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**An Investigation of Implicit Theories and  
Factors Implicated in Sex Offending Theory in  
a Non-Offending Population**

By

**Ashling Bourke**

A Dissertation submitted for the degree of Doctor of Philosophy of the  
University of Dublin, Trinity College, Dublin 2, Ireland.

2012

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## Summary

This thesis set out to explore a number of constructs implicated in the sex offending literature within a sample of non-offending men. This particular sample was chosen in order to investigate the 'normal' presentation of such constructs, the inter-relationships between the constructs, and the methodological issues associated with the assessment of such constructs. It was expected that investigating the constructs in such a way, it would provide information on the 'normal' and in some cases 'deviant' presentation of the constructs that could then be applied to sex offenders theories, and additionally highlight the methodological issues inherent in assessing such constructs. In particular, the Implicit Theory framework (Ward & Keenan, 1999; Ward, 2000) was explored, and the relationship between implicit theories and other constructs implicated in the sex offending literature was investigated. Specifically, the constructs of empathy, theory of mind, executive function, sexual interest, and proclivity for sexual aggression were investigated in relation to implicit theories.

Based on the suggestion that similar processes underlie theory of mind and implicit theories, study one investigated the relationships between an implicit theory, executive functioning, cognitive and affective empathy, and theory of mind. The results indicated there was no relationship between a gender-good implicit theory and theory of mind. Additionally, executive function and cognitive empathy, but not affective empathy, were found to be significant predictors of cognitive theory of mind. An emotional recognition task was found to be the only significant predictor of affective theory of mind.



Study two investigated the relationships between sexual interest and implicit theories related to gender. Three attention-based methodologies, applied to the assessment of sexual interest, were investigated to determine the most sensitive measure of sexual interest. Gender-sex and age-sex implicit theories were also investigated. The results indicated that an age-sex implicit theory could not be identified within the current sample yet a gender-sex implicit theory was found among the heterosexual and homosexual men. Furthermore, the results indicated there was no relationship between sexual interest and the gender-sex implicit theory. However, taken together, the two constructs better predicted sexual orientation than either construct alone.

Study three investigated the role of deviant implicit theories and type of pornography use in an individual's proclivity for sexual aggression. This was based on the proposition that the relationship between pornography use and sexual aggression is moderated by a third variable, perhaps linked to risk factors for sexual aggression. Thus, three implicit theories common among rapists were investigated with regard to this relationship, in non-offending men. The results indicated that while the use of violent and objectifying pornography were related to rape proclivity, the presence of deviant implicit theories was the only significant predictor of an individual's proclivity for sexual aggression.

Overall the three studies outlined here indicate that implicit theories are not necessarily related to the affective constructs implicated in the sex offending literature, such as affective empathy and sexual interest. It is argued that the presence of implicit theories exists as a separate unrelated factor that increases an individual's risk for sexual aggression and together with additional factors, such as sexual interest, may increase risk for sexual aggression. Furthermore, it is argued that theory of mind should be investigated further in the

realm of sex offending, and possible relationship between theory of mind and the neuropsychological functioning and cognitive factors thought to play a role in the aetiology and maintenance of sex offending.

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## **Chapter 1: Introduction**

### **1.1 Prevalence rates and impact of sex abuse**

The issue of sexual abuse is an ever present social problem which can have devastating effects on victims and their families. Estimates of the prevalence of child sexual abuse in the general population of the US have ranged from 6-62% for females and from 3-31% for males (Finkelhor et al., 1986). The wide range in reported prevalence may be due to the difficulties and differences in the definition of sexual abuse. For example, some studies may only include child sex abuse whereas other studies also include adult sexual assault. Additionally, while some studies include only contact abuse others tend to include non-contact offences. Researchers however, have found that the general lifetime prevalence rate for child sexual abuse against females is between 15% and 25% and the rates are slightly lower for males (Finkelhor, Hotaling, Lewis, & Smith, 1990). In the UK, a study by the NSPCC indicated that 11.3% of young people had experienced contact sexual abuse during childhood (Radford, et al., 2011). The Sexual Abuse and Violence in Ireland (SAVI) report indicated that 20.4% of Irish females reported experiencing contact sexual abuse in childhood, with 5.6% of the abuse involving penetrative sex (McGee, Garavan, deBarra, Byrne, & Conroy, 2002). With regard to males, 16.2% reported having experienced contact sexual abuse in childhood, with 2.7% of the reported childhood abuse involving penetrative sex. Furthermore, 20.4% of females reported

experiencing contact sexual assault as an adult, while 9.7% of males reported contact sexual assault as an adult (McGee et al., 2002).

Along with the knowledge of the high prevalence, it is also becoming increasingly evident that the psychological and emotional costs to victims are profound. While remaining cognisant of the difficulties inherent in correlational studies, these studies have indicated an association between child abuse and later psychiatric disorders in women (Fergusson, Horwood, & Lynskey, 1996; MacMillan et al., 2001). In addition to these psychological difficulties, child sex abuse is associated with harmful effects on women's physical health. A number of studies have shown that experience of sexual abuse in childhood is related to increased self-reported prevalence or intensity of chronic pain, headache, gastrointestinal distress, respiratory difficulties, and neurological problems (Drossman, Li, Leserman, Toomey, & Hu, 1996; Felitti et al., 1998; Leserman (2005). The SAVI report also indicated that approximately 30% of women and 18% of men reported that their experiences of sexual violence (either childhood sexual abuse, or adult assault, or both) had a moderate or extreme effect on their lives overall (McGhee et al., 2002). Twenty-five percent of women and sixteen percent of men reported having experienced symptoms consistent with a diagnosis of Post-Traumatic Stress Disorder at some time in their lives, as a consequence of their experience of sexual violence. Those who had experienced sexual violence were significantly more likely to have used medication for anxiety or depression or to have been a psychiatric inpatient than those who did not experience sexual violence. Those who experienced attempted or actual penetrative abuse were eight times more likely to have been an inpatient in a

psychiatric hospital than those who did not experience sexual violence (McGhee et al., 2002).

