results showed some support for the assumption that child abusers hold sex-related associations (i.e., child-sex associations) that share a relationship with sexual fantasies about children. The structural equation modelling study in Chapter 4 provides support for the idea that deviant sexual fantasies are more likely to be used if the individual has a greater proclivity to fantasise generally and holds explicit attitudes that are supportive of the deviant sexual fantasy. Using a dual-task paradigm, Chapter 5 provides support for the hypothesis that sexual fantasising is a controlled process that requires cognitive resources. Chapter 6 outlines data that does not support the hypothesis that sexually fantasising about dominance activates 'self-powerful' associations. In Chapter 7, the results indicate that abusers who repeatedly use sexual fantasies about children strongly associate the concepts of 'children' and 'sexual fantasy'. Chapter 8 concludes the thesis by summarising the findings and discussing their theoretical and clinical implications. Also, the limitations of the studies are outlined, as are some ideas for future research.

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INTRODUCTION

Sexual offending is a universal problem that can have a hugely damaging effect on the individuals involved, as well as the community in general. In the United Kingdom, the latest statistics (i.e., 2011/2012) indicate that 53,665 sexual offences were recorded by the police (Ministry of Justice, 2013). Of these, 82% can be regarded as serious sexual offences (i.e., sexual assault, rape, and activity with a minor). Over the past three to four decades, major advances have been made - in both academia and practice - to understand sexual offenders (Ward, Polaschek, & Beech, 2006). This work has identified a number of factors that contribute to the commission of a sexual offence and treatment programmes have been developed to address the factors that are most associated with sexual (re)offending.

One factor that was of central importance during the early approaches to treatment was deviant sexual interests (Marshall, O'Brien, & Marshall, 2009). That is, it was long presumed that deviant sexual behaviour was the direct product of a deviant sexual interest (McGuire, Carlisle, & Young, 1965). For example, child abusers were thought to sexually abuse children because they have a deviant sexual interest in children. As a result, *deviant sexual fantasies* became a core target for clinicians during treatment, mainly because behaviourists had started conceptualising deviant sexual fantasy as an independent variable that played a role in causing deviant sexual interests (Abel & Blanchard, 1974).

Nowadays, many different factors are of clinical importance when treating sexual offenders (Mann, Hanson, & Thornton, 2010). However, deviant sexual interests are still a core concern as studies show it to be a strong predictor of sexual recidivism (Hanson & Morton-Bourgon, 2005). As such, it follows that deviant sexual fantasies should also remain a core concern (Bartels & Gannon, 2011). Moreover, deviant sexual fantasies are not just sexual in nature but also include issues of power and control, conveying aggression and a desire to humiliate (Marshall, 1996). Thus, their influence on sexual offenders can often extend beyond just creating and/or strengthening a deviant sexual interest (Gee, Ward, & Eccleston, 2003).

Despite the clinical importance of deviant sexual fantasies and the advances that have been made in psychology, little has been done to investigate or understand deviant sexual fantasies more deeply. As Sheldon and Howitt (2008) state, “at the theoretical level, the role of sexual fantasy needs to be better understood" (p. 140). Moreover, the construct itself seems to require a better understanding. This includes explaining the cognitive processes that influence and lead to the use of a deviant sexual fantasy; the processes that underlie the actual act of deviant sexual fantasising; and any other cognitive processes related the use of deviant sexual fantasies.

The field of psychology, and its various approaches (e.g., cognitive psychology), has provided valuable insights into the human mind that can be drawn upon to make predictions about sexual fantasies. It has also developed a number of paradigms and techniques that can be useful in investigating sexual fantasies more fully. Thus, the first overall aim of this thesis was to take what is currently known about deviant sexual fantasies and knit it with contemporary findings from relevant areas of cognitive psychology so that a novel theoretical account of deviant sexual fantasy could be constructed. The second overall aim was to test a number of hypotheses generated by the theory. Not only would this provide empirical support for the theory but it would provide new insights into the cognitive processes underlying and related to deviant sexual fantasies. Such insights may be useful in devising new clinical strategies for treating deviant sexual fantasies in sexual offenders.

Main aims of the thesis

- To examine and evaluate the empirical and theoretical literature on deviant sexual fantasies
- To outline a new theoretical model of deviant sexual thoughts and fantasies
- To empirically test some of the core assumptions of the theoretical model through via five different studies

Structure of the thesis

This thesis aims to understand the cognitive processes associated with deviant sexual fantasies by developing and testing a novel theoretical model. Chapter 1 presents a contemporary review of the literature that examines: 1) the definitional issues related to deviant sexual fantasy; 2) research related to the prevalence of deviant sexual fantasies; 3) research on the effects and functions of deviant sexual fantasies; and 4) the existing theoretical accounts of deviant sexual fantasy.

Chapter 2 presents the Dual-Process of Sexual Thinking (DPM-ST); a theoretical model that accounts for the cognitive processes associated with deviant sexual thoughts and fantasies. This model was constructed by combining the results of the literature review in Chapter 1 with principles and findings from relevant areas of cognitive psychology. These areas are outlined before the theory itself is described, with the aid of a schematic representation.

Chapter 3 describes a study that investigates - using a recently developed indirect measure - whether extrafamilial child abusers hold stronger distorted sex-related associations in their long-term memory relative to other child abusers and non-offenders. Also, this study investigates whether distorted sex-related associations are correlated with deviant sexual fantasies.

Chapter 4 reports a structural equation modelling study that aimed to test whether certain variables influence the use of deviant sexual fantasies in male non-offenders. These variables include fantasy proneness, dissociation, vividness of visual imagery, and explicit distorted attitudes about women.

Chapter 5 describes a study that investigates the hypothesis that sexual fantasising is a controlled process requiring the resources of working memory. The study employs a dual-task paradigm, whereby a task known to require working memory is performed at the same time as mentally envisioning a sexual fantasy. Ratings on vividness, emotional valence, and

arousability are measured before and after the dual-task, as well as before and after a control task.

Chapter 6 reports a study designed to show that sexually fantasising about a deviant theme (i.e., dominance) can prime other, non-sexual associations (i.e., self-powerful associations) and increase one's explicit self-concept (i.e., self-reported powerfulness). Also, the study investigates whether self-esteem and the use of dominance-related sexual fantasies moderate the priming effect.

Chapter 7 describes a study that investigates whether child abusers who regularly use deviant sexual fantasies hold strong associations between the concepts of 'sexual fantasy' and 'children'. The study employs an indirect measure to detect and assess the strength of this presumed association.

In concluding the thesis, Chapter 8 provides a summary of the results, which are then pulled together to discuss the theoretical implications of the research (in terms of the DPM-ST). The clinical implications of the findings are also discussed. Finally, the limitations of each study are addressed, along with some considerations for future research.

STATEMENT OF AUTHORSHIP

The work in this thesis has been used for a number of forthcoming publications (see Appendix A). Specifically, the contents of Chapter 1 and Chapter 2 are being used in a chapter for a forthcoming book and a journal article. The results described in Chapter 5 have been used for a manuscript that has been submitted for publication. Similarly, the results in Chapter 7 have been used for a manuscript that is currently under review. An earlier version of this manuscript was also submitted and awarded the Graduate Student Award from the Association for the Treatment of Abusers (ATSA). I am the lead author on each of these manuscripts, although my supervisors (Anthony Beech and Leigh Harkins) are also included as authors due to their collaborative contribution. In addition, David Thornton is listed as an author on the Chapter 7-based manuscript due to his help in gaining access to forensic participants.

CHAPTER 1

DEVIANT SEXUAL FANTASIES: WHAT IS CURRENTLY KNOWN

Chapter Rationale

The purpose of this chapter is to introduce the concept of deviant sexual fantasy by providing a contemporary review of the empirical and theoretical literature. By examining what is currently understood about deviant sexual fantasies - in terms of definition, prevalence, function, and theory - this chapter aims to underscore the importance of understanding deviant sexual fantasies more fully, particularly from a cognitive perspective. Thus, this chapter can be seen as providing the rationale for the overall thesis.

1.1 Introduction

Deviant sexual fantasies have long played an important in role in the understanding and treatment of sexual offenders. For the most part, this role has been related to the development and maintenance of deviant sexual interests (Abel & Blanchard, 1974), due mainly to the influence of conditioning theories of sexual deviation (e.g., McGuire, Carlisle, & Young, 1965). However, others have held the view that deviant fantasy can influence offending behaviour more directly. These influences include providing offenders with an offence plan (Pithers, 1990; Ward & Hudson, 2000); refining an offender's offence-specific 'expertise' or organisation (Bourke, Ward, & Rose, 2012; Deu & Edelmann, 1997); disinhibiting offenders to their fantasised deviant behaviour (Ward, Hudson, & Keenan, 1998); and providing offenders with a particular *modus operandi* (Leclerc, Carpentier, & Proulx, 2006).

Given their assumed importance, it is no surprise that deviant sexual fantasies are of clinical interest and have been included within relapse prevention models (Pithers, Kashima, Cummings, & Beal, 1988) and treatment programs (Stinson & Becker, 2012). Similarly, deviant sexual fantasies are typically included within macro-theories of sexual offending (e.g., Marshall & Barbaree, 1990; Ward & Beech, 2006) and have been the focus of many empirical studies over the past few decades. Thus, in order to gain an understanding of what is currently understood about deviant sexual fantasies, this chapter examines the literature with regards to four core domains; namely, definition, prevalence, function, and theories of deviant sexual fantasies.

1.2 Definition of deviant sexual fantasy

'Sexual fantasy' has been defined as almost any form of mental imagery that is sexually arousing to the individual (Leitenberg & Henning, 1995). However, despite its frequent use within the literature, there is no formal definition for 'deviant sexual fantasy' (Bartels & Gannon, 2011). This seems to be due to the contentious nature of the term. For example,

Leitenberg and Henning (1995) have debated whether deviant fantasies are simply those that are statistically the most unusual or those linked to unacceptable behaviour even if they are not that unusual. The former of these possibilities is a less convincing definition because many non-offenders report using deviant fantasies (Becker-Blease, Friend, & Freyd, 2006; Crépault & Couture, 1980; Williams, Cooper, Howell, Yuille, & Paulhus, 2009). In other words, the sexual fantasies that are often referred to as deviant (i.e., involving rape or children) appear to be "within the normal realm of human experience" (Gee, Devilly, & Ward, 2004; p.51). However, defining deviant fantasy as 'a fantasy linked with unacceptable behaviour' is also problematic because many non-offenders fantasise about deviant behaviours and do not carry out the behaviour (Leitenberg & Henning, 1995).

Given this, perhaps the referent for the word 'deviant' is simply the behaviour depicted within the fantasy; in other words, deviant sexual fantasies may best be defined as "fantasies that depict deviant sexual behaviour" (Bartels & Gannon, 2011, p. 552). However, this raises the question of what can be regarded as a deviant sexual behaviour. Although formal definitions of 'sexual deviance' remain inconsistent (Ward, Laws, & Hudson, 2003), a number of authors agree that sexually deviant behaviours are largely infrequent in the population; involve intentionally inflicting harm in a sadistic or sexually aggressive way; involve illegal acts (e.g., rape, child abuse, exhibitionism); and involve socially marginal or unacceptable behaviours (Gee and Belofastov; 2006; Gee et al., 2004; Leitenberg & Henning, 1995; Williams et al., 2009; Ward et al., 2003). From this general consensus, it can be seen that 'deviant' does not necessarily mean 'illegal' (i.e., consensual sadistic behaviour). It also means that infrequent yet harmless and non-illegal behaviours - such as the transvestic fetishism (DSM-IV; American Psychiatric Association, 2000) - may be considered deviant. Given that 'sexual deviance' tends to be discussed within the context of sexual offending (Ward et al., 2003), many may view this as problematic.

Noting the contention associated with the term ‘deviant sexual fantasy’, other researchers have proposed alternate terms and definitions (e.g., Bartels & Gannon, 2011; Gee et al., 2004). For example, Gee et al. (2004) introduced the term ‘offence-focused fantasy’, defined as fantasies involving deviant material that if acted out would constitute a sexual offence. According to Gee and Belofastov (2006), this term can be used to differentiate the fantasies used by sex offenders from those evident in non-offender populations. However, as Bartels and Gannon (2011) note, it is unclear how the term helps such a differentiation, since a fantasy involving rape would always constitute an offence if acted out, irrespective of whether an offender or a non-offender created and used it. Also, the term ‘offence-focused fantasy’ does not allow for the inclusion of fantasies involving force with a consenting partner. While these fantasises would not constitute a sexual offence if acted out, they may increase the risk of an offence occurring if the fantasiser has certain traits or is in a certain state that does not enable him to realise or care that a woman is not consenting (Bartels & Gannon, 2011). Thus, while the fantasy was not offence-focused, it still played a part in influencing an offence. Based on this, Bartels and Gannon (2011) propose focusing on the risk-increasing function of deviant sexual fantasies when defining deviant sexual fantasies, as opposed to the content of the fantasy.

Another important definitional issue concerns the term ‘fantasy’, as many researchers consider sexual fantasies to be anything from fleeting sexual thoughts to elaborated sexual scenarios (Leitenberg & Henning, 1995; Wilson, 1978). This is an issue because treating sexual fantasy as an umbrella term is likely to obscure important differences between the different forms of sexual cognition (Bartels & Gannon, 2011; Renaud & Byers, 2001). Over the past few decades, many prominent researchers have shown support for the idea that there is a difference of kind between thoughts and fantasies. For example, Singer (1966) defined fantasy as a shift of attention away from a physical or ongoing task towards an internal stimulus. Thus, by Singer's definition, sexual thoughts triggered by an external stimulus are

not equivalent to a sexual fantasy. Barlow, Hayes, and Nelson (1984) made a distinction between externally triggered sexual thoughts (which they termed 'urges') and internally generated sexual fantasies. Moreover, Jones and Barlow (1990) found support for Barlow et al.'s (1984) distinction by showing that the former occurs at a higher rate than the latter. Finally, Byers, Purdon, and Clark (1998) furthered emphasised that sexual thoughts are distinct from sexual fantasies because they are triggered spontaneously by external cues, whereas the sexual fantasies are generated purposefully and internally.

This distinction corresponds with Kavanagh, Andrade, and May's (2005) work on desire. According to their research, intrusive appetitive thoughts are triggered automatically by external and internal cues, whereas elaborated thought is a more deliberate and controlled process involving greater cognitive effort. Thus, if we draw upon this work and define sexual fantasy as a deliberate and elaborated thought process, it becomes more apparent how sexual fantasies differ from fleeting sexual thoughts. This allows for a more refined conceptualisation to be developed; one that may have important implications for understanding the factors related to deviant sexual fantasies, including how they are assessed and treated.

1.3 Prevalence of deviant sexual fantasies

Research has shown that sex offenders in general tend to use deviant fantasies more than non-sex offender controls (Curnoe & Langevin, 2002; Langevin, Lang, & Curnoe, 1998; Turner-Moore, Waterman, & Smith, 2010). Particularly high prevalence rates have been found in exhibitionists (88%; Dandescu & Wolfe, 2003); serial sexual murderers (86%; Prentky et al., 1989); child molesters (81%; Dandescu & Wolfe, 2003). It was also recently found that high-risk sex offenders (i.e., irrespective of offence type) show a high prevalence rate for deviant fantasies (82%; Woodworth et al., 2013).

As Williams et al. (2009) note, the content of sex offenders' sexual fantasies is typically reflective of their sexual offending behaviour (Gee et al., 2004; Looman, 1995). For example, child abusers tend to fantasise about children and rapists about violence (Woodworth et al., 2013). However, other research shows that the content of sexual fantasies can be rather varied for some offenders (Goldstein & Kant, 1973; Langevin et al., 1998; Prentky et al., 1989). For example, Prentky et al. (1989) found that serial sexual murderers (n = 25), compared to non-serial sexual murderers (n = 17), reported more voyeuristic (75% vs. 43%), fetishistic (71% vs. 33%), and transvestic (25% vs. 0%) sexual fantasies. Similarly, Langevin et al. observed that 33% of 51 exhibitionists and 17% of 24 rapists reported fantasies of children under 16 years old. It is also important to note that many sex offenders also use non-deviant sexual fantasies (Cortoni & Marshall, 2001; Langevin et al. 1998; Looman, 1995; Sheldon & Howitt, 2008; Turner-Moore et al., 2010). For instance, Langevin et al. found that 83% of heterosexual paedophiles reported using fantasies about females aged 21 and over, and 88% of sexual rapists admitted to using fantasies involving non-deviant behaviours.

As previously mentioned, the prevalence of deviant sexual fantasies within non-offender samples has also been reported. Crépault and Couture (1980) observed that, in a sample of 94 non-offending men, 33% admitted to fantasies about raping a woman. Similarly, Goldstein and Kant (1973) noted that 31% of 53 non-offending men reported fantasies of force and sadistic acts. More recently, Williams et al. (2009) noted that, in a sample of 103 students, 68% reported at least one fantasy about sexual assault, 62% about sadism, and 62% about bondage. These rates for rape-related fantasies are one of the highest within the literature. Additionally, child-related sexual fantasies have also been reported in non-offenders. For example, Briere and Runtz (1989) found that 9% of 193 students reported sexual fantasies involving children. Similarly, Williams et al. (2009) report 13% of their 103 students reported fantasies about "paedophilia". Using a larger sample of 531 students,

Becker-Blease et al. (2006) found that 18% reported sexual fantasies about children. Although not as high as sex offenders, these prevalence rates are rather substantial and, thus, warrant further research.

Caution should be taken, however, when interpreting the prevalence rates of deviant fantasies as many of the studies suffer from a number of important problems and differences. First, definitions of sexual fantasy are often missing and inconsistent across studies (Byers et al., 1998). Second, ambiguity regarding the term 'deviant sexual fantasy' can lead to misleading interpretations. For example, in their abstract, Langevin et al. (1998) state that only a third (33.3%) of their sex offender sample (n = 130) reported using deviant sexual fantasies. From this figure, they suggest that deviant fantasies are of little aetiological significance. However, on inspection of Langevin et al.'s results, the 33.3% actually refers to the prevalence of sexual fantasies about children (i.e., <16 years old), rather than deviant fantasies in general. This makes for a rather misleading interpretation of their study. Moreover, in addition to heterosexual (n = 14) and homosexual paedophiles (n = 23), their overall sample was also comprised of rapists (n = 24), exhibitionists (n = 51), and incest offenders (n =17), all of whom are less likely to use child-specific fantasies. Thus, it is not surprising that the prevalence rate for child-related sexual fantasies was relatively low for the overall sample. Indeed, when examined individually, the homosexual and heterosexual paedophiles reported the highest rates for child-specific fantasies (43% and 57%, respectively).

Langevin et al. did note the prevalence rates for 'sexual fantasies of deviant activities' for each of the five offender types (i.e., rapists, exhibitionists, homosexual paedophiles, heterosexual paedophiles, & incest offenders). These deviant activities consisted of a number of behaviours, such as exposing, forcing sexual contact, and beating a partner. However, Langevin et al. did not provide an overall prevalence rate for the sex offenders as a combined group in the way they did for the child-related fantasies. Thus, for the present chapter, the five

individual percentages were deconstructed. It was found that approximately 85 of the 130 sex offenders (65%) reported using sexual fantasies involving deviant sexual activities. This figure is of a higher level of concern than the 33.3% reported by Langevin et al. (1998). Furthermore, if there are any sex offenders within the sample who report using *only* child-specific fantasies, they would be added to this prevalence figure making it even higher. Unfortunately, there is no way to ascertain whether or how many sex offenders reported using just child-specific fantasies. Thus, a prevalence rate for all of the deviant sexual fantasies combined (i.e., sexual fantasies about deviant activities + sexual fantasies about children) cannot be determined.

Nevertheless, providing prevalence rates for sex offenders as a homogenous group is rather uninformative and can lead to divergent conclusions, as sex offenders show a marked degree of heterogeneity (Robertiello & Terry, 2007). Similarly, sexual fantasy itself is a heterogeneous phenomenon (Gee, Ward, & Eccleston, 2003). Thus, a single prevalence rate for a combination of deviant fantasy themes is also likely to be misleading. For instance, Langevin et al. found that 71% of heterosexual paedophiles reported fantasies involving deviant activities. However, it is indiscernible which deviant activities they scored most highly on (i.e., forcing sex, exposing). Thus, researchers should instead try to establish the prevalence rates for various deviant fantasy themes (similar to Williams et al., 2009) for each type of sex offender. This approach would allow for more appropriate comparisons and provide more informative insights.

Another concern is that many studies differ in terms of how they measure sexual fantasy. Most studies typically use questionnaires that ask how frequently certain fantasies are imagined and/or used during masturbation. However, some questionnaires have more items for a fantasy theme than others do. For instance, there are just two items on the Wilson Sex Fantasy Questionnaire (Wilson, 1978) that are associated with child molestation (Baumgartner, Scalora, & Huss, 2002), whereas the Paraphilic Sexual Fantasy Questionnaire

(O'Donohue, Letourneau, & Dowling, 1997) has 14 items directly related to sexual fantasies involving children. Thus, assuming respondents answer honestly, the latter questionnaire has the capability of eliciting more information. Also, the period of time within which participants are asked to state having used certain fantasies is often not provided or inconsistent across studies. For example, some studies measure across one's lifetime (e.g., Sheldon & Howitt, 2008), whereas others specify a certain time period, such as within the last 12 months (Becker-Blease et al., 2006) or the last 24 hours (Lussier, Proulx, & McKibben, 2001). Arguably, the prevalence rates will vary between studies that differ with regards to the specified time-period.

Finally, prevalence rates are likely to vary due to dishonest responding, in that, sex offenders may simply be untruthful about the presence and use of deviant fantasies, particularly since they are measured through self-report. Nevertheless, the prevalence rates reported within the existing literature indicate that deviant fantasies are a concern.

1.4 Effects and functions of deviant sexual fantasy

Deviant sexual fantasy has been assumed to serve a number of functions. From examining the literature, the two most commonly discussed functions are its capability to elicit and strengthen sexual arousal towards deviant themes (Kalmus & Beech, 2005; Laws & Marshall, 1990; McGuire et al., 1965) and act as a form of mental rehearsal for deviant sexual behaviour (Deu & Edelmann, 1997; MacCulloch, Snowden, Wood, & Mills, 1983; Pithers et al., 1988; Prenkty et al., 1989; Ward & Hudson, 2000). The former function clearly provides the basis for Leitenberg and Henning's (1995) arousal-focused definition of sexual fantasy, as well as theories (McGuire et al., 1965) and treatment strategies (Laws & Marshall, 1991) for deviant interests. The latter function has been useful for understanding why certain offenders use certain modus operandi (Leclarc et al., 2006; Bourke et al., 2012) and, as such, has been

of interest to those in the offender profiling field (e.g., Gee & Belofastov, 2006; Hazelwood & Michaud, 2001).

However, other research indicates that sex offenders' fantasies can also serve other functions. For example, in a qualitative study, using a sample of 24 sex offenders, Gee et al. (2003) identified four functions that sex offenders' fantasies can serve. First, they corroborated the link between deviant sexual fantasies and *sexual arousal.* Specifically, they found that such fantasies can both induce and enhance pre-existing arousal levels in sex offenders. This finding is supported by previous research. For example, in a study designed to recondition the sexual interests of 12 patients (which included 5 paedophiles and 2 rapists), Marshall (1973) showed that engaging in deviant fantasies (pre-treatment) induced high levels of sexual arousal. Similarly, Palk and O'Gorman (2004) found that when sex offenders listened to audio content that matched their deviant sexual fantasies, their sexual arousal levels increased.

Second, Gee et al. (2003) found that sexual fantasies allow sex offenders to model future behaviour, either implicitly (i.e., by re-living or rehearsing past experiences) or explicitly (i.e., through the simulation of future scenarios). This function - which they labelled *modelling* - corroborates the presumed link between fantasy and offence rehearsal/planning. For example, MacCulloch et al. (1983) found that sadistic sex offenders would engage in behavioural "try-outs" of their fantasies, before committing the eventual index offence. Leclerc, Beauregard, and Proulx (2008) found that, in a sample of adolescents who offended against children, the use of deviant fantasies prior to the offence was associated with the use of a specific modus operandi. Most recently, in a qualitative study, Bourke et al. (2012) found that experienced (or "expert") sex offenders used deviant fantasies to aid in the planning of their offences. More specifically, the offenders would envision practiced and rehearsed scenarios (which included specific dialogue and sexual actions) in order to visualise and simulate successfully achieving their desired goal.

A third function Gee et al. (2003) identified was termed *affect regulation* and involved offenders using sexual fantasies as a way of eliminating negative affect; elevating an ambivalent affective state (i.e., boredom); and enhancing a pre-existing positive mood/affect. This supports previous research which has shown that deviant sexual fantasies (in both child abusers and rapists) are associated with negative affect (Cortoni & Marshall, 2001; Looman, 1995; McKibben, Proulx, & Lusignan, 1994; Proulx, McKibben, & Lusignan, 1996). In other words, many sex offenders have been found to report experiencing negative affective states, such as loneliness, humiliation, and inadequacy, either prior to or in conjunction with the use of deviant sexual fantasies.

The fourth and final function reported by Gee et al. was termed *coping*, as offenders were found to use sexual fantasies to deal with real or perceived external and/or internal threats. For example, by distorting and manipulating reality within their mind, offenders were able to justify their offending behaviour and gain 'control' over their internal inhibitors. In addition, sexual fantasies also helped some offenders 'escape' or dissociate from a situation or the reality of a situation. This function is supported by a previous study showing that some offenders use deviant (and non-deviant) fantasies to cope with stressful and problematic events (Cortoni & Marshall, 2001).

Gee et al.'s study clearly provides some influential findings. Moreover, there has since been some further corroboration. For example, preliminary results from Turner-Moore and Waterman (2011), using a sample of 93 sex offenders, showed that 'sexual arousal', 'affect regulation', and 'modelling' were reported as functions for sexual fantasies about children and coercion. For both types of fantasies, 'sexual arousal' was the most common function. Also, some offenders reported 'substitution for action' to be a function of coercive fantasies, which was also found in Gee et al.'s study, albeit as a sub-feature of 'modelling'.

It should be noted, however, that Gee et al.'s sample (n = 24) was comprised of 20 child abusers, with only four rapists making up the rest of the sample. Thus, it is not clear

how well the findings generalise to other types of sexual offenders, such as exhibitionists or sexual murderers. Also, it would have been useful if the authors had provided information about the motives of the offenders, as offenders with different motives use sexual fantasies for different purposes. For example, based on Ward, Hudson, Keenan's (1998) Self-Regulation Model, sex offenders with offence-avoidant goals are likely to use sexual fantasies for different purposes (i.e., action substitution) to those harbouring offence-approach goals (e.g., offence preparation). Also, the deviant fantasies of intrafamilial abusers have been found to serve different purposes to those of extrafamilial abusers[1] (Cortoni, Proulx, Paquette, Longpré, & Coutre, 2009). Another related point is that Gee et al. (2003) do not indicate whether more than one function can be experienced by a single offender, as has been suggested by Langevin et al. (1998, p. 323). For example, a recent case report describes how the deviant fantasies of a serial rapist served more than one function (Carabellese, Maniglio, Greceo, & Catanesi, 2011).

Finally, it is possible that other potential functions may also exist. For example, it has been argued that sexual fantasies are often an offender's preferred way of attaining certain non-sexual needs (Ward, Mann, & Gannon, 2007). For example, Marshall and colleagues (e.g., Marshall & Barbaree, 1990; Marshall & Marshall, 2000) proposed that deviant fantasies provide some offenders with a sense of mastery and power that cannot be attained in real-life. Indeed, a few studies offer some support for these assertions. For example, Baumgartner et al., (2002) found that, relative to non-sex offenders, child abusers reported more fantasies involving "...a position of control rather than a position of submission" (p. 26). In the aforementioned case report involving a serial rapist (Carabellese et al., 2011), the offender was reported to experience feelings of grandiosity and omnipotence as a result of using sexual fantasies about forced sex, coercion, and dominance. Finally, Cortoni et al. (2009) found that

[1] Extrafamilial abusers offend against children outside of their family, whereas intrafamilial abusers offend against their own relatives.

intrafamilial child abusers mainly use deviant fantasies as a way of compensating for a low sense of self-worth. Thus, from these findings, it seems that deviant fantasies can also serve a *compensatory function.*

Other functions have also been suggested. For example, Langevin et al. (1998) proposed that deviant fantasies may function as 'wish fulfilment' for some offenders. Interestingly, there is some limited evidence for this. For instance, Tidefors and Kordon (2009) thematically analysed group therapy transcripts of four rapist-murderers and found that a common theme within their fantasies was a "wish to be understood" (p. 8). This involved wanting their victim to see them for who they are and providing the offender with what they need. The offenders also held a wish for "the perfect rape" as evidenced in their fantasies and offence planning (p. 9). This limited support suggests that wish fulfilment may be a function worth investigating further.

In sum, deviant sexual fantasies serve a multitude of functions. More research now needs to be done to understand them further, especially given the heterogeneity among sex offenders and the ways in which the functions may influence offending behaviour. Given their multifaceted nature, it is important to have a sound theoretical understanding of the mechanisms that underlie and drive deviant sexual fantasies. Thus, the following section examines a number of theoretical accounts in order to establish what is conceptually understood about deviant sexual fantasies.

1.5 Theories of deviant sexual fantasy

A thorough search of the literature indicated that there is no existing theory that explains deviant sexual fantasies or fantasising in general, although MacCulloch, Gray, and Watt (2000) propose a theory for the aetiology of *sadistic* fantasies (see Section 1.5.3). Instead, deviant sexual fantasy tends to be conceptually or theoretically discussed within the context of explaining deviant sexual preferences, with a predominant focus on the content of the fantasy.

Thus, to gain any insight into what has been theoretically proposed about deviant sexual fantasies, one must consult existing theories of deviant sexual preferences and piece together the various propositions. The two main sexual preference theories that place deviant fantasy at its core include McGuire, Carlisle, and Young's (1965) sexual deviation hypothesis and Laws and Marshall's (1990) conditioning theory. Thus, both of these theories will be examined to see what they tell us about deviant fantasies, along with MacCulloch, Gray, and Watt's (2000) account of how *sadistic* sexual fantasies emerge.

1.5.1 McGuire, Carlisle, and Young's (1965) account of deviant sexual fantasy

McGuire et al.'s (1965) theory of deviant sexual interest is inspired by the early work of Binet (1888), who postulated that deviant interests are learned during a single sexual experience. However, McGuire et al.'s account differs in an important way. By examining the case histories of 45 men deemed to be sexually deviant, McGuire et al. theorised that the learning process occurs *after* the initial sexual experience and in a more gradual manner. This is because, for 75% of their sample, the initial sexual experience was reported to be important only as far as providing a sexual fantasy for later masturbation. The authors argue that, because the fantasy tends to be a memory of their initial sexual experience, it is likely to have a greater stimulus value than other sources of fantasy (e.g., photos, stories). Drawing upon conditioning principles, the authors theorised that by repeatedly masturbating to this deviant fantasy (before ejaculation), the fantasy becomes even more sexually exciting. As a result, the individual ends up deliberately choosing the deviant sexual memory as a masturbatory stimulus over other less stimulating (non-deviant) sexual fantasies. McGuire et al. state that it is this process that eventually leads to the development of a deviant sexual preference. Thus,
sexual fantasy is seen to be a central feature of McGuire et al.'s theory; that is, an "intervening variable" between the first deviant experience and the resulting deviant sexual interest (Abel & Blanchard, 1974).

By explaining the role sexual fantasy plays within their theory of sexual deviance, McGuire et al. indirectly provide some theoretical assumptions about sexual fantasies. First, McGuire et al. regard sexual fantasies as a stimulus that can be conditioned to elicit sexual arousal in the same way an external stimulus can. They further this point by suggesting that, through conditioning processes, particular cues within the fantasy can become a dominant focus if given emphasis during masturbation. Second, McGuire et al. regard sexual fantasy as a "sexual memory" (p. 188), as deviant fantasies mainly depicted participants' first sexual experience. Third**,** McGuire et al. appear to regard sexual fantasies as something one deliberately chooses to envision during masturbation, as opposed to a more intrusive form of cognition. On this point, McGuire et al. provide two reasons for why deviant fantasies are chosen over fantasies that are "more readily available... and socially acceptable" (p. 186). The first is that the deviant fantasy is more sexually exciting. This is because, according to McGuire et al., it is a memory of a *real* experience and so has a stronger "initial stimulus value" as a masturbatory fantasy (p. 186). This stimulus value is increased through masturbatory reinforcement until it gains dominance as the preferred fantasy. McGuire et al.'s second reason is that many sexual deviants (i.e., 50% of their sample) often believed they could not engage in a normal sex life for a particular reason (e.g., physical or social inadequacy). Thus, they turned to using deviant fantasies.

1.5.1.1 Evaluation of McGuire et al.'s account on deviant fantasies

Despite being developed over 40 years ago, McGuire et al.'s (1965) theory was, and still is, regarded as highly influential in explaining deviant sexual preferences (Ward, Polaschek, & Beech, 2006). The following section will evaluate the assumptions that the theory makes about deviant sexual fantasy.

First, the idea that sexual fantasy is a stimulus that can be conditioned to produce a response (i.e., sexual arousal) has some indirect support, both conceptually and empirically.

On a conceptual level, many behaviourists are in agreement that private (covert) events, such as mental imagery, are forms of behaviour (Cautela & Baron, 1977; Roche & Barnes, 1998; Skinner, 1953). This is based on the idea that private events share a functional equivalence with public (overt) events (Day, 1969), meaning that they can undergo the same conditioning processes. The only difference is that private events are inaccessible to other observers.

There is some research that supports this view. For example, Dadds, Bovbjerg, Redd, and Cutmore (1997) examined the literature on mental imagery and classical conditioning and found that that mental imagery can influence the outcome of classical conditioning and, in some cases, act as a substitute for an actual unconditioned stimulus. Since sexual fantasy is a form of mental imagery, this provides indirect support for McGuire et al.'s assertions about the conditioning of deviant sexual fantasies. Some tenuous support can be gleaned from case studies involving conditioning-based techniques for treating deviant preferences. For example, Kremsdorf, Holmen, and Laws (1980) found that having a paedophilic client masturbate solely to non-deviant fantasies (i.e., 'directed masturbation') daily for eight weeks led to an increase in penile arousal towards non-deviant stimuli. It could be argued here that the non-deviant fantasy became conditioned to elicit sexual arousal. Indeed, the client reported post-treatment that adult females were now his main source of arousal in fantasy. Moreover, since the client showed increased arousal towards *actual* non-deviant stimuli, it can be argued that the fantasy acted as a substitutive unconditioned stimulus. In sum, the available literature provides some limited, indirect support for the idea that deviant sexual fantasy is a stimulus that can be conditioned. More research is needed, however, particularly in the form of well-controlled experimental studies.

McGuire et al.'s assumption that sexual fantasy is a 'sexual memory' is important as it acknowledges the cognitive nature of sexual fantasies. For example, McGuire et al. state that, since they are memories, sexual fantasies "are subject to the usual psychological processes of recall with the result that distortion and selection of cues take place" (p. 186). This

assumption has some conceptual and empirical support. Conceptually speaking, Prentky and Burgess (1991) argue that early childhood abuse can become encoded in memory and retrieved in the form of deviant sexual fantasies. More recently, Ward and Beech (2006) proposed that deviant sexual fantasies are the product of problems occurring in the memory/perception neuropsychological system of the brain. On an empirical level, it has been found that, for some offenders, early abuse and/or past sexual activities were the origin of their deviant fantasies (Gee, Ward, Belofastov, & Beech, 2006), suggesting that memory is playing a role. Also, Gee et al. (2003) found that many sex offenders' sexual fantasies served as way to recall and re-live their previous offences.

However, in spite of this support, other research would suggest that McGuire et al. are only partly correct. For example, in their study on 16 sadistic sex offenders, MacCulloch et al. (1983) found that 12 offenders first experienced non-aggressive sexual fantasies that changed to sadistic content some years after the onset of masturbation ($M = 5$ years). This suggests that their deviant sadistic fantasies may have originated from imagination. Moreover, in Gee et al.'s (2006) study, some sex offenders reported that their sexual fantasies originated purely from imagination, as well as other external sources (e.g., pornography). These findings indicate that deviant sexual fantasies are not always memories of previous experiences.

McGuire et al.'s suggestion that deviant fantasising is a deliberate act has some conceptual support. For example, Byers et al. (1998) state that sexual fantasies are distinguishable from sexual thoughts on the basis of being deliberately and internally generated, whereas sexual thoughts are triggered spontaneously by an external event. Some have also alluded to the distinction within the sex offending literature. For example, Stinson and Becker (2012) state that many sex offenders often confuse sexual fantasies with general sexual thoughts. However, most of the work within the sex offending literature does not make the distinction between deliberate sexual fantasies and intrusive, fleeting sexual thoughts, and so there is little in way of empirical support.

In summary, McGuire et al. provide some theoretical suggestions about the nature of deviant sexual fantasies. Although these suggestions have received little in the way of empirical testing, research from other areas (both within and outside the sex offending field) offer some corroboration. Therefore, although the theory is not fully comprehensive, it does provide some insights into deviant fantasies that may prove useful for developing a more comprehensive understanding.

1.5.2 Laws and Marshall's (1990) account of deviant sexual fantasy

In their theory of deviant sexual preferences, Laws and Marshall (1990) propose that sexual deviance is acquired through the same mechanisms that are thought to produce more socially accepted forms of sexual behaviour; that is, conditioning and social learning processes. They also explain how these two modes of learning can result in the formation of deviant sexual fantasies. These propositions will now be described.

With regards to conditioning, Laws and Marshall essentially elaborate upon McGuire et al.'s (1965) main assumption. That is, that sexual fantasy is an unconditioned stimulus that can be classically conditioned to produce sexual arousal. They elaborate by arguing that any stimulus associated with the original conditioned stimulus (including symbolic stimuli such as fantasies) can elicit sexual arousal; a process known as second-order Pavlovian conditioning. Thus, if an individual becomes conditioned to experience sexual arousal towards a rape scene, he may also come to find other related stimuli sexually arousing, such as fantasies about the rape scene. Laws and Marshall also add that operant conditioning reinforces the Pavlovian associations that are formed.

Laws and Marshall also extend McGuire et al.'s idea of cue selection by introducing the concept of 'autoerotic influence'. This involves deliberately selecting and pairing specific sexual or nonsexual elements within a fantasy with masturbation so that they become eroticised. Laws and Marshall state that this can lead to the creation of new deviant fantasies

or some variation of the original. For example, a man may deliberately focus on or introduce the concept of control into his fantasies. Through conditioning processes, this element can be erotised and become a predominant focus, perhaps even escalating to sadism.

A unique feature of Laws and Marshall's theory is their introduction of social learning theory (Bandura, 1977), particularly the processes of: 1) *participant modelling*, where an individual experiences and then copies the behaviour of another; 2) *vicarious learning* of a non-participant behaviour, whether *in vivo*, print, or visual media; and 3) *symbolic modelling*, where the behaviour and its effects are envisioned and elaborated within one's imagination. Laws and Marshall state that the content for symbolic modelling can originate from "any deviant contact, random deviant fantasy, or exposure to textual or visual representations of deviant behaviour" (p. 221). However, regardless of its origin, the theory argues that symbolic modelling is important in the development of deviant fantasies as it can lead to changes in the original stimulus or to a completely new scenario.

On examination, Laws and Marshall's theory appears to hold some of the same assumptions about deviant sexual fantasy as does McGuire et al.'s (1965) account. For example, they view sexual fantasy as a stimulus that can be conditioned and also appear to hold the view that fantasising is a deliberate act (as suggested by the process of 'autoerotic influence'). However, the theory differs in terms of how the deviant imagery originates. Unlike McGuire et al., Laws and Marshall hold the view that deviant fantasies can reflect more than just the memory of one's first sexual experience (e.g., deviant textual or visual representations).

1.5.2.1 Evaluation of Laws and Marshall's account of deviant sexual fantasy

Laws and Marshall's conditioning theory clearly provides a more thorough description on how deviant sexual fantasies may develop. Much of the same research that supports the suggestions offered by McGuire et al. (1965) is also applicable here. For instance, the

application of second-order Pavlovian conditioning is supported by research showing that mental imagery can work as a substitute for the actual stimulus (Dadds et al., 1997). However, their claim that operant conditioning reinforces the deviant associations formed through Pavlovian conditioning is harder to corroborate since, as Laws and Marshall note, the two forms of conditioning are difficult to separate. For example, in the aforementioned case study where Kremsdorf et al. (1980) used directed masturbation with a paedophilic client, it is possible that operant conditioning also played a role. That is, the rate of non-deviant sexual fantasy use may have increased because non-deviant fantasies had become classically conditioned to produce sexual arousal, which itself became a reinforcer.

Laws and Marshall's idea of 'autoerotic influence', which involves deliberately altering small aspects within a fantasy so that it changes or becomes more focused, is very useful. For instance, it can account for the idiosyncratic differences observed in the content of offenders' deviant fantasies. This idea is supported by MacCulluch et al. (1983) who found that nine sadistic sex offenders (out of 16) deliberately changed an element of their sexual fantasy so that it continued to elicit sexual arousal. Although Laws and Marshall mention reasons why a fantasy might be changed (e.g., to avoid boredom or ensure their fantasy remains sexually arousing), they do not explain why certain themes (e.g., youthfulness, control) or directly deviant elements (e.g., children) are introduced, changed, or focused upon. This is something that needs to be researched further since a study failed to show that sex offenders habituate to their deviant fantasies (Palk & O'Gorman, 2004). Moreover, recent data indicates that far fewer sex offenders change the content of their fantasies compared to non-offenders (Turner-Moore & Waterman, 2011).

Laws and Marshall also place a lot of emphasis upon the social learning process of symbolic modelling when referring to deviant fantasies. However, this process of change appears similar to the process of 'autoerotic influence' and it is not clear whether they are distinct. Nevertheless, there is some support for the assumptions Laws and Marshall (1990)

make about the source of symbolic modelling (i.e., “any deviant contact, random deviant fantasy, or exposure to textual or visual representations of deviant behaviour”, p. 221). For example, Gee et al. (2006) found that sex offenders’ sexual fantasies can originate from their own abusive and non-abusive sexual experiences (cf. “any deviant contact”); from pornography or the media (cf. “exposure to textual and visual representations”); and from imaginative processes (cf. “a random deviant fantasy”).

In summary, Laws and Marshall provide more detailed insights into deviant sexual fantasies. The assumptions made provide direct insight into how some of the processes related to deviant fantasy operate, particularly those that shape fantasy content. They also introduce the idea that sexual fantasies can originate from imagination, as opposed to just memory. However, some of their assumptions lack a thorough explanation (e.g., why a certain cue is changed or focused upon) and there is some overlap among concepts (e.g., change occurring via autoerotic influence and change occurring during symbolic modelling). Thus, much like McGuire et al. (1965), the theory does not provide a complete understanding of deviant sexual fantasy. Moreover, while there is some indirect support for the assumptions made, on the whole there is a need for more empirical support.

1.5.3 MacCulloch, Gray, and Watt’s (2000) account of (sadistic) sexual fantasies

A theory developed specifically to explain how sadistic fantasies develop has been proposed by MacCulloch et al. (2000). The authors recognised that, while some authors found sadistic fantasies are shaped over time (MacCulloch et al., 1983), there was no explanation for how sadistic fantasies are initiated in the first place. Thus, drawing upon the notion of sensory preconditioning (Brogden, 1939), they developed a theoretical account to tackle this question. Sensory preconditioning (SP) refers to a learning process where associations between two representations are formed, in the absence of reinforcement, by simply being presented together or in close succession. Using the example provided by MacCulloch et al. (2000), if a

click is paired with a light, representations of the two stimuli will form (sensory preconditioning). If the click is then paired with a shock, the click will be able to activate a representation of the shock and produce a fear response (Pavlovian conditioning). Due to the previous SP, the light will now appear to produce a fear response. This is because the light activates a representation of the click, which activates a representation of the shock, which elicits a fear response.

Drawing upon sensory preconditioning theory and research, MacCulloch et al. (2000) propose that during and immediately after an episode of sexual abuse, a child may concurrently experience high levels of sexual arousal and aggression. As per the assumptions of SP, it is during this moment that an association will be formed between the internal representation of aggressive feelings and sexual arousal. This association will be strengthened with repeated abuse. As a result, whenever the individual feels aggressive, it will activate feelings of sexual arousal, and vice versa. According to MacCulloch et al., this creates a pathway to generating and envisioning sadistic sexual fantasies. Thus, according to this account, if such an individual ruminates on wanting to hurt someone, they will also feel sexually aroused as a result. This may cause the imagery to become used as a sexual fantasy.

1.5.3.1 Evaluation of MacCulloch et al.'s (2000) account

MacCulloch et al. (2000) provide a novel and well-considered theory on how sadistic fantasies arise. The main strength of the account is that it provides a novel explanation for why an individual may chose to envision a certain sexual fantasy theme (i.e., aggression), especially before they have developed a related sexual interest (i.e., sadism). However, the theory also appears to suffer from a number of limitations. First, the authors base the assumption that sexual arousal is experienced during childhood abuse on a single non-human study. The same goes for the assumption that aggression is experienced during sexual abuse. Second, despite being a central tenet of their theory, there is little to suggest that sexual sadists

experience repeated and chronic childhood sexual abuse. Instead, the literature refers more to physical abuse (Brittain, 1970; Gratzer & Bradford, 1995). Third, the theory does not account for the target of the behaviour, such as why one develops sadistic fantasies involving rape (i.e., Beech, Ward, & Fisher, 2006) when another generates sadistic fantasies involving children (i.e., Firestone, Bradford, Greenberg, Larose, & Curry, 1998). Fourth, the theory has received no direct testing of its assumptions since its publication. For example, the theory would predict that a sample of sadistic fantasisers would report more incidences of repeated childhood sexual abuse relative to a control group or that sadistic offenders are also likely to feel sexual arousal when primed to experience aggression. Finally, while it was not MacCulloch et al.'s intention, it is not known whether the notion of SP can be applied to explain other types of deviant fantasy content. This may be something worth considering, since there is support that the sexual fantasies of other sex offenders can originate from their own abuse (Gee et al., 2006).

From examining these theoretical accounts, it is clear that a number of important insights regarding the nature and processes underlying deviant sexual fantasies have been uncovered and alluded to over the past few decades. These insights have helped in understanding deviant sexual fantasies and, thus, should continue to influence future theoretical accounts of deviant sexual fantasies. While each theoretical account suffers from a number of shortcomings in terms of explaining deviant sexual fantasies, it should be emphasised that these result from their theoretical perspective and the topic upon which they focus. For example, the accounts are based primarily on behaviourist principles and so ignore many of the cognitive features associated with sexual fantasies. As Leitenberg and Henning (1995) stated, although conditioning plays an important role, the development of a sexual fantasy also involves other factors. Indeed, Marshall (1996) suggests that existing conditioning theories of sexual preferences may be strengthened by "translating them into cognitive terms" (p.190).

In terms of focus, MacCulloch et al.'s (2000) account is constrained to sadistic sexual fantasies. More importantly, McGuire et al.'s (1965) and Laws and Marshall's (1990) theories are designed to explain deviant sexual preferences. As a result, deviant sexual fantasy is not explicitly defined and does not receive the level of attention it would otherwise receive had the theories been focused exclusively on deviant sexual fantasies. In addition, the focus of these two theories means that the assumptions made about deviant sexual fantasy are largely confined to its relationship with sexual arousal. This is a problem when considering the multitude of functions deviant sexual fantasy can serve (see Section 1.4).

1.6 Conclusions

In this chapter, a comprehensive examination of the literature relating to deviant sexual fantasies has been presented. Over the past few decades, a great deal has been learned about the content, function, and correlates of deviant sexual fantasies. This work demonstrates that sexual fantasies are a multifaceted phenomenon and one that is important in understanding the psychology and offending behaviour of many sexual offenders. As such, the existing research has helped inform clinicians about how to best assess and treat the deviant sexual fantasies in sexual offenders.

In spite of this, there are many questions that have been ignored and/or left unanswered. More importantly, these questions lie at the centre of some of the most important factors associated with understanding deviant sexual fantasies, such as definition, prevalence, and theoretical insight. Thus, by highlighting that a distinction should be made between sexual thoughts and fantasies; that deviant sexual fantasies may be more prevalent than is otherwise indicated; and that a cognitive understanding of deviant sexual fantasy is needed, there is a strong case for developing a contemporary understanding of deviant sexual fantasies.

CHAPTER 2

THE DUAL-PROCESS MODEL OF SEXUAL THINKING

Chapter Rationale

The literature reviewed in Chapter 1 indicates that deviant sexual fantasy is not a well conceptualised construct. Moreover, an account of the cognitive mechanisms and processes that give rise to deviant sexual fantasies is clearly lacking. Thus, by drawing upon relevant research from cognitive psychology (e.g., associative/controlled processes; mental imagery; working memory; episodic remembering/imagining) and tying it together with what is known about sexual fantasies, a new a priori theoretical model has been developed; the *Dual-Process Model of Sexual Thinking* (DPM-ST). In the present chapter, the cognitive principles underlying the DPM-ST are first outlined, followed by a description of the theory itself. This chapter provides the basis for the rest of the thesis, as the subsequent chapters focus on testing a number of the DPM-ST's core assumptions.

2.1 Introduction

According to the literature, the understanding of deviant sexual fantasies is lacking in theoretical scope (Gee, Ward, & Eccleston, 2003; Sheldon & Howitt, 2008). In light of this, it is argued that a cognitive account of deviant sexual fantasies and their associated processes is a useful addition to the field. In this chapter, a theoretical model designed to explain the chief cognitive processes and mechanisms associated with deviant sexual fantasies will be described. This theory is termed the Dual-Process Model of Sexual Thinking (DPM-ST) and was constructed by knitting together the insights of earlier theories (see Chapter 1) with insights from relevant areas of cognitive psychology. These areas include: dual-process accounts of cognition (i.e., associative and controlled processes); mental imagery; working memory; and episodic memory and episodic future thought. Therefore, before outlining the DPM-ST, the basis of the theory will first be discussed as it will help elucidate the rationale behind the main assumptions of the theory.

2.2 A dual-process approach

As discussed in Chapter 1 (Section 1.2), researchers of sexual cognition have distinguished externally triggered sexual thoughts from internally generated sexual fantasies (Jones & Barlow, 1990). Thus, the DPM-ST seeks to encapsulate this distinction by adopting a dual-process approach to explaining 'sexual thinking'. Human cognition has long been categorised into two processing modes (Evans, 2008; Kahneman, 2011; Schneider & Shiffrin, 1977). One mode is *associative* (also called automatic, implicit, impulsive) and involves the automatic, rapid, and cognitively effortless processing of stimuli. As Smith and DeCoster (1999) state, associative processing is not consciously experienced but the results of it are (i.e., a thought 'popping into mind' or an immediate 'gut feeling'). The other mode is *controlled* processing (also called rule-based, explicit, and reflective) and involves deliberate, slower, and more effortful processing. This dual-processing conceptualisation of human cognition has become

widely embraced, extensively researched, and used to construct dual-process models for an array of phenomena, including attitudes (Gawronski & Bodenhausen, 2006), sexual arousal (Janssen, Everaerd, Spiering, & Janssen, 2000), desire (Kavanagh, Andrade, & May, 2005), and decision making (Kahneman, 2011).

With regards to sexual thinking (i.e., sexual thoughts and fantasies), Kavanagh et al.'s (2005) theory of desire is of particular interest as it distinguishes between automatic intrusive thoughts and a controlled process they term 'cognitive elaboration' (defined as mentally embellishing or 'going beyond' the stimulus). Kavanagh et al. propose that intrusive thoughts about an appetitive target arise when associations are activated in response to an external or internal stimulus. Such thoughts are fleeting unless they are awarded further attention (e.g., if they elicit a strong affective reaction). If a thought is attended to further, Kavanagh et al. argue that the controlled process of cognitive elaboration will occur, which involves holding information about the target in working memory, typically in the form of mental imagery. Byers et al. (1998) state that sexual thoughts and sexual fantasies can be distinguished on the basis of being externally triggered and spontaneous (i.e., associative) and internally generated and purposeful (i.e., controlled). This has some parallels with the propositions made by Kavanagh et al. (2005). Thus, by knitting Byers et al.'s (1998) proposition with Kavanagh et al.'s theory, the DPM-ST views sexual thoughts and fantasies as distinct (yet interrelated) phenomena that operate on the basis of associative and controlled processes, respectively. These two processes will now be discussed in a little more depth.

2.2.1 Associative processes

In their Associative-Propositional Evaluation (APE) model of attitudes, Gawronski and Bodenhausen (2006) state that associative processes are responsible for *immediate affective reactions* towards an object or experience. Hence, encountering a stimulus automatically elicits an affective reaction due to the activation of particular associative links in one's

cognitive network. According to Gawronski and Bodenhausen, the pattern of activation is dependent upon: (a) the pre-existing structure of associations in memory; and (b) the particular context in which the stimulus is encountered. For example, for a child abuser in a certain context, the stimulus “child” may activate an associative pattern that includes concepts such as “daughter” but not “sex”. As a result, this may elicit a nurturing affective response. However, in another context, the associative pattern activated by “children” may include activating the concept of “sex” but not the concept of “daughter”, which may lead to a sexualised affective response (i.e., arousal). Thus, the same stimulus (i.e., children) has the capability of eliciting different associative processes and, therefore, different affective reactions (Gawronski & Bodenhausen, 2006).

There is some support for the view that people hold sex-related associations in long-term memory. For example, a growing body of evidence using cognitive tasks suggests that sex-related associations are held by both normophilic populations (Snowden, Wichter, & Gray, 2008) and sex offender populations (Babchishin, Nunes, & Hermann, 2013). Moreover, some have alluded to the idea that an individual's distorted associative network (often called a 'schema') can give rise to deviant sexual thoughts and fantasies. For example, Johnston, Ward, and Hudson (1997) argued that intrusive deviant sexual thoughts are more chronically accessible for preferential sex offenders as their offending begins earlier in life, compared to situational offenders who begin offending in adulthood. In other words, the associations that give rise to unwanted deviant sexual thoughts in preferential offenders are stronger due to having been formed earlier in life and, therefore, activated more often. In addition, Mann and Beech (2003) stated that distorted schemas interact with environmental variables to produce thoughts supportive of sexual offending (e.g., “I am attracted towards this little girl”). Similarly, Beech and Ward (2004) proposed that deviant fantasies are an acute dynamic (changeable) risk factor that arises when an offender’s core set of schema interact with specific triggers.

Another important feature of associative processes is that they are independent of truth values (Gawronski & Bodenhausen, 2006). In other words, affective reactions can be activated regardless of whether they are endorsed by explicit (conscious) attitudes. However, Gawronski and Bodenhausen state that automatic reactions typically provide people with the basis for their explicit attitudes. In other words, the default mode of evaluative judgment is affirming a proposition based on an affective reaction (e.g., affirming “I dislike X” based upon a negative affective reaction towards X). However, in cases where the default proposition is inconsistent with other momentarily considered propositions and explicit attitudes (e.g., “It is not right to judge someone before knowing them. X may be a nice person”), the default proposition is liable to be rejected. As Gawronski and Bodenhausen note, the idea that affective reactions and endorsed judgments can differ explains the discrepancies often found between implicit attitudes (i.e., those implied by scores on an indirect measure) and explicit attitudes (i.e., those measured using self-reports).

There is some evidence to support this validation process in the context of sexual cognition. For example, 'sexually intrusive thoughts' (SITs) have been defined as "unwanted, personally unacceptable thoughts that are definitely uncharacteristic of one's usual habits and beliefs" (Renaud & Byers, 2005; p. 254). Moreover, a number of studies have documented that SITs can be appraised as negative or distressing (Byers et al., 1998; Clark, Purdon, & Byers, 2000, Renaud & Byers, 1999, 2005; Wetterneck, Smith, Burgess, & Hart, 2011). There is also some indication that some sexual offenders negatively appraise their sexual thoughts. For example, in a case study, an intrafamilial child abuser reportedly complained of "being troubled by pedophilic thoughts every day or two" (Edwards, 1972; p. 57). Also, Johnston et al. (1997) stated that situational sex offenders (who do not harbour a deviant sexual preference) are likely to experience deviant sexual thoughts as unwanted. As a consequence, they are more likely to be motivated to try and control or suppress the thought.

Knitting together ideas from Gawronski and Bodenhausen's (2006) APE model and Kavanagh et al.'s (2005) theory of desire, the DPM-ST proposes that a spontaneous deviant sexual thought (e.g., "I am sexually attracted to this child") is the result of a default proposition (i.e., immediate affective response), ensuing from an association that has been activated by a relevant stimulus (e.g., a smiling child). Since they are based upon associative processes, spontaneous thoughts are fleeting unless they are attended to or retained in working memory; a controlled process termed elaboration (Kavanagh et al., 2005).

2.2.2 Controlled processes

Controlled processing involves the conscious, deliberate, effortful, and goal-directed manipulation of information in working memory (Baddeley, 1996; Bargh, 1994). Working memory is a limited capacity system where task-relevant information is retained and manipulated during the performance of a cognitive task (Baddeley & Hitch, 1974). According to Kavanagh et al. (2005), the cognitive elaboration of a spontaneous appetitive thought is an effortful controlled process requiring working memory resources. For example, elaboration can involve the search and retrieval of episodic information from memory. Indeed, previous research indicates that this specific cognitive operation requires working memory resources (Moscovitch, 1994; Rosen & Engle, 1997). For example, Moscovitch (1994) found that the effortful retrieval of information from long-term memory can be impaired by increasing the cognitive load placed on working memory. Also, recent research has shown that traumatic episodic memories can also be impaired by taxing working memory (Gunter & Bodner, 2008; van den Hout, Muris, Salemink, & Kindt, 2001).

According to Kavanagh et al. (2005), a central tenet of the elaborative process is the involvement of mental imagery. Mental imagery is defined as a perceptual experience that occurs in the absence of a physical stimulus (Finke, 1989). However, mental imagery is not a single, undifferentiated activity but instead involves an array of cognitive processes working

together (Kosslyn, 1995). Moreover, many of these processes, such as the generation and retention of imagery-related information, require the working memory resources (Baddeley & Andrade, 2000; Keller, 2012; Moulton & Kosslyn, 2009). This is demonstrated by studies showing that visual mental imagery (or tasks reliant on visual mental imagery) becomes impaired when the component of working memory responsible for processing visual information (i.e., the visuospatial sketchpad) is concurrently taxed. For example, Logie (1986) showed that looking at visual displays can impair memory performance based on visual imagery. Similarly, Baddeley and Andrade (2000) found that when a visual task is performed concurrently with visual mental imagery, the visual mental imagery becomes impaired (i.e., rated as less vivid). Thus, research suggests that elaborative forms of mental imagery can be regarded as a top-down controlled process (Blair, Ma, & Lenton, 2001; Keller, 2012).

While no research has been conducted to directly demonstrate that sexual fantasising is a deliberate, controlled process, there exists some indirect support. First, sexual fantasies are defined as a form of mental imagery (Leitenberg & Henning, 1995), suggesting that factors necessary for other forms of mental imagery are also at play when sexually fantasising. Also, there are some who hold the view that deviant sexual fantasising is a conscious and deliberate act (Russell, Sturgeon, Miner, & Nelson, 1989). Moreover, Gee et al. (2006) found that the frequency and duration of a sexual fantasy can be controlled by a sex offender, depending on the extent to which they actively or passively regulate the process. This may be suggestive of a controlled process.

A final point to note is the bidirectional nature of associative and controlled processes. As described, activated associations affect controlled processing by providing the basis for a default proposition, which can lead to cognitive elaboration. However, controlled processes can also influence associative processes (Gawronski & Bodenhausen, 2006). For instance, Blair et al. (2001) state that mental imagery has the capability of increasing the accessibility of related mental representations, describing it as a “powerful method of priming” (p.829).

Thus, if a rapist envisions himself forcing sex on a woman, concepts such as ‘women’, ‘sex’, ‘power’, and ‘the self’ may become activated. As a consequence, associations between these concepts have the potential to form, such as ‘the self’ becoming associated with ‘power’. These associative processes may explain the non-sexual effects that sex offenders experience through fantasising, such as a sense of mastery and control (Cortoni & Marshall, 2001; Gee et al., 2003; Carabellese, Maniglio, Greco, & Catanesi, 2011 Marshall & Barbaree, 1990).

2.3 Remembering and imagining episodic events

The literature suggests that deviant sexual fantasies can be constructed from memories of previous sexual experiences as well as from purely imagined sexual scenarios (Beckett, 1994; Gee et al., 2006). This indicates that understanding the processes that underpin remembering and imagining episodic events may be useful in understanding sexual fantasising. The former relies upon episodic memory, whereas the latter is reliant upon future episodic thought; that is, the ability to envision a personal future event (Atance & O’Neil, 2001).

A growing body of research indicates that future episodic thought is related to our ability to recall episodic memories about our past (Schacter, Addis, & Buckner, 2008; Szpunar, 2010). For example, Szpunar and McDermott (2008) found that imagining a future event in a familiar setting (requiring information sampled from episodic memory) was rated as more vivid than future events in a novel setting. Also, studies using functional magnetic resonance imaging (fMRI) have shown that imagining future events shares many of the same neural correlates as does remembering past episodic events (Addis, Wong, & Schacter, 2007). According to Schacter, Addis, and Buckner (2007), these brain regions comprise a ‘core network’ that is responsible for integrating information from past experiences and using it to construct mental simulations about possible future events. Some refer to this capability as “mental time travel” (Corballis, 2011).

The work described above has yet to be applied to topic of remembering and imagining sexual episodic events. However, there are a few studies that suggest sexual offenders draw upon and recombine their episodic memories to create imagery for sexual fantasies. For example, in a case study, Marshall (2006) describes an exhibitionist who, during masturbation, "typically imagined one of his exposing victims approaching him and engaging in consenting intercourse" (p. 17). Arguably, this demonstrates episodic information (i.e., about an offence) being recombined to create a novel scenario. Also, Cortoni, Proulx, Paquette, Longpré, and Coutre (2009) found that some child abusers create deviant sexual fantasies that reflect their early sexual experiences suggesting that past memories are being used as imagery for sexual fantasies. In their qualitative study, Gee et al. (2003) found that some sexual offenders report using sexual fantasies to relive past offences, whereas others simulate future behavior in their sexual fantasies. Arguably, the former involves retrieving episodic information, whereas the latter could involve retrieving and recombining episodic information to form a novel future scenario. This idea is supported by a recent study, which found that 'expert' (or competent) sexual offenders draw upon their past offences when constructing sexual fantasies that function as a mental simulation for a future offence (Bourke, Ward, & Rose, 2012). From this, the authors propose that deviant sexual fantasies can be viewed as a form of mental time travel that can aid offenders in devising the best possible offence plan.

2.4 Outlining the DPM-ST

Having outlined the various cognitive theories, principles, and empirical findings relevant to understanding sexual fantasies, the following section will describe how they were knitted together to construct the Dual-Process Model of Sexual Thinking (DPM-ST). A graphical representation of the theory can be seen below in Figure 2.1. It should be noted that, since a large proportion of the theory is based upon literature pertaining to normative human

cognition, the DPM-ST is likely to apply to all sexual thoughts and sexual fantasies regardless of their content. However, for the purposes of this thesis, the model will be discussed within the context of deviant sexual thoughts and fantasies.

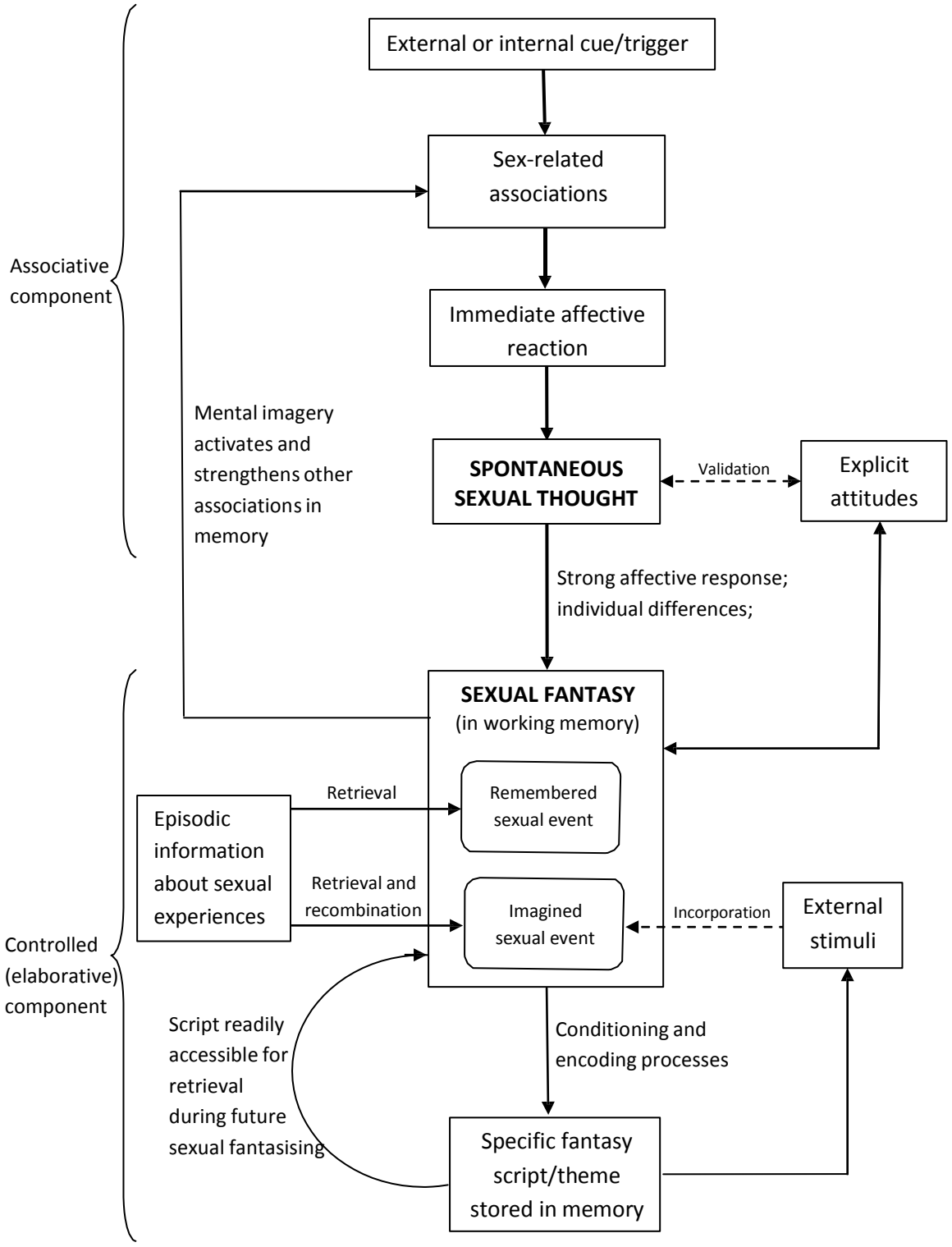

Figure 2.1: Schematic representation of the Dual-Process Model of Sexual Thinking

2.4.1 Associative processes and sexual thoughts

According to the DPM-ST, most people associate sex with a number of possible concepts. These concepts can include categories of people (i.e., men/women; adults/children; behaviours (i.e., oral sex, spanking); objects (i.e., lingerie, fetishes); and emotions (i.e., intimacy, enjoyment). These associations are likely to guide how, when, and what stimuli people regard as sexually relevant and, as such, are likely to form the basis of sexual schema (Andersen, Cyranowski, & Espindle, 1999; Beech, Bartels, & Dixon, 2013). The DPM-ST proposes that when a certain external stimulus is encountered (e.g., a smiling child), sex-related associations held in memory (e.g., a 'child-sex' association) are likely to become automatically activated. This associative process will be dependent upon the cue, context, and pre-existing pattern of associations (Gawronski & Bodenhausen, 2006). Once the association has been activated, it will create an immediate affective response (Gawronski & Bodenhausen, 2006; Janssen et al., 2000), which will be immediately translated into a spontaneous sexual thought (e.g., "I am sexually attracted to this child"). Thus, the thought will feel as though it just 'popped into mind' (Beevers, 2005) and will only be fleeting unless given more deliberate attention (Kavanagh et al., 2005).

2.4.2 From thought to fantasy

The DPM-ST proposes that the likelihood of a sexual thought being elaborated upon (in the form of a sexual fantasy) will be dependent upon a number of factors. First, in line with Kavanagh et al. (2005), the sexual thought will have to elicit a strong affective response, such as sexual arousal or excitement. Indeed, Johnston et al. (1997) note that sexual thoughts are less likely to be suppressed if strong feelings of sexual arousal are experienced. Second, a sexual thought is more likely to be elaborated upon if it is congruent with explicit attitudes and/or other momentarily considered propositions (Gawronski & Bodenhausen, 2006). For example, a deviant sexual thought (i.e., "This child wants sex with me") resulting from a

child's ambiguous gesture will be regarded as congruent or 'true' if it is consistent with distorted explicit attitudes (i.e., "Children enjoy sex with adults"). On the other hand, the same thought will be rejected and negatively appraised if it is *inconsistent* with other endorsed attitudes or considered propositions (i.e., "Children are seriously harmed by sex with adults"). This is more likely to occur if a sex offender has successfully undergone cognitive- behavioural therapy to correct their distorted attitudes.

Third, a sexual offender who has to abide by a relapse prevention plan may be less likely to elaborate upon a fleeting sexual thought, as engaging in a deviant sexual fantasy (referred to as a 'lapse') can cause a negative feeling referred to as the 'abstinence violation effect' (Russell et al., 1989). Fourth, the elaboration of a sexual thought may simply be inappropriate in certain situations (e.g., at work). Finally, elaborating upon a sexual thought in the form of a sexual fantasy is likely to be affected by various individual differences. For example, an offender is more likely to use a deviant sexual fantasy if they are more sexually preoccupied or if they have a greater working memory capacity. They are also more likely to elaborate upon a sexual thought if they are able to effectively form vivid mental imagery (Smith and Over, 1987). Also, offenders who are more fantasy prone in general (Wilson & Barber, 1981) and who have more dissociative experiences are likely to engage in deviant sexual fantasies more often than those who are less fantasy prone and who do not regularly experience dissociative states.

2.4.3 The controlled process of sexual fantasising

According to the DPM-ST, sexual fantasising is an elaborative controlled process that is deliberate, effortful, and goal-oriented[2]. During the process, information is retrieved from episodic memory and is either: 1) reconstructed as a 'remembered sexual event'; or 2)

[2] There are occasions when sexual fantasising can occur in the absence of a preceding sexual thought, such as when asked to describe or write a sexual fantasy on instruction (i.e., in research or clinical practice).

recombined to create a novel ‘imagined sexual event’. This aspect demonstrates that sexual fantasising can incite “mental time travel”, which can lead some offenders to cognitively reflect on a previous offence or possible future offences (Bourke et al., 2012).

Since it involves the retrieval, manipulation, and retention of target-related information (i.e., children, deviant behaviours) in working memory, the act of sexual fantasising is likely to compete with other cognitive tasks for working memory resources. This means that, during times of cognitive load (i.e., when stressed), sexual fantasising will be a difficult cognitive operation to perform. As a result, information from external sources (e.g., pornography) may be incorporated into the imagined fantasies (Gee et al., 2006; Goldstein & Kant, 1973). Indeed, evidence would suggest that some sex offenders use the Internet to fuel their deviant sexual fantasies and interests (Kloess, 2013; Long, Alison, & McManus, 2013). This use of the external world to perform a task that requires working memory is known as ‘off-loading’ in the domain of embodied cognition (Wilson, 2002). Furthermore, the use of external world has also been highlighted as an important point to address when dealing with sexual offenders’ cognition (Ward & Casey, 2010).

Another proposition of the DPM-ST refers to the cognitive-based consequences of sexual fantasising. One example is that sexual fantasising will cause the initially activated associations to strengthen further, essentially creating a feedback loop. Also, other associations may also become activated, since mental imagery has been shown to be a powerful form of priming that can cause other associations to be activated (Blair et al., 2001). For example, sexual fantasising may lead other non-sexual associations to become activated, such as those between ‘the self’ and ‘power’ or the ‘the self’ and ‘children’. This would provide a cognitive explanation for how sexual fantasies provide sexual offenders with non- sexual benefits, such as a sense of mastery/control or a sense of emotional congruence with children, respectively.

A second cognitive effect relates to the encoding of fantasy-related information. For example, the repeated use of a deviant sexual fantasy may lead to the formation of an association between the concept of 'sexual fantasy' and the deviant theme that is depicted in the fantasy. That is, some child abusers who frequently use sexual fantasies about children may come to associate the concept of 'sexual fantasy' with 'children'. Also, the specific pattern of behaviour within a repeatedly used deviant sexual fantasy is likely to become encoded in memory as a 'cognitive script' (Huesmann, 1998; Ward & Hudson, 2000). This will increase the likelihood that it will be retrieved during future instances of elaboration (Huesmann, 1998). In other words, due to being more cognitively accessible, an encoded cognitive script is more likely to be brought to mind when an offender elaborates upon a sexual thought, as it requires less cognitive effort than generating a new scenario.

2.5 Conclusion

The aim of this chapter has been to describe the basis of the DPM-ST as well as the DPM-ST itself. The literature that was reviewed in Chapter 1 helped guide what aspects of cognitive psychology would be most useful in devising the DPM-ST. It also highlighted the areas within the literature that are in need of clarification, such as distinguishing fleeting sexual thoughts from elaborate sexual fantasies. These aspects and insights were incorporated into the DPM-ST so that, not only does the theory draw together what has already been theorised and empirically uncovered about deviant sexual fantasies, but it also provides new assumptions that have never been applied to the construct before. It is because of this that the DPM-ST has the potential to open up new and exciting avenues for future research and treatment. However, the core assumptions of the DPM-ST need to be tested and corroborated in order for these implications to hold. Fortunately, the DPM-ST is able to generate a number of testable hypotheses; a number of which are tested in the following chapters of this thesis. These include testing whether:

- Child abusers hold sex-related associations that show a relationship with corresponding deviant sexual fantasies (Chapter 3).

- Individual differences (i.e., in the ability to fantasise generally) and congruent explicit attitudes influence the use of deviant sexual fantasies (Chapter 4).

- Memory and imagination-based sexual fantasies require the resources of working memory (Chapter 5).

- Deviant sexual fantasies prime other associations related to the content of the fantasy (Chapter 6).

- Child abusers who repeatedly use deviant fantasises associate the concept of sexual fantasy with the theme of their deviant sexual fantasy (i.e., children) (Chapter 7).

CHAPTER 3

INVESTIGATING SEX-RELATED ASSOCIATIONS IN CHILD ABUSERS

Chapter Rationale

As discussed in Chapter 2, the 'Dual-Process Model of Sexual Thinking' states that when a relevant stimulus is encountered, sex-related associations are activated leading to the automatic generation of a fleeting deviant thought and possible sexual fantasy use. Therefore, the DPM-ST rests upon the idea that sex-related associations are stored within individuals' associative memory. This chapter describes a study aimed at corroborating the presence of distorted associations in child abusers and investigating whether such associations show a relationship with self-reported deviant fantasies.

3.1 Introduction

A core aspect of the Dual-Process Model of Sexual Thinking (DPM-ST) is that people hold sex-related associations within their associative networks. Since the DPM-ST proposes that these associations - when activated - give rise to spontaneous sexual thoughts and subsequent sexual fantasies, the assumption can be viewed as a foundational component of the DPM-ST. As such, examining sex-related associations is a logical starting point for corroborating the theory.

One way to infer the strength of a particular association is to use a reaction-time task that measures the speed in which an individual responds to stimuli congruent with the association. This is because stronger associations are thought to influence a person's reaction time to related stimuli (Mihailides, Devilly, & Ward, 2004). The most widely used reaction-time (or indirect) measure is the Implicit Association Task (IAT; Greenwald, McGhee, & Schwartz, 1998). In brief, the IAT is a blocked reaction-time task designed to measure how fast words and/or pictures (i.e., *orgasm* and *school*) are categorised into the correct superordinate category (i.e., 'Sex' and 'Child', respectively). One of the blocks involves pairing two congruent categories (i.e., Sex and Adult) on the same key, while another block involves pairing two incongruent categories (i.e., Sex and Child) on the same key. To assess association strength, researchers measure how fast participants categorise stimuli into the congruently-paired category relative to the incongruently-paired category. In the example above, child abusers would be expected to be faster than non-offenders during the incongruent block (with child and sex paired) relative to the congruent block.

Over the past decade, research using the IAT has provided support for the assertion that people hold automatic sex-related associations. For example, heterosexual and homosexual participants have been found to hold associations that correspond to their sexual orientation (Ó Ciardha & Gormley, 2012; Snowden, Wichter, & Gray, 2008; Snowden & Gray, 2013). Moreover, child abusers have been found to demonstrate stronger associations

between children and sex than non-child abusers (Banse, Schmidt, & Clarbour, 2010; Brown, Gray, & Snowden, 2009; Gray, Brown, MacCulloch, Smith, & Snowden, 2005; Mihailides et al., 2004; Nunes, Firestone, & Baldwin, 2007; Steffens, Yundina, & Panning, 2008). Although these findings are highly encouraging, they cannot be used to make entirely conclusive statements about sex-related associations. This is because the IAT is based on a relative, rather than absolute, paradigm. Thus, researchers are unable to rule out the possibility that the results on child-sex IATs are due to reduced adult-sex associations or stronger adult-not sex associations (Snowden, Craig, & Gray, 2011).

In an attempt to corroborate the assumption that child abusers hold stronger child-sex associations than adult-sex associations, Hempel, Buck, Goethals, and van Marle (2012) used the Single-Category IAT (SC-IAT; Karpinski & Steinman, 2006). The SC-IAT is similar to the original IAT except it has no opposing category for one of the concepts being tested. In Hempel et al.'s study, the opposing category of 'not sex' was omitted. The results showed that child abusers responded faster when child and sex-related words were categorised using the same response key. Conversely, the non-abusers and adult sex offenders (i.e., 7 "sexual assaulters", 3 rapists, 2 exhibitionists, and a frotteur) were faster when adult and sex shared the same key. While informative, these results do not conclusively indicate that child-sex associations were stronger than adult-sex associations, as it is possible that the results were due to decreased adult-sex associations; a point acknowledged by Hempel et al., (2012). Unfortunately, like the original IAT, the SC-IAT does not offer the capability of reliably comparing the strength of each association.

An indirect measure that may prove fruitful is the *Sorting Paired Features* task (SPF; Bar-Anan, Nosek, & Vianello, 2009). This is because the SPF assesses the strength of all four associations in a single block. The task involves sorting two stimuli (e.g., '*Husky*' and '*Happy'*) into its corresponding paired category (e.g., dog-pleasant, dog-unpleasant, cat-pleasant, and cat-unpleasant), which are located in the four corners of the screen. Thus, in the

example above, the correct category would be ‘dog-pleasant’. In the original SPF paper, Bar-Anan et al. (2009) present findings showing that Caucasian people hold stronger white-good and black-bad associations than white-bad and black-good associations, relative to Black people. Similarly, female participants were found to hold stronger female-good and male-bad associations than female-bad and male-good associations compared to male participants. Thus, the SPF shows good known-groups validity.

Moreover, Bar-Anan et al.'s SPF results show that opposing categories not measured by an IAT (e.g., black-bad, white-bad) may be important in understanding an individual’s socio-cognitive processing. Applied to child abusers, these associations would be adult-not sex and child-not sex. In addition to assessing and comparing all possible associations, the SPF has other benefits. For example, the fact that the SPF involves a single block means that the problems related to block switching (e.g., order effects) are absent. Also, the developers suggest that, because the SPF displays two stimuli concurrently, it is more sensitive to stimulus meanings than other indirect measures.

Given these unique properties, the SPF seems an ideal tool to use with child abusers. First, all four associations can be assessed and compared. This will provide insights into whether abusers hold increased child-sex associations or decreased adult-sex associations and allows not-sex associations to be examined. Second, due to being more sensitive to the meaning of each stimulus, the SPF should be better able to tap the associations of interest (i.e., child-sex), as opposed to other child-related associations (e.g., child-parenting). Furthering this point, child abusers with more chronically accessible associations are likely to be more responsive to this heightened sensitivity than abusers with less accessible associations. According to the literature, exclusively extrafamilial child abusers (i.e., who only abuse children unrelated to them) hold deeply entrenched distorted schemas (or associative networks) compared to non-extrafamilial abusers (Gannon, Keown, & Polaschek, 2007; Gannon & Polaschek, 2006; Ward, 2000). Also, extrafamilial abusers tend to report

using more deviant fantasies than other abusers (Marshall, Barbaree, & Eccles, 1991). Thus, it can be argued that extrafamilial abusers will attend to the meaning of the child-sex stimuli more readily (i.e., faster) than other abusers on the SPF.

In light of this, the present study had two main aims: 1) to apply the SPF to the assessment of sex-related associations in exclusively extrafamilial abusers, non-extrafamilial abusers, and non-offenders, and: 2) to examine whether child-sex scores on the SPF are correlated with self-reported child fantasies. Four specific hypotheses were tested.

Hypothesis 1: Due to having more chronically accessible child-sex associations, extrafamilial abusers will show stronger child-sex associations on the experimental SPF than the non-extrafamilial abusers and the non-offenders.

Hypothesis 2: Within the extrafamilial group, child-sex associations will be significantly greater than adult-sex associations. For the other two groups, adult-sex associations will be significantly greater than child-sex associations.

Hypothesis 3: On the control SPF, there will be no group differences in how strongly flower-good associations are held. Support for this hypothesis will help rule out the possibility that variables associated with general SPF performance account for the results on the experimental SPF.

Hypothesis 4: For the extrafamilial abusers, the child-sex association will positively correlate with the use of deviant sexual fantasies involving children.

3.2 Method

3.2.1 Participants

3.2.1.1 Offender participants

The child abusers in this study were patients from a secure treatment facility in Wisconsin, USA, who were detained under Wisconsin's Sexually Violent Persons law. The researcher visited each wing of the facility to notify patients that the study was running. They were informed that the study was looking at the speed in which people respond to pictures of people as well as sexual and non-sexual words. A sign-up sheet was left on the notice-board of each wing as a way for offenders to indicate their interest in volunteering. This form was collected a week later. Participants were included in the study if their case file described a current or previous conviction for a sexual offence against a child. A staff member notified the researcher about which of the signed-up patients met this criterion. Given the restricted timeframe in which to recruit and test participants, as well as the possibility of excluding certain participants (e.g., due to low cognitive functioning, unusually high error rates), as many eligible participants were recruited as possible for this study. Thus, the final sample size was a result of convenience sampling.

Offenders who only abused post-pubescent children (i.e., hebephiles) were removed from the sample, as previous research suggests that they do not hold indirectly assessed child-sex associations (Brown et al., 2009). Thus, their inclusion in the sample would have contaminated the findings. In addition, participants that had very low cognitive functioning were excluded because they may have found the SPF task too difficult to understand and perform. Participants who were taking neuroleptic medication were also excluded because the side-effects of the drugs affected their motor skills, which greatly slowed their reaction time.

The resulting number of male child abusers used for this study was 39. Using case file information to review sexual offence histories, the subtype of each child abuser was

ascertained. Twenty-six were identified as exclusively extrafamilial (i.e., only abused children outside the family unit), while the remaining 13 were a mix of non-extrafamilial abusers (e.g., 5 intrafamilial child abusers; 3 predominantly intrafamilial abusers; 5 individuals who assaulted both children and adults). Coincidentally, 84.6% of the extrafamilial group (n=22) and 84.6% of the non-extrafamilial group (n=11) had a diagnosis of paedophilia, as defined by the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000).