Given the high prevalence rates and the effects of childhood sexual abuse, it is important to accurately understand, assess and treat those who sexually abuse children. Without an understanding of the problem, it is almost impossible to address it. While sexual abuse is a sensitive subject for many, often resulting in emotive and aggressive social responses, a more considered societal response is required in order to attempt to prevent future abuse and protect future victims. As Finkelhor states;

‘...it is only by highlighting (child sexual abuse) that we can undo the consequences of its invisibility. Public awareness is essential. To the extent that public awareness exists we treat the problem and find resources to deal with it’ (Finkelhor, 1984)

One example of the negative impact of a lack of public awareness comes from the over-emphasis on the notion of the stranger perpetrator. The vast majority of offenders are either related to or well known to their victims (Kelly, Koh, & Thompson, 2006) and even these figures are thought to be under-reported as families are less likely to report abuse by other family members or people within their immediate social circle (Groth & Birnbaum, 1978). Despite this finding however, prevention and awareness programmes with children still tend to focus on the stranger perpetrator. Thus rather than society taking a measured response to the problem, the focus remains on the stranger perpetrator, which in turn puts the onus on children themselves to protect themselves from abuse. This issue highlights the need for societal and community awareness of perpetrator characteristics, in order to protect future victims.



A more considered societal response to the problem of sexual abuse requires investigating the possible causes of offending, starting with the characteristic of the perpetrator. A major difficulty encountered in this area is the heterogeneity of offenders. There is no one typical sex offender and sex offenders tend to have unique personal and criminal histories with varied attitudes and beliefs that support their offending behaviour (Gordon & Porporino, 1990). Although broad classification systems have been developed, with the more sophisticated models attempting to take this heterogeneity into account, sex offenders as a group can include both genders, all ages, all socioeconomic classes, all racial and ethnic backgrounds, all levels of educational achievement and intellectual levels. Despite this heterogeneity, however, common characteristics have been found, including low self-esteem (Pithers, 1994; Ward, Hudson & Marshall, 1995); intimacy deficits (Marshall, 1989; Seidman; Marshall, & Hudson, 1994); victim empathy deficits (Marshall, Barbaree, & Fernandez, 1995; Pithers, 1994); unassertiveness (Abel, Mittelman, & Becker, 1985) and holding distorted ideas about sexual activity (Ward, Hudson, & Marshall, 1995). Building on this research, Fisher, Beech, and Browne (1999) found that seven measures successfully discriminated child sex offenders from non-offenders, suggesting that child sex offenders have lower self-esteem, are emotionally lonelier, have higher levels of personal distress, are less assertive and have less empathy towards victims of sexual abuse than non-offenders.

A number of theories have been postulated in an attempt to explain both the aetiology and maintenance of sexual abuse. It has been suggested that a comprehensive theory of sex offending should be able to describe not only the



aetiology of sex offending (Level 1 analysis) but also the mechanisms associated with offending (Level 2 analysis) and the process of sex offending as it unfolds across time (Level 3 analysis) (Ward, Polaschek, & Beech, 2005). The various theories will be discussed below with specific emphasis given to the level 3 theories. Later chapters will explore the role of the cognitive factors outlined in these theories.

## **1.2 Offender Classification**

This section will begin by introducing some of the models frequently employed to classify sex offenders. Given the heterogeneity of sex offenders mentioned previously, no classification system has yet achieved universal validity. However, to ensure appropriate assessment and treatment, it is important to understand the characteristics common to the different types of offenders and classify them accordingly. Quinsey (1977) initially proposed that incestuous offenders are primarily situational offenders whose offences are primarily a result of family dynamics and opportunity rather than to an underlying sexual preference for children. Groth, Hobson, and Gary (1982) built on this proposition and put forward a classification method based on the degree to which the deviant sexual behaviour is entrenched in the offender and constitutes a pervasive psychological need. This is known as the fixated-regressed dichotomy of sex offending, which characterises the fixated offender as having a persistent, continual and compulsive attraction to children. On the other hand, for the regressed offender, offending stems from stressors in the individual's environment which undermine self-esteem and confidence and offending is a departure from the offender's attraction to adults (Terry & Tallon, 2004).

Finkelhor (1984) conceptualises fixated offenders as exclusively involved with children with virtually no age-appropriate relationships. They are usually involved with children from adolescence and are likely to be diagnosed with paedophilia. For the regressed offender, on the other hand, sexual involvement with children is a temporary departure from the offenders' primary sexual attraction to adults. The offending behaviour tends to be precipitated by external stressors. These stressors can be situational (e.g., marital difficulties, substance abuse) or can be related to negative affective states such as stress, loneliness or anxiety. Regressed offenders often victimise their own children. Arousal patterns for the regressed offender are often similar to that of normal men. A number of researchers have built upon this fixated-regressed typology.

For example, the FBI expanded on Groth's typology to include seven subgroups of offenders based on the situational-preferential dichotomy. The situational offender can be further subdivided into four categories; (1) the regressed offender, who is characterised by poor coping skills, their target victims are easily accessible, and they abuse children as a substitute for adult relationships; (2) the morally indiscriminant offender who does not prefer children over adults but uses them sexually in order to meet their own needs; (3) the sexually indiscriminant offender who is mainly interested in sexual experimentation and abuse out of boredom and, (4) the inadequate offenders who include socially inadequate individuals with low self-esteem, whose relationship with children is seen as their only sexual outlet. The preferential type offender is further subdivided into three categories; (1) the seductive offender, who 'courts' children and gives them affection

and gifts in an attempt to carry out a 'relationship'; (2) the fixated offender who, is characterised by poor psychosexual development, desires affection from children and is compulsively attracted to children and, (3) the sadistic offender, who is aggressive and sexually excited by violence, who tends to target stranger victims and is extremely dangerous (Holmes & Holmes, 1996).