Table 3.1 below displays demographic information for all participant groups in the study. As shown, the mean age of the two offender groups differed by only 2 years. Also, both groups were mainly comprised of Caucasian participants. Other ethnicities in the extrafamilial group included Black (n=1), Asian (n=1), and Native American (n=1). For the non-extrafamilial group, the other ethnicities included Native American (n=2) and Black (n=1). Further, all of the offenders reported not being in a relationship, except for one offender in the extrafamilial group. This is not surprising, however, given the circumstances of their life at the time of the study (i.e., incarcerated indefinitely in a secure mental health facility).

Table 3.1: Demographic information for the extrafamilial abusers, non-extrafamilial abusers, and non-offenders.

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**	**Non-offender controls (*n* = 28)**
Mean age:	46 (*SD*=11.5)	44 (*SD*=11.3)	20 (*SD*=2.6)
Ethnicity:			
Caucasian	88.6%	76.9%	85.7%
Black	3.8%	7.7%	0
N. American	3.8%	15.4%	0
Asian	3.8%	0	10.7%
Other	0	0	3.6%
Relationship status:			
In a relationship	3.8%	0	21.4%
Single	76.9%	84.6%	78.6%
Divorced/separated	15.4%	15.4%	0
Widowed	3.8%	0	0

Table 3.2 presents mean scores for a number of clinical factors for each offender group. This information was drawn from the participants' files and was always based on the most recently recorded score/assessment. The factors include *static risk* (as measured by the Static-99R; Helmus, Thornton, Hanson, & Babchishin, 2012), *dynamic risk* (as measured by the Structured Risk Assessment - Forensic Version, Thornton, 2002), *psychopathy* (as measured by the Psychopathy Checklist-Revised; Hare, 1991), and *IQ* (as measured by the Wechsler Adult Intelligence Scale, 3rd and 4th Editions; Wechsler, 1997, 2008). As shown, both groups exhibited very similar static risk, dynamic risk, and IQ scores. Indeed, independent *t*-tests indicated no significant group differences on these factors. Also, while the psychopathy scores differ by 3 points on the PCL-R, the difference was not significant.

Table 3.2: Mean scores (*SD*s) for static and dynamic risk, psychopathy, and IQ in both offender groups

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**
Static risk:	5.6 (1.3)	5.8 (1.9)
Dynamic risk:	3.8 (0.5)	3.6 (0.7)
Psychopathy:	23.4 (4.0)	26.3 (4.5)
IQ:	97.2 (12.9)	96.3 (14.1)

Many of the participants were undergoing cognitive-behavioural treatment at the time of study, which involved moving through two phases depending on their progress. Relative to pre-treatment participants, most of the offenders in each group were in treatment, particularly Phase 2 (see Table 3.3). As shown, there were a greater proportion of extrafamilial abusers in treatment than non-extrafamilial abusers, although the difference was not significant.

Table 3.3: The proportion of participants in treatment and pre-treatment for both groups

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**
Pre-treatment	15.4%	38.5%
In-treatment:	84.6%	61.5%
Phase 1	26.9%	15.4%
Phase 2	57.7%	46.2%

Table 3.4 shows information about the offenders' offence history, which was also derived from their case files. Both offender groups appeared to have started sexually offending around the same age and, thus, showed no group differences. Extrafamilial abusers offended against just male children at a higher rate than non-extrafamilial abusers, although this was not significantly different. Extrafamilial also offended against both genders at a higher rate but, again, the difference was not significant. Non-extrafamilial abusers mainly offended against female children and at a higher rate than extrafamilial abusers, χ^2 (1) = 7.8, $p < .01$.

A final observation is that most of the offenders in both groups had prior convictions for sexual offences, with no significant differences found. However, non-extrafamilial abusers had significantly more prior convictions for both violent offences, χ^2 (1) = 5.85, p <.05, and nonsexual, nonviolent offences, χ^2 (1) = 4.18, p < .05.

Table 3.4: Offence history information for both offender groups

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**
Mean age at first sexual offence	18 (*SD*= 5.9)	19 (*SD* = 7.8)
Victim gender:		
- Male	34.6%	15.4%
- Female	23.1%	69.2%
- Both	42.3%	15.4%
Prior sexual convictions	88.5%	92.3%
Prior violent convictions	11.5%	46.2%
Prior nonsexual nonviolent convictions	34.6%	69.2%

3.2.1.2 Non-offender participants

A comparison sample of 28 non-offending males was recruited from the University of Birmingham, UK via the online Research Participation Scheme (RPS). This sample size was also a function of convenience sampling. As shown in Table 3.1, the mean age of the non-offenders was 20 years old (*SD* = 2.6, range = 18-31). Like the offender groups, the majority of non-offenders were Caucasian, with three participants having an Asian background and one responding with ‘Other’. The majority of non-offenders were single, although six stated to be 'in a relationship'.

Ethical approval to conduct this study with sex offenders was granted from: 1) the Institutional Review Board in Wisconsin (Appendix B) and; 2) the Science, Technology, Engineering and Mathematics Ethical Review Committee at the University of Birmingham (see Appendix C). Ethical approval to conduct this research with non-offending males was granted from the University of Birmingham's Science, Technology, Engineering and Mathematics Ethical Review Committee (see Appendix C).

3.2.2 Materials

3.2.2.1 Experimental SPF

In order to assess sex-related associations, a SPF task was constructed using information outlined by Bar-Anan et al. (2009). The category pairings were 'Child-Sex', 'Child-Not Sex', 'Adult-Sex', and 'Adult-Not Sex'. As shown in Figure 3.1, each category corresponded with a particular response key according to its position on the screen. The SPF task involved participants categorising two different stimuli simultaneously. Thus, if the words '*school*' and '*orgasm'* were presented together (as shown in Figure 3.1), a participant would have to quickly press the key for the 'Child-Sex' category (i.e., 'P' in Figure 3.1). Note also that the positions of the category labels were counterbalanced between-participants, resulting in 8 different screen arrangements.

Figure 3.1: Example screen from the Sorting Paired Features task.

The stimuli for the task were 8 sex, 8 not sex, 8 adult, and 8 child words (see Appendix D). All words were drawn from Gray et al.'s (2005) IAT study, as, in their study, the words were judged by sex offenders as being valid exemplars of their respective category. Using E-Prime, adult and child-related words were set to randomly pair-up with a sex or not sex word. These stimulus-pairings were presented in random order throughout the task. The total number of trials was conservatively set at 80 (i.e., 20 trials per category). This is because any more would have run the risk of causing mental fatigue (Vianello, personal communication, 2010), which would have negatively affected the participants' performance. However, before the 80 critical trials began, a 16-trial practice phase was first completed to ensure the task was understood.

3.2.2.2 Control SPF

A control SPF was also constructed in order for the results of the experimental SPF to be more reliably interpreted. Previous IAT studies have commonly used the Flower-Insect IAT as a control task (e.g., Brown et al., 2009) because research shows that most people hold positive associations towards flowers relative to insects (Greenwald et al., 1998). The set-up of the task was identical to the experimental SPF except that the category pairs were 'Flowers-Good', 'Flowers-Bad', 'Insects-Good', and 'Insects-Bad'. The stimuli were derived from previous studies using a Flower-Insect IAT (e.g., Gray et al. 2005; Greenwald et al., 1998). However, it was thought that many of the offenders would not be familiar with the names of certain flowers (e.g., snowdrop, crocus). Thus, only the most common flower names were used, which resulted in five flower stimuli. To match this, five Insect, five Good, and five Bad words were used (see Appendix D). Finally, as with the experimental SPF, the position of the category labels was counterbalanced between-subjects.

3.2.2.3 Wilson Sexual Fantasy Questionnaire (WSFQ; Wilson, 1978).

The WSFQ is a 40-item questionnaire that uses a 6-point Likert Scale (0-5) to measures how frequently 40 specific sexual fantasies are used (see Appendix E). This measure is comprised of four factor-analytically derived subscales labelled: Exploratory, Impersonal, Sadomasochistic, and Intimate. For the subscales and overall scale, scores are summed to provide a total score. Baumgartner, Scalora, and Huss (2002) found that the four subscales have good internal consistencies when used with child abusers (α's ranging from .83 to .92), as well as the overall scale (α = .95). The WSFQ is argued to have two items that may refer to children (Baumgartner et al., 2002). These are: '*Having sex with someone much younger than yourself*' and '*Seducing an innocent'*. Baumgartner et al. found that child abusers scored higher on these two items compared to non-sex offenders. Thus, only these two items of the WSFQ were focused upon in this study.

3.2.2.4 Thoughts and Fantasies Questionnaire (Thornton, unpublished).

This is an open-ended questionnaire designed to assess whether sex offenders have recently used a deviant sexual fantasy during their time in treatment. The measure asks about six specific deviant fantasies; that is, abduction, force, children <13 years, children between 13 and 17 years old, sadism, and past victims. For each fantasy an offender reports using, the questionnaire asks a number of further open-ended questions, such as how often it is used in a month; when it was last used; and how long does it last for? It also asks the respondent to describe the fantasy in detail. The measure was adapted slightly so as to not be confined to fantasies used during treatment. Also, for the purposes of this study (i.e., which included non-offenders), the sexual fantasies about past victims was changed so that it asked about any other frequently used sexual fantasy (see Appendix F).

3.2.3 Procedure

The offender participants and non-offenders completed the study in a quiet meeting room and lab, respectively. Each participant was informed (verbally and in writing) about the nature of the study. Specifically, it was explained that the study aimed to investigate the speed in which people respond to words about adults, children, and sex. All participants were informed that some of the words would be of a sexual nature. Participants were not informed about why these responses were being recorded until after the study was completed. Participants were also told that they would be asked to complete a couple of follow-up questionnaires after the computer task. Offender participants were also asked to provide consent for the researcher to use data within their case files and psychometric reports. All participants were informed that they had to right to withdraw at any point in the study if they felt they wanted to.

After consenting to take part, each participant completed the control SPF, then the experimental SPF, and finally the questionnaires. Both SPF tasks were presented on a PC using the experiment software package, E-Prime. The control SPF was administered before the experimental SPF so that participants would be familiar with the procedure for when they completed the experimental version. The fantasy questionnaires were administered last to reduce any priming effects that they may have had on the experimental SPF.

Identical instructions on how to complete the SPF were presented onscreen to all participants when they started. The instructions explained that the task involved presenting a picture and a word together, and that they had to categorise them into the correct paired category using one of four keys responses. The instructions also stated that mistakes were to be expected and that, whenever a mistake is made, a red cross would appear (i.e., error feedback). It was stated that the correct response must be made in order for the next trial to begin. Finally, they were told to go as fast as possible but also to be as accurate as possible.

After reading the instructions, participants began the practice phase. After the practice phase, participants completed the critical phase. This exact procedure was used for both SPF

tasks. Finally, all participants completed the two sexual fantasy questionnaires in a counter-balanced order. After the study was completed, each participant was fully debriefed and thanked for their time.

3.2.4 Data treatment

Before any statistical analyses were performed, the raw data had to be converted into a standardised form. This is important because there is likely to be unwanted variance from procedural variations and individual differences (e.g., natural reaction-time, cognitive ability, age). Indeed, from looking at the raw reaction times (RTs) in Table 3.5, it can be seen that non-offenders are generally faster on all four categories when compared to the sex offenders. Thus, in order for the response latencies to be comparable between groups, a standardised score needed to be calculated.

Table 3.5: Mean raw response latencies (milliseconds) and *SD*s from the experimental SPF for extrafamilial abusers, non-extrafamilial abusers, and non-offenders.

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**	**Non-offender (*n* = 28)**
Adult-Sex	1838.2 (519.8)	1791.1 (527.6)	1327.0 (372.6)
Child-Sex	1776.9 (401.6)	2023.4 (708.5)	1406.2 (313.1)
Adult-Not Sex	1992.5 (470.2)	2024.9 (528.02)	1434.1 (292.6)
Child-Not Sex	1822.4 (457.9)	1892.1 (475.6)	1391.9 (326.3)

For the IAT, Greenwald, Nosek, and Banaji (2003) devised a scoring algorithm that produces a *D*-score (see Chapter 6) that helps reduce the confounding effects mentioned above. This algorithm has been used in almost all subsequent IAT studies since its publication. On this basis, the SPF developers devised a similar scoring algorithm to be used for each of the four associations. This scoring procedure results in a $D_{\text{-association}}$ and is thought to be comparable to the IAT's *D*-score (Bar-Anan et al., 2009).

The procedure first involves removing any RTs below 400ms or above 5000ms, as well as removing any participant with more than 10% of their responses outside these cut- offs. This is because, as with the IAT, RTs below or above these cut-off points are reflective of anticipated and distracted responding, respectively. According to the SPF developers, these RT cut-offs were based on "informed judgment". That is, when the SPF was being developed, the RT cut-offs for the IAT were 300ms and 3000ms. However, the SPF is a harder task to perform than the IAT. Therefore, the SPF developers decided to increase the cut-offs for the SPF in order to account for this increased difficulty (Nosek, personal communication, 2012).

The next step involved generating a *D*-$_{\text{association}}$ for each of the four associations. Each *D*-$_{\text{association}}$ represents the performance of sorting stimuli into a specific paired-category compared to the overall performance. Thus, the equation for the *D*-$_{\text{association}}$ is as follows:

$$D_{\text{association}} = (M_{\text{overall}} - M_{\text{association}})/SD_{\text{overall}}$$

That is, the mean RT for each category is subtracted from the mean overall RT. The resulting figure is then divided by the overall standard deviation. This is done for each category, thereby, producing four individual *D*-$_{\text{associations}}$. Each *D*-$_{\text{association}}$ represents the strength of a particular association. This scoring algorithm was used for both SPF tasks in this study.

3.3 Results

3.3.1 Hypothesis 1: Extrafamilial abusers will show stronger child-sex associations than non-extrafamilial abusers and non-offenders.

Looking at Figure 3.2, it can be observed that only the extrafamilial abusers showed a positive child-sex *D*-$_{\text{association}}$ (black bar) indicating a strong child-sex association. For the other two groups, adult-sex was the strongest *D*-$_{\text{association}}$ (bars with diagonal lines). Interestingly, the non-extrafamilial abusers showed stronger adult-sex associations than non-offenders. It can also be seen that the *D*-$_{\text{association}}$ for adult-not sex (dotted bar) was very weak in all three

groups. While this may indicate that all groups hold weak adult-not sex associations, it is more likely to have been an artefact of that particular stimulus set (see Section 3.3.5).

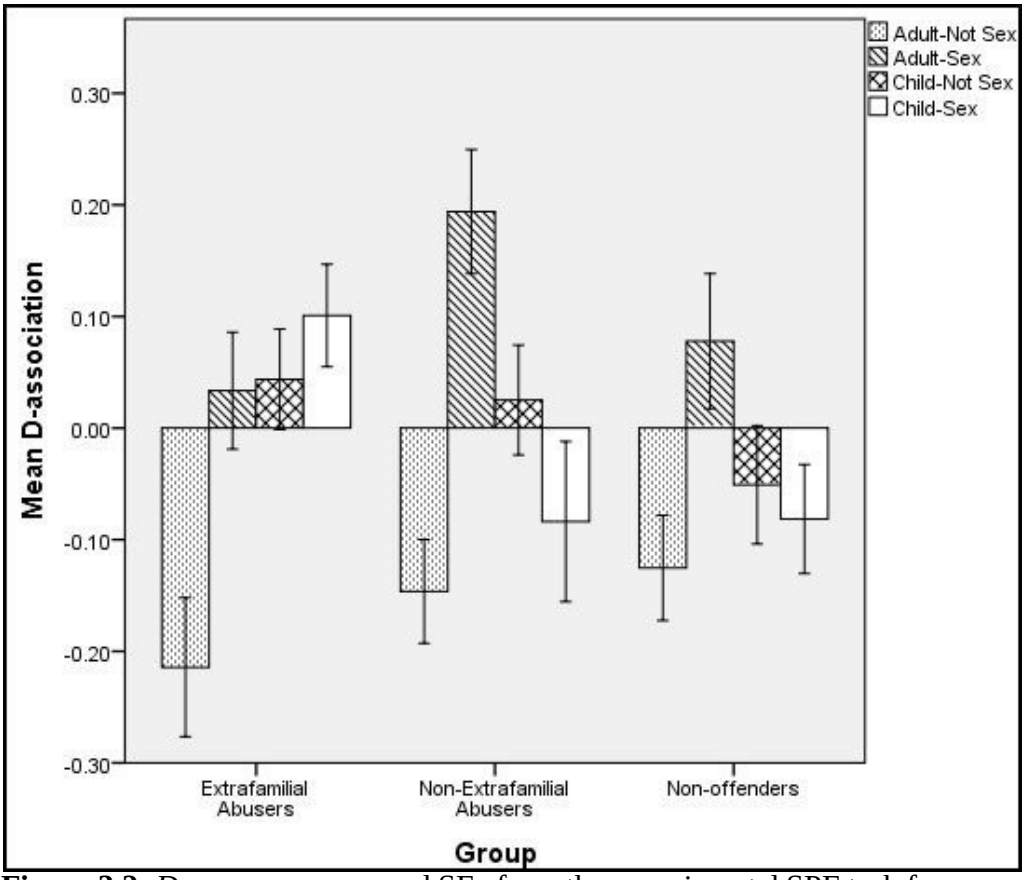

Figure 3.2: *D*-$_{association}$ means and SEs from the experimental SPF task for extrafamilial abusers, non-extrafamilial abusers, and non-offenders.

Table 3.6: Mean error rates (%) and *SDs* from the experimental SPF for extrafamilial abusers, non-extrafamilial abusers, and non-offenders

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**	**Non-offender (*n* = 28)**
Adult-Sex	8.5 (11.8)	11.9 (12.8)	7.5 (8.2)
Child-Sex	7.9 (8.9)	14.2 (14.3)	8.2 (6.3)
Adult-Not Sex	9.2 (15.2)	15.4 (21.5)	13.4 (10.8)
Child-Not Sex	6.5 (9.2)	13.1 (23.4)	7.7 (9.9)

To test for statistical differences, the four *D*-$_{associations}$ were subjected to a 3 (Group) x 4 (Association) mixed factorial ANOVA, with 'Group' as the between-subjects factor and 'Association' as the within-subjects factor. Since Hypothesis 1 was directional, the ANOVA

was run with between-subjects planned contrasts (with regards to the child-sex *D*-association). The results showed a significant main effect of Association, $F(3, 192) = 9.83$, $p < .001$, but not Group, $F(2, 64) = 1.55$, $p > .05$. The interaction effect between Association and Group was approaching significance $F(6, 192) = 2.09$, $p = 0.056$, and so the planned contrasts were examined to determine whether Hypothesis 1 was supported.

The planned contrasts of this interaction were non-orthogonal (as the data for the extrafamilial group was being contrasted twice). Therefore, to control the risk of increased familywise error associated with multiple comparisons, a sequential Dunn-Sidák correction[3] was applied. This adjusted the alpha (α) levels to 0.025 for the comparison between extrafamilial abusers and non-offenders, and 0.05 for the comparison between extrafamilial abusers and non-extrafamilial abusers. As such, the planned contrasts showed the child-sex *D*-association to be significantly stronger in extrafamilial abusers than in non-extrafamilial abusers ($p < .05$, one-tailed $d = .75$) and non-offenders ($p < .01$, one-tailed, $d = .74$). These findings seem to support Hypothesis 1. Note also that, although the non-extrafamilial abusers and non-offenders showed stronger adult-sex *D*-associations than extrafamilial abusers (as shown in Figure 3.2), post-hoc comparisons (with Bonferroni corrections) indicated that the differences were not significant.

As shown in Table 3.6, the mean error rates show a pattern of responding that is reflective of the hypothesised biases. For example, the extrafamilial abusers made fewer mistakes for the child-sex category than the adult-sex category. Also, while the non-extrafamilial abusers and the non-offenders made more mistakes overall, they both produced more incorrect responses for the child-sex category than did the extrafamilial abusers. However, error analyses using between-subject ANOVAs on arcsine-transformed error rates (i.e., to normalise distributions) found no significant differences between groups.

[3] To calculate sequential Dunn-Sidák corrections, the smallest *p*-value must be less than $1-(1-\text{alpha})^{1/k,}$ where *k* equals the number of comparisons and alpha is 0.05. If it is less, the next smallest *p*-value must then be less than $1-(1-\text{alpha})^{1/(k-1)}$ (McDonald, 2009).

3.3.2 Hypothesis 2: For extrafamilial abusers, child-sex associations will be significantly greater than adult-sex associations. For the other two groups, adult-sex associations will be significantly greater than child-sex associations.

As shown in Figure 3.2, the extrafamilial abusers were the only group whose child-sex *D*-$_{association}$ was greater than the adult-sex *D*-$_{association}$. In the two comparison groups, the adult-sex *D*-$_{association}$ was much greater than the child-sex *D*-$_{associations.}$ Thus, the findings are in the desired direction.

To test for statistical differences, within-subject planned contrasts were also run with the 3 x 4 mixed factorial ANOVA described above. Syntax had to be used for this since SPSS does not have a specific function (i.e., from the drop-down menus) for doing planned contrasts with repeated-measure ANOVAs. Results indicated that the child-sex *D*-$_{association}$ did not significantly differ from the adult-sex *D*-$_{association}$ in extrafamilial abusers. However, the adult-sex *D*-$_{association}$ was found to be significantly greater than the child-sex *D*-$_{association}$ in non-offenders (p <.01, one-tailed, d = 2.2) and the non-extrafamilial abusers (p <.01, one-tailed, d = 1.3). Thus, on the basis of these results, Hypothesis 2 seems to be partially supported.

3.3.3 Hypothesis 3: On the control SPF, there will be no group differences in how strongly flower-good associations are held.

Examining whether all participants hold an innocuous flower-good association is a common strategy undertaken in many IAT studies, including those with sex offenders (Gray & Snowden, 2009). This is because it helps support the assumption that any group differences on the experimental task are due to differences in association strength rather than factors that affect performance on the task. As can be seen in Figure 3.3, all three groups showed very similar flower-good *D*-$_{associations}$ (dotted bar).

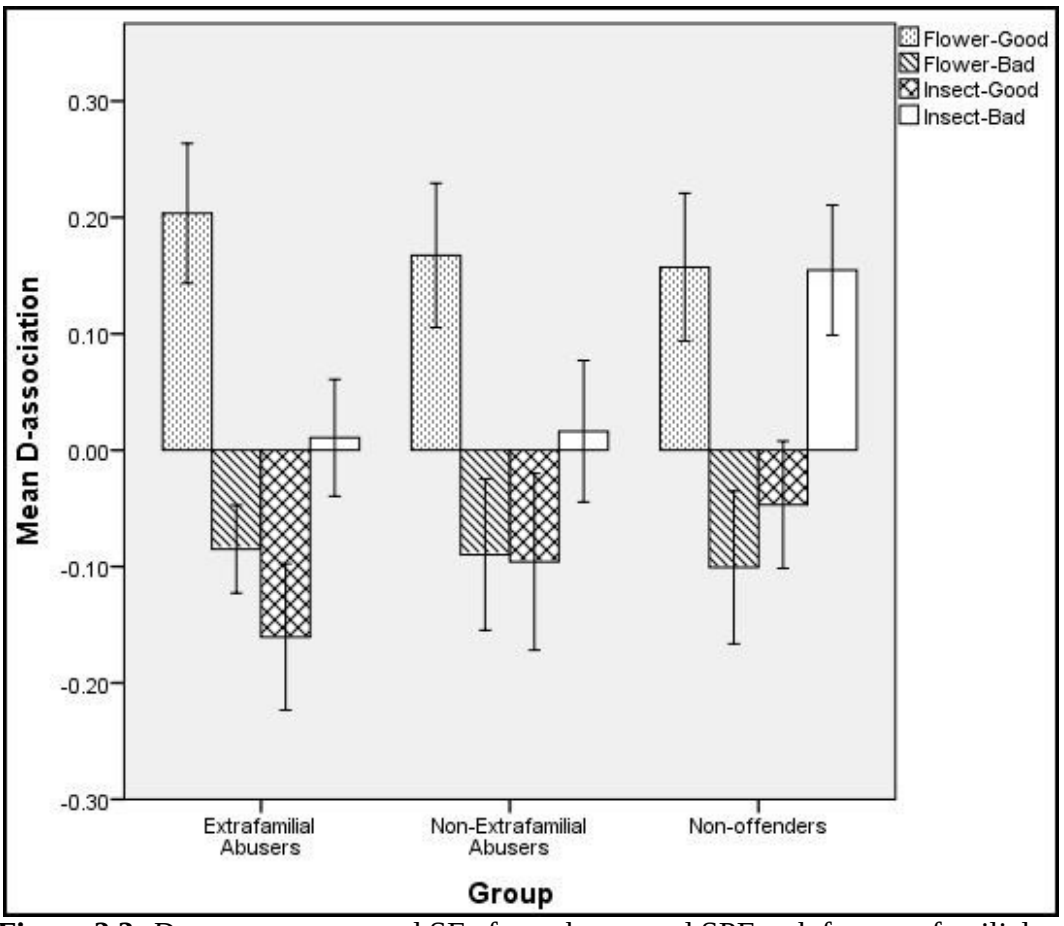

Figure 3.3: *D*-$_{association}$ means and SEs from the control SPF task for extrafamilial abusers, non-extrafamilial abusers, and non-offenders.

Table 3.7: Mean error rates (%) and *SDs* from the control SPF for extrafamilial abusers, non-extrafamilial abusers, and non-offenders

	Extrafamilial abusers (*n* = 26)	**Non-extrafamilial abusers (*n* = 13)**	**Non-offender (*n* = 28)**
Flower-Good	4.4 (6.4)	8.5 (12.5)	6.9 (6.1)
Insect-Good	10.4 (12.8)	13.9 (17.2)	12.3 (8.1)
Flower-Bad	10.2 (10.9)	12.7 (15.4)	10.5 (9.1)
Insect-Bad	5.6 (6.1)	9.6 (10.5)	8.8 (8.0)

To ensure that the groups showed no differences on the flower-good *D*-$_{association}$, a (Group) x 4 (Association) mixed factorial ANOVA was conducted, with Group as the between-subjects factor and Association as the within-subjects factor. Analyses showed that the main effect of Association was significant, $F(3, 192) = 12.81$, $p < .001$. However, as predicted, the main

effect for Group was not significant, nor was the interaction effect between Association and Group. These results provide support for Hypothesis 3.

In addition, the pattern of mean error rates is also reflective of Hypothesis 3 (see Table 3.7). For example, all three groups appeared to make fewer mistakes when responding to the congruent associations (i.e., Flowers-Good and Insect-Bad) and more mistakes on the incongruent associations (i.e., Flowers-Good and Insects-Good). Also, it can be seen that the non-extrafamilial abusers made slightly more mistakes across all associations. However, an error analysis using between-subject ANOVAs on arcsine-transformed error rates found no significant differences between groups.

3.3.4 Hypothesis 4: For extrafamilial abusers, the child-sex association will positively correlate with the use of deviant sexual fantasies about children

According to Hypothesis 4, the extrafamilial abusers' child-sex *D*-association would correlate with the use of deviant sexual fantasies involving children. For the Thoughts and Fantasies Questionnaire, a bi-serial correlation was conducted as the data was categorical due to the dichotomous coding (i.e., Deviant fantasiser = 'Yes' versus 'No'). The only significant result was found in the extrafamilial group, which was a negative relationship between a child-related sexual fantasy and the child-not sex *D*-association. As indicated by a Shapiro-Wilk test, the data for the WSFQ were non-normal for all groups. Therefore, a non-parametric correlation test (Spearman's Rho) was used to analyse the relationship between each of the 40 WSFQ items and the four *D*-associations.

As shown in Table 3.8, the child-sex *D*-association did not correlate with any of the child-related fantasies for the extrafamilial group. Instead, the adult-not sex *D*-association showed a positive correlation with the two WSFQ items related to children. The adult-sex *D*-association also correlated with these two WSFQ items but in a negative direction. The child-not sex *D*-associations showed negative correlations with '*Seducing an innocent*'. It can also be seen that the

child-sex *D*-association was negatively correlated with some other WSFQ items, (e.g., *Participating in an orgy, Tying someone* up). The adult-sex *D*-association also negatively correlated with a number of other WSFQ items (e.g., *Taking someone's clothes off, Kissing passionately).* As shown in Tables 3.9, the child-not sex *D*-association was negatively correlated with a number of WSFQ items (including the two child-related fantasies) for non-extrafamilial abusers. Finally, Table 3.10 shows that there were only three positive correlations for the non-offenders, which were between the adult-sex *D*-association and *Participating in an orgy, Homosexual activity,* and *Giving oral sex.*

Although these correlational results suggest that Hypothesis 4 is not supported, there is a possibility that the markedly slow adult-not sex RTs were having a negative effect on the *D*-associations, thereby, masking any existing relationships (see Section 3.3.5).

Table 3.8: Significant correlations between the four D-$_{associations}$ and WSFQ sexual fantasies for extrafamililal abusers

Group	Measure	Child -Sex	Adult -Sex	Adult- Not Sex	Child- Not Sex
Extrafamilial	**Having sex with someone much younger than yourself**	.21	-.46*	.45*	-.36
	Seducing an "innocent"	.15	-.58**	.69***	-.52**
	Participating in an orgy	-.46*	.11	.04	.27
	Watching others have sex	- .44*	- .09	.25	.19
	Mate-swapping	-.47*	.15	-.06	.29
	Tying someone up	-.42*	-.12	.25	.29
	Transvestism	-.39*	.14	-.06	.22
	Receiving oral sex	.12	-.44*	.17	.07
	Giving oral sex	.04	-.43*	.17	.14
	Taking someone's clothes off	.15	-.58**	.29	.12
	Making love elsewhere than bedroom	.31	-.40*	.15	-.15
	Having sex with someone of a different race	-.14	-.52**	.38	.09
	Looking at obscene pictures or films	-.17	-.48*	.41*	.01
	Kissing passionately	.30	-.45*	.12	.04
	Intimate subscale	.15	-.50**	.18	.09
	Exploratory subscale	-.17	-.45*	.33	.11
	Impersonal subscale	-.21	-.54**	.38	.16

* $p < .05$
** $p < .01$
***$p < .001$

Table 3.9: Significant correlations between the four *D*-associations and WSFQ sexual fantasies for non-extrafamilial abusers

Group	Measure	Child -Sex	Adult -Sex	Adult- Not Sex	Child- Not Sex
Non-Extrafamilial	**Making love outdoors in a romantic setting**	.35	-.03	.08	-.72*
	Sex with two other people	.19	-.21	.28	-.66*
	Forcing someone to do something	.14	.23	-.08	-.61*
	Homosexual activity	.08	-.28	.39	-.59*
	Giving oral sex	.15	.07	.09	-.60*
	Taking someone's clothes off	.32	-.16	.11	-.56*
	Being excited by material or clothing	.40	.12	-.14	-.75**
	Transvestism	.27	-.06	.09	.70**
	Being promiscuous	.53	.24	-.33	-.81**
	Being much sought after by the opposite sex	-.06	.39	.23	-.59*
	Having sex with someone of a different race	.49	-.17	.06	-.65*
	Mate-swapping	-.09	-.22	.57*	-.43
	Intimate subscale	.16	.11	.09	-.66*
	Exploratory subscale	.15	-.09	.23	-63*

* $p < .05$
** $p < .01$

Table 3.10: Significant correlations between the four *D*-associations and WSFQ sexual fantasies for non-offenders

Group	Measure	Child -Sex	Adult -Sex	Adult- Not Sex	Child- Not Sex
Non-offender	**Participating in an orgy**	-.29	.47*	-.03	-.09
	Homosexual activity	-.12	.39*	-.01	.03
	Giving oral sex	-.12	.40*	.03	.04

* $p < .05$

3.3.5 Exploring the possible biasing effects of Not Sex stimuli

The results from the SPF (as shown in Figure 3.2) indicate that all three groups sorted adult-not sex stimuli at a much slower rate than the other three categories. An examination of the error rates across all groups indicated that the trials for the 'Adult-Not sex' category contained a higher number of initial wrong responses (see Table 3.6). This may account for the apparent slower responding for the adult- not sex category in all three groups. If this is the case, it could highlight a problem with the stimulus set for this category (see section 3.4.1 of the Discussion).

To explore whether the adult-not sex RTs may have been biasing the results of this study, two 'amended D-$_{associations}$' were computed for child-sex and adult-sex associations. This followed the same formula as the original $D_{\text{-association}}$ but only the data for adult-sex and child-sex categories were used. The results still appeared to support the hypothesis that extrafamilial abusers hold stronger child-sex associations than the comparison, and vice versa (see Figure 3.4). *T*-tests with Bonferroni corrections ($\alpha = .025$) showed that extrafamilial abusers produced significantly greater amended child-sex D-$_{associations}$ than non-extrafamilal abusers ($p = .008$) and non-offenders ($p = .02$). In contrast, non-extrafamilial abusers demonstrated marginally greater amended adult-sex D-$_{associations}$ than extrafamilial abusers ($p = .029$). No significant differences were found between non-offenders and extrafamilial abusers.

Also similar to the original analysis, the amended child-sex and adult-sex D-$_{associations}$ did not differ within the extrafamilial group. However, within both the non-extrafamilial abusers and non-offenders, the adult-sex D-$_{association}$ was significantly stronger than the child-sex D-$_{association}$ (both *p*s = .02).

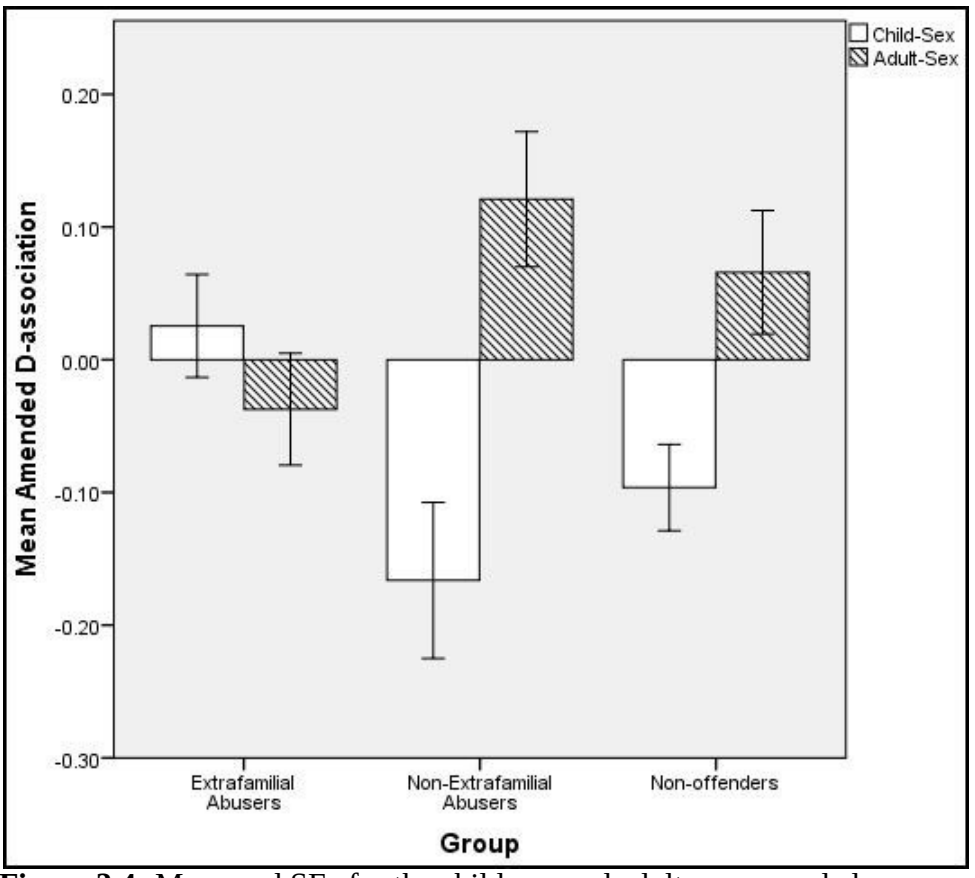

Figure 3.4: Mean and SEs for the child-sex and adult-sex amended *D*-$_{associations}$ for extrafamilial abusers, non-extrafamilial abusers, and non-offenders

Regardless of these similar results, there was an indication that a biasing effect was present in the original analyses. For example, the extrafamilial abusers now appeared to hold weaker adult-sex associations, as shown by the negative amended *D*-$_{association}$ (see Figure 3.4). Furthermore, correlational analyses revealed that, for the extrafamilial abusers only, the amended child-sex *D*-$_{association}$ was now positively correlated with the WSFQ item '*Seducing an Innocent'* (Spearman's Rho = .41, $p < .05$). The relationship with the item *'Having sex with someone much younger than yourself'* was just shy of significance (Spearman's Rho = .38, $p = .055$). These results are in clear contrast to the original results and fall more in line with Hypothesis 4. Other significant correlations also emerged (all *p*s <.05) between the amended child-sex *D*-$_{association}$ and the following WSFQ items: *Taking someone's clothes off* (Spearman's Rho = .39), *Having sex someone other than the bedroom* (Spearman's Rho = .46), and *Kissing passionately* (Spearman's Rho = .43). No significant correlations were found in the non-extrafamilial group. However, one significant correlation emerged for the non-

offenders between the amended child-sex D-$_{association}$ and the WSFQ item '*Being seduced as an innocent'* (Spearman's Rho = .43, p <. 05).

3.3.6 Exploring the heterogeneity within the non-extrafamilial group

While the results have so far provided some support for the hypotheses, it should be noted that the comparison offender group (i.e., non-extrafamilial abusers) was not a 'pure' subtype. Rather, it was comprised of various subtypes of abusers; namely, intrafamilial, 'predominantly intrafamilial', and those who have offended against both children and adults. This point needs to be addressed as important differences may be disguised as a consequence of treating the subtypes as one overall group. For example, it could be the case that intrafamilial abusers actually respond just as fast on the child-sex category as extrafamilial abusers, but due to slow responding in the other subgroups, it is not being made apparent. Thus, in this section, the results for each subtype will be explored.

As shown in Figure 3.5, each of the three subtypes show a similar negative child-sex D-$_{association}$, suggesting that they are not showing a child-sex bias. Rather, they show a pattern of responding indicative of an adult-sex bias, with those who offended against children and adults showing the greatest adult-sex D-$_{association}$.

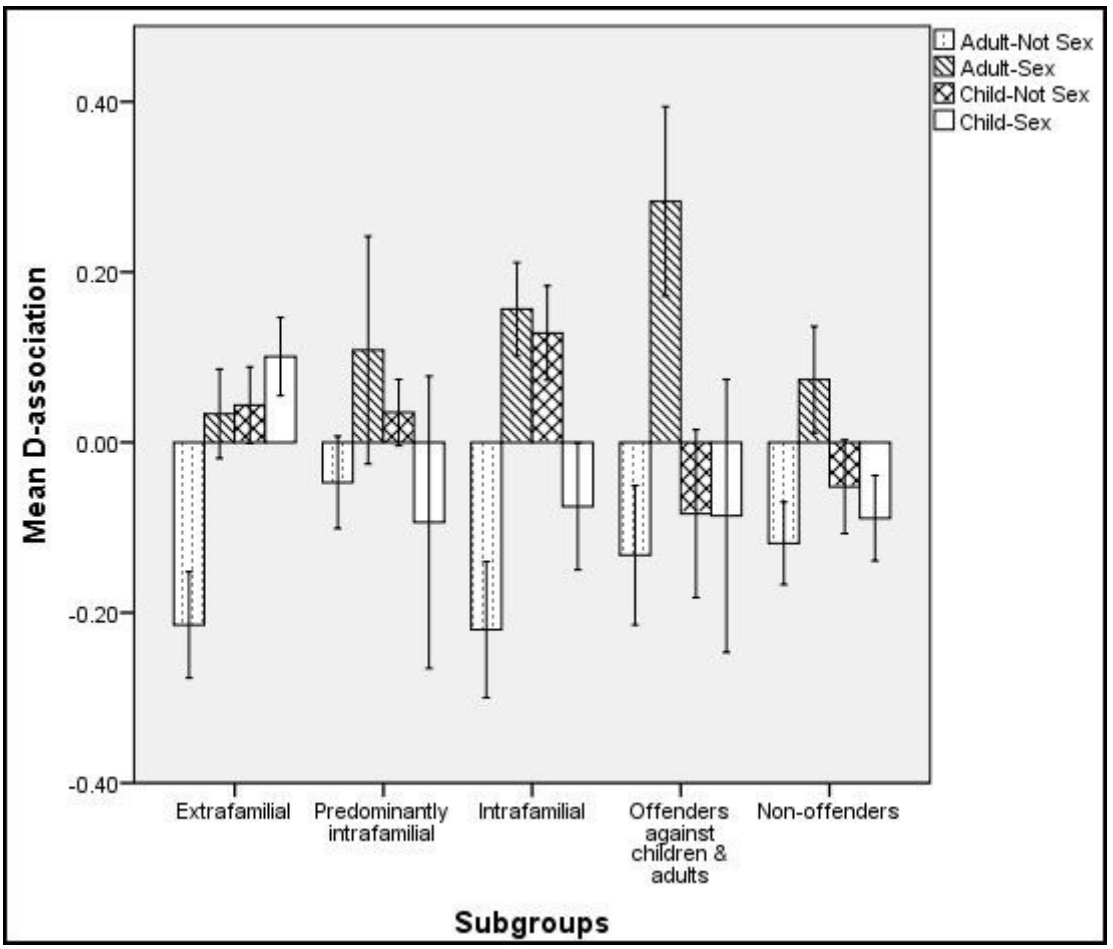

Figure 3.5: Mean *D*-$_{\text{associations}}$ (and SEs) for each of the non-extrafamilial subgroups, extrafamilial abusers, and non-offenders

In spite of these patterns, *t*-test analyses showed that none of the subgroups significantly differed from extrafamilial abusers on the child-sex *D*-$_{\text{association.}}$ However, given that the data may be skewed by the 'non-sex' words (as suggested by the analysis in section 3.5.5), the amended *D*-$_{\text{associations}}$ were also examined. As shown in Figure 3.6, the offenders against children and adults had the weakest child-sex amended *D*-$_{\text{association}}$, which was significantly different from the extrafamilial abusers ($p < .05$). The intrafamilial abusers also showed a lower child-sex *D*-$_{\text{association}}$ than the extrafamilial abusers ($p = .05$), while the predominantly intrafamilial abusers did not significantly differ. No significant differences were found between the three subgroups. Thus, while the offenders who offended against children and adults showed the weakest child-sex association, the intrafamilial abusers also showed weak child-sex associations, which is in support of the Hypothesis 1. Furthermore, in support of Hypothesis 2, the intrafamilial abusers showed a significant difference between the adult-sex

and child-sex amended D-$_{associations.}$ Finally, no significant associations were found between the amended child-sex D-$_{association}$ and the measures of child-related sexual fantasies.