Knight and Prentky (1990) developed the MTC:CM3 classification system, a multidimensional typology on two axes. Axis 1 assesses the extent to which the offender is fixated with children, and further assesses the offender's level of social competence. Axis 2 assesses the amount of contact an offender has with children, assesses the meaning of the contact (interpersonal or sexual) and assesses the amount and type of physical injury involved, including threats and use of force. This system assigns each offender with a separate axis 1 and axis 2 typologies and can theoretically distinguish between twenty four different types of offenders. This typology has shown adequate reliability and validity (Knight, Carter, & Prentky, 1989) and is often regarded as the most comprehensive typology of child molesters (Marshall, 1997).

### **1.3 Theories of offending**

While the classification schemes described above are useful for law enforcement agencies and sex offender interventions, they tell us little about the mechanisms underlying sex offending. Theories from a number of different psychological perspectives have been postulated in an attempt to explain the aetiology of child sex offending. It is beyond the scope of this thesis to give a comprehensive account of each perspective; however I will give a brief overview of four different perspectives, to contextualise the findings described later, with; genetic, feminist, learning, and



cognitive theories, of which the first three have mainly focused on the development of deviant sexual interest. For the sake of brevity, I will keep these explanations brief, in order to focus in more depth on the explanations pertinent to the current thesis. Following consideration of these different theoretical perspectives, I will then discuss a number of multi-factorial explanations of offending. These theories are seen as advantageous in terms of their ability to account for the heterogeneity of sex offenders as well as the various possible causal routes to offending. The chapter will end with an analysis of the Integrated theory of Sex Offending (Ward & Beech, 2006), a theory that will be revisited in later chapters of the thesis.

Before discussing the different theories on how deviant sexual interest might develop, it should be noted that deviant sexual preference is only one factor which plays a role in offending. As will be highlighted by the multifactorial theories of offending, a combination of factors have been proposed as causal strands underlying sexual abuse, including low self-esteem, intimacy deficits, problems empathising with victims, distorted beliefs and deviant sexual interest. However, attention will be given to how deviant sexual interest develops, given its importance in the aetiology and maintenance of offending and as the construct will be explored later in the thesis. There is a general consensus that deviant sexual interest is a major predictor of deviant sexual behaviour. This was first proposed by McGuire, Carlisle, and Young (1965) and later evolved into the “sexual preference hypothesis” (Lalumiere & Quinsey, 1994). This hypothesis asserts that men who engage in sexually deviant behaviours do so because they prefer them to socially acceptable behaviours. The

following theories will provide possible explanations for the development of deviant sexual interest.

### **1.3.1 Biological Theories.**

Advances in brain research have increased our understanding of brain development and biochemical influences on our behaviour. Quinsey and Lalumiere (1995) hypothesised that men who have a sexual preference for children over adults have a biologically evolved malfunction in their sexual preference system as a result of an in utero hormonal problem. This malfunction is hypothesised to cause offenders to prefer children's body shapes. However, a number of authors have argued that there is little evidence that a hormonal problem in utero provides an adequate explanation for paedophilic preferences (Blanchard & Bogaert, 1998; Bogaert, Bezeau, Kuban, & Blanchard, 1997).

#### ***1.3.1.1 Kafka's Monoamine Hypothesis (1997; 2003).***

Kafka (1997; 2003) suggested that the neurotransmitters noradrenalin, dopamine and serotonin may be implicated in deviant sexual interest. This hypothesis was derived from a number of different sources. Kafka argues that there is evidence that decreased levels of 5HT may disinhibit sexual appetitive behaviour while increased central 5HT activity may inhibit sexual appetitive behaviour in some animals (Kafka, 1997). Additionally, it is argued that the side effects of pharmacological treatment for Axis I disorders, which have an effect on monoamine function, appear to have substantial effects on human sexual functioning, including a reduction in paraphilic arousal. Research also indicates a significant increase in epinephrine in paedophiles compared with non-paedophiles after administration of a post-synaptic 5-HT<sub>2</sub> receptor agonist (Maes et al., 2001). While this is an interesting

hypothesis, the research is tentative at present, and much more work needs to be completed to understand clearly the biological basis for paraphilic arousal and behaviour. Furthermore, as with most biological theories, it does not account for the role of the environment in offending behaviour. Ward and Beech (2006) argue that there is not a great deal of firm evidence regarding the relationship between monoamine dysfunction and deviant sexual interest and, as Kafka notes, dysregulation of 5HT may underpin more general disinhibition rather than being specific to deviant sexual preference.

### **1.3.2 Feminist theories.**

Feminist theories of sexual offending have been proposed in light of the finding that the vast majority of perpetrators of abuse are men and the majority of victims are female (Finkelhor, 1979; 1990). These theories state that sexual assault reflects the perpetration of power and control that men hold over women and others with less power in society (Herman, 1990; Hooper & Kalaski, 2006). This notion of power and control is suggested to account for not only offences against adult women but also sexual abuse of male and female children, as children are seen to have less power and control than adult men in Western societies. One such feminist theory, Cossins' Powerlessness Theory, states that child sex abuse is a method by which some men establish their masculinity and power and alleviate their experiences of powerlessness (Cossins, 2000). The theory asserts that gender is not a static property, but rather it is constructed out of the activities peoples engage in. The social construction of masculinities is suggested to involve the construction of dynamic relationships of power between men which results in men's lives being characterised by a combination of power and powerlessness. The central features of masculinity are



thought to be power and sexuality. Thus, in order to experience power men must repeatedly engage in certain social practices to prove his masculinity, including forming relationships with a less powerful partners and engaging in endless sexual conquests. It is argued that these masculinities can be established through child sex offending within a cultural environment where the characteristics of less powerful individuals include willingness, compliance, petiteness, and submissiveness, all characteristics of children. It proposes that through child sexual abuse a man can accomplish a sense of masculinity and overcome the experiences of powerlessness (Cossins, 2000). Support for this theory comes from the finding that sexual abuse has been documented at higher rates in male dominated societies (Herman, 1990; Palmer, 1989). However, the contention that societal values are the basis for offending provides a very narrow view of the problem, and as with the preceding theory, only explains one particular aspect that may contribute but cannot possibly explain all the contributing factors to offending. A major difficulty with the theory is that the majority of adult males in the same society as offenders do not offend against children and the theory fails to account for abuse perpetrated by females. Ward and Beech (2006) argue that psychological literature has confirmed that men commit child sexual abuse for a variety of reasons and that normal male sexuality is probably more complex than Cossin's description. Furthermore, sexuality is more than simply a social construct as this theory proposes, but reflects a combination of inherited, biological dispositions and powerful social learning experiences (Symons, 1979).

### **1.3.3 Learning theories.**

Learning theories emphasise the impact of the environment, including influences from watching and interacting with others in the offender's life. Learning theories

postulate that deviant sexual interests, fantasies and behaviours may be developed and maintained through a combination of conditioning and learning processes (Laws & Marshall, 1990; Marshall & Marshall, 2000). The theories have developed from the observation that sex offenders consistently report a higher frequency of childhood maltreatment, including sexual abuse, than do members of the general population (Marshall & Marshall, 2000; Ryan, 2002). The high prevalence of abuse indicates there is a likely relationship between adverse childhood environments and the development of sexually offending behaviour (Laws & Marshall, 1990). It should be borne in mind, however, that such factors do not fully explain offending behaviour, given that the majority of individuals who experience childhood maltreatment do not go on to sexually abuse and not all offenders have experienced negative childhood experiences.

Theorists who use classical conditioning to explain sexual offending assume that human sexual arousal is initially an unconditioned response which can become a conditioned response through pairings with environmental or symbolic stimuli (Laws & Marshall, 1990). According to these authors, assuming sexual arousal is an unconditioned response, then exposing an initially neutral stimulus (e.g., a child's body) in proximity or in association with an unconditioned stimulus (e.g., masturbation) with sexual arousal is likely to cause the neutral stimulus over time to become a conditioned stimulus and to produce a response of sexual arousal (conditioned response) (Laws & Marshall, 1990).

Operant conditioning is also thought to play a role in sex offending (Laws & Marshall, 1990). Operant conditioning theorists argue that an association is made

between a behaviour and a consequence (reward or punishment) for that behaviour (Skinner, 1953). In terms of sexual offending, it is presumed that reinforcement may result in deviant sexual interest if a person's sexual arousal to young children is paired with the sexual gratification the person receives by masturbating to fantasies of young children (Laws & Marshall, 1990). A combination of both classical and operant conditioning could explain the more complex concepts of deviant sexual arousal and behaviour (Laws & Marshall, 1990). A person's initial deviant sexual arousal may develop through classical conditioning and this arousal may be further strengthened through an operant conditioning reinforcement process.

Social learning theorists suggest that rather than people reacting solely to consequences, people apply cognitive processes to the consequences they experience, or that they view others to experience (Bandura, 1973). People can learn by observing the behaviour of others and the outcomes of those behaviours (Bandura, 1973). The reinforcement or punishment, either seen to occur to others or experienced by the observer themselves, influences their future behaviour (Bandura, 1973). Bandura outlined three processes that are involved in social learning; participant learning, vicarious learning and symbolic learning. Participant learning occurs when an individual learns a behaviour by directly participating in the behaviour with others and the person replicates that behaviour in the future. This type of learning may explain the aetiology of some sex offending behaviours (Bandura, 1973). For example, if an offender was themselves sexually abused as a child, they may offend against a child in the same manner as they were abused. Vicarious learning occurs when a person who is not participating in a behaviour observes others participating in



the behaviour and later replicates the observed behaviour (Bandura, 1973). For example, someone who watches sexual abuse occur, in person or through some media, and later re-enacts those behaviours. As will be discussed in more detail in chapter five, this explanation is frequently offered when discussing the role of pornography in sexual offending. For example, it has been suggested that exposure to pornography in childhood may be related to sexual offending, especially for those with a predisposition to sexually offend (Seto, Maric, & Barbaree, 2001). Symbolic modelling occurs when a behaviour and its consequences (either positive or negative) are developed or enhanced through fantasy (Bandura, 1973). In terms of sexual offending, this is theorised to occur when the individual masturbates to deviant sexual fantasies (Laws & Marshall, 1991). This type of learning may first begin through participant modelling and vicarious learning (Laws & Marshall,). That is, whether through personal experience, media presentation or watching others, exposure to deviant stimuli is believed to be enough to provide the information required to formulate and later enhance deviant fantasy (Laws and Marshall). These fantasies may then be enacted with someone with whom the offender has access. However, it should be noted that some researchers have found that many sex offenders only experience deviant fantasies after offending (Swaffer et al. 2000). Furthermore, the mechanisms of how deviant fantasy influences behaviour are not well understood, for example, not all sex offenders experience deviant fantasies and deviant fantasies are also found in 'normal' populations (e.g., Hall, Shondrick, & Hirschman, 1993). Thus symbolic modelling may be more appropriate in understanding the maintenance of offending behaviour rather than the aetiology (Carter, 2007).

While the above theories attempt to explain deviant sexual interest, it is likely that deviant sexual interest alone would not be sufficient to explain all sex offending and additional factors need to be present for the offending to occur. This is particularly relevant given the finding that that a large proportion of child sex offenders do not show an exclusive sexual interest in children, and often show an equal or larger sexual interest in adult females (Barsetti, Earls, Lalumière, & Bélanger, 1998; Lang & Frenzel, 1988).

#### **1.3.4 Cognitive theory.**

Along with theories of deviant sexual interest, cognitive theories have also been suggested to explain the aetiology of offending. A brief introduction to cognitive theory will be provided here and the topic will be revisited more comprehensively in later chapters as the role of cognition in offending is a central facet of this thesis. The concept of deviant cognitions is an important component of cognitive behavioural therapy, the most widely accepted and effective treatment programme for sex offending (Beech & Fisher, 2004). Cognitive theories posit that sex offenders offend because they hold particular cognitive distortions related to their victims, sexuality and the world in general and use these cognitive distortions to explain, support and justify their offending behaviour (Abel, Osborn, & Twigg, 1993). For example, Sternmac and Segal (1989) hypothesised that child sex offenders were more permissive in their thinking regarding sexual contact with children and more accepting of such behaviour compared to non-child sex offenders. This theory will be covered comprehensively in later chapters, with particular emphasis on the Implicit Theories account of cognitive distortions. While cognitions are generally presumed to play a role in offending, whether as a precursor to offending or as a post-offence



rationalisation, they are only one factor and by themselves, such distortions, may not be sufficient in explaining the aetiology of sexual offending behaviour. For example, in addition to cognitive distortions offenders may have additional problems such as poor coping skills, poor impulse control, emotional dysregulation, and poor interpersonal skills that may contribute to sex offending behaviours (Abel et al., 1993; Marshall & Marshall, 2000). Thus, this factor by itself may not be sufficient in explaining sexual offending but should deviant cognitions be present, this may increase an individual's likelihood of offending.