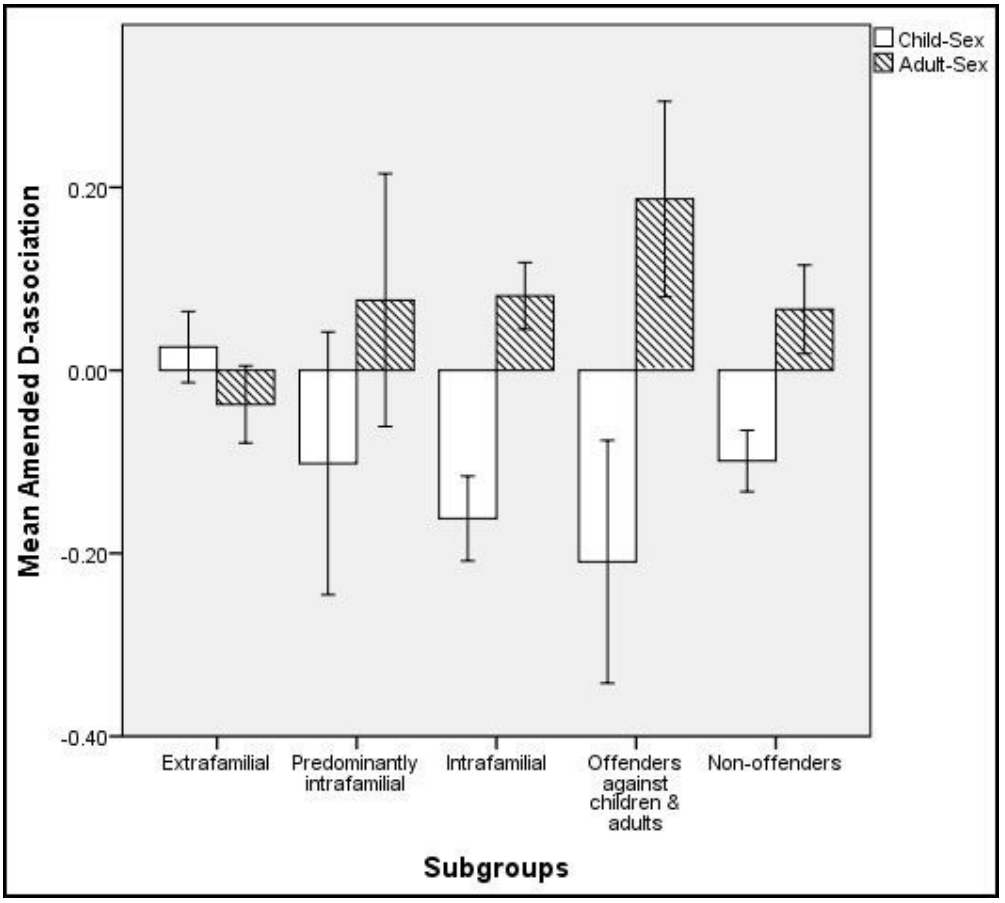

Figure 3.6: Means for the amended D-$_{association}$ (and SEs) for each of the non-extrafamilial subgroups, extrafamilial abusers, and non-offenders

3.4 Discussion

Previous research using the IAT has provided evidence that child abusers hold stronger child-sex associations than controls. However, the evidence it is not wholly conclusive due to the limitations of the IAT. For example, the IAT does not measure all four associations. Also, previous research has failed to take into account the heterogeneity evident in child abusers. Thus, using the Sorting Paired Features task (SPF) to assess all four possible associations, the present study aimed to show that extrafamilial child abusers hold stronger child-sex associations than non-extrafamilial abusers and non-offenders, and that the child-sex associations would be stronger than adult-sex associations. In line with the DPM-ST, it was

hypothesised that stronger child-sex associations would be correlated with child-related sexual fantasies.

Results showed that extrafamilial abusers held significantly stronger child-sex associations than non-extrafamilial abusers and non-offenders, thus, supporting Hypothesis 1. In addition, the error rates also corresponded with this pattern of results, in that, the extrafamilial abusers made fewer mistakes on the child-sex category (and more on the adult-sex category) relative to the other two groups. However, there were no significant group differences. Results also showed that, although the extrafamilial abusers held stronger child-sex associations compared to adult-sex (as shown in Figure 3.2), the difference was not significant. However, the non-extrafamilial abusers and the non-offenders were found to hold significantly stronger adult-sex associations compared to child-sex associations. Thus, Hypothesis 2 was partially supported.

An analysis of the reaction times and error rates also showed that there were no group differences on the Flowers-Good association of the control SPF. This supported Hypothesis 3. It also supports the assumption that the group differences on the experimental SPF were due to differing association strengths as opposed to differences in general SPF performance. Curiously, Figure 3.3 shows that both of the abuser groups hold weaker insect-bad associations compared to the non-offenders. As to why this may be the case is beyond the scope of this study. However, it does demonstrate the benefits of being able to assess the strength of all four associations.

Finally, the correlational analyses revealed that the child-sex $D_{\text{-associations}}$ did not correlate with deviant sexual fantasies about children in extrafamilial abusers. However, it did show negative correlations with some other fantasy items (e.g., *Watching others having sex, Tying someone up*). These results suggest that Hypothesis 4 was not supported. However, the other three $D_{\text{-associations}}$ showed significant correlations in this group. For example, the adult-sex $D_{\text{-associations}}$ were negatively correlated with the child-related WSFQ items. In the non-

extrafamilial group, the child- not sex *D*-association negatively correlated with a number of WSFQ items from the Exploratory and Intimate subscales (and with the total score for these two subscales).

It is important to emphasise that the results of the experimental SPF in this study appeared to have been affected by the slow RTs of the adult-not sex category. As shown by the equation in the Method section, each *D*-association is based on the difference between the single association and the overall performance on the SPF. This means that each *D*-association is algebraically related to the other three *D*-associations (Bar-Anan et al., 2009). Thus, although each *D*-association has its own distinct validity allowing for each association to be compared with the others (Bar-Anan et al., 2009), if one category suffers from a methodological issue that results in unusually slow RTs, the overall *D*-association will be distorted. As Bar-Anan et al. state, this highlights an important limitation of the SPF.

To test if this was the case, two 'amended *D*-associations' based on just the adult-sex and child-sex categories were calculated. Results showed that extrafamilial abusers still displayed stronger child-sex associations than the other two groups. However, the adult-sex associations had become weaker, indicated by the adult-sex *D*-associations turning from positive to negative. Despite this change, the adult-sex *D*-association still did not significantly differ from the child-sex *D*-association within the extrafamilial group. Importantly, however, the amended child-sex *D*-associations now showed significant positive correlations with the two child-related WSFQ items for the extrafamilial abusers. It also showed significant correlations with some other items, such as *Taking someone's clothes off, Having sex somewhere other than the bedroom,* and *Kissing passionately.* Interestingly, the amended child-sex *D*-association was positively correlated with the item *Being seduced as an "innocent"* in the non-offender group. This suggests that non-offenders who hold a child-sex association may be more likely to engage in fantasies involving themselves as a child. As to whether a child-sex association leads to this type of fantasy (or vice versa) cannot be ascertained from these correlational results.

However, it highlights a course for future research. It also demonstrates that using *D*-associations can be problematic if methodological issues arise. As such, this point emphasises the importance of using well-chosen stimuli in the SPF (as well as other indirect measures).

Taken altogether, these results suggest that extrafamilial abusers hold stronger child-sex associations than other abusers and non-offenders, and that the child-sex associations may have a positive relationship with child-related sexual fantasies. While this conclusion would support the DPM-ST, great caution needs to be made when interpreting these results as: 1) the slow adult-not sex RTs appear to have distorted the *D*-associations of the original analysis; and 2) the amended *D*-associations involved removing the not-sex categories, which means the amended scores may have less validity. Thus, it is more prudent to take these results as grounds for further investigation using an improved SPF task.

3.4.1 Limitations of the study

Although this study has uncovered some interesting findings, there are a number of limitations that need highlighting. First, the SPF involved a single session of 80, which was advised by the SPF developed authors via personal communication. However, this only allows for 20 trials per association and so it may have been advantageous to have had more trials. Indeed, other SPF studies have involved administering an 80-trial SPF (Ranganath, Smith, & Nosek, 2008) and a 40-trial SPF (Bar-Anan & Nosek, 2013) three times, resulting in 240 and 120 trials, respectively.

A second limitation concerns the stimuli used for the SPF. The words were derived from an IAT used in a previous study (Gray et al., 2005). In hindsight, this stimulus set has two problems specifically associated with the ‘not-sex’ words. The first issue is that some of the words are ambiguous and could arguably be seen as relating to ‘sex’ rather than ‘not-sex’ (i.e. *smile, eyes, toe*). Indeed, one offender participant stated that "eyes can be sexy", while another mentioned that people can have a ‘toe fetish’. An examination of the error rates did

indicate that the trials for 'not-sex' categories contained a high number of initial wrong responses, which explains the slower responding for the 'adult-not sex' category in all of the groups. The second issue is that many of the words are neutral in nature (e.g., run,). Thus, it may have been better to have used words that denote a lack of sexual appeal, such as: *ugly, cold, dull, bland,* and *boring* (O´ Ciardha & Gormley, 2012). Given that the slower adult-not sex RTs appeared to have an effect on the SPF results, this recommendation is strongly advised for future researchers, including those using other indirect measures such as the IAT.

Third, there were some issues regarding the samples used in this study. For example, considering that the SPF only involved 80 trials (20 per category), the sample size of each group (particularly the non-extrafamilial group) is likely to have been inadequate. Moreover, the non-extrafamilial group was comprised of a number of subgroups (e.g., intrafamilial abusers, abusers of children and adults, predominantly intrafamilial). By disaggregating this group and analysing the data, the results showed that all three subgroups showed similar child-sex *D*-associations. An analysis of the amended child-sex *D*-association showed that the intrafamilial abusers and the abusers of children and adults were significantly different from the extrafamilial abusers. However, the predominantly intrafamilial abusers were not. These results indicate that, while the non-extrafamilial subgroups showed similar patterns of child-sex associations on the SPF, future research should aim to use more homogenous comparison groups (e.g., a group of 'pure' intrafamilial abusers).

In addition, many of the abusers were in treatment and had progressed to Phase 2. Thus, it is possible that the strength of the child-sex associations and adult-sex associations were influenced by the treatment these participants were receiving (i.e., weakened and strengthened, respectively).

Finally, positive correlations were found between a number WSFQ items and the amended child-sex *D*-association. From this, it is tempting to conclude that child-sex associations can be associated with sexual fantasies that are unrelated to children. However, these

correlations may highlight the limitations of the WSFQ, particularly in terms of assessing child-related sexual fantasies. For example, it is possible that the items *Taking someone's clothes off* and *Having sex somewhere other than the bedroom* positively correlate with the amended child-sex *D*-$_{association}$ because the respondent was thinking of a child within those fantasies (e.g., taking a child's clothes off). In other words, the WSFQ does not allow one to ascertain who the person is when referring to sexual fantasies about specific behaviours or locations. It should also be noted that the individual significant correlations reported in this study should be treated with caution, as they are based upon multiple correlation analyses. In other words, there is an increased risk of committing a Type 1 error. Thus, future research in this area should account for this issue and aim to use a more detailed means of assessing sexual fantasies.

3.4.2 Future directions for research

In light of the present findings, the SPF has some potential as a research tool for assessing sex-related associations in child abusers. However, since this is the first time the SPF has been applied to this area of cognition, it is necessary for future studies to be conducted. For example, in addition to addressing the issues outlined above, researchers should think about using pictures as the stimuli for adults and children categories. First, pictures have been found to be just as good as words in IAT studies (Banse et al., 2010; Brown et al., 2009). Second, the SPF allows non-focal associations, such as gender of the person in the image, to be assessed (Bar-Anan et al., 2009). In other words, in addition to comparing 'child-sex' and 'adult-sex' associations, the SPF could be used to examine whether child abusers hold stronger associations between 'male children' and 'sex' or stronger associations between 'female children' and 'sex'. If successful, such a feature would be useful in distinguishing heterosexual abusers from homosexual abusers.

The correlational results between the *D*-associations and the child-related sexual fantasies cannot be used to draw any causal conclusions. Thus, experimental research is needed to support the hypothesis that deviant thoughts and fantasies arise from activated sex-related associations. For example, in a recent, albeit non-forensic study, Birmbaum, Simpson, Weisberg, Barnea, and Assulin-Simhon (2012) found that the content of a sexual fantasy can be affected by explicitly and implicitly priming an attachment orientation. For example, after explicitly priming insecurity, participants wrote fantasies that involved themes of interpersonal distance and hostility, especially in men who were anxiously attached. In light of this, it would be valuable to conduct a similar study in which child abusers are asked to write a sexual fantasy after having a child-sex association primed.

CHAPTER 4

INVESTIGATING THE FACTORS THAT INFLUENCE THE USE OF DEVIANT SEXUAL FANTASIES

Chapter Rationale

Having found some support for the assumption that sex-related associations are held in long-term memory in Chapter 3, the purpose of this chapter was to examine the factors that may influence the use of deviant sexual fantasies once such associations are (presumably) activated. According to the DPM-ST, these factors can include individual differences related to the ability to fantasise in general as well as the presence of explicit cognitions that are congruent with the activated associations and prospective sexual fantasy content. The structural equation modelling study described in this chapter aimed to test these assumptions in the context of aggressive sexual fantasies used by men in the general population.

4.1 Introduction

According to the Dual-Process Model of Sexual Thinking (DPM-ST), a spontaneous sexual thought will be fleeting unless attended to and elaborated upon in the form of a sexual fantasy. As discussed in Chapter 2, the transition of a spontaneous sexual thought to a sexual fantasy is more likely to occur if the thought elicits a strong affective reaction (e.g., arousal, excitement). Also, the transition is more likely if the sexual thought is congruent with an individual's explicit attitudes. For example, if a sexual thought about forcing sex on a woman intrusively enters the consciousness of a man, it is more likely to be elaborated upon if the man holds an explicit attitude that women enjoy forced sex. Indeed, a number of studies have demonstrated that non-offending males who hold negative or hostile attitudes about women, or who endorse rape-myths, are more likely to report using dominance, forceful, or coercive sexual fantasies (Bartels & Gannon, 2009; Greendlinger & Byrne, 1987; Malamuth, 1981; Plaud & Bigwood, 1997; Renaud & Byers, 2005; Smeaton & Byrne, 1987; Zurbriggen & Yost, 2004). From the perspective of the DPM-ST, these attitudes have an influential role in whether someone generates and uses aggressive sexual fantasies.

The DPM-ST also proposes that certain individual differences will influence whether someone elaborates upon a sexual thought via sexual fantasy, some of which relate to the act of fantasising. These include: 1) how prone someone is to fantasising in general; 2) the ability to form vivid visual mental imagery; and 3) whether someone often has dissociative experiences in daily life.

'Fantasy proneness' - a constellation of personality traits and experiences related to deep involvement in fantasy (Wilson & Barber, 1981) - has rarely been investigated in relation to sexual fantasies. However, from interviews that led to the discovery of the fantasy-proneness construct, Wilson and Barber (1981) found that, out of 27 fantasy-prone women, 75% reported using vivid sexual fantasies that resulted in orgasm in the absence of additional stimulation. However, no such information was provided about sexual fantasies in fantasy-

prone men. A thorough search of the literature failed to find any empirical studies investigating fantasy proneness in relation to deviant sexual fantasies. However, Curnoe and Langevin (2002) suggest that sexual offenders who engage in deviant sexual fantasies may be fantasy-prone in general. Curnoe et al. (2002) based this on previous research showing that people either have a tendency to sexually fantasise or not (Langevin, Handy, Paitich, & Russon, 1985).

There is also some indication that sexual fantasies are related to vividness. For example, in non-offenders, research had shown that the more sexual experience an individual has, the more vivid their sexual fantasies will be (Brown & Hart, 1977; Gold & Gold, 1991). Importantly, it has been found that sexual fantasies are affected by an individual's ability to produce vivid mental imagery. For example, Smith and Over (1987) found that men who are able to generate vivid mental imagery were more aroused by their sexual fantasies, relative to men who are less able to produce vivid mental imagery. There is a dearth of published research examining vividness and sexual fantasies within the sex offender literature. However, Prentky and Burgess (1991) have proposed that the vividness of sexual fantasies will vary among sexual offenders.

Dissociation is a state characterised by a lack of integrating various aspects of an experience (i.e., thoughts, feelings, images) into consciousness (Carlson, Putnam, Ross, Torem, Coons, & Dill, 1993). While very little has been done to investigate the relationship between dissociation and sexual fantasising, some have stated that sexual fantasies provide sex offenders with a step towards dissociating from both their victim's distress and their own offensive behaviour (Giannangelo, 1996). Similarly, Becker-Blease and Freyd (2007) have argued that dissociation may contribute to sexual abuse by influencing intense deviant sexual fantasies, which, as a result, enables the offenders to dehumanise their victims and behave 'normally' in their daily life. However, no empirical research has been conducted to support these ideas.

It is important to highlight that there are some interrelations among these three constructs. For example, fantasy proneness has been shown to have a strong relationship with dissociation (Merckelbach, Campo, Hardy, & Giesbrecht, 2005; Pekala, Angelini, & Kumar, 2001). It has also been found that fantasy prone individuals have greater vividness of visual mental imagery than those who are less fantasy-prone (Aleman & de Haan, 2004). Thus, by combining the assumptions of DPM-ST with the findings and suggestions discussed in this Introduction, the present study used structural equation modelling (SEM) to test the hypothesis that:

1) The use of aggressive sexual fantasies will be influenced by distorted attitudes about women.

2) Higher fantasy proneness, dissociation, and vividness of visual mental imagery will increase the likelihood that aggressive sexual fantasies will be used.

In the following subsection, the hypothesised SEM will be outlined along with the empirical and theoretical rationale that underlies it.

4.1.1 The hypothesised structural equation model

Fantasy proneness, dissociation, and vividness of visual imagery were subsumed under a single, overarching latent factor, which was termed 'Rich Fantasy Life'. Thus, this variable represents the proclivity to engage in deep and vivid fantasies without being distracted by the external world. 'Distorted Attitudes about Women' was also defined as a latent factor and was made up of variables such as calloused attitudes towards women and the belief that women are deceitful. Finally, 'Aggressive Sexual Fantasies' was conceptualised as a latent factor comprised of rape-related and sadistic sexual fantasies (Knight & Sims-Knight, 2003). The

relationship between these three latent factors is represented in the structural component of the hypothesised SEM model in this study (see Figure 4.1 below).

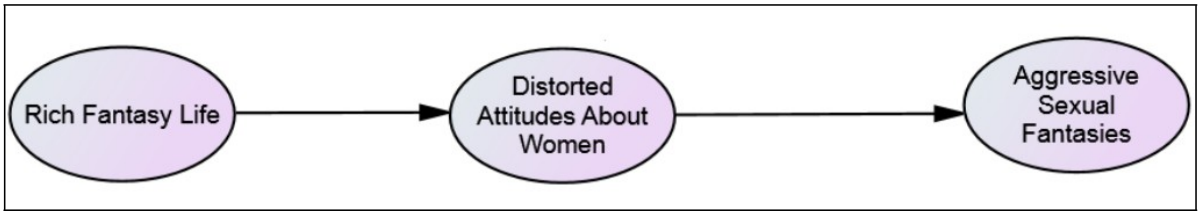

Figure 4.1: Structural component of the hypothesised SEM model.

This a priori model was based upon theoretical and empirical insights. For example, research indicates that fantasy proneness is a constellation of personality traits that develop in childhood (Wilson & Barber, 1981; Rhue & Lynn, 1987) and dissociation (as defined in this study) is a trait construct (Hagenaars & Krans, 2011). Therefore, Rich Fantasy Life was considered to be a more stable latent variable. In contrast, Distorted Attitudes about Women was regarded as less stable because research indicates that explicit attitudes can be changed more quickly and easily than implicit attitudes (e.g., Rydell & McConnell, 2006). Indeed, in the sexual offending field, distorted attitudes are regarded as a risk factor amenable to change; that is, a dynamic risk factor (Hanson & Harris, 2001; Thornton, 2002).

Taken together, having the proclivity and ability to engage in deep fantasies (i.e., Rich Fantasy Life) was hypothesised to be the initial factor influencing aggressive sexual fantasies, followed by the presence of congruent explicit distorted attitudes about women. Put differently, the SEM model proposed that a Rich Fantasy Life, via Distorted Attitudes about Women, influences the use of Aggressive Sexual Fantasies.

4.2 Method

4.2.1 Participants

To test the proposed SEM model, 159 male non-offenders from the general community were recruited via a convenience sampling methodology. The sample had a mean age of 23.5 years (*SD* = 6.5, range 18-60). Initially, 20 participants completed the study in a laboratory setting using hard copies of the materials. However, to increase the response rate, the study was transposed to an online format. Thus, the majority of participants (*n* = 139) completed the study online. Out of the 139 participants, 88 were recruited through the University of Birmingham's Research Participation Scheme. The study was advertised as an online psychology study on sexual fantasies that male participants could anonymously take part in. The remaining 51 participants completed the study online via online survey software (Survey Monkey®). These particular participants were recruited in number of ways. For example, the link to the study on Survey Monkey® was distributed through social networking sites (e.g., Facebook); advertised on websites that host online studies (e.g., www.onlinepsychresearch.co.uk); and passed on by colleagues at other universities and work places. Ethical approval was granted from the Science, Technology, Engineering and Mathematics Ethical Review Committee at the University of Birmingham (see Appendix G).

4.2.2. Materials

4.2.2.1 Creative Experiences Questionnaire

The Creative Experiences Questionnaire (CEQ; Merckelbach, Horselenberg, & Muris, 2001) is a 25-item self-report measure designed to assess fantasy proneness (see Appendix H). Each item requires a 'Yes' or 'No' response, with the 'Yes' responses being summed to produce a total score (ranging from 0 to 25). The higher the score, the greater the level of fantasy proneness. The CEQ has been found to have good internal consistency (α = .79; Merckelbach et al., 2001). It should be noted that eight of the items specifically refer to indications of fantasy-proneness during childhood. For the purposes of the present study, only fantasy proneness in adulthood was of interest. Therefore, the eight childhood items were omitted in

the analysis. According to Saucier and Skrzypińska (2006), this 17-item measure of 'current fantasy-proneness' has been found to have good internal consistency (α = .77).

4.2.2.2 Vividness of Visual Imagery Questionnaire

The Vividness of Visual Imagery Questionnaire (VVIQ; Marks, 1973) is a 16-item measure designed to assess individual differences in the vividness and clarity of visual mental imagery (see Appendix I). The VVIQ is comprised of four general scenes that the respondent must visualise (e.g., the rising sun). For each scene, four additional images (e.g., "A rainbow appears") must then be visualised and rated in terms of vividness. Each item is scored on a scale from 1 ("No image at all") to 5 ("Perfectly clear and as vivid as normal vision"). For the present study, the scores were reversed so that when summed to create a total score, higher scores indicated higher imagery vividness. Previous research shows the VVIQ has a Cronbach's alpha of .85 (D'Argembeau & van der Linden, 2006).

4.2.2.3 Dissociative Experiences Scale-II

The Dissociative Experiences Scale II (DES II: Carlson & Putman, 1993) is a 28-item measure designed to assess dissociation in non-clinical and clinical populations (see Appendix J). Each item describes a different dissociative experience and then asks the respondent to indicate the percentage of time spent (on a scale ranging from 0% to 100%) experiencing the same phenomenon. Internal consistencies have been shown to be very good, with α's ranging from .83 to .93 (Bruce, Bruce, Hancock, & Lynch, 2009).

4.2.2.4 Women are Deceitful scale

The Women are Deceitful Scale (WDS; Offending Behaviour Programmes Unit, unpublished) is a short five-item questionnaire that measures the extent to which women are believed to be devious and manipulative (see Appendix K). Reponses range from 0 (strongly disagree) to 4

(strongly agree) and the items are summed to produce a total score. Higher scores indicate greater endorsement of the belief that women are deceitful. The scale has a Cronbach's alpha of .79 (Webster, Bowers, Mann, & Marshall, 2005).

4.2.2.5 Calloused Sex Attitudes Towards Women subscale

The Calloused Sex Attitude Towards Women (CSATW) is one of three subscales that make up the Hypermasculinity Inventory (Mosher & Sirkin, 1984). The Hypermasculinity Inventory is an assessment of 'macho personality' and the CSATW subscale specifically examines the extent to which a man believes sex with women establishes masculine power and female submission, with little concern for the women or her experience. The CSATW is comprised of ten items that require one of two responses; one of which is supportive of a callous sex attitude (see Appendix L). Responses that support a callous sex attitude are given a score of 2, while the alternative answer is given a 0. A total subscale score is calculated by summing the items.

This specific subscale was chosen as it is used within treatment programmes within HM Prison Service and has been shown to account for most of the variance related to forceful sex in college students (Mosher & Anderson, 1986). According to Mosher and Sirkin (1984), the subscale has a Cronbach's alpha of .79, indicating good internal consistency.

4.2.2.6 Rape-related sexual fantasies

Rape-related sexual fantasies were measured using four items from the sexual fantasy questionnaire designed by Gray, Watt, Hassan, and MacCulloch (2003). The four items were identified as relating specifically to rape-related acts (e.g. "Forcing somebody to have sex against their will"). This particular questionnaire was chosen because: 1) it was designed by Gray et al. (2003) to specifically address aggressive (or sadistic) sexual fantasies; 2) the items are a lot less ambiguous than those of the more popular Wilson Sex Fantasy Questionnaire (Wilson, 1978); 3) while they focus on deviant themes, the items are not as graphic as those in

O'Donohue, Letourneau, and Dowling's (1997) Paraphilic Sexual Fantasy Questionnaire; and 4) it has been previously used in studies with non-offenders (Gray et al., 2003; Maile & Jeglic, 2009). Each item requires stating how often each fantasy theme is used via a 4-point Likert-type scale, ranging from 0 (No sexual interest) to 3 (I can't get it out of my mind). All items are summed to produce a total score for the subscale, with higher scores indicating more frequent use of rape-related fantasies (see Appendix M; bolded items indicate those that are rape-related).

4.2.2.7 Sadistic-related sexual fantasies

Using items from the same sexual fantasy questionnaire (Gray et al., 2003), ten items were deemed to reflect sadistic acts/themes (e.g., "physically hurting the person you are having sex with"). As described above (Section 4.2.2.6), each item required stating how often the fantasy theme is used on a 4-point scale ranging from 0 (No sexual interest) to 3 (I can't get it out of my mind). To produce a total score, all responses are summed. Higher scores reflect more frequent use of the sadistic-related sexual fantasies (see Appendix M).

4.2.3 Procedure

All male participants were asked to take part in a study looking at the attitudes, thoughts, and experiences that relate to sexual fantasies. Prior to starting the study, participants were made aware that their responses would remain completely confidential and as anonymous as possible (i.e., using an ID code). As such, the participants were asked to be as honest as possible on each questionnaire. They were also reminded of their rights to withdraw before providing consent to take part. Each participant completed all of the questionnaires at their own pace in a randomised order. As stated in the 'Participants' section, most of the participants (n = 139) completed the study online, while 20 completed it by hand. Following the study, the participants were debriefed and thanked for their help.

4.2.4 Analytic plan

Initially, descriptive (i.e., means and standard deviations) and internal consistency (i.e., Cronbach's alpha) tests were conducted for each of the measures. Following this, correlational analyses were conducted between all of the indicator (observed) variables. This helped confirm whether or not the multiple indicator variables (e.g., WDS, CSATW) that were related to a specific latent variable (i.e., distorted sexual attitudes) were associated in the predicted direction. It was also a way to check for multicollinearity, which occurs when two or more indicator variables are highly correlated (> .80). This is important to check as multicollinearity can have negative effects on the regression analyses that occur in SEM, rendering results uninterpretable (Pedhazur & Schmelkin, 1991).

SEM was used to test how well the data in this study fit the hypothesised model. SEM is a combination of multiple regression and confirmatory factor analysis (Schreiber, Nora, Stage, Barlow, & King, 2006) and is regarded as a highly useful analytic method. This is because it allows for: the analysis of latent (i.e., unobserved) variables; a priori hypothesised pathways to be tested; and adjustments to be made for measurement error (Byrne, 2010).

As shown in Figure 4.2, the full hypothesised SEM model was comprised of a structural component (indicated by etched arrows) and a measurement component (indicated by solid arrows). The structural component of the model had three latent variables (i.e., Rich Fantasy Life, Distorted Sexual Beliefs, and Aggressive Sexual Fantasies), one of which was exogenous (Rich Fantasy Life) and two of which were endogenous (Distorted Sexual Beliefs, and Aggressive Sexual Fantasies). The measurement component relates to the links between indicator (observed) variables and their associated latent variable, as well as the error variances. As shown in Figure 4.2, the indicator variables associated with Rich Fantasy Life were fantasy proneness (CEQ), vividness of visual imagery (VVIQ), and dissociation (DES-II). The Distorted Sexual Beliefs latent variable was comprised of calloused sex attitudes

(CSATW) and women are deceitful (WDS). Finally, Aggressive Sexual Fantasies was made up of Rape-related and Sadistic sexual fantasies.

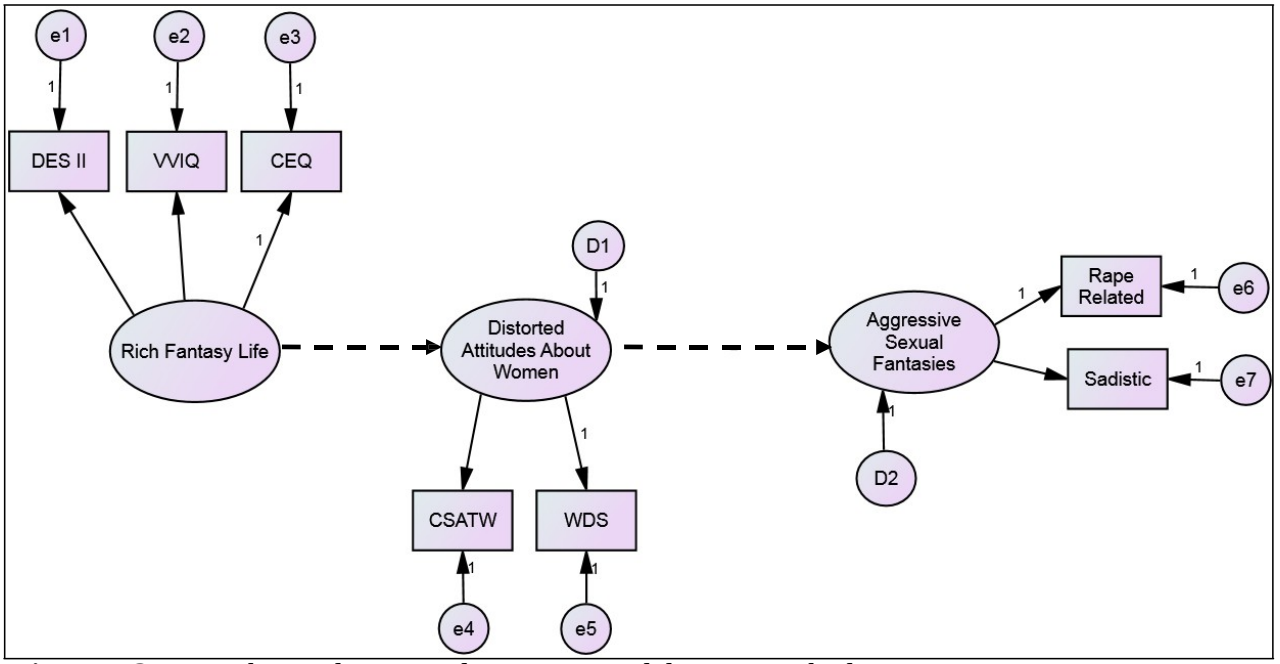

Figure 4.2: Hypothesised structural equation model. *Note*: Etched arrows between the latent variables (ellipses) signify the structural model. The indicator variables (rectangles) and errors (circles with an 'e' inside) represent the measurement model.

Having specified the model based upon theoretical assumptions derived from the DPM-ST, the model then needed to be identified. Model identification is the extent to which the parameters of the model (i.e., the paths being estimated) correspond to the available data points. The aim is to specify a model that has more data points than parameters so that it has positive degrees of freedom (i.e., known as an 'over-identified' model). This makes the model scientifically useful as it can be rejected (Byrne, 2010). The present model has 16 parameters; that is, seven error variances; four indicator paths (the other three are fixed to the value of one and so are not estimated); two structural paths (between latent variables); two disturbances (i.e., error term associated with the two endogenous latent variables); and one factor variance (for the exogenous variable). As there were seven measured variables, the number of data points is: $7(7+1)/2 = 28$. Therefore, the model is over-identified as there are more data points than parameters (28 versus 16, respectively).

With regards to sample size, a common 'rule of thumb' in SEM is to have 10 participants per parameter (Schreiber et al., 2006). With 16 parameters, 160 participants were required. Therefore, 159 participants in this study was just about enough to conduct the analysis. Using data from all 159 participants (with no missing data), the next step involved evaluating the fit of the hypothesised model. This was done with the aid AMOS 21; a software package that can be used to run SEM analyses. Based on recommendations in the SEM literature (e.g., Businelle, Kendzor, & Wetter, 2010; Byrne, 2010; Hu & Bentler, 1999; Schreiber et al. 2006), various goodness-of-indices were consulted to determine how well the model fitted with the observed data.

Specifically, a Chi-square goodness-of-fit index (χ^2) was used to test the hypothesis that the model is significantly different to the data. Thus, a good model will not differ, as indicated by a *p*-value >.05. In addition, the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) were used, both of which compare the hypothesised model with a null (i.e., worst-fitting) model. According to Hu and Bentler (1999), scores >.95 indicate an excellent fit. Also, Root Means Square Error of Approximation (RMSEA) was also used. The RMSEA, essentially, measures the error of approximation in the population, expressed per degree of freedom (Byrne, 2010). Since degrees of freedom are related to the number of parameters in the model, RMSEA is sensitive to model complexity and favours models with less parameters. An RMSEA of 0.8 of more indicates greater error of approximation and, therefore, poor fit, while an RMSEA below 0.05 is considered excellent fit. However, a cut-off value of 0.6 (Hu & Bentler, 1999), or a stringent upper limit of 0.7 (Steiger, 2007), can be suggestive of a reasonable or good-fitting model.

Finally, due to the small sample size, it was predicted that the data would be not be normally distributed (Ievers-Landis, Burant, & Hazen, 2011). Therefore, a nonparametric "bootstrapping" procedure was carried out after the initial model was tested. Essentially, bootstrapping is a resampling method that involves treating the original sample as the

population so that numerous subsamples (the same size as the original) can be randomly drawn from it. As a result, the same parameter estimates and tests of fitness are able to be tested on each of the subsamples so that a distribution of the result is produced (Ievers-Landis et al., 2011). In this study, a bias-corrected bootstrap procedure was used with 95% confidence intervals. Using AMOS 21, parameter estimates were tested across 1000 subsamples (Cheung & Lau, 2008). This was followed by the Bollen-Stine bootstrap; a procedure that allows researchers to ascertain whether the original model fits with the model derived from the multiple bootstrap samples (Ievers-Linden et al., 2011).

4.3 Results

4.3.1 Means, internal consistencies, and correlations among indicators

Table 4.1 displays the means and standard deviations for each of the observed variables, as well as the internal consistency (α) associated with each measure. As can be seen, most of the measures had very good internal consistencies as indicated by high Cronbach's alphas, with the exception of the CSATW scale (α =.63).

Table 4.1:
Means, standard deviations, and internal consistencies for the indicator (observed) variables

Indicator Variable	*N*	Mean	*SD*	Cronbach's Alpha (α)
CEQ	159	4.9	3.2	.75
VVIQ	159	57.3	10.7	.92
DES-II	159	17.5	13.7	.95
CSATW	159	4.1	4.3	.63
WDS	159	8.5	3.7	.85
Rape SF	159	.74	1.8	.89
Sadistic SF	159	2.7	3.8	.88

Note: SF = Sexual Fantasies

Spearman's Rho correlations are shown in Table 4.2. Spearman's Rho was used because, as predicted, the data in this study was not normally distributed (see Section 4.3.2). Looking at Table 4.2, it can be seen that the strongest correlations were between indicators associated with a specific latent variable, with the exception of VVIQ and DES-II. For example, in relation to Rich Fantasy Life, the CEQ showed a positive relationship with the VVIQ and the DES-II; in relation to Distorted Attitudes about Women, the CSATW and WDS were correlated; and in relation to Aggressive Sexual Fantasies, the two sexual fantasy subscales (i.e., rape-related and sadistic) were strongly associated. None of the correlations exceeded 0.8, thereby, ruling out multicollinearity.

Table 4.2:
Correlations (using Spearmen's Rho) for all indicator (observed) variables

Indicator Variable	1	2	3	4	5	6	7
1. CEQ	1	--	--	--	--	--	--
2. VVIQ	.23**	1	--	--	--	--	--
3. DES-II	.49***	.09	1	--	--	--	--
4. CSATW	.08	-.01	.15	1	--	--	--
5. WDS	.23**	-.09	.29**	.40***	1	--	--
6. Rape SF	.16*	.09	.20*	.33***	.25**	1	--
7. Sadistic SF	.20*	.09	.21**	.23**	.18*	.61***	1

*** <.001, ** < .01, * < .05 *Note*: SF = Sexual Fantasies

4.3.2 Testing the SEM model

SEM was run using AMOS 21. Maximum likelihood (ML) was the chosen method of parameter estimation because, according to Schreiber et al. (2011), ML can be appropriately used with sample sizes ranging from 100-150. Figure 4.3 shows the final SEM model with the standardised coefficients derived from the SEM analysis added. As can be seen, the paths between the three latent variables were significant. The specific details of these two paths

coefficients are as follows: Rich Fantasy Life → Distorted Sexual Beliefs (standardised β = .50; unstandardised β = .52; standard error [SE] = .15, p = <.001); and Distorted Sexual Beliefs → Aggressive Sexual Fantasies (standardised β = .58; unstandardised β = .40, SE = .09; p = <.001). Furthermore, all of the non-fixed indicators were significant at the p <.001 level, except for the path between Rich Fantasy Life to VVIQ (p <.05).

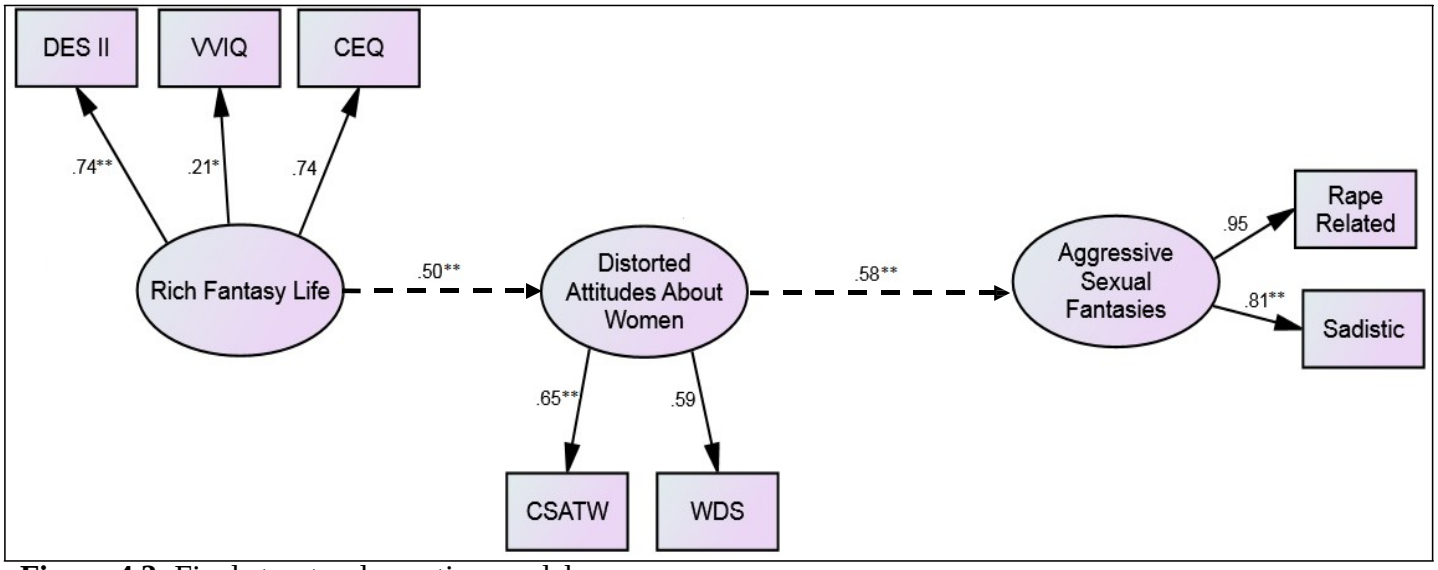

Figure 4.3: Final structural equation model.
** <.001, * <.05.

In evaluating the model, the goodness-of-fit indices indicated that the model had a reasonable to good fit with the observed data; χ^2 (12) = 20.43, p >05; CFI = .97; TLI = .95; RMSEA = .067. As indicated, the Chi-square statistic was not significant, suggesting that the hypothesised model did not differ from the observed data. The CFI and TLI indices were above and equal to the cut-off points for a good fitting model, respectively. Finally, the RMSEA suggested a reasonably fitting model. Taken together, no further adjustments or model modifications were deemed necessary to improve the model (Byrne, 2010). While these results were encouraging, these indices are susceptible to inflation by small samples (Ievers-Landis et al., 2011). Moreover, as predicted (see Section 4.2.4), the data was found to be non-normally distributed, indicated by a high multivariate kurtosis value (z-statistic = 16.76). For normality to be established, this value should be < 5.00 (Bentler, 2005). Thus, the following

section outlines the results of the bootstrapping procedures that were applied to help validate the model.