Given the heterogeneity of offenders, a number of multifactorial theories have been suggested to explain sexual offending. Multifactorial theories implicate a number of different factors in the explanation of sex offending, generally including social, cognitive and personality factors. An outline of the main multifactorial theories of sexual offending is provided below, which include: Finkelhor's precondition Model (Finkelhor, 1984), Marshall and Barbaree's Integrated Theory (Marshall & Barbaree, 1990), Hall and Hirschman's quadripartite Model (Hall & Hirschman, 1992) , Ward and Siegert Multiple Pathways Model (Ward & Siegert, 2002) and the Integrated Theory of Sex Offending (Ward & Beech, 2006). These theories tend to be informed by each other, and a number of similar factors have been outlined in each, which will be discussed in more detail later. One of the aims of this thesis is to investigate the methodological and theoretical issues inherent in some of the concepts outlined in these theories. The purpose of this thesis is to determine the relationship between these factors, in a sample of non-offending men, with particular emphasis on the cognitive components of the concepts.

### **1.3.5 Precondition Theory (Finkelhor, 1984).**

Finkelhor (1984) was one of the first theorists to emphasise the need for a multifactorial account to explain the factors that motivate the initiation and maintenance of child sex offending. The precondition theory outlined four factors, each of which is proposed to be a contributing factor to sex offending; sexual arousal to children, emotional congruence, blockage, and disinhibition. Emotional congruence refers to the offender having more affinity to children than to adults, that is, the child satisfies important emotional, non-sexual needs of the offender. Blockage refers to obstacles that prevent the development of socially acceptable sexual interactions with adults, for example, poor social skills and difficulties with intimacy. Disinhibition can include factors such as intoxication, antisocial attitudes, psychosis or impulsivity. The theory also outlines four conditions required for the offence to occur; motivation to commit the offence; overcoming internal inhibitions, for example, fear of arrest, empathy; overcoming external inhibitions (situational factors), for example, presence of other adults; and overcoming the resistance of the child which can include coercion and grooming. All of these conditions must be met for the abuse to occur (Finkelhor, 1984).

One major advantage of this theory is that it was one of the first theories in the area to attempt to explain sex offending from a multidimensional perspective. Thus according to the theory, an individual does not offend because of deviant sexual interests alone, but rather because of the interaction of multiple factors. As it implicates a number of different factors in offending, the theory can account for the different offender typologies and illustrates the diversity of processes involved in sex offending. However, the theory does not place much emphasis on how these factors

may have developed within an individual and how these factors may interact, particularly that of blockage and emotional congruence. Furthermore the theory gives little attention to the role of cognition in offending.

#### **1.3.6 An Integrated Theory (Marshall & Barbaree, 1990).**

Marshall and Barbaree (1990) proposed a multidimensional developmental theory that integrates biological vulnerabilities and adverse early experiences in the development of social skills deficits and self-regulation problems. The theory suggests that the biological vulnerabilities reflect disturbances in male-typical predispositions towards sexual behaviour and physical aggression. The theory emphasises the need for adolescents to learn to discriminate between aggressive and sexual impulses and to regulate aggressive tendencies during sexual behaviour. An individual's predisposition to sexual offending occurs on a continuum ranging from extreme weakness to extreme resilience. An individual's resilience is made up of their skills, attitudes, and values. According to the theory, vulnerability factors develop over a lifespan but early childhood experiences are particularly important as it is during this period that individuals develop social and interpersonal skills through attachment and role modelling. An abusive or hostile early home environment can lead to maladaptive attitudes and distorted schemas of relationships. Adverse earlier childhood experiences can make the transition into adolescence difficult and may hinder the development of normal sexual relationships. According to the theory it is during this period that the individual is most receptive to developing sexual preferences. An increase in sex hormones during this period is thought to increase the salience and potency of sexual stimuli. Those individuals with social skills and



intimacy deficits are hypothesised to be adversely affected by these hormonal changes and they learn to meet their emotional and social needs in a sexually deviant manner. Deviant sex or fantasies are hypothesised to reduce sexual tension, increase an individual's feeling of personal effectiveness and control, and increase their self-esteem. An inability to form age appropriate relationships can lead an individual to turn to children as a substitute for adult company. Any fantasies about children are then reinforced by masturbation and this increases the individual's motivation to sexually offend against children. Children can be seen as a more viable intimate partner as they are less likely to reject the person seeking intimacy. Alternatively, the offender may commit rape in order to gain sexual gratification, as their poor social skills leads to difficulties managing sexual urges appropriately, and difficulties establishing intimate relationships. The greater the level of vulnerabilities, the less an individual is able to deal with stressors and the greater the chance of them committing a sexual offence. The subsequent reinforcement, through sexual pleasure, sense of control and reduction of negative mood, can increase the likelihood of repeating the behaviour (Marshall & Barbaree). Furthermore, the theory suggests that sex and aggression are difficult to discriminate as they are suggested by the authors to be similar instinctual constructs and originate from the same neural structures (e.g., the hypothalamus). The existing vulnerability factors interact with transient situational factors such as stress, intoxication or the presence of a potential victim which increases the potential of an individual to sexually offend.