4.3.3 Bootstrapping procedures

Bootstrapping was used to examine the stability of the original hypothesised model and determine whether it was unbiased. This was done via two steps (Ievers-Landis et al., 2011). The first involved comparing the bootstrap regression weight means (unstandardised and standardised) derived from the 1000 bootstrap samples with those produced from the original sample. If they did not considerably differ, it would provide evidence of an unbiased model. As shown in the fourth column of Tables 4.3 and 4.4, the difference between the weights (unstandardised and standardised) of the mean bootstrap sample did not greatly differ from those of the original sample. Taking the path between Rich Fantasy Life and Distorted Sexual Attitudes in Table 4.3 as an example, it can be seen that the difference between the original and bootstrap unstandardised regression weights was only -.01. These findings provided the first indication that the model was unbiased.

The second step to further determining whether the model was unbiased involved comparing the SE of the mean bootstrap with the SE-Bias (which is the difference between the SE of the original sample and the bootstrap sample) for all paths. An unbiased model is indicated if the SE-Bias is less than the SE of the mean bootstrap. As shown in the last two columns of Tables 4.3 and 4.4, all of the SE-Biases were less than SE's derived from the mean bootstrap. Thus, the overall bootstrapping procedure suggested that all of the paths were unbiased.

Table 4.3: Comparisons Between the Original Sample and Mean Bootstrap Sample of 1,000 (using unstandardised regression weights)

Path	Original Sample	Mean Bootstrap	Difference (Bias)	SE of Mean	SE-Bias

		Sample		Bootstrap	
1. 'Rich Fantasy Life' to 'Distorted Sexual Attitudes'	.52	.51	-.01	.27	.008
2. 'Distorted Sexual Attitudes' to 'Aggressive SF	.40	.42	.02	.17	.005
3. 'Aggressive SF' to 'Sadistic SF'	1.8	1.85	.02	.38	.012
4. 'Distorted Sexual Attitudes' to 'CSATW'	.97	1.03	.06	.34	.011
5. 'Distorted Sexual Attitudes' to 'WDS'	Fixed to 1	1	0	0	0
6. 'Rich Fantasy Life' to 'CEQ'	Fixed to 1	1	0	0	0
7. 'Rich Fantasy Life' to 'VIVQ'	.92	.85	-.08	.39	.012
8. 'Rich Fantasy Life' to 'DES-II'	4.2	4.4	.09	2.1	.065
9. 'Aggressive SF' to 'Rape-related SF'	Fixed to 1	1	0	0	0

SE = Standard Error, SF= Sexual Fantasies

Table 4.4: Comparisons Between the Original Sample and Mean Bootstrap Sample of 1,000 (using standardised regression weights)

Path	Original Sample	Mean Bootstrap	Difference (Bias)	SE of Mean	SE-Bias

		Sample		Bootstrap	
1. 'Rich Fantasy Life' to 'Distorted Sexual Attitudes'	.50	.48	-.03	0.17	0.005
2. 'Distorted Sexual Attitudes' to 'Aggressive SF'	.58	.57	-.02	0.14	0.004
3. 'Aggressive SF' to 'Sadistic SF'	.82	.81	-.002	0.09	0.003
4. 'Distorted Sexual Attitudes' To 'CSATW'	.65	.65	.004	0.12	0.004
5. 'Distorted Sexual Attitudes' to 'WDS'	.59	.58	-.003	0.11	0.003
6. 'Rich Fantasy Life' to 'CEQ'	.74	.78	.04	0.18	0.006
7. 'Rich Fantasy Life' to 'VIVQ'	.21	.21	.00	0.10	0.003
8. 'Rich Fantasy Life' to 'DES-II'	.74	.73	-.01	0.16	0.005
9. 'Aggressive SF' to 'Rape-related SF'	.95	.96	.01	0.09	0.003

SE = Standard Error, SF= Sexual Fantasies

Finally, a final test of the model's validity was conducted using the Bollen-Stine method. This bootstrapping procedure involves transforming the data so that it perfectly matches the model. Then multiple samples are drawn from the transformed sample. Essentially, it uses the χ^2 statistic to assess whether the bootstrap-derived model significantly differs from the originally hypothesised model. Thus, a Bollen-Stine χ^2 with a *p* value >.05 indicates that the two models do not significantly differ. In this study, the Bollen-Stine statistic and the *p*-value was found to be .126. Thus, this provided further validation of the original SEM model.

4.4 Discussion

The main aim of this study was to test the hypothesis that individual differences related to the ability to fantasise in general (i.e., high fantasy proneness, dissociation, and vividness of visual imagery), in conjunction with congruent explicit cognitions, influences the use of aggressive sexual fantasies in non-offending males. This hypothesis was represented as a conceptual single-path model where Rich Fantasy Life, via Distorted Attitudes about Women,

influenced Aggressive Sexual Fantasies. Using structural equation modelling with data from 159 male non-offenders, the model was found to be a good fit with the data. As a result, support for the model (and, therefore, the main hypotheses) was obtained.

In line with the DPM-ST, the results suggest that aggressive sexual fantasies are more likely to be used by male non-offenders if they have: 1), a greater ability to dissociate from reality and engage in fantasies involving vivid mental imagery; and 2), distorted explicit cognitions that are congruent with the aggressive themes within the sexual fantasy. Furthermore, the findings would appear to add to the literature showing a relationship between distorted attitudes about women and deviant sexual fantasies about women (i.e., those involving coercion, dominance, force) (Greendlinger & Byrne, 1987; Zurbriggen & Yost, 2004). While these previous studies have been purely correlational, the present study provides support for a possible causal direction. This causal direction has previously been articulated in the literature. For example, in their model of risk for sexual offending, Beech and Ward (2004) proposed that offence-supportive cognitions produce deviant thought/fantasies.

The results of this chapter can also be contrasted with the Knight and Sims-Knight's (2003) three-path model of sexual coercion against women. While their model is more complex in nature, given that it attempts to explain a far more complex phenomenon (i.e., sexual coercion), they did propose a path between two latent variables called 'Callousness/Unemotional' (CU) and 'Aggressive Sexual Fantasy'. Using SEM to test the model with adult sexual offenders (n = 275), Knight and Sims-Knight (2003) found support for this path (β = .39). However, when they tested the model with community males, CU appeared to serve as a suppressor variable (β = -.25). It should be noted that, while the Aggressive Sexual Fantasy construct was made up of aggressive and sadistic sexual fantasies subscales (similar to the current study), the CU factor was comprised of measures of general callousness/unemotionality (i.e., negative masculinity, superficial charm, and dyscontrol). Thus, given the results of the present study, perhaps distorted attitudes about women are more

pertinent to explaining aggressive sexual fantasies in non-offending males than is a general callous/unemotional trait. However, that is not to say that such a trait does not further increase the likelihood of using aggressive sexual fantasies. For example, Williams, Cooper, Howell, Yuille, and Paulhus (2009) found that psychopathy - which is comprised of callous/emotional traits (Knight & Sims-Knight, 2003) - was associated with sexual fantasies of bondage and sadism in a sample of non-offenders.

There are a number of strengths associated with this study. First, the hypotheses, latent variables, and a priori SEM model were all empirically and theoretically informed, allowing for stronger conclusions about the model to be drawn. Second, rather than examining observed variables (i.e., fantasy proneness, dissociation, and vividness of visual imagery) in relation to aggressive sexual fantasies, the use of SEM allowed for the testing of latent variables defined by multiple observed variables. Third, in other multivariate analyses (e.g., regression), the error of observed variables is treated as having disappeared. This is problematic because it is essentially analogous to ignoring error, which can lead to major inaccuracies (Byrne, 2010). SEM, however, is able to avoid these potential problems as it takes into account and makes adjustments for measurement error.

In addition, this study is one of the first to directly examine the theorised link between sexual fantasies and the constructs of fantasy proneness and dissociation. Moreover, as the results suggest (see Table 4.1), a positive relationship appears to exist between sexual fantasies (i.e., involving rape and sadistic acts) and both fantasy proneness and dissociation. Future research should extend these findings by examining the relationship between these variables and other types of sexual fantasy. Finally, and pertinent to this thesis, the study supports some of the unique assumptions of the DPM-ST.

4.4.1 Limitations and suggestions for future research

The present study is not without limitations. First, the sample size was not quite adequate for a SEM study. The 'rule of thumb' for estimating sample size is that there should be 10 participants per estimated parameter. With 16 parameters, 160 participants were required. This study involved 159 participants, resulting in 9.9 participants per parameter. Thus, the sample size was borderline appropriate. As such, the data was predicted and found to be non-normally distributed. In these cases, Ievers-Landis et al. (2011) have advised using bootstrapping procedures to test whether the model is unbiased. In this study, results from two bootstrapping procedures verified that the model was valid or unbiased. Nevertheless, "SEM is still a large sample analysis technique" (Schreiber et al., 2011, p. 334) and so the model should certainly be tested with a much larger sample.

Second, it is strongly advocated that latent variables be defined by multiple indicators as opposed to one aspect of measurement. This is because a single indicator is unlikely to account for all of the variance in the latent variable, causing the latent variable to be reflective of biased or unreliable information (Raykov & Marcoulides, 2000). While all of the latent variables in the present study had more than one indicator, two of them were made up of only two indicators. This can sometimes be problematic because two indicators per latent variable can sometimes cause estimation problems (Bollen, 1989; Kline, 2004). However, as noted by Violato and Hecker (2007), most SEM models often only use two indicators per latent variable. Nevertheless, it would be beneficial to run a model with three indicators for the Distorted Attitudes about Women and Aggressive Sexual Fantasies factors. Note that this would mean adding more parameters to the model, which would require a larger sample.

Third, no information was gained as to the sexual orientation of the sample. This highlights a potential issue because if there were any homosexual participants present in the sample, it is possible that their attitudes about women would have no bearing on their aggressive sexual fantasies, as the content would likely involve men. Future research would benefit from gaining information on sexual orientation or having homosexuality as an

exclusion criterion. Alternatively, testing the current model in relation to homosexual attitudes and homosexual fantasies would be of benefit, both as way of addressing this limitation and further validating the core premise of the SEM model.

Finally, although the model was a reasonably good fit to the data, other models may have been an identical or better fit. In light of this, it is important to keep in mind that the present results suggest only that the model is plausible; not conclusively correct. However, the model is a first step into examining the impact of fantasy proneness, dissociation, and imagery vividness on sexual fantasies. Thus, validation of the model with larger samples and offender samples is required. Also, applying the model to include different explicit cognitions and sexual fantasies (e.g., child-related, non-deviant) are also warranted.

CHAPTER 5

TESTING WHETHER SEXUAL FANTASIES REQUIRE WORKING MEMORY RESOURCES

Chapter Rationale

The 'Dual-Process Model of Deviant Sexual Thinking' proffers some novel assumptions about the cognitive mechanisms associated with envisioning a sexual fantasy. The first and primary assumption is that sexual fantasies are a controlled cognitive process that one deliberately engages in. As such, the DPM-ST states that sexual fantasies rely on the processing resources of working memory, since visual information drawn from the external world and the internal world (i.e., long-term memory) have to be activated, retained, and manipulated in the mind's eye. This assumption is integral to the model and will have a number of important implications if it is corroborated. Therefore, this next chapter describes a study aimed at establishing whether working memory underpins the act of sexually fantasising.

5.1 Introduction

A core assumption of the Dual-Process Model of Sexual Thinking (DPM-ST) is that sexual fantasising is a controlled cognitive process that requires the resources of working memory (WM). WM is conceptualised as a limited-capacity storage system for information that is necessary to complete an immediate or current cognitive operation (Baddeley & Hitch, 1974). According to Baddeley and Hitch, WM is comprised of a main control system (the *central executive*) that controls attention and the allocation of resources. It is also comprised of two subsidiary 'slave' systems; the *visuospatial sketchpad* and the *phonological loop*. The former subsystem is necessary for the retention and manipulation of visual information, while the latter does the same for auditory information. It has been assumed that the maintenance of information in the slave systems is essential for the operations underpinning mental imagery (Baddeley & Andrade, 2000).

One way to test if a cognitive operation requires WM is to employ a 'dual-task'. This involves having an individual perform the cognitive operation of interest at the same time as performing another task known to require WM. If this cognitive operation requires the resources of WM then an individual's performance will be impaired relative to when it is performed with no dual task. This is because the dual task leaves less WM capacity/resources for the cognitive operation. With respect to mental imagery (as the cognitive operation), bilateral eye-movements (EMs) have been increasingly used as a dual task (van den Hout & Engelhard, 2012) as evidence suggests that bilateral EMs tax working memory (Andrade, Kavanagh, & Baddeley, 1997). For example, it has been found that responses on a reaction time task (known to require WM) are significantly slower when EMs are performed simultaneously, relative to when no EMs are made (Engelhard, van Uijen, & van den Hout, 2010; van den Hout et al., 2011).

There is a growing body of research showing that the vividness and emotionality of negative memories are reduced after one undergoes a session of bilateral EMs at the same time as envisioning the negative memory (Andrade et al., 1997; Gunter & Bodner, 2008;

Maxfield, Melnyk, & Hayman, 2008; van den Hout, Muris, Salemink, & Kindt, 2001; van den Hout et al., 2011). Moreover, Gunter and Bodner (2008) found that these effects are greater for individuals with a naturally lower WM capacity, further supporting the account that EMs tax WM. A recent meta-analysis of these studies revealed a large effect size for reductions in vividness of negative memories (Lee & Cuijpers, 2013). Given that EMs are shown to tax WM, these findings suggest that mental imagery requires WM resources.

This conclusion is reinforced by research showing that the effects of EMs are not confined to negative memories. For example, EMs have been found to impair positive memories (Hornsveld et al., 2011) and negative imagery related to the future (Engelhard, van den Hout, Janssen, & van der Beek, 2010; Engelhard et al., 2011). Furthermore, EMs have also been found to reduce the vividness of food imagery, as well as the level of craving related to the food (Kemps, Tiggemann, Woods, & Soekov, 2004; McClelland, Kemps, & Tiggemann, 2006).

In light of this research, it can be argued that sexual fantasies – as a form of mental imagery – require the resources of WM. Thus, the present study aimed to test this hypothesis by using EMs as a dual-task. As research of this kind of research has never been conducted with sexual fantasies in general, it was decided that deviant sexual fantasies should not be the sole focus and that non-offenders should be tested before sex offenders.

Given that future-based imagery is affected by EMs in the same way as memory-based imagery (Engelhard et al., 2010b), this study tested both memory and imagination-based fantasies separately with the prediction that they will not significantly differ in terms of how they are affected by EMs. Thus, drawing upon the methods used in previous research, this study comprised two Experimental conditions (one where memory-based sexual fantasies were envisioned while making EMs; and one where imagination-based sexual fantasies were envisioned while making EMs), and two Control conditions (one where a memory-based

sexual fantasy was envisioned with no EMs; and one where an imagination-based sexual fantasy was envisioned with no EMs).

For each condition, sexual fantasies were rated on three variables (emotionality, vividness, and arousability) both before and after the task. Arousability was a unique addition to this study as it is an effect of sexual fantasies (Gee, Ward, & Eccleston, 2003). This is similar to the study by Kemp et al. (2004) who added a measure of food craving to their study since food craving is an effect of that particular imagery. Since EMs were expected to affect memory and imagination-based fantasies to the same extent (i.e., not significantly differ), fantasy type was not considered as a factor in the design of this study. Thus, the following hypotheses were tested:

Hypothesis 1: The vividness of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

Hypothesis 2: The emotionality of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

Hypothesis 3: The arousability of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

5.2 Method

5.2.1 Participants

In this study, a within-subjects design was used to reduce the effect of individual differences (e.g., habituation rates, levels of imagery vividness, emotionality, and arousability). A sample of 47 students was recruited from the University of Birmingham to take part in a study looking at the cognitive and structural properties of sexual fantasies. The sample size was a

result of convenience sampling via the online Research Participation Scheme (RPS). The sample had a mean age of 19.4 years old (*SD*=1.1, range 19-21 years) and was comprised of 38 female participants and 9 male participants. The sample was comprised of mainly Caucasian participants (83%), although individuals from other ethnic backgrounds also took part, including Asian (11%), Black (2%), and Mixed Race (4%). Also, the sample was comprised of mainly heterosexual individuals (94%), although three homosexual individuals (6%) took part. Approximately half of the sample identified themselves as 'Single' (51%), while the other half identified themselves as being 'In a relationship' (49%). Ethical approval for this study was granted from the Science, Technology, Engineering and Mathematics Ethical Review Committee at the University of Birmingham (see Appendix N.)

5.2.2 Materials

5.2.2.1 Adapted Wilson Sexual Fantasy Questionnaire (WSFQ; Wilson, 1978)

Sexual fantasies were measured using the Wilson Sex Fantasy Questionnaire (WSFQ; Wilson, 1978). A more detailed description can be found in Chapter 3 (Section 3.2.2.3). However, for this study, the WSFQ was adapted to include six extra questions. This was done to elicit other necessary information about each fantasy. These six questions were: 1) Does the fantasy involve an elaborate scenario, or is it just a passing thought? 2) Is it based on the memory of a previous experience, or pure imagination? 3) In general, does it automatically pop in your mind or do you deliberately bring it to mind? 4) Do you expect it to occur in the future, or is it an unrealistic, fanciful idea? 5) How arousing do you find this fantasy? 6) How do you evaluate this fantasy? 7) Do you watch or read pornography related to this fantasy? All questions required one of two categorical-type responses (e.g., 'Memory' versus 'Imagination' for Question 2), with the exception of questions 5 and 6, as these were scored on a Likert-type scale (see Appendix O). To aid participants in answering the additional questions, guidelines were provided (see Appendix P).

5.2.2.2 Visual analogue scales

Following many of the previous studies in EMs (e.g., van den Hout et al., 2011), emotionality, vividness, and arousability levels for each sexual fantasy were measured using visual analogue scales (VAS; see Appendix Q). Each VAS was comprised of a single 10cm line that had descriptive anchors at each end. The emotionality VAS ran from 'extremely unpleasant' (left) to 'extremely pleasant' (right); the vividness VAS ran from 'not clear at all' (left) to 'very clear' (extreme right); and the arousability VAS ran from 'extremely non-arousing' (left) to 'extremely arousing' (right). For each variable, participants had to mark a vertical line through the horizontal line of the VAS wherever it felt appropriate. The VAS's were scored by manually measuring (i.e., using a ruler) the position of each response.

5.2.2.5 Eye-movement task

Using E-Prime, a 1cm wide white dot was programmed to move back and forth across a computer screen (black background) at a rate of about one movement per second (i.e., back and forth the screen in one second). The horizontal movement of the white dot is designed to facilitate bilateral eye-movements in participants and has been successfully used by previous researchers (van den Hout et al., 2011). One of these researchers (Daniel Beetsma) kindly shared the basic E-Prime script for the moving dot, which was adapted to suit the present study. For example, following the procedure used by the previous researchers, the circle was programmed to make 24 full right-to-left movements over four separate blocks (24 per block). Each block was separated by a 10 second break (where the word 'Rest' was presented on screen). Thus, the task comprised bilateral 96 movements in total (van den Hout et al., 2001; Engelhard et al., 2010b). Ninety-six eye movements have been used in previous research (and the present study) in order to avoid the issues associated with dose-exposure research. For instance, any more EMs may induce mere-exposure effects that overshadow the effects that

EMs can have, whereas any less may be too little to observe any EM effects (van den Hout, personal communication, March, 2013).

A similar task was also programmed for the control (no eye-movement) condition. This simply involved a blank black screen being displayed for four 24-second blocks, each separated by a 10 second break. During the presentation of the blank screen, participants would envision a sexual fantasy. When the screen presented the word 'Rest', they would have to rest for 10 seconds.

5.2.3 Procedure

Each participant entered the lab and sat in front of a computer. Each participant was informed about what they had to. That is, to envision a series of sexual fantasies that they regularly use while doing a secondary task at the same time. After providing informed consent, all participants first completed the Adapted WSFQ. The researcher then identified four sexual fantasies from the completed Adapted WSFQ; two based upon an experience and two based upon pure imagination. The fantasies that were most frequently used (i.e., a score of 3 or more) were chosen. These four sexual fantasies were used for each of the four conditions.

Following completion of the Adapted WSFQ, all participants were first told to envisage a sexual fantasy for 20 seconds (nb: The participants were informed about which of their four selected fantasies they had to envision. That is, a number corresponding to the selected WSFQ fantasy theme was written by the researcher on the top of the VAS sheet). After envisioning the fantasy for 20 seconds, participants then completed a pre-task rating of the fantasy's emotionality, vividness, and arousability using the VASs.

Next, all participants took part in the four conditions (i.e., EM-Memory, EM-Imagination, No EM-Memory, and No EM-Imagination), the order of which was counterbalanced by Experimental and Control Condition. For each condition, the instructions were presented to them on a computer screen (via E-prime). During the Experimental

conditions (EM-Memory, EM-Imagination), participants were instructed to visualise a sexual fantasy with their eyes open for a period of 96 seconds (i.e., four 24-second blocks separated by a 10 second rest). At the same time as envisioning the fantasy, participants were told to make 96 EMs by following a white dot that moved across the computer screen. After the EM task ended, a screen appeared informing participants to re-visualise the same sexual fantasy and re-rate it using a set of new VASs. This procedure was completed twice: (1) for a memory-based fantasy; and (2) for an imagination-based fantasy. The order of which fantasy was visualised first (i.e., memory versus imagination) was also counterbalanced between participants within the Experimental condition to ensure that order effects were reduced.

In the two Control conditions, participants were asked to simply visualise their memory and imagination-based fantasies for a period of 96 seconds with their eyes open, again in a counterbalanced order. No eye-movements were made. After each control task, participants re-visualised and re-rated the sexual fantasy using new VASs. After the study ended, each participant was debriefed and thanked for their time.

5.2.4 Statistical Analyses

Memory and imagination-based sexual fantasies were not predicted to differ with regards to the effects of EMs. Thus, fantasy type was not included as an independent variable in the analyses. In order to highlight the similar pattern of results for each fantasy type, the analysis of the three dependent variables (vividness, emotionality, and arousability) were analysed separately for memory-based and imagination-based fantasies.

Thus, for each type of sexual fantasy (Memory and Imagination), a two (pre-test, post-test) x two (EM condition, control condition) repeated measures ANOVA was conducted on each dependent variable to examine any main and interaction effects. Also, for each dependent variable, pre-test scores were subtracted from post-test scores to produce a difference score for each condition (i.e., a negative mean difference signifies a decrease in the

dependent variable). Whenever a significant interaction effect was found, paired *t*- tests were conducted on the mean differences to compare the conditions. Effect sizes (Cohen's *d*) were calculated using Morris and DeShon's (2002) equation to correct for any dependence among the means. According to Cohen (1988), a *d* of 0.2 is regarded as a small effect size; 0.5 is regarded as a medium effect size, and 0.8 indicates a large effect size.

5.3 Results

Before describing the experimental results, it is useful to examine the participants' scores on the WSFQ so as to gain an idea of their sexual fantasies they most often engage in.

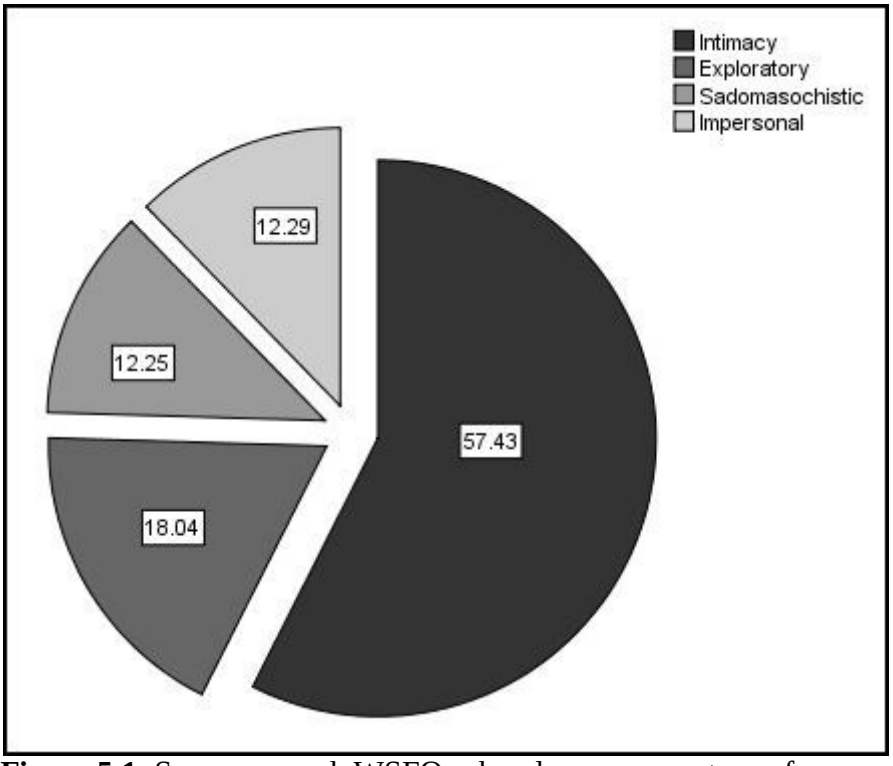

Figure 5.1: Scores on each WSFQ subscale as a percentage of the overall score

As Figure 5.1 shows, Intimate fantasies were the most frequently used (M = 30.2, SD = 7.9). The next most frequently used sexual fantasies were Exploratory (M = 9.5, SD = 6.9), with Impersonal (M = 6.5, SD = 4.6) and Sadomasochistic fantasies (M = 6.4, SD = 7.1) both being used the least. This pattern of results has also been found in both males and females in

previous WSFQ studies (Wilson & Lang, 1981). Paired-samples *t*-tests (with Bonferroni corrections) indicated that the scores on each subscale were significantly different from each other (all *p*s <.001), except between the Impersonal and Sadomasochistic subscales. In addition, independents *t*-test showed no significant differences between males and females on any of the subscales in the present study.

Table 5.1 and Table 5.2 show the mean pre-ratings and post-ratings for vividness, emotionality, and arousability for memory-based fantasies and imagination-based fantasies, respectively. It can be seen, in both tables, that there is a trend for the ratings to decrease in the EM condition and increase in the control condition.

Table 5.1: Means and *SD*s of vividness, emotionality, and arousability ratings before and after eye-movements for memory-based sexual fantasies.

	Eye-movement condition		**Control condition (Fantasy only)**	
	Pre	Post	Pre	Post
Vividness	7.8 (1.7)	6.9 (2.3)	7.8 (1.5)	8.5 (1.5)
Emotionality	7.6 (1.6)	7.2 (1.8)	7.6 (1.8)	8.1 (1.9)
Arousability	7.5 (1.5)	6.8 (2.0)	7.4 (1.9)	7.9 (1.9)

Table 5.2: Means and *SD*s of vividness, emotionality, and arousability ratings before and after eye-movements for imagination-based sexual fantasies.

	Eye-movement condition		**Control condition (Fantasy only)**	
	Pre	Post	Pre	Post
Vividness	6.2 (2.4)	5.8 (2.4)	5.8 (2.3)	7.0 (2.2)
Emotionality	7.0 (2.2)	6.5 (2.0)	6.6 (2.2)	7.0 (2.5)
Arousability	6.6 (2.5)	5.8 (2.5)	6.3 (2.4)	6.7 (2.4)

5.3.1 Hypothesis 1: The vividness of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

5.3.1.1 Memory-based sexual fantasies

First, paired *t*-tests showed that baseline (or pre-test) vividness ratings did not significantly differ between the EM and Control condition. Pre- and post-test ratings for fantasy vividness were subjected to a two-way ANOVA, with Time (pre-test, post-test) and Condition (EMs with memory-based fantasy, no EMs with memory-based fantasy) as within-subjects factors. Results revealed a significant main effect of Condition $F(1, 46) = 14.15$, $p = <.001$, as well as for the crucial Time x Condition interaction $F(1, 46) = 28.67$, $p = <.001$.

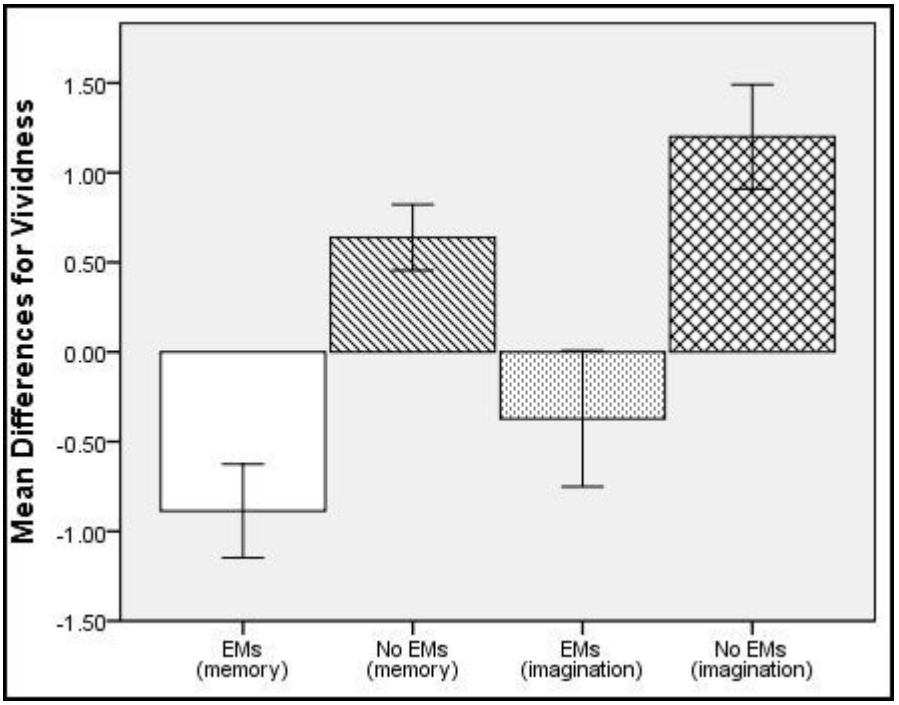

Figure 5.2: Mean difference scores and SEs for vividness for all four conditions.

In order to meaningfully decompose the interaction, a paired *t*-test was conducted on the mean difference scores (i.e., pre-test minus post-test ratings) for each condition (Engelhard et al., 2010b; Hornsveld et al., 2011). Figure 5.2 depicts these mean differences. As can be seen, vividness decreased in the EM condition and increased in the control condition (no EMs).

Results revealed that the decrease in vividness after EMs was significantly different to the condition involving fantasising only, $t(46) = 5.4$, $p < .001$, $d = .80$.

5.3.1.2 Imagination-based sexual fantasies

Again, paired *t*-tests showed no significant differences on baseline vividness between the EM and control conditions. A two-way ANOVA was conducted, with Time (pre-test/post-test) and Condition (EMs with imagination-based fantasy/no EMs with imagination-based fantasy) as within-subjects factors. The two main effects were not significant but the crucial Time x Condition interaction was significant, $F(1, 46) = 18.18$, $p = < .001$. To meaningfully decompose this interaction, a paired *t*-test was conducted on the mean difference scores (i.e., pre-test minus post-test ratings) for each condition. As can be seen in Figure 5.2, vividness decreased in the EM condition and increased in the control condition (no EMs). The paired *t*-test showed these two mean differences were significantly different, $t(46) = 4.3$, $p < .001$, $d = .64$.

5.3.1.3 Comparing memory and imagination-based fantasies

As depicted in Figure 5.2, the decrease in vividness for the memory-based fantasies after EMs appears greater than that for imagination-based fantasies. The reverse is also the case when looking at the increase in vividness after making no EMs. However, as stated earlier, no differences were expected between the two fantasy types. Thus, to ensure these differences were not significant, two post-hoc paired *t*-tests (with Bonferroni corrections; $\alpha = .025$) were conducted on the mean differences for the two fantasy types (i.e., one *t*-test per condition). As expected, the results showed no significant differences (*p*s both >.05).

5.3.2 Hypothesis 2: The emotionality of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

5.3.2.1 Memory-based sexual fantasies

As with vividness, paired *t*-tests showed that the baseline ratings for emotionality did not differ between conditions. A two-way ANOVA conducted on the pre-test and post-test emotionality ratings revealed a significant main effect of Condition, $F(1, 46) = 5.44$, $p < .05$, and a significant Time x Condition interaction effect, $F(1, 46) = 5.91$, $p < .05$. To decompose this interaction, the mean difference scores for the EM and control condition (see Figure 5.3) were analysed using a paired *t*-test. It was found that the decrease in emotionality after EMs was significantly different to the change in emotionality found in the control condition, $t(46) = 2.43$, $p < .05$, $d = .40$.

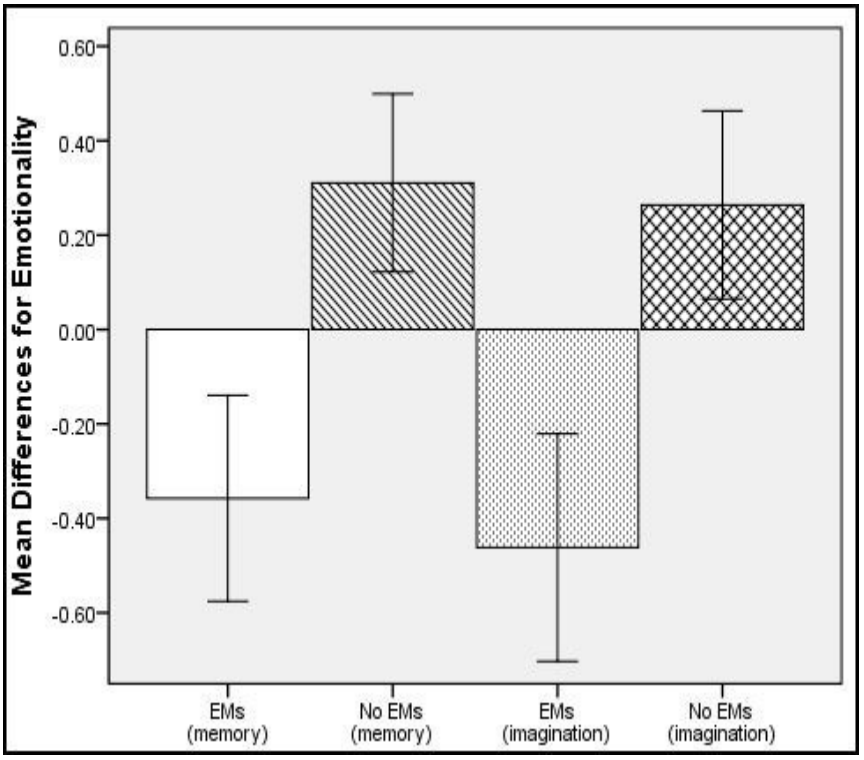

Figure 5.3: Mean difference scores and SEs for emotionality for all four conditions.

5.3.2.2 Imagination-based sexual fantasies

For both conditions, no significant differences were found between the baseline emotionality ratings. Running a two-way ANOVA on the pre- and post-test ratings for emotionality revealed no significant main effects. However, the crucial Time x Condition interaction was found to be significant, $F(1, 46) = 6.1$, $p < .05$. A paired *t*-test showed that the mean difference

for the EM condition was significantly different to that of the control condition, $t(46) = 2.5$, $< .05$, $d = .40$.

5.3.2.3 Comparing memory and imagination-based fantasies

Small observable differences between memory and imagination-based fantasies can be seen for each condition (see Figure 5.3). Thus, to ensure these differences were not significant, two paired *t*-tests (with Bonferroni corrections) were conducted. The results revealed no significant differences between the two fantasy types for each condition (*p*s both >.05).

5.3.3 Hypothesis 3: The arousability of memory and imagination-based sexual fantasies will reduce for the EM condition relative to the control condition.

5.3.3.1 Memory-based sexual fantasies

In line with the other ratings for memory-based fantasies, no significant differences were found for baseline ratings of arousability. A two-way ANOVA was conducted on the pre-test and post-test scores, which revealed a significant main effect of Condition, $F(1, 46) = 5.5$, $<.05$, as well as a significant Time x Condition interaction effect, $F(1, 46) = 13.81$, $p < .01$. Figure 5.4 shows the mean differences for each condition. Using a paired *t*-test on these mean difference scores, it was found that the decrease in arousability in the EM condition was significantly different to the increase in arousability in the control condition, $t(46) = 3.71$, $p < .01$, $d = .54$.

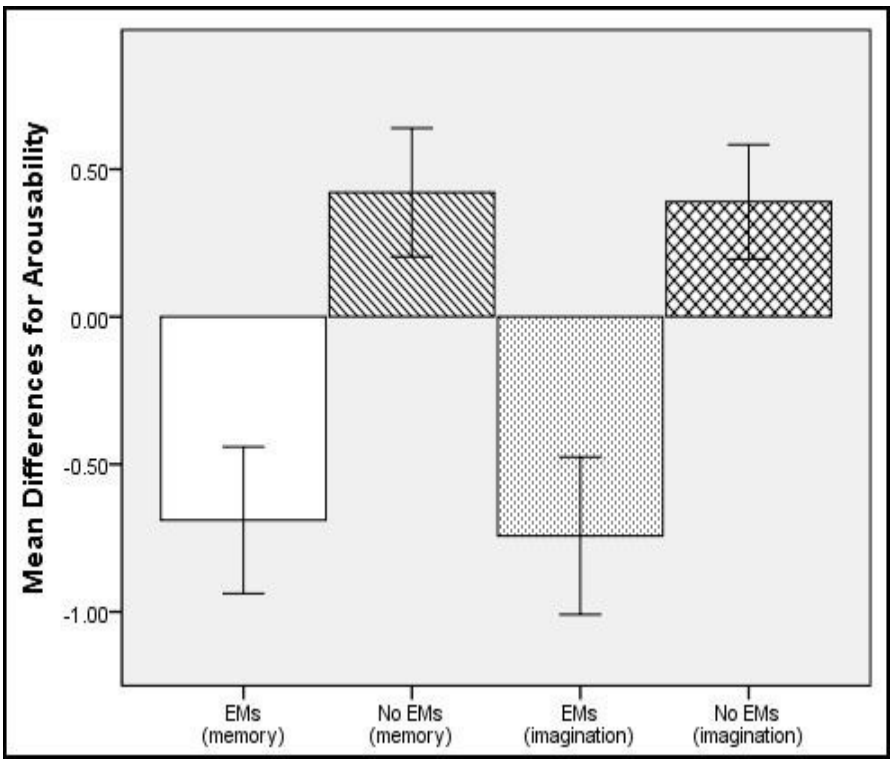

Figure 5.4: Mean difference scores and SEs for arousability for all four conditions.

5.3.3.2 Imagination-based sexual fantasies

A paired *t*-test showed that baseline arousability scores for imagination-based fantasies were not significantly different between conditions. A two-way repeated measures ANOVA was conducted on the pre- and post-test VAS scores for arousability. The only significant result was for the crucial Time x Condition interaction, $F(1, 46) = 21.9$, $p < .001$. A follow-up paired *t*-test on the mean difference scores (see Figure 5.4) showed that the large decrease in arousability for the EM condition was significantly different to the mean difference of the control condition, $t(46) = 4.7$, $p < .01$, $d = .71$.

5.3.3.3 Comparing memory and imagination-based fantasies

Comparing the mean difference scores (as shown in Figure 5.4), it can be seen that memory and imagination-based fantasies hardly differ. Indeed, two paired *t*-tests (with Bonferroni corrections) showed no significant differences between the two fantasy types for either condition (both *p*s >.05).

5.4 Discussion

This study is the one of the first attempts to investigate the cognitive processes underlying sexual fantasies. The DPM-ST posits that sexual fantasies are a form of mental imagery (either memory or imagination-based) that people deliberately engage in. In other words, sexual fantasy is a controlled cognitive operation that requires working memory (WM). To test this, bilateral eye-movements (EMs) were used as a dual-task competing for the resources of WM. Drawing upon previous research on other forms of mental imagery, it was hypothesised that the vividness, emotionality and arousability of sexual fantasies (regardless of whether they are memory or imagination-based) would reduce after EMs are performed while sexual fantasising, relative to the control condition (i.e., no EMs).

The findings supported all three hypotheses. Specifically, the level of vividness, emotionality, and arousability were found to decrease for the EM condition. Since EMs tax working memory, these findings support the DPM-ST's assumption that sexual fantasies are a controlled cognitive operation that require the resources of WM. The results are also a novel addition to the existing research on how EMs impair mental imagery. First, the fact that EMs impaired both memory and imagination-based fantasies to the same extent supports previous studies showing that EMs impair both memories (van den Hout et al., 2001) and "flashforwards" (based on imaginative processes) (Engelhard et al., 2010b). Second, sexual fantasies are predominantly positive, enjoyable experiences (Ellis & Symons., 1990). Thus, the results support previous findings that EMs can impair positive mental imagery (Hornsveld et al., 2011; van den Hout et al., 2001).

To explain the present findings in more depth, it is worth referring to previous authors who have researched in this domain. For example, Gunter and Bodner (2008) postulated that EMs deplete WM resources causing a reduction in the quality of the mental imagery (i.e., lowered vividness). This lowered vividness causes the imagery to be appraised as less emotional. Put differently, individuals create and appraise low-quality mental imagery. A

recent study investigating time-course changes in vividness and emotionality provides support for this view. Specifically, Smeets, Dijs, Pervan, Engelhard, and van den Hout (2012) found that vividness dropped after only two seconds of making EMs, whereas emotionality decreased after 74 seconds. In support of Gunter and Bodner, these findings suggest that vividness decreases before emotionality reduces.

Drawing upon 'visual imagery theory' (Kosslyn, 1994), Smeets et al. (2012) state that visual information held in the visuospatial sketchpad of WM needs to be refreshed in order to maintain the vividness of the mental imagery. They argue that EMs interfere with this refreshment process leading to lowered imagery vividness and, in turn, lowered emotionality when the imagery is appraised. In the present study, it can be argued that the EMs interfered with the refreshment of the sexual visual information held in WM. This led to reduced vividness and, in turn, a lowered rating of emotionality and arousability.