One of the major strengths of this theory is that it considers the interaction of an individual's predisposition to offend with environmental factors, and suggests why

some individuals offend in some circumstances and not in others. It is a comprehensive model that takes into account the causal mechanisms that generate the clinical symptoms evident in sex offenders. The theory is also seen as advantageous as it takes a developmental perspective, incorporating childhood experiences and adolescent development into later adult offending behaviour.

However there are a number of limitations to the model. It tends to have a negative view of adult male functioning suggesting that aggression and sexuality are automatically linked and therefore it is possible for any individual to sexually offend depending on the circumstances. The theory also tends to focus on the heterosexual relationship as being the 'healthy' interpersonal relationship and discusses sexual preference as developing during adolescence. Therefore, the theory tends to ignore the issue of homosexual preference and the possibility that preference being inherent to the individual from birth or being formed early in life.

Ward (2002) has argued that the general nature of the theory means that it fails to take into account the different subtypes of offenders. In particular Ward (2002) argues that while the theory appears to account for the preferential subtype of offender, it fails to account for the behaviour of situational offenders. These offenders tend to begin offending later in life and may not have the interpersonal or social skills deficits outlined in the model. Furthermore, Seto and Lalumiere (2010) have argued that the theory is unclear about why individuals who are unsuccessful in peer relationships would choose sex with children or coercive sex rather than options such as sex with prostitutes or masturbation to pornographic material.



Additionally, the suggestion of the similarity between sex and aggression tends to be oversimplified. The theory suggests that the similarity is based on the observation of similar subjective experiences involved in the two constructs and shared neuroanatomical structures. However, this gives a crude idea of neuroanatomical function. Because two constructs share neurological structure does not necessarily mean that they will share functions. Furthermore, the theory tends to discuss both rape and child sex abuse as involving similar aggressive elements. However research indicates that the use of physical violence is rare during child sex abuse (Knight & Prentky, 1990).

#### **1.3.7 The Quadripartite Theory (Hall & Hirschman, 1992).**

Hall and Hirschman (1992) later proposed the Quadripartite theory of offending in which they outlined four factors that contribute to offending. This model originally focused on rape and later became extended to include child sex abuse. The four factors include physiological sexual arousal to children or sexual coercion, cognitions that justify sexual contacts with children, affective dysregulation and personality problems. While the factors have been hypothesised to operate both singly or in combination, one particular factor is likely to be the primary, prominent factor for a particular type of offender. Those primarily motivated by sexual arousal will hold deviant sexual interests and fantasies which are the primary motivation for offending. They are expected to have multiple victims, use low levels of force/threat and are unlikely to engage in non-sexual offences. Those primarily motivated by cognitions are hypothesised to justify and rationalise their offending behaviour through cognitive distortions and victim blaming. They are hypothesised to engage in a high level of

planning, and are more likely to commit offences against related children. Those primarily motivated by affective dysregulation are hypothesised to have difficulties regulating emotion, commit offenses opportunistically, use higher levels of violence, and commit both sexual and nonsexual offenses. The final subgroup of offenders consists of those with personality problems. They are hypothesised to have difficulty establishing intimate adult relationships. This type of offender is similar to Groth's fixated offender. Overall, activation of one primary motivator increases the intensity of others, thus pushing the individual above the critical threshold for sexual offending.

This theory is seen as advantageous as it allows for different pathways to offending and therefore takes into account different subgroups of offenders. Furthermore, by introducing the idea of an offence-threshold, it accounts for why offenders abuse under some circumstances and why non-offenders can share some of the characteristics of offenders, yet never sexually offend. However, unlike Marshall and Barbaree's (1990) theory outlined above, this theory tends to focus on factors inherent to the individual and fails to incorporate the role of situational factors in offending. The theory has also been criticised for not explaining why one factor is the most important for a particular individual or how the factors interact to increase the likelihood of sexual offending (Seto & Lalumiere, 2010). The different factors are likely to interact in particular situations thus increasing the individual's likelihood to offend, however how the factors interact and under what circumstances is not outlined by the theory.

### **1.3.8 The Multiple Pathways Model (Ward & Siegert, 2002).**

Ward and Siegert (2002) used a 'theory-knitting approach' to integrate the important elements and address the limitations of the preceding theories. Thus they developed a more comprehensive multifactorial theory, the Multiples Pathways Model of offending. According to the theory, there are multiple etiological pathways that lead to offending, and each pathway is associated with a set of core primary psychological mechanisms that act as vulnerabilities to offending. Sex offending occurs when these mechanisms interact with each other. Each mechanism is influenced by the individual's learning history, biological factors, social and cultural factors, and environmental factors.

The model suggests that the clinical phenomena evident in child sex offenders are generated by four distinct and interacting types of psychological mechanisms; intimacy and social skills deficits, cognitive distortions, emotional dysregulation, and distorted sexual scripts. Each mechanism depicts a specific offence pathway with different psychological and behavioural profiles. A fifth pathway represents individuals with multiple dysfunctional mechanisms. Although each pathway is hypothesised to be associated with a unique set of primary mechanisms and cluster of symptoms, the model proposes that the mechanisms always interact to cause a sexual crime. That is, every sexual offence involves emotional, cognitive, arousal and intimacy components; however each distinct pathway has at its centre a set of primary dysfunctional mechanisms that interact with the others. The intimacy deficit pathway results in offenders who have normal sexual scripts and only offend at specific times, for example, times of emotional loneliness. The model suggests that offenders along this pathway prefer sex with adults and are more likely to abuse



children when adults are not available. The child becomes a surrogate partner. The primary dysfunctional mechanism is hypothesised to be an insecure attachment style. The deviant sexual script pathway results in offenders who have subtle distortions in their sexual scripts which interact with dysfunctional relationship schemas, where relationships are represented in purely sexual terms. Men along this pathway are likely to perceive relationships in sexual terms, be characterised by a drive for impersonal sex and as a consequence find them ultimately unsatisfying. They are not hypothesised to have developed sexual preferences for children as such, rather, abuse is more likely to be opportunistic and a way of easing a sexual or emotional needs. They are likely to confuse sex with intimacy and seek emotional reassurance through sex. They may confuse sexual cues with those signalling affection and closeness. They may fear rejection by others if they were to form intimate relationships and they may abuse a child after experiencing rejection by a peer. The emotional dysregulation pathway offender is thought to possess normal sexual scripts but has dysfunctional mechanisms associated with emotional regulation. They may have difficulty controlling their anger or they may be unable to control their negative emotions. During times of emotional stress they may be unable to access appropriate social supports and may use children opportunistically to satisfy a sexual need or to punish a partner. Their preference is for sex with an age-appropriate partner, but sex is used inappropriately as a coping mechanism. The antisocial cognitions pathway offender contains no distortions in their sexual scripts but possess pro-criminal attitudes and their offending represents their general antisocial tendencies. It is hypothesised that this group of offenders will frequently engage in criminal actions as children and