Interestingly, the findings from the control condition showed that vividness, emotionality, and arousability levels (for both memory and imagination-based fantasies) increased after the fantasies were simply envisioned. This supports previous research showing that sexual fantasies can enhance sexual arousal levels (Gee et al., 2003). Furthermore, these results can be explained by reversing Smeets et al.'s (2012) explanation of how EMs impair imagery. That is, since the imagery is not impaired, it is able to be refreshed in working memory. This increases the vividness of the imagery, which is how it is re-encoded into long-term memory. Note that this may explain why some sex offenders report their sexual fantasies to be more concrete and vivid with each use (Gee, Ward, Belofastov, & Beech, 2006). As a consequence of the improved imagery quality, sexual fantasies are likely to have been appraised as more pleasant and more arousing than when first rated. Indeed, Smith and Over (1987) found that men were more sexually aroused by sexual fantasies that were deemed vivid, relative to men with non-vivid imagery. If this interpretation of the control condition

findings results is correct, it suggests a cognitive explanation for how sexual fantasies can become more arousing with repeated use.

5.4.1 Limitations and suggestions for future research

As this is presently the first study of its kind with regards to sexual fantasy, it is important to address the limitations. First, the research relied upon self-reported ratings of vividness, emotionality, and arousability. As with any self-report procedure, there is a risk of socially desirable responding. This risk may have been even greater in this study as it dealt with mental imagery of a sensitive (i.e., sexual) nature. Also, since the study follows a basic dose-response design, there is an increased risk that demand characteristics may have been an issue, in that, participants may have tried to respond in a manner they thought was expected of them. Considering that participants were told to engage in a sexual fantasy while concurrently making EMs and while making no EMs, participants may have guessed the aim of the study and responded in a manner that confirms the hypotheses.

Gunter and Bodner (2008) found that the vividness of aversive memories reduced after they were recalled at the same time as making EMs, but not when EMs were performed with no imagery in mind. They argued that this challenges a demand characteristic account of the findings as the demand would have also been present in the latter. A more recent EM study directly addressed this issue by using an objective behavioural (reaction-time) measure to assess reductions in memory vividness after making concurrent EMs (van den Hout, Bartelski, & Engelhard, 2012). The results demonstrated that a reduction in the vividness of a memory during the EM-recall condition (relative to a no-EM condition) can be observed from objective, non-self report data. These results corresponded with their self-report data. These results further challenge a demand characteristic account of the effects of EM (at least in relation to vividness). However, while these findings are promising, they were not employed in the present study. Thus, before any solid conclusions can be made about the effects of EMs

on sexual fantasies, future research should aim to circumvent the issue of demand characteristics. This can include using a between-subjects design where one group of participants are told a hypothesis that is the opposite of that actually being tested. If no increase in the indices occurs, but reductions in the indices are observed in the other groups who are not told the hypothesis, then demand characteristics could be ruled out. Also, an objective measure could also be used, as well as a physiological measure that assesses changes in the autonomic nervous system. For example, reductions in heart rate variability could provide further evidence that opposes a demand characteristic account of EM effects.

Second, as with most research involving mental imagery, there is no way to ascertain whether the participants were actually envisioning the sexual fantasies during this study. It is possible that participants did not envision certain (or any) sexual fantasies during the conditions. It is also possible that participants tried to envision the sexual fantasies but had trouble keeping them in mind due to natural 'mindwandering'. This has always been an issue with mental imagery research and needs to be addressed in the future. For example, one way to address this issue is to include a behavioural measure that provides some indication of sexual arousal (e.g., penile plethysmography, heart rate variability) while the sexual fantasy is being envisioned.

Third, the sexual fantasies that the participants had to envision were chosen by the researcher on the basis of how frequently they were used by each participant. Thus, it would be beneficial if a follow-up study used a more rigorous method of selecting fantasies. For example, participants could complete the Adapted WSFQ before the day of the EM study. This would allow the fantasy themes to be broken down into separate units (perhaps using a computer program such as E-Prime) so that a more randomised selection/presentation process can be implemented. Note also that this procedure would reduce any priming or carry-over effects that may occur when completing the questionnaire only minutes before envisioning and rating the sexual fantasies. Alternatively, it may have been beneficial for participants to

haven chosen which fantasy they wanted to envision, as this would be more ecologically valid. It could have made them feel more comfortable with the task. Also, the fantasy they chose may have been the one they most often engage in outside the lab, meaning that it would (arguably) be the most vivid, positive, and arousing fantasy in their repertoire of fantasies.

Another limitation is that no measures were made to confirm that WM was actually being taxed by the EMs. However, as discussed in the Introduction, previous researchers have found support for this assumption. For example, responses on a reaction time task known to tax WM are slower when making EMs (Engelhard et al., 2010a; van den Hout et al., 2011). Also, the effects of EMs on memory impairment are stronger for those with lower WM capacity (Gunter & Bodner, 2008). Thus, there is sufficient evidence for *assuming* that WM is being taxed by the EM procedure in this study. However, to evaluate the scientific integrity of these results, future research on EMs and sexual fantasies needs to include a measure that indicates WM is being taxed (e.g., including a measure of WM capacity; engaging in progressively more taxing tasks and comparing results; or including a third condition that involves doing EMs at the same as a task known to require WM).

A final limitation is that the sample was comprised of predominantly female participants. No gender differences were found with regards to the WSFQ subscales. However, with only 9 males taking part, this comparison must be interpreted cautiously. Although WM resources are likely to underpin sexual imagery in the same way for both males and females (as indicated by previous EM research), there may be other important gender differences at play when investigating sexual fantasies (e.g., in terms of how vividly they were picturing certain fantasies; their willingness to engage in the task; their subjective arousal to certain fantasies). Also, the high number of female participants makes the generalisation of these results to male sex offenders less reliable. Indeed, female sexual offenders differ from male sex offenders in a number of important ways (Gannon & Rose,

2008). Future research should aim to use a sample of male participants only, as well as a sample of male sex offenders who predominantly use deviant sexual fantasies.

In addition to addressing these limitations, future research should also investigate whether the changes in vividness, emotionality, and arousability remain at a follow-up, since previous studies using negative memories have found that the effects can last for at least a week (van den Hout et al., 2001). It would also be advantageous to investigate whether the effects of EMs crossover to other sexual fantasies that are different yet share similarities in their content. Also, in light of the present thesis, steps need to made to further these results by focusing on deviant sexual fantasies and testing offender populations.

This chapter describes the first investigation into whether WM underpins sexual fantasising. The results support all of the hypotheses and show a pattern that is similar to the findings of previous studies using eye-movements to impair mental imagery. Moreover, the results corroborate the DPM-ST by indicating that sexual fantasies require working memory resources. Although deviant sexual fantasies were not focused upon, the idea that WM underlies sexual fantasies applies to all sexual fantasies irrespective of their content and so can be viewed as being applicable to deviant fantasies. Nevertheless, as stated above, it is important to test the same hypotheses with a sex offender population, particularly those who use deviant fantasies. Not only will this corroborate the DPM-ST further, but it may pave the way for a new treatment strategy for reducing deviant sexual fantasies in sexual offenders (see Section 8.2.2 of Chapter 8).

CHAPTER 6

INVESTIGATING WHETHER SEXUAL FANTASIES ACTIVATE NON-SEXUAL ASSOCIATIONS

Chapter Rationale

Chapter 5 supported the assumption that sexual fantasising is a controlled process involving the manipulation of relevant information in working memory. The manipulation of this information results in mental imagery that can be observed in the mind's eye. Following on from this, the present study aimed to test whether the information present in sexual mental imagery (i.e., fantasies) primes other, non-sexual associations held in long-term memory. Since it is theorised that a sense of power can be acquired by deviantly fantasising, sexual fantasies about dominance and associations between the concepts of 'self' and 'powerful' were focused upon.

6.1 Introduction

The Dual-Process Model of Sexual Thinking (DPM-ST) proposes that sexual fantasising can have a number of cognitive effects. One of these proposed effects is the priming of other associations. In other words, it is argued that sexual fantasising can activate associations held in long-term memory. This is based on research showing that mental imagery increases the accessibility of related cognitive associations and representations (Blair, Ma, & Lenton, 2001; Carroll, 1978). For example, across a number of experiments, Blair et al. (2001) found that mental imagery about a counter-stereotypic (i.e., strong) woman led to increased 'strong-woman' associations, relative to neutral imagery and no imagery. Thus, as Blair et al. (2001) state, mental imagery can function as a powerful method of priming. The objective of the present study was to test this assumption in relation to sexual mental imagery (i.e., sexual fantasy).

As Ó Ciardha (2011) argues, sexual fantasising is likely to strengthen sex-related associations (or schemas) via a feedback loop. In addition, it is possible that other associations become activated or primed by sexually fantasising. For example, sexual fantasies typically involve the fantasiser being present within the imagery. Thus, it can be argued that certain self-related associations will also be activated through sexual fantasies. According to previous studies, the concept of 'self' is often found to be associated with other concepts within memory. For example, using the Implicit Association Task (IAT), researchers have studied self-esteem by measuring 'self-positive' associations (Greenwald & Farnham, 2000); aggression via 'self-aggressive' associations (Uhlmann & Swanson, 2004); suicide ideation via 'self-death' associations (Nock et al., 2010); and emotional congruence with children via 'child-self' associations (McPhail, Sewell, Nunes, & Hermann, 2010).

Of particular note are IAT studies showing that people hold 'self-powerful' associations. For instance, using an IAT, Nunes, Firestone, and Baldwin (2007) found that child abusers and non-sex offenders held self-powerful associations to a similar extent. Also

using an IAT, Haines and Kray (2005) found women held weaker self-power associations compared to men. However, they also found that when women were primed with a sense of power (i.e., told they have superior trading skills on a laboratory-based 'bargaining game'), their self-power associations strengthened. Based on these findings, Haines and Kray proposed that activities and situations associated with high power can activate self-power associations.

The self-power association is of interest because a number of theories suggest that a sense of power - acquired through deviant sexual fantasy - is an important factor in the aetiology of sexual offending. For example, Marshall and Marshall (2000) state that, due to their experiences of rejection and neglect as a child, sex offenders are more likely to incorporate non-sexual elements, such as power and control, into their sexual fantasies. Similarly, in their theory on paraphilia and lust murder, Arrigo and Purcell (2001) argue that sexual fantasies are a major influential factor. They propose that feelings of inadequacy (due to social and sexual difficulties at a young age) can lead individuals to develop sexual fantasies about power and domination. There is also some empirical support for these assertions. For example, Cortoni, Proulx, Paquette, Longpré, and Coutre (2009) found that a subset of child abusers reported using sexual fantasies to compensate for a low sense of self-worth. In a case study, Carabellese, Maniglio, Greco, and Catanesi (2011) described a serial rapist who gained a sense of omnipotence and grandiosity from his sexual fantasies of dominance.

Based on the DPM-ST, it can be argued that the reason individuals gain a sense of power from their dominance sexual fantasies is because the content of the fantasy activates self-power associations. Thus, by combining the results of Blair et al.'s (2001) study, which showed that mental imagery can prime associations, with those of Haines and Kray (2005) who found that power-related activities/situations can prime self-power associations, the present study aimed to test whether sexual fantasies about dominance (where the fantasiser is

in a position of power) activate self-powerful associations. In addition to this main aim, it was decided that self-reported powerfulness should also be measured to ascertain whether changes in powerfulness were confined to participants' automatic self-concept, their explicit self-concept, or both. Finally, based on existing theories, individuals with low self-esteem and dominant-related sexual fantasies are likely to be most affected by sexual fantasies about dominance. Thus, the following hypotheses were proposed:

Hypothesis 1: Compared to a control group, participants who create and envision a sexual fantasy involving dominance will demonstrate a stronger association between 'self' and 'powerful', as measured by a subsequent IAT.

Hypothesis 2: Compared to the control group, participants who create and envision a sexual fantasy involving dominance will evidence stronger self-reported feelings of powerfulness.

Hypothesis 3: An increase in self-powerful associations in the sexual fantasy group will be moderated by self-esteem and the use of dominance-related sexual fantasies.

6.2 Method

6.2.1 Participants

A convenience sample of fifty-one participants (40 females and 11 males) was recruited from the University of Birmingham via the online Research Participation Scheme (RPS).The mean age of the sample was 22 years old (*SD*=3.8, range = 18-36) and it comprised of Caucasian (92%), Asian (4%), and Mixed Race (4%) participants. Also, 63% of the sample identified themselves as ‘Single’, with 37% stating they were ‘In a relationship’. Ethical approval for this study was granted from the Science, Technology, Engineering and Mathematics Ethical Review Committee at the University of Birmingham (see Appendix R).

6.2.2 Materials

6.2.2.1 Self-powerful Implicit Association Task (IAT)

To measure self-powerful associations, Greenwald et al.'s (1998) original seven-stage Implicit Association Task (IAT) was constructed using E-Prime (see the Introduction in Chapter 3 for a brief description of the IAT). This particular version of the IAT was chosen because it has been used in previous studies investigating self-powerful associations (Haines & Kray, 2005; Nunes et al., 2007).

Table 6.1
Implicit Association Task (IAT) for Powerfulness: Task Sequence

Stage	No. of trials	Task	Response Key Assignment	
			Left Key (Q)	**Right Key (P)**
1	20	Target discrimination	Other	Self
2	20	Attribute discrimination	Weak	Powerful
3	20	Combined task (practice)	Other/Weak	Self/ Powerful
4	48	Combined task (critical)	Other/Weak	Self/ Powerful
5	20	Reversed target discrimination	Self	Other
6	20	Reversed combined task (practice)	Other/Powerful	Self/Weak
7	48	Reversed combined task (critical)	Other/Powerful	Self/Weak

Note: The order of Stages 2-4 and Stages 5-7 were counterbalanced between participants to reduce any order effects that may arise from presenting the Self+Powerful combination first.

The self-powerful IAT involved assigning randomly presented words (via a left or right keyboard response) into one of two categories. As Table 6.1 shows, Block 1 involved categorising words into an appropriate target concept (i.e., 'Other' or 'Self'). Block 2 involved categorising words into an appropriate attribute category (i.e., 'Weak' or 'Powerful'). Blocks 3 and 4 involved combining target and attribute concepts so as to form two opposing paired categories (i.e., 'Weak/Other' versus 'Powerful/Self'). Thus, following the examples shown in Table 6.1, participants would press the right key (i.e., P) if either a powerful or self-related

word was presented. Block 5 involved categorising words into the same attribute concepts as Block 2. However, the position of the categories was now the opposite of those in Block 2 (i.e., 'Powerful' or 'Weak'). In Blocks 6 and 7, these reversed attribute concepts were combined with the target concepts to form a reversed combination task. Thus, continuing the example used above, participants would now press the right key when responding to either a weak or self-related word.

Five 'Self' and five 'Other' words were used for the present IAT. These stimuli were derived from previous IAT studies that focused on these two concepts (Greenwald & Farnham, 2000). The words for the attribute concepts were derived from a small pilot study involving individuals from the community that did not take part in the main study (n = 26). That is, six words most strongly related to 'Powerful' and six words most strongly related to 'Weak' were used (see Appendix S).

6.2.2.2 Self-reported measure of powerfulness

Two 'feeling thermometers' were created to measure self-reported powerfulness. The first required participants to rate themselves on a scale from 1 ("Not powerful at all") to 8 ("Very powerful"). The second was the exact same scale but in relation to "Other people" (see Appendix T).

6.2.2.3 Short Self-esteem Scale (SSES; Thornton, 1989)

The SSES is a 12 -item questionnaire (four of which are distracter items) designed to measure self-esteem (see Appendix U). It was initially used for both research and clinical purposes within HM Prison Service. It was later incorporated into the Sex Offender Treatment Programmes operated by HM Prison Service. For each item, participants must respond with either a 'Yes' or a 'No'. A response of 'Yes' is scored as 2 and a response of 'No' is scored as 0. A score of 1 is given for a missing response. The scale has been used with non-offender

samples which, as expected, showed higher scores than sex offenders (Webster, Mann, Thornton, & Wakeling, 2007). Moreover, the scale has been shown to have a Cronbach alpha coefficient of .84 (Webster et al., 2007), thus, demonstrating an excellent internal consistency (Kline, 2000).

6.2.2.4 Wilson Sexual Fantasy Questionnaire (WSFQ; Wilson, 1978)

The WSFQ is a 40-item questionnaire designed to measures how often people use 40 specific sexual fantasies (see Appendix E). It is scored on a Likert-type scale from 0-5 and has been used with both non-offenders and sex offenders (Baumgartner, Scalora, & Huss, 2002). Moreover, Baumgartner et al. (2002) found that the scale had very good internal consistency (Cronbach's α = .95). For the purposes of the present study, only dominance-related sexual fantasies were of interest. Thus, the following items were focused upon: "*Tying someone up*", "*Forcing someone to do something*", and "*Hurting a partner*".

6.2.3 Procedure

Upon entering the lab, each participant was reminded of the sexual/sensitive nature of the study. They were informed that the study aimed to investigate the non-sexual effects of sexual mental imagery. After each participant provided their consent to take part, they were assigned to either the Fantasy Condition or the Control Condition. Participants assigned to the Fantasy Condition were asked to create and imagine a consensual sexual scenario where they are in total control (see Appendix V). They were told to imagine, from a first-person perspective (i.e., through their own eyes), that they were engaging in a number of controlling/dominant behaviours. This could include tying up their partner; whipping and/or spanking them; holding them down, and so on. A first-person perspective was chosen as research shows that it has a stronger emotional effect than an observer-oriented perspective (Holmes, Coughtrey, & Connor, 2008).

Participants in the Control Condition were simply told to create and imagine (from a first-person perspective) doing their grocery shopping (see Appendix V). This particular scenario was chosen for the Control Condition because it was regarded as a neutral event that participants could easily create and envisage within their mind's eye. Indeed, previous research indicates that "doing some shopping" is representative of a neutral event (D' Argembeau, Comblain, & van der Linden, 2003, p.287).

In addition to these instructions, participants in both conditions were told to imagine the scenario for a total of three minutes, which was measured by the researcher using a stopwatch. After this time, all participants were required to describe the scenario in writing. This allowed the researcher to gain some insight into how well the participants engaged in the task. It also provided an approximate indication of how dominant each participant was being in the scenario (Fantasy Condition only). Finally, participants had to indicate how vivid the imagery was using a scale ranging from 1 (Not clear at all) to 7 (Extremely vivid). This was done to provide further indication of how well the scenarios were being envisioned.

Following the mental imagery task, participants were required to complete the self-powerful IAT. For each group, half of the participants completed the IAT that presented the 'Self+Powerful' block first, while the other half completed the IAT with the 'Self+Weak' block presented first. For all participants, full instructions for how to perform the IAT were presented on-screen via E-Prime. The instructions were also repeated verbally by the researcher. Participants would only begin the IAT after indicating that they understood the instructions.

Following the IAT, all participants completed the various self-reported measures in a random order. These included the two feeling thermometers (i.e., self-reported powerfulness), the SSES, and the WSFQ. The self-report measures were administered after the IAT so as to reduce any priming effects they may elicit. It is also worth noting that, according to previous research, completing an IAT before self-report measures does not induce any biasing effects

in the subsequent self-reports (Nosek, Greenwald, & Banaji, 2005). After the study had ended, participants were debriefed and thanked for their time.

6.2.4 Data treatment

Before any meaningful statistical analyses could be performed on the IAT data, the raw data needed to be scored according to the algorithm recommended by Greenwald, Nosek, and Banaji (2003). This scoring algorithm has been used in most IAT studies since its publication and only involves the combined blocks (i.e., 3, 4, 6, and 7). There are a number of steps associated with this scoring method. First, RTs above 10,000ms are removed. This is because anything above this cut-off is likely to be due to inattention or distraction (Greenwald et al., 2003). Also, participants with more than 10% of RTs below 300ms are removed, as it indicates they are engaging in anticipated responding (Greenwald et al., 1998). However, none of the participants in this study had more than 10% of scores below 300ms.

Next, a single pooled standard deviation (*SD*) is calculated for all RTs in Blocks 3 and 6, and another for all RTs in Blocks 4 and 7. Then, the mean RT for correct trials is calculated for each of the four blocks. Any errors are replaced with the newly calculated mean RT plus a penalty of 600ms (Greenwald et al., 2003). Following this, all RTs in each block are averaged producing four means (i.e., for Blocks 3, 4, 6, and7). The mean difference between Blocks 6 and 3 is then computed, as is the mean difference between Blocks 7 and 4. The resulting mean difference scores are then divided by their associated pooled *SD*. Finally, these two quotients are averaged. The resulting score is commonly referred to as the *D*-score and is shown to be less vulnerable to extraneous influences such as cognitive ability and IQ (Greenwald et al., 2003). In this study, *D*-scores above zero indicated stronger self-powerful associations, whereas those below zero indicated stronger self-weak associations.

6.3 Results

6.3.1 Hypothesis 1: Compared to a control group, participants who create and envision a sexual fantasy involving dominance will demonstrate a stronger association between 'self' and 'powerful'.

As shown in Figure 6.1, the mean response latencies (using treated data) depict a trend in this predicted direction. In other words, participants in the Fantasy Condition appear to categorise words into the 'Powerful + Self' category faster (M = 831ms, SD = 224.8) than those in the Control Condition (M = 978ms, SD = 298.4). Furthermore, results from a t-test show this difference to be marginally significant; $t(49) = 2.0$, $p = .051$. The error rates indicate that participants in the Fantasy condition made more incorrect responses on the Powerful-Self block (see Table 6.2). This is at odds with Hypothesis 1 as fewer mistakes would be expected in this block for this condition. However, t-test analyses on the arcsine-transformed error rates found no significant differences between the conditions for both IAT stages.

Table 6.2: Mean error rates (%) and *SD*s for each block of the IAT for each condition

	Powerful-Self	**Powerful-Other**
Fantasy condition	8.6 (4.5)	9.2 (4.9)
Control condition	6.9 (5.9)	10.2 (8.3)

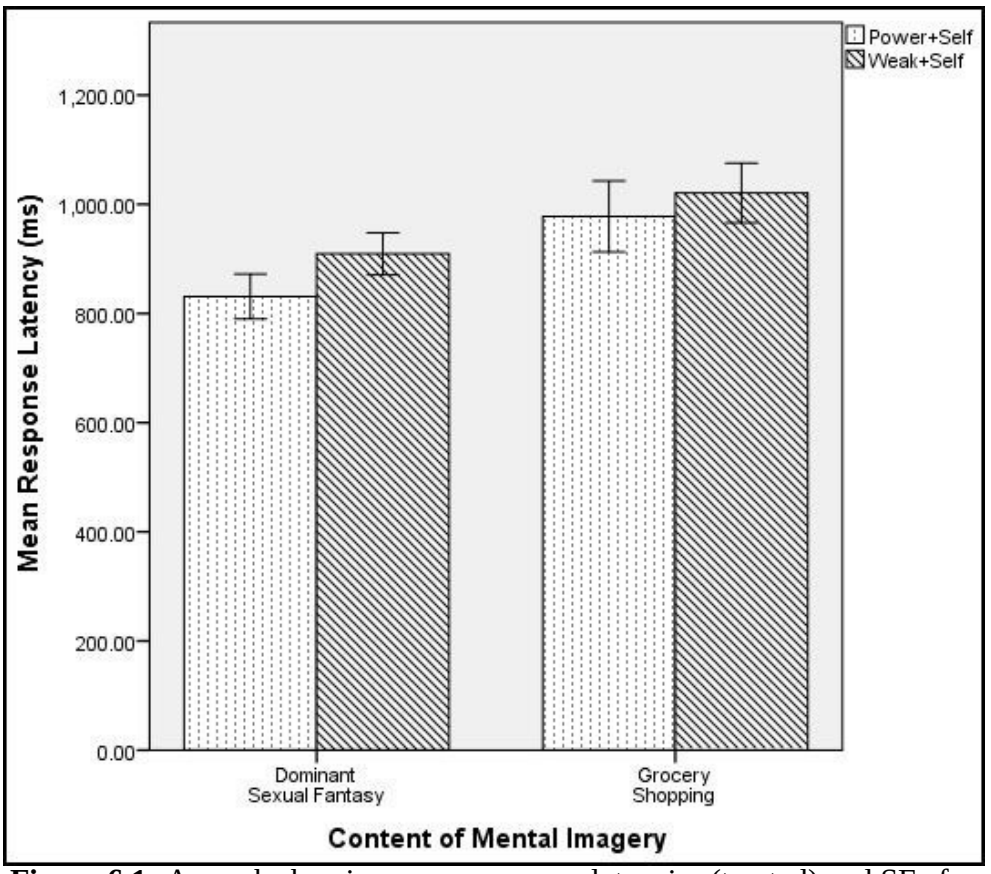

Figure 6.1: A graph showing mean response latencies (treated) and SEs for each association, across both groups

It should be noted that these decomposed results are not indicative of an absolute association between 'powerful' and ''self' because the IAT operates on a relative basis. Thus, analytically separating the data into a single 'self-powerful' association does not provide conclusive results. This is because the isolated association reflects some aspect of the relative comparison between 'Powerful + Self' and 'Weak + Self'. As a result, *D*-scores (which embody the relative nature of the IAT's procedure) were focused upon in the main analysis.

When looking at the *D*-scores, the same pattern of results shown in Figure 6.1 was still observed. For example, while both *D*-score were positive (indicating that both groups hold stronger self-powerful associations than weak-self), participants in Fantasy Condition had slightly greater *D*-scores (M = .22, SD = .42) than those in the Control Condition (M = .15, SD = .52). However, the results of a two (Group: 'Fantasy' versus 'Control') two (Block Order: 'Powerful/Self' versus 'Weak/Self') ANOVA were less supportive. Specifically, there was no

significant main effect for Group. In other words, the observed difference in *D*-scores between the two groups was not significantly different.

A significant main effect was found for Block Order; $F(1, 47) = 18.23$, $p < .001$. Follow-up analyses indicated that those who completed the 'Powerful + Self' block first had a higher *D*-score ($M = .39$, $SD = .39$) than those who completed 'Weak + Self' block first ($M = -.04$, $SD = .43$). This difference was highly significant, $t(49) = 3.8$, $p < .001$. However, this result was expected as it is a well-documented extraneous effect associated with the IAT procedure (Nosek et al., 2005). Moreover, by counterbalancing the block order in the present study, these effects were likely to been cancelled out or reduced. Finally, there was no significant interaction between Group and Block Order. It should also be noted that the vividness levels for the mentally imagined scenarios was greater in the Control Condition ($M = 5.3$, $SD = 1.5$) than in the Fantasy Condition ($M = 4.4$; $SD = 1.2$). Moreover, this difference was found to be statistically significant, $t(49) = 2.4$, $p < .05$.

In summary, while the results are in the predicted direction, the results of the statistical analyses did not support Hypothesis 1.

6.3.2 Hypothesis 2: Compared to the control group, participants who create and envision a sexual fantasy involving dominance will evidence stronger self-reported feelings of powerfulness.

To test this hypothesis, the ratings of the self-powerful feeling thermometer were subtracted from the ratings of the other people-powerful feeling thermometer. This produced a mean difference that is comparable to the scores of the IAT (Uhlmann & Swanson, 2004). In other words, a positive score would suggest an explicit attitude that oneself is more powerful than other people.

Contrary to the hypothesis, the results indicated that participants in the Fantasy Condition saw themselves as less powerful than other people ($M_{difference} = -0.7$, $SD = 1.87$). Participants in the Control Condition also rated themselves as less powerful than other people

($M_{difference}$ = - 0.52, *SD* = 1.63). Results from a paired *t*-test indicated that there was no significant difference between the two groups. In summary, these findings do not provide support for Hypothesis 2.

6.3.3 Hypothesis 3: An increase in self-powerful associations in the sexual fantasy group will be moderated by self-esteem and the use of dominance-related sexual fantasies.

Examining the WSFQ scores in Figure 6.2, it can be seen that the pattern of results are similar to those found in Chapter 5.

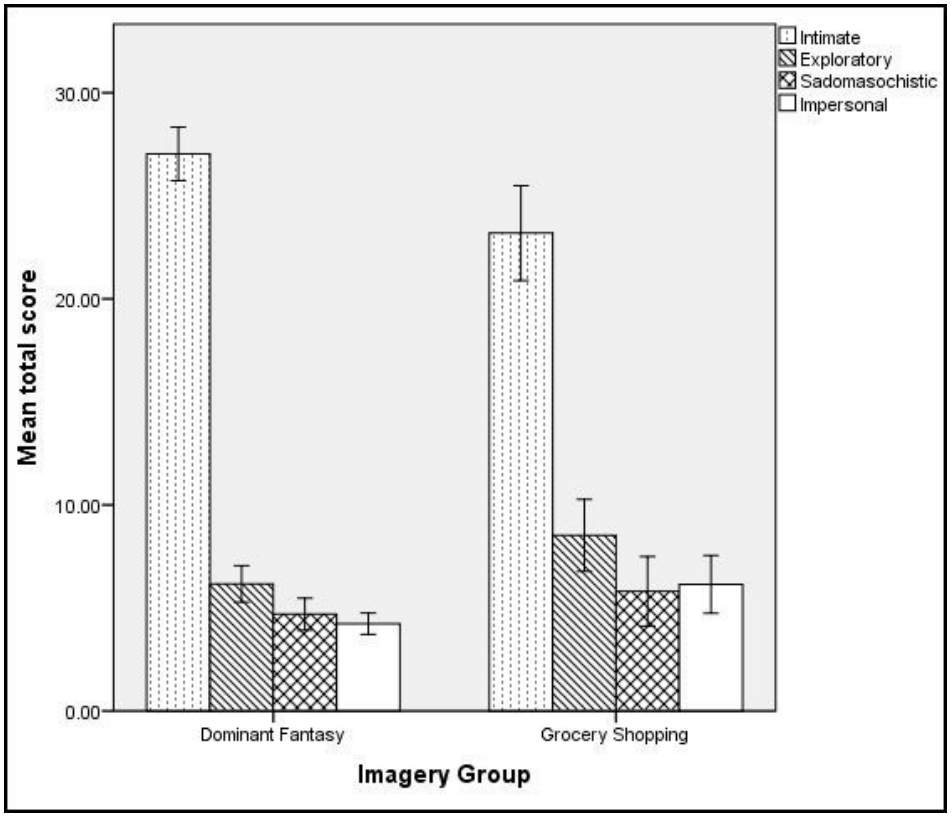

Figure 6.2: Mean scores (and SEs) for each WSFQ subscale across both groups

Specifically, scores on the Intimate subscale were the highest for both the Fantasy group (*M* = 27, *SD* = 7.1) and the Control group (*M* = 23.2, *SD* = 10.5). The next most frequent fantasies were Exploratory, with the Fantasy group showing a mean of 6.7 (*SD* =4.8) and the Control group showing a mean of 8.5 (*SD* = 8.0). For both groups, the least used fantasies were Sadomasochistic (Fantasy group: *M* = 4.7, *SD* = 4.3; Control group: *M* = 5.8, *SD* = 7.7) and

Impersonal (Fantasy group: *M* = 4.2, *SD* = 2.8; Control group: *M* = 6.1, *SD* = 6.4). From these results, it can be seen that the Control group reported less Intimate fantasies than the Fantasy group, but more Exploratory, Sadomasochistic, and Impersonal fantasies. However, in spite these trends, *t*-tests analyses revealed there were no significant differences between the two groups on any of the subscales (all *p*s >.05).

Since Hypothesis 1 was not supported, Hypothesis 3 was unable to be directly tested. Exploratory analyses of the self-report data showed no group differences on the SSES or any of the three dominanc-related sexual fantasies. Furthermore, for both groups, *D*-scores did not significantly correlate with any of the self-report measures of interest. However, in the Control group, the *D*-score was found to positively correlate with the items *Intercourse with someone you know but have not had sex with* (*r* = .75, *p* <. 001), *Being seduced as an 'innocent'* (*r* = .49, *p* < .05), and *Having sex with someone of a different race* (*r* = .46, *p* < .05). In addition, when the two groups were collapsed together, *D*-scores were found to correlate with the sexual fantasy theme labelled "*Forcing someone to do something*" (*r* = .29, *p* < .05).

To explore the data further, the two main groups were split by gender. In the Fantasy Condition, the *D*-scores of male participants were found to be significantly (and positively) associated with the sexual fantasy themes of "*Forcing someone to do something*" (*r* = .89) and "*Hurting a partner"* (*r* = .89). These findings were not found in males in the Control Condition or in females in either condition. However, these results should be interpreted with caution given their ad-hoc nature and the fact that only 6 men were present in the Fantasy Condition. At most, they provide a possible direction for further research (i.e., comparing the self-powerful associations of males who report already using dominance-related sexual fantasies with those who do not).

6.4 Discussion

The main aim of the current study was to test whether sexual fantasies involving dominance activated and strengthened self-powerful associations, relative to neutral imagery. The results indicated that, although the means of the raw RTs were in the predicted direction (i.e., participants who imagined a dominance-related sexual fantasy tended to assign stimuli into a 'Powerful + Self' category faster than they assorted stimuli in a 'Weak + Self' category), the critical *D*-scores derived from the IAT did not differ between the two groups. Thus, the main hypothesis of the study was not supported.

It was also hypothesised that explicit powerfulness would increase after sexually fantasising about dominance, as indicated by higher self-reported powerfulness in the Fantasy Condition. However, both groups were found to report feeling less powerful than other people. Moreover, the two groups did not significantly differ on this measure. Thus, Hypothesis 2 was not supported. Finally, it was hypothesised that an increase in self-powerful associations would be moderated by self-esteem and the use of dominant-related sexual fantasies. However, given that the experimental manipulation appeared to have no effect on participants' *D*-scores, this hypothesis could not be tested. When comparing groups on their level of self-esteem and use of dominant-related sexual fantasies, no significant differences were found.

However, it was found that, for the Control group, powerful-self associations were positively associated with fantasies about having sex with someone you know but have not had sex with, being seduced as an 'innocent', and having sex with someone of a different race. Since this occurred after imagining a neutral scenario and not after imagining a dominant fantasy, one interpretation may be that engaging in the latter has an inhibitory effect on reporting sexual fantasies. Also, it was found that, when the two groups were collapsed into one, a positive relationship emerged between the *D*-scores and the item of the WSFQ related to forceful sex. This may indicate that, regardless of their group assignment,

participants who had previously used force-related fantasies were more likely to associate the concepts of powerful and self. On the other hand, the results could simply reflect a priming effect of the self-powerful IAT. However, as mentioned earlier (Section 6.2.3), Nosek et al. (2005) report that performing the IAT before self-report measures does not have an extraneous effect on subsequent self-report measures. There was also some tentative indication that males who reported using sexual fantasies about forcing and hurting someone were more likely to have a higher *D*-score on the self-powerful IAT. However, these results are open to criticism due to the fact that they are based on two combined groups, each of which was subjected to different experimental manipulations.

At face value, this series of findings suggests that sexual fantasising does not activate and/or strengthen associations related to the content of the fantasy. To be more specific, dominance-related sexual fantasies do not appear to prime self-powerful associations, regardless of whether they are indirectly or directly assessed. However, to the author's knowledge, this is the first study of this kind with respect to sexual fantasy. Thus, before any solid conclusions are made, it is worth considering other reasons for the null effects. Note that these reasons also highlight the various limitations associated with the study.

6.4.1 Limitations and suggestions for future research

First, perhaps participants should have been told exactly what to fantasise about (i.e., via guided imagery), rather than being allowed to create a dominant sexual fantasy themselves. For example, on inspecting the written descriptions, participants appeared to create predominantly playful and romantic fantasies. Thus, while most participants engaged in dominant and controlling behaviours in their fantasy, they did so in the context of playfulness and intimacy. Perhaps this was not adequate for priming self-powerful associations. This also highlights the issue of having participants envision fantasies that they themselves are not likely to hold naturally. In hindsight, it may have been more beneficial to have only used

participants who report actively using dominant fantasies and examining whether their self-powerful associations are increased after using such fantasies.

Second, it has been found that people's cognitive load can be increased by performing an irrelevant task (Gilbert & Hixon, 1991). Thus, as noted by Blair et al. (2001), it is possible that creating and imagining neutral mental imagery increased the IAT results from baseline levels, thereby, obscuring the actual difference between the two conditions. To rule-out of this possibility, it would have beneficial to have included and compared a 'no imagery' condition.

Third, Haines and Kray (2005) found that the strength of women's self-powerful associations (as measured by an IAT) can change in response to the situational context. Thus, it is possible that the participants in the present study- the majority of which were female - felt a lack of power in the context of the study (i.e., having to imagine a sexual fantasy that they may not normally use). Put differently, the context of the experiment would not have primed self-powerful associations. In fact, the context may have primed weak-self associations. It would have been useful to have tested the participants on both the self-powerful IAT and self-reported measures before the imagery task, as well as after. This would have provided pre-task (or baseline) scores that the post-task scores could have been compared to.

A fourth point is that the design of the IAT could have been at fault. For example, in Haines and Kray's (2005) study, the actual category labels for the attribute concept were 'Dominant' and 'Subordinate'. Perhaps sexual fantasies about dominance increase the strength of the 'dominant-self' associations. This is a subtle point but there may be an important conceptual difference between the two associations.

Finally, the sample in the present study was comprised mostly of female participants. Research shows that women are more likely to report sexual fantasies about submission (Knafo & Jaffe, 1984; Pelletier & Herold, 1988; Zurbriggen & Yost, 2004), which may explain why the vividness of the mental imagery was lower for those in the Fantasy Condition compared to those in the Control Condition. Moreover, it has been argued that fantasies of

submission are more about having the power to overwhelm a man with lust, rather than about being overpowered by a man (Hariton, 1973). In other words, submission-related sexual fantasies are actually about female power, suggesting that submission fantasies may have been better for priming self-powerful associations in female participants. This may explain why tentative correlations between *D*-scores and fantasies of forcing and hurting someone were found only for male participants in the Fantasy Condition. Perhaps successful results would have been acquired in female participants if they had been asked to create and imagine sexual fantasies where they have the power to seduce a man.

Given these post-hoc observations, this study may have generated successful results had just males been used. Indeed, the results of the structural equation modelling study in Chapter 4 would suggest that men who harbour distorted attitudes about women may be a population to target. Moreover, as mentioned in Chapter 5, results from a study using solely male participants would allow for more appropriate generalisations with regards to male sex offenders.

Thus, before any conclusions about whether sexual fantasies prime other associations, it is clear that more research is needed to address the various issues and limitations associated with this study. Therefore, at this stage, the priming aspect of the DPM-ST is not supported. It should also be noted that, from these results, no insights can be made as to how sex offenders acquire a sense of power and mastery from their sexual fantasies (Marshall & Barbaree, 1990). To test this, a study similar to this one needs to be conducted with a sample of sexual offenders who report using deviant sexual fantasies.

CHAPTER 7

INVESTIGATING WHETHER SEXUAL ABUSERS ASSOCIATE SEXUAL FANTASIES WITH CHILDREN

Chapter Rationale

The aim of this chapter was to assess another proposed cognitive effect of sexual fantasising; namely, that an association will form between the concept of 'sexual fantasy' and the theme within the fantasy. The study in this chapter tested this assumption using an indirect measure – the *Go/No-Go Association Task* – with a sample of child abusers. It was hypothesised that extrafamilial child abusers (who abuse children outside of their family and are known to regularly use sexual fantasies about children; Marshall, Barbaree, & Eccles, 1991) will demonstrate a stronger association between 'children' and 'sexual fantasy' than non-extrafamilial child abusers and non-offenders.

7.1 Introduction

Following on from Chapter 6, another cognitive effect of repeatedly using a deviant sexual fantasy, proposed by the Dual-Process Model of Sexual Thinking (DPM-ST), is that information within a deviant sexual fantasy will become encoded in long-term memory. One manner in which the information can become encoded is in the form of a cognitive script. This is based on previous assertions that the repeated use of aggressive fantasies can lead to the encoding of an aggressive script (Huesmann, 1988) and that the repeated use of deviant sexual fantasies can lead to the generation of an implicit offence script (Gee, Ward, & Eccleston, 2003; Ward & Hudson, 2000). These scripts are thought to be more readily accessible for retrieval, thereby, increasing the likelihood that they will be used again (Huesmann, 1998).

In addition to this, the DPM-ST proposes that a simpler form of encoding occurs from repeated deviant fantasising. That is, the concept of 'sexual fantasy' will become associated with the concept it depicts. Put differently, if an individual repeatedly fantasises about a certain person, object, or behaviour, the concept of 'sexual fantasy' is likely to form an association with that same person, object, or behaviour in memory.

Given this reasoning, it can be hypothesised that child abusers who have a history of frequently using child-related sexual fantasies are likely to hold a strong association between the concepts of 'sexual fantasy' and 'children', which may be detectable using an indirect measure. It can be argued that extrafamilial child abusers are more likely to evidence a history of deviant sexual fantasising and, therefore, a child-sexual fantasy association. This is because research shows that extrafamilial child molesters tend to show higher levels of sexual deviance, as measured phallometrically (Firestone, Bradford, Greenberg, & Serran, 2000; Quinsey, Chapline, & Carrigan, 1979) and psychometrically (Beech, Friendship, Erikson, & Hanson, 2002). Also, Pawlak, Boulet, and Bradford (1991 found that, relative to incestuous abusers, extrafamilial abusers endorsed more Sexual Fantasy items on the Derogatis Sexual

Functioning Inventory (Derogatis, 1976). Moreover, Marshall, Barbaree, and Eccles (1991) found that extrafamilial molesters used more deviant fantasies (after their first offence) than did incest offenders. Langevin et al. (1998) also found that heterosexual and homosexual paedophiles[4] reported more child fantasies than incest offenders. Finally, extrafamilial molesters have been found to form deviant fantasies earlier in life than do intrafamilial molesters who use deviant fantasies (Cortoni et al., 2009; Marshall et al., 1991).

To indirectly measure child-sexual fantasy associations, a *Go/No-Go Association Task* (GNAT; Nosek & Banaji, 2001) was used. This is because the concept of sexual fantasy - as a form of mental imagery - has no clear opposite (i.e., as male versus female; child versus adult). Most of the other measures, such as the Implicit Association Task (IAT), require the use of an opposite concept whereas the GNAT can be (and has been) used to measure associations towards a single concept. For example, Teachman (2007) previously used the GNAT in this manner to assess the strength of a fear-spider association relative to a calm- spider association (i.e., 'spider' was the single category). It should be noted that the GNAT has previously been used to assess child-sex associations in child abusers with some success (Snowden, Gray, Brown, & Power, 2007). However, opposing categories were used (Adult versus Child; Sex versus Not Sex).

The main aim of the present study was to investigate whether child-related sexual fantasies in exclusively extrafamilial abusers could be indirectly assessed using the GNAT. There were three main hypotheses:

Hypothesis 1: Extrafamilial abusers will report using more child-related sexual fantasies than non-extrafamilial abusers and non-offenders.

[4]However , Langevin et al. (1998) did not explicitly state that these offenders were extrafamilial

Hypothesis 2: Due to engaging in elaborate deviant sexual fantasies more frequently, exclusive extrafamilial child abusers will demonstrate stronger associations between 'child' and 'sexual fantasy' on the GNAT than non-extrafamilial abusers and non-offenders.

Hypothesis 3: On a control GNAT, there will be no group differences. Support for this hypothesis will help rule out the possibility that task-specific confounding variables account for the results on the experimental GNAT.

Hypothesis 4: The scores on the experimental GNAT will predict deviant sexual fantasisers regardless of subtype.

7.2 Method

7.2.1 Participants

7.2.1.1 Offender sample

As in Chapter 3, offender participants were patients held under Wisconsin's Sexually Violent Persons law at a secure treatment facility in the State of Wisconsin (USA). All patients in each wing were informed by the researcher that a study measuring the speed in which people respond to pictures of people and words related and unrelated to sex was taking place. The patients were informed that they could voluntarily take part and to indicate their interest by writing their name on a sign-up sheet, which was left in each wing.

A week later, the sign-up sheets were collected. Patients with a current or previous sexual offence against a child (as indicated in their case file) were eligible to take part in the study. Staff members informed the researcher on which of the signed-up patients met this criterion. Information from the case files also led to some patients being excluded. For example, due to the fact that the indirect task used in the study presented pictures of only pre-pubescent children (see Method), child abusers who offended against post-pubescent children

(13 years and above) were excluded so that clearer results were obtained. Also, as in Chapter 3, patients with very low cognitive functioning and taking antipsychotic medication affecting their motor skills were excluded.

Due to these criteria and the limited time-frame, as many patients were tested as was possible. Thus, the final sample was based on convenience and consisted of 48 child abusers. Using information from case files, 29 participants were identified as being exclusively extrafamilial, whereas 19 were identified as non-extrafamilial offenders (i.e., 6 intrafamilial child molesters, 5 predominantly intrafamilial child molesters, and 8 individuals who assaulted children and adults). All of the participants had a diagnosis of paedophilia except for four extrafamilial offenders and three non-extrafamilial offenders. Table 7.1 displays the demographic information for all three groups in the study. As shown, the mean age of the extrafamilial offenders only differed by two years. It can also be seen that most of the offender participants were Caucasian, although the groups were also comprised of ethnicities, including Black, Asian, and Native American participants.

Table 7.1: Demographic information for the for extrafamilial abusers, non-extrafamilial abusers, and non-offenders.

	Extrafamilial abusers (*n* = 29)	**Non-extrafamilial abusers (*n* = 19)**	**Non-offender controls (*n* = 26)**
Mean age:	47 (*SD*=10.6)	45 (*SD*=9.9)	20 (*SD*=1.9)
Ethnicity:			
Caucasian	86.2%	68.4%	80.8%
Black	3.4%	21.1%	0%
N. American	3.4%	10.5%	0%
Asian	3.4%	0%	7.7%
Other	0%	0%	11.5%
Relationship status:			
In a relationship	3.4%	0%	34.6%
Single	69%	73.7%	65.4%
Divorced/separated	24.1%	21.1%	0%
Widowed	3.4%	5.3%	0%

Table 7.2 shows the mean scores for a number of clinical factors for each offender group; namely, *static risk* (measured using the Static 99R, Helmus, Thornton, Hanson, & Babchishin, 2012), *dynamic risk* (measured using the Structured Risk Assessment - Forensic Version, Thornton, 2002), *psychopathy* (measured using the Psychopathy Checklist-Revised; Hare, 1991), and *IQ* (measured using the Wechsler Adult Intelligence Scale, 3rd and 4th Editions; Wechsler, 1997, 2008). This information was derived from the participants' case files and was based on the most recently recorded score/assessment. As shown in the Table 7.2, both groups showed similar scores on all four variables (all *p*s > .05).

Table 7.2: Mean scores (*SD*s) for static and dynamic risk, psychopathy, and IQ in both offender groups

	Extrafamilial abusers (*n* = 29)		**Non-extrafamilial abusers (*n* = 19)**	
Static risk:	5.6	(1.2)	5.5	(1.93)
Dynamic risk:	3.8	(.57)	3.5	(.69)
Psychopathy:	24.2	(4.9)	26.6	(4.03)
IQ:	93.4	(14.9)	94.8	(12.6)

At the time of the study, some of the participants were undergoing cognitive-behavioural treatment. As shown in Table 7.3, most of the extrafamilial abusers were in treatment and a high proportion of non-extrafamilial abusers were in treatment. A comparison of the groups showed that significantly more extrafamilial abusers were in-treatment relative to non-extrafamilial abusers, χ^2 (1) = 4.89, p <.05. It is also worth noting that, in both groups, a higher proportion of abusers that were in-treatment had progressed to Phase 2.

Table 7.3: The proportion of participants in treatment and pre-treatment for both groups

	Extrafamilial abusers (*n* = 29)	**Non-extrafamilial abusers (*n* = 19)**
Pre-treatment	10.3%	36.8%
In-treatment:	89.7%	63.2%
Phase 1	34.5%	15.8%
Phase 2	55.2%	47.4%

Finally, Table 7.4 shows the offence information for the two offender groups. As indicated, the extrafamilial offenders committed their first offence only slightly earlier than non-extrafamilial offenders, $t(45) = .91$, $p < .05$. It can also be seen that extrafamilial abusers appear to abuse male children at a higher rate than non-extrafamilial abusers, although it was not significantly different. Extrafamilial abusers also abused both genders and at a higher frequency than non-extrafamilial abusers, χ^2 (1) = 6.3, p <.05. Conversely, the non-extrafamilial offenders abused female children at a much higher than extrafamilial abusers, χ^2 (1) = 13.89, p <.001. Finally, it can be seen that a similar proportion of offenders in each group had prior convictions for a sexual offence. While the non-extrafamilial abusers appeared to have more prior convictions for violent and nonsexual, nonviolent offences, the difference was not significant (both *p*s > .05).

Table 7.4: Offence history information for both offender groups

	Extrafamilial abusers (*n* = 29)	**Non-extrafamilial abusers (*n* = 19)**
Mean age at first sexual offence	18 (*SD*= 5.7)	20 (*SD* = 6.9)
Victim gender:		
- Male	34.5%	15.8%
- Female	20.7%	63.2%
- Both	44.8%	21.1%
Prior sexual offences	93.1%	94.7%
Prior violent offences	20.7%	44.4%
Prior nonsexual offences	44.8%	68.4%

7.2.1.2 Non-offender sample

A comparison sample consisting of 26 non-offending students was recruited from the University of Birmingham in the United Kingdom. The mean age of the comparison sample

was 20 years old (*SD* = 1.87, range = 18-25). As shown in Table 7.1 above, most of the non-offenders were Caucasian, with a small proportion of sample having a Black and Other ethnic background. Most of the non-offenders were also single at the time of the study.

Ethical approval to conduct this research with offenders was granted [redacted]

7.2.2 Materials

7.2.2.1 Experimental GNAT

To indirectly measure child-sexual fantasy associations, the *Go/No-Go Association Task* (GNAT; Nosek & Banaji, 2001) was used. The GNAT involves categorising stimuli presented on a computer screen as belonging to a particular concept (e.g., a child, an adult, or a sexual fantasy) as quickly and as accurately as possible. However, only stimuli related to the two concepts displayed on screen are responded to (the 'Go' trials). Stimuli that are unrelated to the concepts are not responded to (the 'No-Go' trials). In this study, a GNAT consisting of two blocks was used. In one block, the concept of Sexual Fantasy was paired with 'Child'. In the other block, Sexual Fantasy was paired with the opposing category of 'Adult'. The concept labels were displayed in the top two corners of the screen with each stimulus being presented in the centre in a randomised order (see Appendix W).

Participants were required to respond to the stimuli from one category pairing while ignoring unrelated stimuli. For example, when 'Child' and 'Sexual Fantasy' were paired and displayed on screen, participants had to respond (by pressing the spacebar) to a total of 15 images of children and 15 words related to sexual fantasy. Based upon prior GNAT studies

(Teachman, 2007), each block consisted of 16 practice trials and 60 critical trials. Stimuli for 'Go trials' remained on screen for 1400ms, while 'No-Go trials' remained on screen for 1000ms (Teachman, 2007). If participants made a mistake or did not respond in time, error feedback was given.

Stimuli for the concepts of 'Child' and 'Adult' were computer modified images of 15 adults and 15 children. All of the children images were taken from the commercially available Not Real People (NRP) set devised by Laws and Gress (2004) for use in assessing and researching sexual offenders (see Appendix X for examples). A set of computer modified adult images developed by Ó Ciardha (2010) were also used as there were not enough adult images in the NRP set (see Appendix X for examples). The words used for the concept of Sexual Fantasy were derived from commonly used sexual fantasy questionnaires, such as the Wilson Sexual Fantasy Questionnaire (Wilson, 1978). Fifteen words judged as being most strongly related to sexual fantasy by a sample of students (n = 27) were used for the final stimuli set (see Appendix X). Finally, 15 distracter words (i.e., words unrelated to Sexual Fantasy) were chosen in order to form half of the 'No-Go' trials (see Appendix X). Each distracter word was matched with a Sexual Fantasy word on the initial letter, character length, and syllable length (e.g., *Orgy* versus *Oven*).

7.2.2.2 Control GNAT

In order to corroborate that the GNAT has the capability to capture child-related associations more generally, a control GNAT was also designed. This was similar to the Sexual Fantasy-GNAT except the target concept was 'Toy'. Fifteen words describing a toy (e.g., *yoyo, Barbie*), which were judged by the same student sample as being most strongly related to the concept of 'Toy', were used (see Appendix X). There were also 15 different distracter words, matched to the Toy words on initial letter, syllable length, and character length (see Appendix

X). Children and adult-related stimuli were taken from the same two sets of computer modified images, although they were different to those in the experimental GNAT.

7.2.2.3 Wilson Sexual Fantasy Questionnaire (WSFQ; Wilson, 1978).

The WSFQ is a 40-item tool designed to measure the frequency of fantasy use (see Appendix E). See Chapter 3 (Section 3.2.2.3) for a more detailed description. As in Chapter 3, only two items that have reference to children were used (i.e., '*Having sex with someone much younger than yourself*' and '*Seducing an innocent'*).

7.2.2.4 Thoughts and Fantasies Questionnaire (Thornton, unpublished).

The Thoughts and Fantasies Questionnaire is an open-ended self-report measure designed to establish how often and for how long an individual uses six particular deviant fantasies (Appendix F). See Chapter 3 (Section 3.2.2.4) for a more detailed description. Only the section related to children under 13 years old was used in this study.

7.2.3 Procedure

All offender participants completed the study in a quiet meeting room in one of the facility's wings. Each of the non-offender participants completed the study in a lab within the University of Birmingham. All participants were informed - both verbally and in writing – that the study required them to complete a task designed to investigate the speed in which people respond to certain pictures and words. As with Chapter 3, all participants were made aware that some words would be of a sexual nature. However, to help reduce the likelihood of socially desirable responding, participants were only told about the full purpose of the study after they had participated. In addition, participants were made aware that there would be a few questionnaires to complete after the computer task. The offender participants were also asked to give consent for the researcher to access information within their case files and

psychometric reports. All participants were informed that they had to right to withdraw at any point in the study without consequence.

After providing informed consent, each participant completed the GNATs and then the questionnaires. With regards to the GNATs, the control GNAT was always administered first so that the GNAT procedure was familiar when completing the experimental GNAT. Both GNAT tasks were run using the experiment software package, E-Prime. For both tasks, identical instructions were presented to all participants on the computer screen before they started. The instructions stated that a picture of an adult or child would be presented as would words related and unrelated to sexual fantasies. For the first block, the instructions stated that they had to respond to whichever labels were present on the screen. Sexual fantasy would always be present but in one block 'child' was a label and in the other 'adult' was a label. Thus, for the block with 'child' as the label, participants were told to respond only to pictures of children by pressing the Spacebar. If they made an incorrect response or were too slow to respond, they would be presented with error feedback on the screen. The instructions also told the participants to respond as quickly and as accurately as possible, and that mistakes were to be expected.

All participants read these instructions before completing the practice phase. Once it was deemed that the participant was comfortable with what they had to do, the participant completed the critical phase. The order of the two blocks was counterbalanced so that half of the participants completed the 'Child + Sexual Fantasy' block first and other half completed the 'Adult + Sexual Fantasy' block first. This was done to reduce any possible order effects.

7.2.4 Data treatment

Prior to conducting any statistical analyses with the GNAT data, the raw reaction times (see Table 7.5) were converted into a standardised form. As discussed in Chapter 3 (with the SPF) and Chapter 6 (with the IAT), standardising reaction-time data helps reduce the effects of

unwanted variance related to procedural variations and individual differences (e.g., reaction speed, cognitive ability, age).

Table 7.5: Mean raw reaction times (*SD*s) for all three groups on each block of each GNAT

	Child Abusers		**Non-offenders**
	Extrafamilial	Non-extrafamilial	
Child + Toy	593.1 (65.1)	652.0 (126.5)	624.4 (93.7)
Adult + Toy	641.9 (83.4)	655.9 (115.8)	645.6 (78.6)
Child + Sexual Fantasy	616.7 (69.4)	670.5 (117.4)	659.7 (112.7)
Adult + Sexual Fantasy	637.7 (88.6)	629.5 (103.3)	618.8 (78.5)

Reduction of the data was based on the procedure used by Teachman (2007), who successfully used a single-concept GNAT. Teachman's procedure followed the recommendations of the GNAT developers (i.e., Nosek & Banaji, 2001), as well as Greenwald, Nosek, and Banaji's (2003) algorithm for the IAT. First, all trials <300ms were removed. This is because research indicates that responses to stimuli that occur within 300ms are not consciously controlled (Bargh & Chartrand, 2000) and categorisation tasks, such as the GNAT, require the execution of consciously intended responses. Also, Greenwald et al. (1998) state that some of these outlying responses indicate anticipated responding (i.e., response made before the stimulus has been consciously perceived). Errors produced a RT of zero because, in E-Prime, they reflect 'no response' for a stimulus that should have been responded to. Using unaltered errors in the scoring of the GNAT would have been a flawed strategy as the errors would mistakenly suggest that participants were responding to the stimulus at the exact moment it was presented. Therefore, following the scoring procedure of other indirect measures, such as the IAT, an error penalty was applied. Nosek (personal communication, June 6, 2012) recommended replacing the errors with the stimuli duration deadline (i.e., 1400ms) as it represents the maximum possible RT a participant could produce.

Second, RTs for distracter trials were removed as they are considered noise and, thus, are not included in the analysis. Third, for all participants, a *D*-score was calculated for both the experimental and control GNAT. The *D*-scores were calculated by subtracting the mean of

the trials in Child + Sexual Fantasy block from the mean of the trials in the Adult + Sexual Fantasy block and then dividing the difference by the standard deviation of all the trials across both blocks. *D*-scores that were positive indicated a stronger association between 'child' and 'sexual fantasy', whereas negative *D*-scores indicated a stronger 'adult-sexual fantasy' association.

7.3 Results

7.3.1 Hypothesis 1: Extrafamilial abusers will report using more child-related sexual fantasies than non-extrafamilial abusers and non-offenders.

Before testing this hypothesis, the four WSFQ subscales (Intimate, Exploratory, Impersonal, Sadomasochistic) were examined for each group to determine the types of fantasies the participants most regularly use.

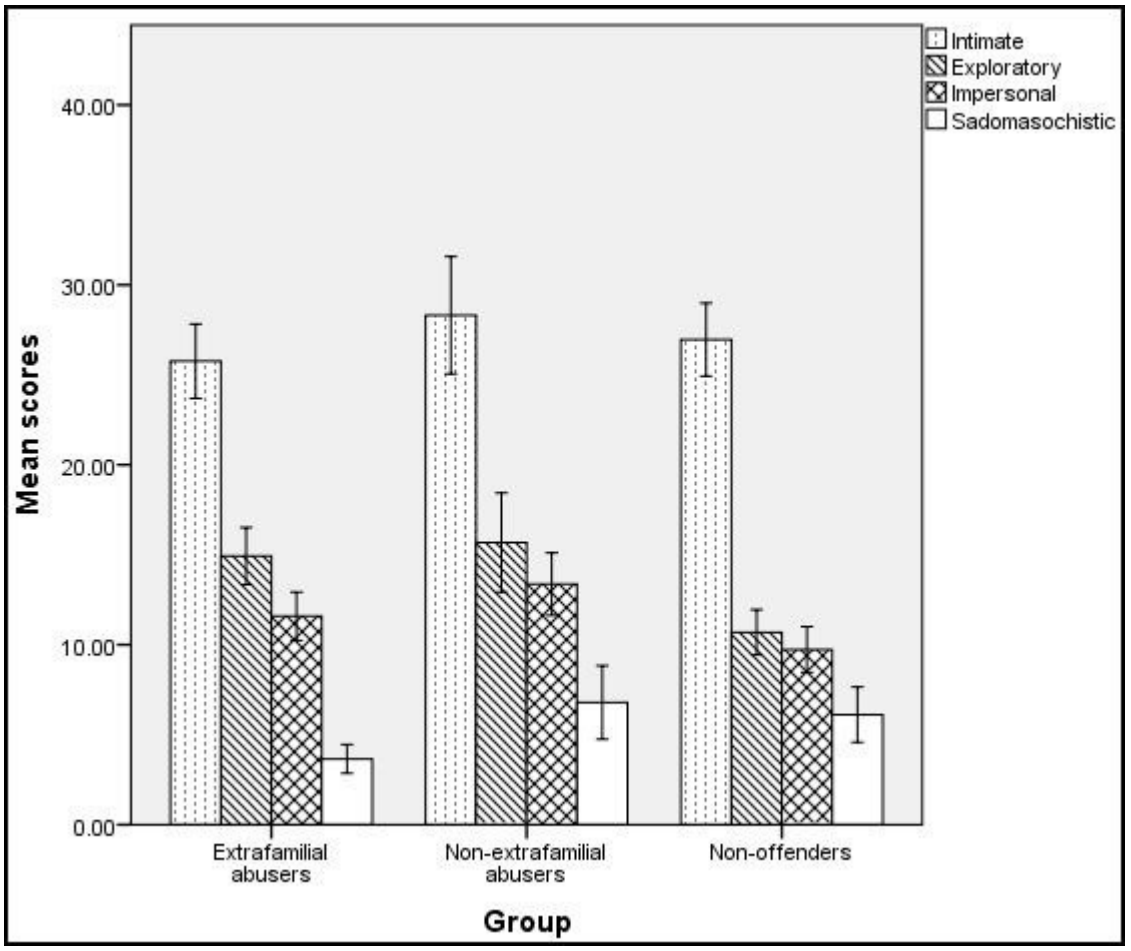

Figure 7.1: A graph showing the mean scores (and SEs) on each WSFQ subscale across all groups

As shown in Figure 7.1, all three groups showed a similar pattern of results in relation to the sexual fantasy subscales. Across the three groups, the sexual fantasies that were most frequently used were Intimate. The least common were Sadomasochistic, with Extrafamilial abusers using them the least. Both offender groups appeared to use more Exploratory fantasies than the non-offenders. However, a series of ANOVA tests (where Group was the between-subjects factor and the total subscale score was the dependent variable) produced no significant main effects for Group (all *p*s <.05). Thus, although there appears to be a trend suggesting that child abusers in this study used more exploratory fantasies and that the extrafamilial abusers were less sadomasochistic, the differences did not reach significance.

To test the hypothesis that extrafamilial abusers used more sexual fantasies related to children relative to the two comparison groups, all three groups were compared on the two child-related WSFQ items using separate one-way ANOVAs. Only one significant main effect was found, which was for the WSFQ item '*Having sex with someone much younger than yourself*', $F(2, 70) = 18.9$, $p < .001$. Follow-up analyses showed that the mean score for extrafamilial child abusers ($M = 2.35$, $SD = 1.72$) and the other child abusers ($M = 1.68$, $SD = 1.42$) were both significantly greater than that of the non-offenders ($M = 0.16$, $SD = 0.37$). The two offender groups did not significantly differ. This does not support Hypothesis 1, but does support previous findings that child abusers report using child-related fantasies more frequently than non-offenders (Baumgartner et al., 2002).

On the Thoughts and Fantasies Questionnaire, only sexual fantasies about children under the age of 13 were of interest. Since this questionnaire does not provide continuous data, a dichotomous categorical variable labelled 'deviant fantasiser' (Yes/No) was created. An individual was deemed a deviant fantasy user if they reported using sexual fantasies of a pre-pubescent child more than once a month; that lasted longer than a few seconds; and that were clearly elaborate (i.e., involved vivid imagery, had a clear script/narrative). None of the non-offenders reported such fantasies. Of the 29 extrafamilial offenders, 72% ($n = 21$)

reported using child-related fantasies and 60% (n = 8) of the 19 other offenders reported using such fantasies. Using chi-square analysis, a significant association was found between offender group and whether or not a child-related fantasy was used, χ^2 (1) = 4.41, p <.05. This indicates that the odds that extrafamilial child abusers will use an elaborate child-related sexual fantasy are 3.60 times more than the odds of non-extrafamilial abusers. Thus, the results from this questionnaire support Hypothesis 1.

7.3.2 Hypothesis 2: Extrafamilial abusers will demonstrate stronger associations between 'child' and 'sexual fantasy' on the GNAT than non-extrafamilial abusers and non-offenders.

It can be seen from Figure 7.2 below that only the extrafamilial abusers had a positive *D*-score, indicating a stronger association between 'child' and 'sexual fantasy'. To compare groups, the *D*-scores of the experimental GNAT were analysed using a one-way ANOVA. A significant main effect was found, $F(2, 71) = 5.46$, $p < .05$. In order to test the hypothesis that extrafamilial abusers would hold a significantly stronger association between children and sexual fantasy, three planned comparisons were performed. Results showed that extrafamilial abusers had a significantly higher *D*-scores than both the other child abusers, $t(71) = 2.78$, p <.01, (one-tailed), d =.97, and the non-offenders, $t(71) = 2.81$, $p < .01$, (one-tailed), d =.71. According to Cohen (1992), these effects sizes are reflective of a large and a medium effect, respectively. The *D*-scores for the other child abusers and the non-offenders did not differ. Thus, these results are support of Hypothesis 2.

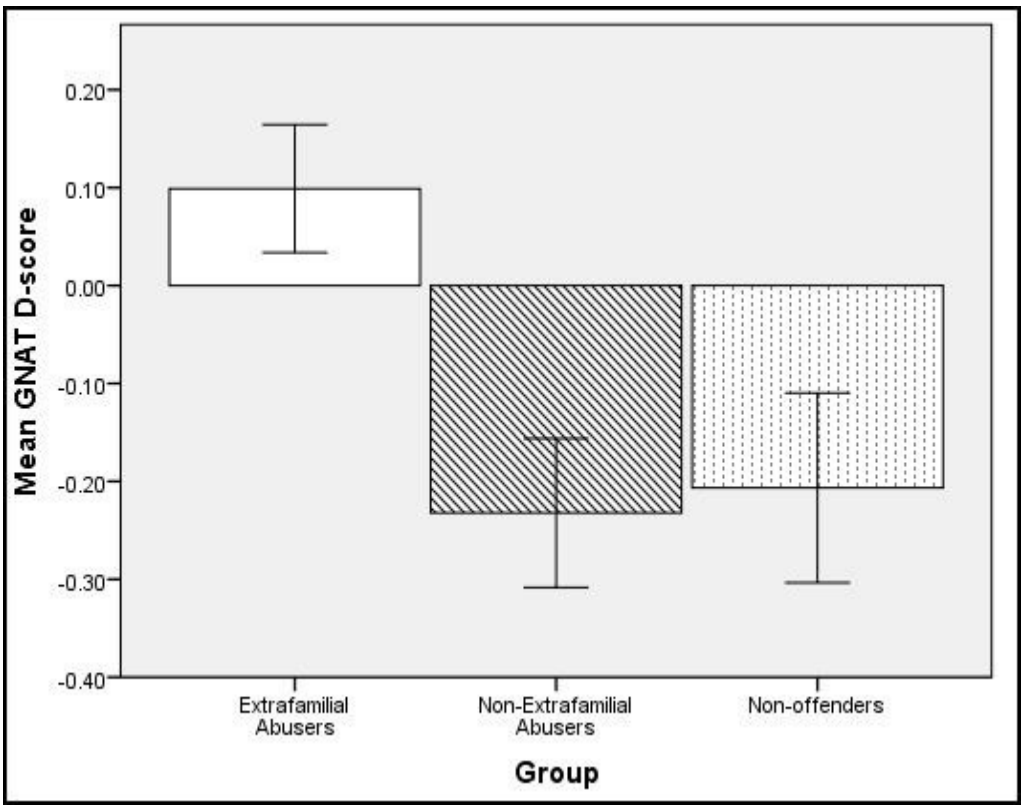

Figure 7.2: Mean *D*-scores and SEs for each group on the experimental GNAT

To corroborate this conclusion further, the error rates for Go and No-Go trials across both blocks were calculated (see Table 7.6). It can be seen that the non-offenders made the fewest mistakes overall, while the non-extrafamilial abusers made the most mistakes. After arcsine-transforming the error rates, one-way ANOVAs were performed and showed there was a significant main effect of Group for the No-Go trials in the Adult-Sexual Fantasy block [$F(2, 71) = 5.9$, $p < .01$] and the Child-Sexual Fantasy block [$F(2, 71) = 6.9$, $p < .01$]. Post-hoc analyses indicated that the non-extrafamilial abusers made more No-Go mistakes (i.e., pressed the Spacebar when they should not have) than both the extrafamilial abusers and non- offenders on both blocks.

Given that the extrafamilial abusers made fewer mistakes than the non-extrafamilial abusers, these data can be seen to provide some corroboration for Hypothesis 2. However, it should be noted that the within-group differences for the extrafamilial abusers show a bias that is the opposite of what would be expected. For example, the extrafamilial abusers would

be expected to make more No-Go mistakes in the Adult block (i.e., pressing the response key when they saw an image of a child), relative to the Child block, but this was not found.

Table 7.6: Mean error rates (%) and *SDs* from the experimental GNAT for extrafamilial abusers, non-extrafamilial abusers, and non-offenders

	Child Abusers		**Non-offenders**
	Extrafamilial	Non-extrafamilial	
Go trials			
Child + Sexual Fantasy	1.8 (2.8)	3.9 (5.9)	1.2 (1.6)
Adult + Sexual Fantasy	1.9 (2.9)	2.8 (5.2)	2.3 (2.6)
No-Go trials			
Child + Sexual Fantasy	4.7 (4.3)	8.4 (6.7)	3.1 (3.9)
Adult + Sexual Fantasy	2.9 (4.2)	7.2 (6.0)	2.4 (2.6)

7.3.3 Hypothesis 3: Hypothesis 3: On the control GNAT, there will be no group differences.

As shown in Figure 7.3, all three groups show a positive *D*-score on the control GNAT. This suggests that all three groups hold an association between children and toys. Moreover, a one-way ANOVA showed no significant main effect and follow-up analyses confirmed there were no significant differences between the groups (all *p*s >.05). This provides corroborating evidence that the GNAT can be used to assess child-related associations. Also, it indicates that the group differences on the experimental GNAT are most likely to be due to differing associations strengths as opposed to factors related to general performance on the GNAT.

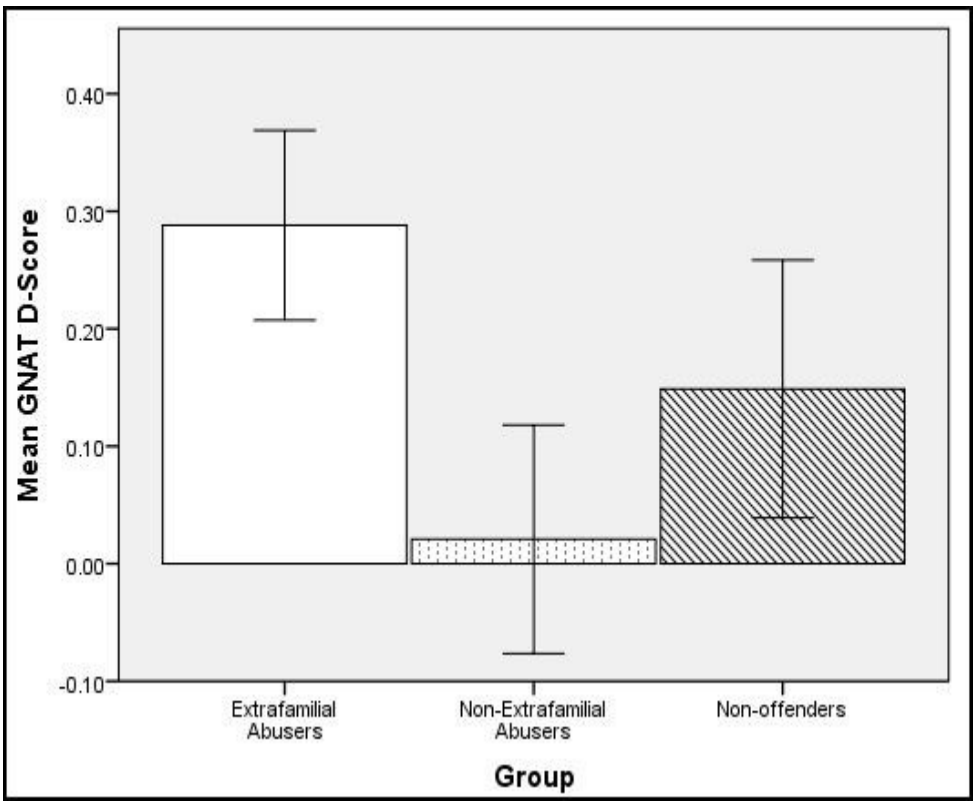

Figure 7.3: Mean *D*-scores and SEs for each group using the control GNAT

Table 7.7: Mean error rates (%) and *SDs* from the control GNAT for extrafamilial abusers, non-extrafamilial abusers, and non-offenders

	Child Abusers		**Non-offenders**
	Extrafamilial	Non-extrafamilial	
Go trials			
Child + Toys	1.8 (2.5)	3.9 (5.8)	1.5 (2.7)
Adult + Toys	2.1 (3.3)	3.3 (6.4)	2.2 (3.4)
No-Go trials			
Child + Toys	6.9 (6.2)	10.7 (8.3)	3.7 (3.8)
Adult + Toys	8.3 (8.8)	13.2 (12.4)	3.6 (4.9)

Table 7.7 shows the error rates for the Go and No-Go trials for both blocks. It can be seen that, as with the experimental GNAT, the non-offenders made the least number of incorrect responses, while the non-extrafamilial abusers made the most errors. One-way ANOVAs on the arcsine-transformed error rates found a significant main effect of Group for the No-Go trials in the Adult-Sexual Fantasy block [$F(2, 71) = 9.2$, $p < .001$] and the Child-Sexual Fantasy block [$F(2, 71) = 6.7$, $p < .01$]. Post-hoc analyses showed that the non-offenders made fewer No-Go errors than both the extrafamilial abusers and non-extrafamilial abusers across

both blocks. However, there were no group differences between the extrafamilial abusers and the non-extrafamilial abusers. This lack of difference between the two offender groups provides some further support for the reaction time results.

7.3.4 Hypothesis 4: Scores on the experimental GNAT will predict deviant sexual fantasisers regardless of offender subtype

To test this hypothesis, the two offender groups first had to be collapsed into a single sample (n=48). Then, Receiver Operating Characteristics (ROC) was then used to determine how well the *D*-scores on the experimental GNAT predicted 'deviant fantasisers', as measured by the Thoughts and Fantasies Questionnaire. ROC curve analysis produces an Area Under the Curve (AUC), which can be used to determine the predictive effectiveness of a tool. In this case, the AUC indicates how likely an offender randomly drawn from the group of 'deviant fantasisers' would have a higher *D*-score than an offender drawn from the group of 'non-deviant fantasisers'.

An AUC of .50 can be produced by chance alone and indicates that the tool has no predictive value, while an AUC of .80 is regarded as good (Santtila et al., 2009). The ROC curve analysis in this study yielded an AUC of .74 (95% CI: .59-.89; p <.01). Thus, this demonstrates that the experimental GNAT has reasonable predictive validity, which is supportive of Hypothesis 4.

7.3.5 Exploring the heterogeneity within the non-extrafamilial group

As in Chapter 3, the comparison group (i.e., non-extrafamilial abusers) was made up of three subgroups (i.e., intrafamilial abusers, 'predominantly intrafamilial' abusers, and abusers of children and adults). Thus, to strengthen the conclusions that can be drawn, it is important to determine that the pattern of differences found in this study still hold when the three

subgroups are examined individually, particularly those who only abused children (i.e., the intrafamilial abusers and predominantly intrafamilial).

When examining the two child-related WSFQ items, no significant differences were found except for between the extrafamilial abusers and the predominantly intrafamilial abusers. For the item "*Having sex with someone much younger than yourself*", results of a *t*-test (using a Bonferroni adjustment) indicated that extrafamilial abusers had a significantly higher score (M = 2.4, SD = 1.72) than the predominantly intrafamilial abusers (M = 0.8, SD = 0.84); [$t(11) = 3.1$, $p < .01$]. Similarly, on the item "*Seducing an 'innocent'*", extrafamilial abusers showed significantly higher scores (M = 1.5, SD =1.66) than the predominantly intrafamilial abusers (M = 0.2, SD = 0.45); [$t(25) = 3.5$, $p < .01$].

Looking at the GNAT *D*-scores in Figure 7.4, it can be seen that all three subgroups showed a pattern of responding that supports the Hypothesis 2. That is, they show a trend for associating adults with sexual fantasy (relative to the extrafamilial abusers who show the opposite).

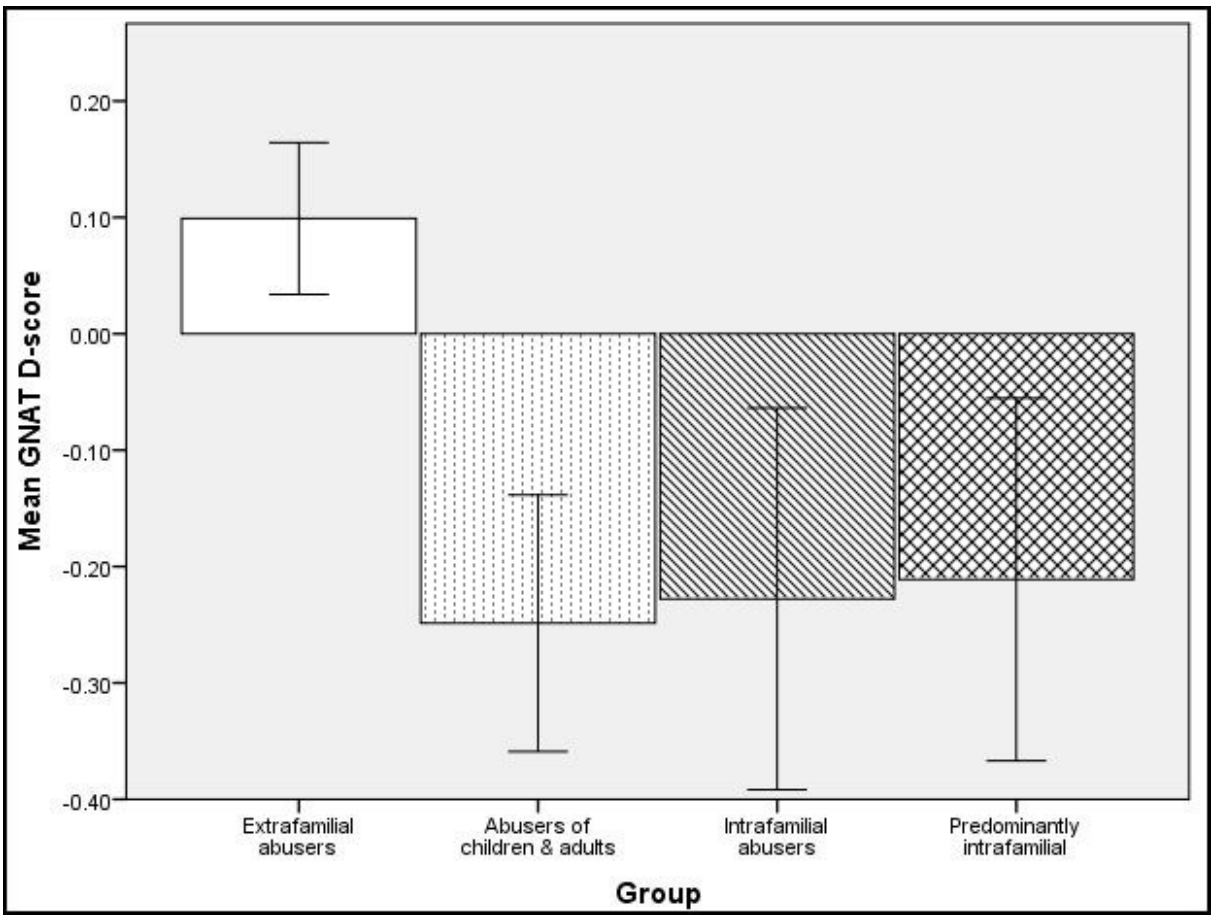

Figure 7.4: A graph showing the mean GNAT *D*-score (and SEs) for the extrafamilial group and the three non-extrafamilial subgroups

T-test analyses indicated that the predominantly intrafamilial abusers did not significantly differ from the extrafamilial abusers. However, the intrafamilial abusers were found to significantly differ from the extrafamilial abusers ($p < .05$), as did the abusers of children and adults ($p < .05$). Given the very small sample sizes of the subgroups, these results are to be interpreted with caution. However, these results, in conjunction with the trend shown in Figure 7.4, are supportive of the overall hypothesis that extrafamilial hold stronger child-sexual fantasy associations.

7.4 Discussion

The main aim of the present study was to investigate whether child abusers who regularly use child-related sexual fantasies (i.e., extrafamilial abusers) hold a child-sexual fantasy

association in their long-term memory. This was done using an indirect measure called the GNAT and the results appear to support this assumption. First, in support of Hypothesis 1, extrafamilial abusers did report more child-related sexual fantasies on the Thoughts and Fantasies Questionnaire than the two comparison groups. Second, the extrafamilial child abusers evidenced positive *D*-scores on the GNAT indicating an association between sexual fantasy and children. More importantly, this score was significantly different to the negative -*D*-scores produced by both the non-extrafamilial abusers and non-offenders. Thus, this supported Hypothesis 2.

These results were partially strengthened by the pattern of error rates shown by the offenders. That is, the extrafamilial abusers made fewer No-Go errors in the Adult block than the non-extrafamilial abusers. Moreover, the support for Hypothesis 2 was also strengthened by the corroboration of Hypothesis 3 and 4. With regards to Hypothesis 3, a control GNAT that measures a non-deviant child-related association (i.e., toy-child association) was administered to all participants. The fact that the *D*-scores on the control GNAT was positive for all three groups and did not significantly differ between the groups indicates that the GNAT is able to detect child-related associations. Thus, differences between groups on the experimental-GNAT can be more confidently concluded as being due to group-related differences (i.e., that the extrafamilial offenders associate children with sexual fantasy). With regards to Hypothesis 4, it was found that child abusers who use deviant fantasies could be predicted reasonably well by their *D*-scores on the experimental GNAT. This further supported the idea that child-sexual fantasy associations are held by abusers who regularly use deviant fantasies about children.

The DPM-ST proposes that frequently fantasising about a deviant theme can have a number of cognitive-based consequences. One consequence is that the deviant theme will become associated with the concept of sexual fantasy in memory. Similar to research that assesses belief-related associations in long-term memory (as in Chapter 3), it was

hypothesised that this assumption of the DPM-ST could be tested using an indirect measure. As discussed, the corroborated hypotheses in this study collectively support this assumption and, therefore, provide some support for this aspect of the DPM-ST.

This study also had a number of other elements that helped strengthen the reliability of the results. First, the stimuli were words known to be related to sexual fantasy, as they were derived from existing sexual fantasy measures. Furthermore, each stimulus had a corresponding distracter word matched in terms of initial letter, syllable length, and character length. Thus, participants had to pay extra attention to the stimuli and not assume, for example, that a word starting with 'Wh' was the fantasy word '*whipping*' as it could have just as likely been '*whirling*' (a distracter word). Second, the Thoughts and Fantasies Questionnaire was used as a way of detecting elaborate deviant sexual fantasies as opposed to fleeting sexual thoughts. The DPM-ST stipulates that it is the controlled process of sexual fantasising that will lead to the formulation of child-sexual fantasy associations. Thus, the fact that extrafamilial abusers used more elaborate child-related sexual fantasies and had a stronger child-sexual fantasy association than the other child abusers, it can be argued that this specific point of the DPM-ST has some empirical support.