adolescents and may receive a diagnosis of conduct disorder. A fifth pathway involves multiple dysfunctional mechanisms. It contains individuals who have developed deviant sexual scripts that alleviate deviant sexual fantasies and usually reflects a history of sexual abuse or exposure to sexual activity at a very young age. This type of offender is thought to have pronounced flaws in other primary psychological mechanisms. This pathway offender is likely to constitute what is termed a 'pure' paedophile (Ward & Siegert, 2002). Their vulnerability interacts with all four of the problematic common clusters, that is, deviant arousal, intimacy deficits, inappropriate emotions and cognitive distortions. They tend to idealize relationships with children and maintain dysfunctional ideas about children's sexuality, and the child's ability to make informed decisions about sex. They are likely to have intimacy deficits with adult relationships, making them unable to relate in ways that will foster a mature relationship. These common clusters of deviant sexual arousal, intimacy deficits, inappropriate emotions and cognitive distortions interact with the vulnerability factors and within this context, factors become more or less significant across the developing life course.

This theory is similar to the Hall and Hirschman (1992) theory in that one of the four factors may be the primary motivational precursor that activates the other elements. However, Hall and Hirschman also suggested that each factor can operate on its own to cause sexual deviance. The pathways model on the other hand argues that every sexual offence involves all four sets of factors with one factor being the primary motivator for offending. Given the involvement of all four factors in each offender, this allows for the heterogeneity of offenders. By outlining the different



offence pathways it accounts for why offenders with similar deviant sexual interest will present with different clinical symptoms.

Connolly (2004) used qualitative analysis to investigate the model, in particular the developmental trajectories and early life experiences of offenders. The results were tentative but suggested that the majority of offenders were found to be a reasonable fit to the model. Middleton, Elliot, Mandeville-Norden and Beech (2006) investigated this theory with a group of internet offenders and found the most common pathway for this population was the intimacy deficits pathway. However, almost half of the internet offenders could not be assigned to any of the five pathways as they did not score above average in any of the measures used in the study. This would indicate that the theory has limited applicability, particularly to this particular group of offenders. Ward, Polaschek, and Beech (2005) argued that the idea that there are four sets of mechanisms underlying the four clusters of problems may be a little too neat and may not actually work. This potential weakness is addressed in the following theory.

#### **1.3.9 The Integrated Theory of Sex Offending (Ward & Beech, 2006).**

Ward and Beech (2006) carried out a further critique of the theories available and argued that while there have been some good accounts suggested, the majority of theories tended to focus on the surface level of symptoms and fail to take into account the biological underpinnings of human nature. The authors suggest that the causal factors of sex offending that have been highlighted are simply general descriptions of observable factors. 'They are convenient labels for summarising behaviour masquerading as causal mechanisms' (Ward & Beech, 2006, p. 45). They argue that existing theories neglect neuropsychological and biological levels of analysis thus

giving incomplete explanations of sexual offending. The integrated theory incorporates a number of different causes of offending including; developmental experiences, such as child abuse; genetic predispositions; social and cultural factors; contextual factors, such as negative affect or intoxication; and psychological dispositions, including cognitive distortions, empathy deficits, social skills deficits and deviant sexual interest. The theory reduces each of these causal elements to three sets of factors which interact continuously; biological factors, influenced by genetic factors and brain development; the offender's proximal and distal ecology, that is the social, cultural and personal circumstances; and three neuropsychological systems.

It is suggested that genetic predispositions and social learning have a significant impact on brain development and result in the establishment of three interlocking neuropsychological systems. The three sets of factors are proposed to interact to generate the clinical factors evident in offenders. The consequences of offending, in terms of the impact on the environment and psychological functioning, may then maintain a positive feedback loop that entrenches the individual's vulnerabilities (Ward & Beech, 2006).

The theory was strongly influenced by the work of Pennington (2002) who suggested that psychopathology requires four levels of analysis: Aetiology, the genetic and environmental factors that may cause psychopathology; Brain mechanisms, the effect of the etiological factors on the development of the brain and its subsequent functioning; Neuropsychological functioning, brain based psychological systems generating human behaviour (e.g., language development and spatial reasoning); Symptom/ surface level, the clinical phenomena thought to

characterise the various forms of psychopathology. In sex offenders the symptom level is proposed to encompass four problem structures; emotional problems, social problems, deviant sexual arousal and cognitive distortions (Ward & Beech, 2006). In terms of the neuropsychological level, Pennington argued that the central nervous system could be subdivided into three functional systems. The motivational/emotional system is associated with the cortical, limbic and brainstem brain structures. According to Pennington, it allows goals and values to influence both perception and action selection rapidly and to adjust the motivational state to fit the changing environmental circumstances. The action selection and control system interacts with the motivational/emotional system. This system helps the organism to plan, implement and evaluate action plans and to control behaviour, thoughts and emotions in the service of higher goals. Finally, the perception and memory system processes incoming sensory information and constructs representations of objects and events and makes them available to the other two systems. The three systems are hypothesised to interact to produce all psychological processes and phenomena.