As mentioned in the Introduction, the GNAT has previously been used to assess child-sex associations in child abusers in an unpublished study (Snowden et al., 2007). Using sensitivity as the dependent variable, the researchers found that child abusers evidenced stronger associations between children and sex than did rapists. However, child abusers did not significantly differ from non-offenders on this outcome. Moreover, no significant differences were found when RTs were used as the dependent variable. From this it could be argued that the GNAT is unable to adequately detect child-related associations using RTs. However, as discussed, the results on the control GNAT in the present study indicate that this is not case. The reason is more likely to be due to the authors using a relatively short response window for participants to categorise stimuli. Nosek and Banaji (2001) recommend using a

short response window when the dependent variable is sensitivity, but to extend this window when using RTs as the dependent variable. In the present study, this recommendation was followed. It should be noted, however, that the non-extrafamilial group showed the greatest amount of incorrect responses on the No-Go trials on both GNAT tasks. This is unlikely to be due to unfamiliarity with the task or with computers as they had a similar mean age to the extrafamilial abusers. One possible interpretation of this finding could be related to inhibition, in that, the non-extrafamilial group may have general inhibitory issues, which the GNAT tasks were detecting in the No-Go trials for both stages. This could be a novel avenue for future research in this field.

7.4.1 Limitations of study

There are a number of limitations of this study. First, the study would have benefited from larger sample sizes, particularly in terms of the non-extrafamilial comparison group. Moreover, the non-extrafamilial group was made up of intrafamilial abusers, abusers of children and adults, and predominantly intrafamilial abusers. Thus, the results may have been affected by the heterogeneity within this group. However, an examination of the subgroups indicated that the three subgroups responded similarly on the experimental GNAT; that is, they showed stronger adult-sexual fantasy associations. Moreover, when compared to the extrafamilial abusers, the intrafamilial and abusers of children and adults showed significantly different GNAT *D*-scores. Although these results corroborate Hypothesis 2, stronger conclusions could have been drawn had a pure comparison group (e.g., a group comprised of only intrafamilial abusers) been used. This is a crucial aim for future research.

Second, most of the child abusers were in treatment. It may be possible that, due to talking regularly about deviant sexual fantasies in treatment, some offenders have formed stronger associations between children and sexual fantasy. However, it is unlikely that

extrafamilial abusers would talk about sexual fantasies any more than other abusers would have to do in therapy.

Third, sexual fantasy may be conceptualised differently in the minds of some of the offenders. For example, for one participant, sexual fantasy may be regarded as something they would never do (as opposed to reality), whereas for another it may be anything they think about to induce sexual arousal, which is typically how the term is used in forensic research and practice (e.g., Langevin et al., 1998). This is important because participants conceptualising it as the opposite of reality may not regard certain stimuli presented to them as being a 'fantasy' (e.g., *sex*). Indeed, one participant raised this point regarding the word 'sex', stating that sex is not a fantasy but a reality for them.

Fourth, the experimental GNAT showed no significant correlations with the two child-related items of the WSFQ. This may undermine the convergent validity of the GNAT. However, these particular items have been noted as being rather vague (O'Donohue et al. 1997). For example, the sex offenders in this study had a mean age of 45 and 47. Therefore, someone "much younger" could include a 25 year old, which is not illegal. Thus, the poor criterion validity of the WSFQ items may contribute to their lack of correlation with the -GNAT *D*-scores. A fifth limitation is that a non-offender sample was used to evaluate how strongly the sexual fantasy words were related to the concept of 'sexual fantasy'. Perhaps sex offenders would have identified different words. Sixth, it is possible that the Sexual Fantasy-GNAT was simply assessing deviant interest or sexual schemas as opposed to sexual fantasy per se. For example, the GNAT's positive correlation with being a 'deviant fantasiser' may reflect an association between deviant interest (measured indirectly) and deviant fantasy use, as the two concepts are associated (Bartels & Gannon, 2011). Also, the word 'sexual' in the term sexual fantasy may have had greater valence, meaning that the experimental GNAT was assessing stronger child-*sexual* associations. Finally, the study could have been strengthened by using a non-offender group that was not comprised of undergraduate psychology students,

as they are likely to be more familiar with using computers and participating in experimental (reaction-time) research. This is supported by the fact that the non-offenders' error rates were the lowest on both GNATs. Despite these limitations, this study provides evidence that child-sexual associations can be assessed indirectly using reaction-time data from a GNAT.

7.4.2 Suggestions of future research

To corroborate the current findings, future work should look to confirm the construct validity of the experimental GNAT. For example, researchers should investigate whether similar results are found when the category is changed from 'Sexual fantasy' to simply 'Fantasy'. This would eliminate the possibility that the experimental GNAT is simply assessing associations between 'child' and' sexual'. Since some child abusers have been found to use deviant fantasies for nonsexual reasons, such as compensating for a lack of self-esteem (Cortoni et al., 2009), it would be beneficial to ascertain whether child abusers who show no deviant sexual arousal (i.e., measured using penile plethysmography), but who report using deviant fantasies, show a positive *D*-score. This would aid in verifying that that GNAT is measuring child-sexual fantasy associations and not the construct of deviant sexual arousal/interest.

Sexual fantasy in the present study was operationalised as imagery depicting deviant sexual behaviour and themes. Future work should aim to test only those offenders who regard deviant sexual fantasy in this way, rather than as the opposite to 'sexual reality'. It would also be useful to investigate whether other indirect measures designed to measure associations towards single concepts, such as the Single-Category IAT find similar results. Finally, it is also worth investigating whether the GNAT can be used to assess the deviant fantasies of other types of sex offenders (i.e., rapists, sexual murderers). If such future work was to corroborate the experimental GNAT, not only would the DPM-ST be more strongly

supported, but it would indicate its potentiality as a clinical tool for assessing entrenched deviant fantasies.

The findings add to the general indirect measures literature, in that they demonstrate the GNAT's potential as a valuable research tool, particularly when using response latency as the dependent variable. Hopefully this provides researchers with the confidence to use the GNAT for future research on sex offender's cognition, particularly as it offers a number of features that are not available to the more popular IAT (i.e. the use of two possible dependent variables; providing associations towards a single concept; and allowing the measurement of absolute associations).

CHAPTER 8

GENERAL DISCUSSION

The main aims of this thesis were to: 1) develop a theoretical model to account for the cognitive processes underlying and associated with deviant sexual fantasies; and 2) empirically test some of the core assumptions proposed by the model. To highlight the academic and clinical importance of deviant sexual fantasies, as well as to justify the need for a contemporary theoretical account, the thesis also aimed to provide an overview of the relevant empirical and theoretical literature (Chapter1). This information was then used, in conjunction with insights from other domains (e.g., cognitive psychology), to develop the Dual-Process Model of Sexual Thinking (DPM-ST); a novel theoretical account of the cognitive processes underpinning and related to sexual fantasising (Chapter 2). A number of studies were then conducted to provide preliminary support for various key aspects of the model. In this final chapter, a summary of the main findings from each study is provided, followed by a discussion of their theoretical and clinical implications. Limitations of the thesis and suggestions for future research are also examined.

8.1 Summary of the findings

The first study (Chapter 3) examined four sex-related cognitive associations (child-sex; child-not sex; adult-sex; adult-not sex) in child abusers via the use of a recently developed indirect measure; the Sorting Paired Features task (SPF). First, exclusively extrafamilial child abusers were found to hold significantly stronger child-sex associations than the two comparison groups (i.e., non-extrafamilial abusers and non-offenders). Second, within the extrafamilial group, the strength of the child-sex associations did not significantly differ from adult-sex associations. However, both comparison groups showed significantly stronger adult-sex associations compared to child-sex associations. Third, no group differences were found on a control version of the SPF task that measured an association most people hold (i.e., flowers-

good). This supports the assumption that the group differences on the main SPF were due to differing association strengths as opposed to some other factor (i.e., task difficulty, age, motor functioning). Finally, in the extrafamilal group, adult-sex associations showed a negative relationship with child-related sexual fantasies, while adult-not sex and child-not sex associations showed positive relationships. Child-sex associations did not show a significant relationship with child-related sexual fantasies.

An important point to note is that the results of this study may have been affected by the strikingly slower adult-not sex RTs. To address this, the data were reanalysed using amended $D_{\text{-associations}}$ that were computed without the two adult-not sex categories. The results showed that the extrafamilial abusers still demonstrated stronger child-sex associations relative to the comparison groups. However, their $D_{\text{-association}}$ for adult-sex became much weaker (i.e., the $D_{\text{-association}}$ turned from positive to negative). Moreover, the child-sex $D_{\text{- associations}}$ now showed a significant and positive relationship with the child-related items of the WSFQ. Thus, the results may be more supportive of the hypotheses than was originally thought. In spite of this, it would be unwise to make any solid conclusions from either the original or amended results, as they were biased and omitted some of the SPF data, respectively.

The second study (Chapter 4) tested the hypothesis that the use of aggressive sexual fantasies by non-offending males is influenced by a greater ability to fantasise (i.e., greater fantasy proneness, dissociative experiences, and vividness of visual imagery) and the presence of distorted explicit attitudes about women. Correlational analyses showed that fantasy proneness and dissociation had a positive relationship with sexual fantasies related to rape and sadistic acts, as did the questionnaires measuring attitudes about women. Using structural equation modelling (SEM), a single-path model (i.e., 'Rich Fantasy Life' → 'Distorted Attitudes about Women' → 'Aggressive Sexual Fantasies') was specified, identified, and

evaluated. The results of the study supported the hypothesis, as the SEM model was found to show a good fit with the data. However, due to the relatively small sample and non-normal data, it was possible that the model was biased. Therefore, bootstrapping procedures were applied and provided statistical support that the model was unbiased.

The third study (Chapter 5) used a within-subjects design to investigate the proposition that sexual fantasising is a controlled process that draws upon the resources of working memory. In two experimental conditions, male and female non-offenders envisioned a memory and an imagination-based sexual fantasy whilst performing another task that requires working memory (i.e., bilateral eye-movements). The two control conditions involved simply envisioning a sexual fantasy. The sexual fantasies in each condition were rated on vividness, emotional valence, and arousability. It was hypothesised that, due to competition for resources, sexual fantasies would become impaired (i.e., less vivid, less emotional, less arousing) by eye-movements. The results supported these hypotheses, as sexual fantasies significantly reduced on all three variables after making eye-movements compared to the control condition. No differences were found between memory and imagination-based sexual fantasies in terms of their reduction on the three variables.

The fourth study (Chapter 6) investigated whether sexual fantasies of dominance can prime (strengthen) self-powerful associations. In the experimental condition, a group of female and male non-offenders created and imagined a dominance (consensual) sexual fantasy before completing an Implicit Association Task (IAT) designed to measure self-powerful associations, as well as a self-report measure of powerfulness, self-esteem, and dominance-related sexual fantasies. Participants in the control condition created and imagined neutral imagery (i.e., grocery shopping) before completing the IAT and all three self-report measures. Results showed no group differences on the IAT or the self-report measures. To aid in

explaining the results, exploratory post-hoc analyses were conducted. After collapsing both groups, scores on the IAT showed a positive relationship with sexual fantasies about forcing. Also, in the experimental condition, the IAT scores for male participants were found to positively correlate with sexual fantasies of forcing and hurting a partner.

In the final study (Chapter 7), an indirect measure (i.e., the Go/No-Go Association Task; GNAT) was used to test the hypothesis that extrafamilial child abusers would associate 'child' and 'sexual fantasy' more strongly than 'adult' and 'sexual fantasy', relative to non-extrafamilial abusers and non-offenders. The findings from the study were found to support this hypothesis. No group differences were found on a control GNAT designed to measure 'child-toy' associations, indicating that the GNAT can reliably assess child-related associations. It also indicated that the group differences found on the child-sexual fantasy GNAT were more likely due to differences in the strength of child-sexual fantasy associations than other factors (i.e., those affecting performance on the GNAT). Furthermore, extrafamilial abusers reported more sexual fantasies about children (<13 years) than did non-extrafamilial abusers and non-offenders. Finally, across all child abusers, scores on the child-sexual fantasy GNAT were found to be a good predictor of offenders who reported using sexual fantasies about children.

8.2 Implications of the findings

Deviant sexual fantasies have long been thought of as an important factor in sexual offending. Research findings on the subject, from over the past few decades, have contributed greatly to our understanding of their prevalence, content, function, and treatment. While this is the case, there has been a dearth of empirical and theoretical literature pertaining to the cognitive processes underlying and associated with deviant sexual fantasising. This is an important observation to address as a great deal is likely to be learned about deviant sexual fantasies if

these processes are investigated. Moreover, insights gained from investigating the cognitive aspects of deviant sexual fantasy have the potential to open up new avenues for therapeutic intervention. Thus, in the following two subsections, the results from each of the five studies will be discussed into terms of their theoretical and clinical implications.

8.2.1 Theoretical implications

The present thesis sought to develop and test an a priori theory of the cognitive processes associated with deviant sexual fantasies; the Dual-Process Model of Sexual Thinking (DPM-ST). While the model was originally developed to account for *deviant* sexual fantasies, many of the theoretical assumptions are based upon the psychological literature on human cognition in general. As a consequence, it is argued that the DPM-ST is also applicable to non-deviant sexual fantasies (as exemplified in Chapter 5). The basic premise of the theory is that there are two kinds of sexual thinking; 1) spontaneous sexual thoughts that operate on automatic or associative processes; and 2) sexual fantasies that operate on controlled processes. In brief, the theory proposes that distorted sex-related associations become activated by relevant external cues. This activation is experienced as a spontaneous sexual thought entering conscious awareness, which will be fleeting unless it is attended to further. However, to be granted further attention, the thought must elicit a strong affective reaction (i.e., sexual arousal). If attended to, the thought may be elaborated upon. If this elaborative process occurs and involves mental imagery, it can be regarded as sexual fantasising. The likelihood of the thought being elaborated upon in the form of a sexual fantasy is increased if the person exhibits greater levels of sexual preoccupation; possesses a greater ability to fantasise; and holds explicit cognitions that validate/support the sexual thought and fantasy.

As a controlled cognitive process, sexual fantasising is theorised to involve drawing upon information in episodic memory, either as a process of recollection or as way of constructing novel (i.e., imagination-based) imagery. Further, as this information needs to be

retained and manipulated in the 'mind's eye', the DPM-ST proposes that sexual fantasising requires the resources of working memory in order to be performed effectively. The theory also states that processes involved in sexual fantasising (e.g., constructing and envisioning sexual scenarios) can prime other associations and strengthen the originally activated association. Finally, the DPM-ST posits that, in addition to encoding a sexual script, the repeated use of a specific sexual fantasy theme (i.e., a particular person or behaviour) is likely to cause an association to form between the concept of 'sexual fantasy' and that particular theme.

The findings from the five studies in this thesis provide direct and indirect support for many of these assumptions. First, the model is based on the idea that people hold sex-related associations, for which there is a growing body of empirical support. For example, a number of IAT studies suggest that child abusers hold child-sex associations (Babchishin, Nunes, & Hermann, 2013). However, these results are not conclusive because the IAT scores may be due to decreased sex-adult associations or increased adult-not sex associations (Snowden, Craig, & Gray, 2011). The indirect measure used in Chapter 3 (i.e., Sorting Paired Features task) allowed for the assessment of all four possible associations. The results (based on both the original and amended analyses) supported the assumption that child abusers (specifically extrafamilial abusers) hold child-sex associations. Also, in line with Snowden et al.'s (2011) criticism of the IAT, the results (based on both the original and amended analysis) suggested that extrafamilal abusers hold decreased adult-sex associations, evidenced by weaker adult-sex $D\text{-}_{\text{associations}}$ relative to the two comparison groups.

While the original analysis found no correlation between child-sex $D\text{-}_{\text{associations}}$ and child-related fantasies in the extrafamilial group, the amended analysis showed them to be positively correlated. This provides some support for the DPM-ST's proposition that child-sex associations lead to deviant sexual fantasies about children. However, as stated earlier, no firm conclusions should be drawn from these results. First, the results are correlational and

cannot be used to infer causality. Second, the results are based on a post-hoc re-analysis and so need to be corroborated using an improved SPF task; one that addresses the issue associated with the adult-not sex category.

Second, the DPM-ST states that once a sexual thought has been triggered, the likelihood of the thought being elaborated upon in the form of a sexual fantasy is increased by various factors. Two proposed factors were: 1) individual differences in the ability to fantasise (i.e., fantasy proneness, vividness of visual imagery, dissociation); and 2) whether the person holds explicit cognitions that are congruent with the triggered thought and prospective sexual fantasy. The results of the SEM study in Chapter 4 provide some preliminary support for the first assumption.

According to Butler (2006), the core variable tying dissociative experiences to other concomitant constructs, such as fantasy proneness, is 'absorption'. Absorption is defined as the full commitment of one's cognitive, perceptual, and imaginative resources to a representation of an attentional object (Tellegen & Atkinson, 1974), and is strongly related to dissociativity and fantasy proneness (Kihlstrom, Glisky, & Angiulo, 1994; Lynn & Rhue, 1988). According to Butler (2006), absorption can occur in relation to both external stimuli (i.e., a novel, film) and internal stimuli (i.e., fantasies, daydreams). Arguably, the quality of a stimulus is likely to affect the ability to become sufficiently absorbed in it. In the case of internal stimuli, greater vividness can be reflective of higher quality. This may explain why vividness of visual imagery was positively associated with fantasy proneness in Chapter 4. Moreover, the findings from Chapter 4 indicate that sexual fantasies are an internal stimulus that an individual can become absorbed in, especially if they have a proclivity to do so (i.e., high fantasy proneness, dissociativity). Further research into how these particular variables interact with sexual fantasy is highly advocated. For example, it is possible that a reduced ability to engage in sexual fantasy influences whether an individual uses pornography. This

has implications for researchers studying internet offenders who use indecent images of children.

The findings in Chapter 4 also suggest that a certain theme is more likely to be sexually fantasised about if the person holds explicit (i.e., consciously accessible) cognitions that are compatible with the theme. This finding supports Marshall and Marshall's (2000) argument that sex offenders are likely to introduce expressions of anger and hostility towards women into their sexual fantasies. In line with the present results, they suggest that this will often take the form of excessive control, cruelty, humiliation, and degradation. The DPM-ST furthers these assumptions by stating that, in addition to affecting the content of the aggressive fantasies, individuals' explicit hostile attitudes towards women are used to validate whether a particular sexual fantasy should be used (or whether a preceding sexual thought should be elaborated upon). Arguably, a mismatch between the two would lead to a sense of cognitive dissonance, reducing the likelihood that the sexual fantasy will be used. However, it is worth emphasising that, although the findings of Chapter 4 provide support for the idea that explicit cognitions influence congruent sexual fantasies, they are unable to directly support the idea that they have a validating function. Thus, future research is encouraged to test and build upon these ideas.

Third, a core assumption of the DPM-ST is that sexual fantasising is a controlled process requiring the resources of working memory. The results of Chapter 5 provided direct support for this hypothesis, as sexual fantasies were found to become impaired after being performed concurrently with a task known to tax working memory (i.e., bilateral eye-movements). Although previous research has shown that recalled personal memories are rated as more vivid than imagined future thoughts (D'Argembeau & Van der Linden, 2004), the baseline ratings between memory-based and imagination-based sexual fantasies in Chapter 5 did not differ. Moreover, both types of fantasies were found to reduce in vividness, emotionality and arousability to the same degree (statistically speaking). This suggests that

the impairment of sexual fantasies (via eye-movements) is unaffected by whether the fantasy involves mentally "re-experiencing" or "pre-experiencing" a sexual event.

While this paradigm has been used with other forms of mental imagery, it has not been investigated in relation to sexual fantasies. Thus, this is the first study to support the notion that sexual fantasies require working memory. The effect observed in this study can be explained by the idea that, due to reduced resources, the sexual imagery was unable to be formed as effectively (or as vividly) as when the resources were not being used by a concurrent task. Smeets, Dijs, Pervan, Engelhard, and van den Hout (2012) argue that eye-movements affect the refreshment of visual information in working memory (Kosslyn, 1994). As a result, the imagery is reconsolidated (i.e., stored in long-term memory) as less vivid. When recalled later (i.e., post-task), the imagery still appears less vivid and, thus, is deemed as having less emotional and erotic valence. In contrast, when no eye-movements are made, the imagery is able be refreshed and become more vivid. The results of the control condition in Chapter 5 support this proposition as sexual fantasies become more vivid after simply fantasising (i.e., making no eye-movements). There is some small indication that this occurs in sex offenders also. For example, in a qualitative study, sex offender reported that their sexual fantasies "became more concrete each time, they were extremely vivid in my mind" (Gee, Ward, Beech, & Belofastov, 2006, p. 220).

The idea that a sexual fantasy is deemed less positive and arousing as a consequence of being less vivid also lends support to the findings (and hypotheses) in Chapter 4, since vividness of visual mental imagery (in conjunction with low fantasy proneness and dissociative tendencies) was found to influence the use of sexual fantasies. While vividness was experimentally reduced in Chapter 5, both findings taken together suggest that the phenomenological quality of the imagery is important when appraising and using sexual fantasies.

Another assumption of the DPM-ST is that a feedback loop is formed when a sexual fantasy is used. This is because the content of the sexual fantasy is likely to strengthen the association that leads to its use. Related to this, it is also proposed that the content of sexual fantasies have the potential to activate (and strengthen) other associations. In other words, sexual fantasies can function as a source of priming (Blair, Ma, & Lenton, 2001). This hypothesis was tested in Chapter 6 using dominance sexual fantasies and self-powerful associations. Unfortunately, the hypothesis was not supported. Before solid theoretical conclusions are made, further studies need to be conducted to ensure the results were not due to methodological limitations. This is because support for this aspect of the DPM-ST can offer insights into how sexual fantasies provide sex offenders with a sense of power and control, as well as other non-sexual gains.

The DPM-ST also attempts to provide a cognitive account for why specific themes (i.e., types of people, a particular person, whipping) are regularly incorporated into the content of an individual's sexual fantasy. It is proposed that, in addition, to encoding specific behavioural scripts, repeatedly fantasising about a particular theme can lead that theme to becoming associated with the concept of sexual fantasy. If this is the case, indirect measures should be able to detect the association. The results from Chapter 7 support this hypothesis, as child abusers who regularly use deviant sexual fantasies (i.e., extrafamilial abusers) were found to harbour child-sexual fantasy associations. These findings suggest that when the word 'sexual fantasy' is heard, thought of, or read by an offender who has a history of repeatedly using child-related fantasies, they are likely to automatically think of children or a specific child. However, before any solid conclusions are made regarding these specific theoretical prospects, replication studies and further research designed to rule out alternative explanations are needed.

In summary, the DPM-ST has generated a number of testable hypotheses, many of which are novel and have not been previously investigated. Moreover, many of the

hypotheses were supported, providing the initial steps towards corroborating the DPM-ST. As such, this thesis has contributed to furthering our theoretical understanding of the cognitive processes underlying and associated with deviant sexual fantasies/fantasising.

8.2.2 Clinical implications

The DPM-ST offers a number of potential implications for clinicians, both in terms of assessing and treating deviant sexual fantasies. With regards to assessment, the results of Chapter 7 suggest that indirect measures (i.e., the GNAT) can be used to assess deviant sexual fantasies, in terms of finding an association between the concept of sexual fantasy and the deviant theme depicted in the fantasy (e.g., children). While many indirect measures are thought to be useful for assessing sexual deviance (Banse, Schmidt, & Clarbour, 2010), not all sex offenders who have a sexual preference for children report corresponding sexual fantasies (Langevin, Lang, & Curnoe, 1998). As Beech and Ward (2004) note, many sex offenders with normative sexual scripts will use deviant fantasies as way of increasing their sense of well-being. Thus, an indirect measure specifically designed to assess deviant sexual fantasies may provide a way of detecting individuals who frequently use deviant fantasies, irrespective of whether they harbour a deviant sexual preference. The results of Chapter 7 provide some preliminary support for this, as the GNAT showed reasonably good predictive validity for predicting deviant sexual fantasisers when the subtypes were collapsed together.

Further research aimed at increasing the effectiveness of an indirect assessment tool for deviant sexual fantasy is a valuable endeavour given that sexual fantasies are a highly private and personal form of mental imagery. This is likely to be even more so for individuals who harbour deviant sexual fantasies, particularly sex offenders who may want to appear as though they are rehabilitated (Hall, 1996). As such, self-report methods of assessing sexual fantasy are likely to be susceptible to faking and socially desirable responding. A valid and

reliable indirect measure for assessing deviant sexual fantasy will provide a way to avoid this issue, as indirect measures are thought to be less susceptible to faking (Snowden et al., 2011).

Finally, the results of Chapter 5 suggest that, in line with assessing the content of sexual fantasies, it might also be worthwhile for clinicians to assess factors associated with fantasy ability (i.e., fantasy proneness, vividness of visual imagery). This may provide an indication of how deeply the offender becomes involved/absorbed in their sexual fantasies. It will also indicate whether vividness is a factor to address in treatment (see below).

With regards to treatment, some of the findings provide support for devising techniques that do not focus on (but can be used in conjunction with) strategies that aim to alter sexual arousal levels (i.e., directed masturbation, satiation). For example, the results from Chapter 4 suggest that it might be beneficial to address an individual's ability to fantasise in general, particularly if they present as fantasy prone and dissociative. This may involve identifying and encouraging activities that the offender expresses genuine interest in and which he is likely to become absorbed in (i.e., writing, drawing, solving puzzles, playing chess, playing music). The aim of this strategy is to channel the individual's attention away from sexual fantasies and on to other, less risky stimuli. The strategy could also be tied in with a strengths-based approach to treatment (i.e., the Good Lives Model; Ward & Stewart, 2003), so that the activity also enables the offender to acquire other needs that will help him function effectively in the community. However, these suggestions are preliminary and based on results with non-offenders. Thus, more research is needed before any action is taken to develop or adopt such strategies.

According to the DPM-ST, weakening and/or changing distorted associations would ultimately reduce the likelihood that sexual fantasies will be used. Unfortunately, due to the nature of the results in Chapter 3, this theoretical implication is unable to be supported. However, according to the SEM model in Chapter 4, distorted explicit cognitions about women played a role in determining whether aggressive sexual fantasies were used. Thus, it

can be argued that changing these explicit cognitions would reduce the use of aggressive sexual fantasies. There are a few studies showing that offenders' distorted explicit cognitions (i.e., those measured using self-report tools) can be altered using cognitive restructuring techniques (Beech et al., 2013). Thus, future research should aim to assess deviant sexual fantasy use before and after cognitive restructuring to see if this hypothesised technique is effective.

A final implication for treatment is offered by the results in Chapter 5. These results showed that the vividness, emotionality, and arousability of non-offenders' sexual fantasies are reduced by eye-movements. Thus, it can be argued that eye-movements may be an effective technique to use with sexual offenders who have trouble with deviant sexual fantasies. The use of eye-movements to clinically impair mental imagery has been researched in other domains and fall under what Hackmann, Bennett-Levy, and Holmes (2011) referred to as "imagery-competing" tasks. As the name suggests, these techniques affect the cognitive processes associated with mental imagery by competing for the same working memory resources (Gunter & Bodner, 2008; van den Hout, Engelhard, Beetsma... et al., 2011). In previous research, these techniques have been applied to positive memories (Hornsveld et al., 2011); negative imagery about the future (Engelhard, van den Hout, Janssen, & van der Beek, 2010); and food-related imagery (McClelland, Kemps, & Tiggemann, 2006). However, eye-movements have mostly been applied to traumatic and negative mental imagery, largely as a way of providing insights into how Eye-Movement Desensitisation and Reprocessing (EMDR) operates (Andrade, Kavanagh, & Baddeley, 1997; Gunter & Bodner, 2008; van den Hout, Muris, Salemink, & Kindt, 2001).

EMDR is an effective, 8-stage therapeutic protocol for treating trauma-related disorders (Shapiro, 1995). During the fourth stage, clients are required to bring the traumatic memory to mind and make a series of bilateral eye-movements. A recent meta-analysis has demonstrated that the use of eye-movements is an effective component of the EMDR process

(Lee & Cuijpers, 2013). An EMDR study using child abusers aimed to treat traumatic imagery associated with childhood sexual abuse (Ricci, Clayton, & Shapiro, 2006). The results showed a reduction in 'sexual thoughts' and deviant sexual arousal. In response to these findings, Vanhoeck, Van Daele and Gykiere (2011) argued that EMDR could be used to reduce deviant sexual fantasies related to an offender's victimisation memories. However the results of Chapter 5 indicate that EMDR (or at least the eye-movement component of EMDR) can be applied to treating sexual fantasies per se.

It could be argued that sexual fantasies based on real experiences are likely to be harder to treat with eye-movements due to their higher erotic valence (McGuire et al., 1965) and the richer quality associated with emotional autobiographical memories (Schaefer & Philippot, 2005). However, in line with previous findings (Engelhard et al. 2010), the results from Chapter 5 show that eye-movements can impair purely imagined sexual fantasies to the same extent as sexual fantasies based on recalled experiences. It can also be argued that the non-offender participants used their sexual fantasies because they found them to be pleasurable and positive. Thus, given their impairment, the results of Chapter 5 also support previous findings related to impairing positive memories with eye-movements (Hornsveld et al., 2010). More importantly, this is a clinically useful finding as many sexual offenders are likely to regard their sexual fantasies as positive. A technique that can affect a sexual fantasy regardless of this fact may prove highly beneficial.

In summary, the results of Chapter 5 can be seen as the first step towards formulating a new strategy for treating deviant for sexual fantasies. It is now important to replicate these results, particularly with sex offenders who have problems with deviant sexual fantasies. Also, Kavanagh, Freese, Andrade, and May (2001) and Gunter and Bodner (2008) found that the effects of EMs on negative memories were still present at a one week follow-up. Thus, it would also be advantageous for researchers to investigate whether the changes in vividness,

emotionality, and arousability of sexual fantasies persist at a follow-up period, as this would also have direct implications for the treatment of deviant fantasies.

8.3 Limitations and future directions

Throughout this chapter, a number of limitations have been mentioned. In this following section, a number of other noteworthy limitations will be highlighted so that future research can build upon the results effectively. First, in Chapter 3, there were a few issues regarding the Sorting Paired Features (SPF) task. The most significant limitation relates to the stimuli used for the adult-not sex category, as all three groups were noticeably slower at categorising them. This appeared to be facilitated by making an initial incorrect response and greatly affected the results. This issue may have occurred because the not-sex stimuli are an inadequate reflection of the category. For example, in their IAT study, Ó Ciardha and Gormley (2012) used words that could be used to describe an unattractive or non-sexual person (e.g., *dull, ugly, boring*). Although the stimuli used in Chapter 3 were derived from previous IAT studies (Gray, Brown, MacCulloch, Smith, & Snowden, 2005), adult-not sex and child-not sex associations were not examined in those studies as they are not needed/included in the calculation of an IAT score. Thus, this limitation of the SPF study may highlight a general limitation of this particular stimuli set and calls into question the results of previous IAT studies that have used them.

Another limitations of the SPF was the use of just 80 trials (20 per association). Although this was recommended by the developer of the SPF and resulted in supportive findings, it seems that, in retrospect, an increased number of trials may have been better for obtaining more reliable results. It is also worth highlighting that the sample sizes were relatively small. While it is important to delineate offender subtypes so that potentially important effects are not cancelled out, larger sample sizes are needed to ensure the study is not underpowered. Also, larger samples will increase the likelihood that there will be enough

offenders in each subtype. In the SPF, only 13 non-extrafamilial offenders were identified. Although reliable SPF results have been found and published with samples of just 14 participants (Bar-Anan, Nosek, & Vianello, 2009), it is highly recommended future researchers try and gain larger samples.

The SEM study in Chapter 4 also suffered from a sample size issue and so it is recommended that larger samples be used in the future. Also, the results could be made more reliable if an extra indicator was added to the Distorted Sexual Beliefs and Aggressive Sexual Fantasies latent variables. In retrospect, another latent variable that may have been important to have included in the SEM model is that of sexual preoccupation, as it is regarded as being closely associated with the use of sexual fantasies (Knight & Knight-Sims, 2003). This should be taken into consideration when looking to test a SEM model of this kind in the future.

While the DPM-ST states that working memory underlies all sexual fantasies regardless of their content (i.e., deviant and non-deviant fantasies), the present thesis would have benefited if the study in Chapter 5 had also used a sex offender sample or focused on deviant sexual fantasies. As stated earlier, this is certainly warranted for future research. Also, a more randomised strategy for allocating sexual fantasies to participants would have helped reduce the likelihood of the results being influenced by demand characteristics. Another point is that, although previous studies have shown eye-movements slow down reaction times on a task known to require working memory (e.g., van den Hout, Engelhard, Beetsma et al., 2011), it would have been worthwhile to have demonstrated and corroborated this in Chapter 5. This would have helped strengthen the argument that sexual fantasies require working memory.

In retrospect, the null effects of Chapter 6 are likely due to a number of possible methodological limitations. For example, the sample was comprised of mainly female participants. Previous research shows that females are more likely to use fantasies about submission rather than dominance (Zurbriggen & Yost, 2004). As the findings in Chapter 4 show, if someone does not hold explicit cognitions related to a particular sexual fantasy, they

are unlikely to use it. In light of these two points, it is possible that dominance fantasies were unable to sufficiently prime self-powerful associations in many of the female participants. As a result, future research should aim to focus on male participants, particularly those with a proclivity for coercive sex (including sex offenders).

Also, it would have been useful to have acquired baseline scores on the self-powerful IAT (i.e., pre-manipulation) in order to more confidently ascertain whether any changes occurred after envisioning dominance sexual fantasies. Another important consideration is whether the inclusion of a 'no-imagery' control group would have been useful to ensure that the neutral imagery was not increasing cognitive load and, therefore, affecting the IAT results. Given that previous research has convincingly shown that mental imagery can prime associations (Blair et al., 2001), similar studies to that in Chapter 6 should be conducted, but with the above limitations taken into account.

Finally, the study in Chapter 7 had some limitations. The main limitation was that the GNAT results may have been due to participants responding to the word 'sexual' in the category 'Sexual Fantasy'. Thus, future research should aim to use a GNAT with the category label 'Fantasy' as it will help provide insights into whether the present results were due to responding to the word 'sexual' or the phrase 'sexual fantasy'. If such a GNAT was able to show group differences and predict deviant sexual fantasisers to the same degree as in this thesis, stronger conclusions could be made. A further point is that some offenders mentioned that the stimulus word 'sex' was not regarded as a sexual fantasy. This indicates that perhaps the concept of fantasy was not viewed as a form of mental imagery but rather as the opposite of reality. This would need to be addressed in future studies, perhaps by using the GNAT with sex offenders who define sexual fantasy as a form of mental imagery.

In discussing these limitations, a number of suggestions for future research were raised. In addition to these, there are some other notable future directions to highlight. First, the use of pictorial stimuli with the SPF may be useful as it will introduce the option of

assessing non-focal associations, such as those related to gender or race. In others words, a pictorial SPF would enable associations between female child-sex and female adult-sex to be compared and the same for male related associations. While gender has been taken into account in IAT studies assessing sexual interest in children (Banse et al., 2010), it has done so using separate IATs (i.e., one for each gender). Thus, a pictorial SPF would allow gender-based associations to be assessed within one measure.

Another idea would be to investigate whether other 'imagery-competing' tasks (as opposed to eye-movements) can also be used to impair sexual fantasies. Tasks used in previous research include attentional breathing (van den Hout, Engelhard, Beetsma et al., 2011), mental arithmetic (Engelhard, van den Hout, & Smeets, 2011), the computer game Tetris (Engelhard, van Uijen, & van den Hout, 2010), and clay modelling (Andrade, Pears, May, & Kavanagh, 2012). Not only would this provide further support for the idea that working memory underlies sexual fantasising, but it would help ascertain if there are better imagery-competing tasks than eye-movements.

Finally, the DPM-ST is able to generate other hypotheses that were not examined in this thesis. For example, to test the idea that deviant sexual fantasies are influenced by activated sex-related associations, different groups of participants could be asked to write a sexual fantasy after a certain association has been primed. If participants write a fantasy related to the primed association, then this aspect of the DPM-ST would have some support. Other research ideas include testing whether individuals with a low working memory capacity or who experience a high cognitive load (i.e., stress) produce less vivid sexual fantasies than those with higher (or unloaded) working memory, and whether a low working memory capacity influences the use of external imagery (i.e., pornography), as opposed to internal sexual fantasies. Also, to support the DPM-ST further, it would be advantageous for future research to find more conclusive support that fleeting sexual thoughts are distinct from

elaborate sexual fantasies, as well as whether imagination-based sexual fantasies require drawing upon episodic information stored in memory.

8.4 Conclusion

This thesis aimed to further our understanding of the cognitive processes associated with deviant sexual fantasies by knitting together the literature on deviant sexual fantasy, mental imagery, associative and controlled processes, episodic memory/future thought, and fantasy-related abilities to produce a novel theoretical model; The Dual-Process Model of Sexual Thinking (DPM-ST). Taken as a whole, the main empirical findings of this thesis indicate that: 1) extrafamilial child abusers are more likely to hold distorted sex-related associations; 2) the use of a deviant sexual fantasy is partly dependent upon the individual's ability to fantasise in general (i.e., higher fantasy proneness, vividness of visual imagery, and dissociation) as well as on whether they harbour explicit cognitions that are congruent with the sexual fantasy; 3) if a sexual fantasy is engaged in, it will be at the expense of engaging in other cognitive tasks as the process requires the resources of working memory; 4) if other cognitively effortful tasks are performed at the time as sexual fantasising, then the sexual fantasy is likely to become impaired when brought back to mind at a later time; and 5) the frequent use of deviant sexual fantasies may cause an association to be formed between the deviant theme and the concept of sexual fantasy.

On a general level, the results of this thesis demonstrate just how multifaceted sexual fantasies are (Bartels & Gannon, 2011). In addition, the results provide a number of novel insights into the nature of deviant (and non-deviant) sexual fantasies. This has potential implications for both researchers and clinicians working with deviant sexual fantasies. Indeed, researchers in this field should aim to follow the various recommendations for future research in this thesis as they will help build upon the present findings and contribute to a fuller understanding of deviant sexual fantasy. Moreover, corroboration of the findings will provide

further justification for actualising the clinical implications outlined in this chapter (e.g., using eye-movements as a treatment strategy). Given that the DPM-ST has gained some preliminary support, it would also be beneficial for researchers to test other hypotheses generated by the model.

In closing, it is important to emphasise that the DPM-ST and the findings of this thesis only provide insights into the cognitive nature of deviant sexual fantasies. This is only one piece of a larger puzzle and it is important to keep in mind that other factors (i.e., endocrinological, neurological, behavioural, and affective) also play an important role in influencing sexual fantasies (Bartels & Gannon, 2011; Toates, 2009). Thus, an eventual aim should be to investigate how these cognitive processes interrelate with these various other factors, as it will provide a more holistic and sophisticated account of how deviant sexual fantasies operate and effect offending behaviour.

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Appendices

Appendix List

Appendices B-X are not available in the access copy of this thesis

Appendix A: Presentations, awards, and forthcoming publications arising from the work in this thesis

Conference Presentations

Bartels, R. M. (2013, June). *Investigating what underlies the dynamic risk factor of sexual deviancy*. Presented at the at the Division of Forensic Psychology Annual Conference, Belfast UK.

Bartels, R. M. (2013, February). *Untangling the cognitive associations of child abusers.* Presented at the 2103 European Winterschool for Forensic Psychology, Seeon, Germany.

Bartels, R. M., Beech, A. R., & Harkins, L. (2012, September). *Using the Implicit Association Task with child sex offenders: Current issues and future directions.* Presented at the Annual Conference of the National Organisation for the Treatment of Abusers, Edinburgh, UK.

Bartels, R. M., Beech, A. R., Harkins, L., & Dixon, L. (2012, June). *Investigating offence supportive cognition in male sex offenders: What we know, what we need to do.* Presented at the Division of Forensic Psychology Annual Conference, Cardiff, UK.

Bartels, R. M., Beech, A. R., & Harkins, L. (2011, November). *New directions for indirect measurement? Application of the Sorting Paired Features task and Go/No-Go Association Task.* Presented at the 30th Annual Conference of the Association for the Treatment of Sexual Abusers, Toronto, Canada.

Poster Presentations

Bartels, R.M., Beech, A. R., & Harkins, L. (July, 2013). *Through the eyes of the beholder: Using EMDR techniques with sexual fantasies.* Poster presented at the 28th Annual psyPAG Conference, Lancaster, UK.

Bartels, R.M., Beech, A. R., & Harkins, L. (2012, October). *Can Child Abusers' Deviant Sexual Fantasies Be Measured Indirectly?* Poster presented at the 31st Annual Conference of the Association for the Treatment of Sexual Abusers, Denver, Colorado, USA.

Bartels, R. M., Beech, A. R., & Harkins, L. (2012, July). *Towards a dual-process model of deviant sexual fantasy*. Poster presented at the 27th Annual psyPAG Conference, Newcastle, UK.

Bartels, R. M., Beech, A. R., & Harkins, L. (2012, April). *Applying the Sorting Paired Features task to the study of sex offender cognition.* Poster presented at the Annual BPS Conference, London, UK.

Awards

Best Student Poster Prize (2012, April) for a poster entitled: *Applying the Sorting Paired Features task to the study of sex offender cognition.* Awarded at the Annual BPS Conference, London, UK.

Graduate Research Award (2012, October) for the paper entitled: *The Indirect Assessment of Deviant Sexual Fantasy in Child Molesters.* Awarded at the 31st Annual Conference of the Association for the Treatment of Sexual Abusers, Denver, Colorado, USA.

Prize for Best Poster (2013, July) for a poster entitled: *Through the eyes of the beholder: Using EMDR techniques with sexual fantasies.* Awarded at the 28th Annual psyPAG Conference, Lancaster, UK.

Publications

Bartels, R. M, & Beech, A. R., Harkins, L., & Thornton, D. (under review). *Assessing deviant sexual fantasy in child molesters using an indirect assessment approach.*

Bartels, R. M., Beech, & Harkins, L. (under review). *Sexual fantasies become less vivid, emotional, and arousing after making bilateral eye-movements: Implications for the treatment of deviant sexual fantasies in sexual offenders*

Bartels, R. M. & Beech, A. R. (*in preparation*). Theories of deviant sexual fantasy. In T. Ward & A. R. Beech (eds.), *Theories of sexual offending.*