The Integrated Theory applied this perspective to the sex offending field. According to the theory, brain development and social learning interact to establish individuals' level of psychological functioning. Such functioning may be compromised in some way by inherited genetic vulnerabilities, biological insults, or developmental adversity to make it difficult to function in an adaptive manner. This can lead to problematic psychological functioning and subsequent clinical symptoms. For example, being exposed to violence at an early age can both adversely affect an individual's brain development and affect the functioning of the three primary



neuropsychological systems. Exposure to an adverse and hostile environment in childhood may also result in maladaptive learning, resulting in interpersonal difficulties and possible deviant attitudes about the world, making it difficult for the individual to develop healthy age appropriate intimate relationships. As a result these individuals may display social difficulties as their clinical symptoms (Ward & Beech, 2006)

The above theory appears to be the most promising theory to date as it incorporates the biological, psychological and environmental factors and, unlike the preceding theories, gives recourse to the cooperation between these factors by emphasising Pennington's levels of analysis and applying this to the sex offending field. The theory also appears more advantageous than other theories in the area as it not only emphasises the role of situational factors, but also the influence of an individual's culture and social learning in sex offending. While the theory takes into account a number of the factors outlined by earlier theories and thus does not negate these concepts, it does treat these factors as surface level features, and attempts to discuss the aetiology of offending in terms of deeper causal mechanisms and engages in a deeper level of theorising by emphasising the genetic and neuropsychological aspects of behaviour. However it has been argued that the theory does not clearly define or specify the factors that are thought to help explain sexual offending (Seto & Lalumiere, 2010). In particular, Seto and Lalumiere (2010) suggest that the theory does not explain what genetic predispositions are involved, nor does it explain how sexual problems such as paraphilic sexual interests or sexual preoccupation arise from the other problems they considered. Additionally, given the relative newness of



the theory it has received little empirical support to date and the relationships proposed between the genetic, environmental and psychological factors are little more than hypotheses at present, particularly in relation to sex offenders. Thus while the theory appears to give a comprehensive account of sex offending, and offers much to the understanding of the phenomenon, its value can only be established through empirical investigation which to date is lacking.

#### **1.4 The Present Study**

It is clear from the theories described above that the concepts of deviant sexual interest and cognitive distortions are frequently cited as playing a role in sex offending. While earlier theories describe these factors in terms of their causal role in sex offending, Ward and Beech (2006) conceptualize these factors as clinical phenomena that result from deficits in underlying neuropsychological subsystems which in turn can lead to sexual offending. Nonetheless, regardless of whether these factors reflect surface level symptoms or deeper etiological mechanisms, each has been implicated in sex offending and has been identified within groups of sex offenders (e.g., Hall & Hirschman, 1992; Ward & Siegert, 2002). The following studies will attempt to investigate these factors within a non-offending population. This thesis focuses primarily on the cognitive component of offending and thus cognitive distortions, or more specifically, implicit theories will be a common feature throughout the thesis. Other factors, in particular, deviant sexual interest and empathy deficits, will be investigated specifically with regard to their cognitive components and relationships with implicit theories. Initially the concept of implicit theories will be investigated in terms of 'theory of mind' development and its possible relationship

to empathy and emotional recognition. As described earlier, the role of neuropsychological subsystems have recently been highlighted by Ward and Beech (2006). Therefore, the role of one neuropsychological function, executive functioning, will be investigated in the context of the cognitive factors implicated in 'theory of mind' and empathy. Following this, chapter three will focus on sexual interest and its relationship with cognition in 'normal' sexual interest. As highlighted in the single factor theories above, sexual interest is a well-established component of offending. The efficacy of implicit methodologies in assessing this component and the cognitive component of sexual interest will be investigated. Finally, chapter four will investigate the relationship between the presence of deviant implicit theories and the likelihood of engaging in sexual assault, as well as the possible role of different types of pornography use in this relationship.

Throughout the thesis, when referring to sex offenders, I will be specifically referring to male sex offenders, as the vast majority of offenders are male. Therefore the samples used throughout the thesis will be comprised of non-offending males. The reason for using a non-offending sample is threefold. First, by looking at these concepts outside the deviant/offending realm, it facilitates clearer, less ambiguous theorising with regard to the normal presentation of factors outlined in sex offending theories. Secondly, the use of assessment measures in this population highlights the methodological issues that may be inherent in assessment procedures, particularly in terms of implicit measures, with the reduced likelihood of test faking. While the ability to fake these tasks is not addressed here, by employing a sample that may be less motivated to fake, it is expected that there will be less noise in the data. Thirdly,

the use of non-offending samples allows for the identification of normal behaviour within a non-offending population thus facilitates the identification of deviant behaviour. Without data on how a normal male may score on these factors, it is difficult to determine what constitutes deviancy. For example, unresolved questions include whether the cognitive distortions found among sex offenders also present in non-offending men? The overarching themes of this thesis include the following questions; (1) whether it is appropriate to compare sex offenders with non-offending men, (2) do the existing measures appropriately assess such constructs and (3) how do the constructs apparent in the offending population function in a normal population.

A central issue which is pertinent throughout the thesis relates to the sample employed. Some of the possible confounds caused by the sample will be discussed in the individual chapters; however the reader should be cognisant of potential volunteer bias and possible deviants within the sample. Research in this area tends to indicate that there is a difference between individuals who volunteer for sexuality research and those who do not. Research has indicated that volunteers for sexuality research may differ significantly from non-volunteers in terms of personality factors (Bogaert, 1996) levels of sexual guilt (Strassberg & Lowe, 1995) and levels of sexual sensation seeking and erotophilia (Gaither, Franklin, Hegstad, & Plaud, 1997). Additionally, it is presumed that the samples used would not show any sexual interest in children. However, research indicates that a minority of men report some sexual interest in children. For example, Ahlers et al. (2011) reported paedophilic sexual arousal patterns of 9.5% and 3.8% in sexual fantasies and real-life socio-sexual development,

respectively, in a community sample of men. This indicates that there may have been a small minority of the sample who had a sexual interest in children. Additionally, throughout the thesis the sample will be referred to as consisting of non-offenders yet it is possible that some participants may have sexually offended in the past but were not detected given the under-reporting of this type of crime. Thus, as with all sexuality research, results should thus be interpreted in light of these issues.



# **2 Chapter Two: An Investigation of the Relationships between Implicit Theories, Empathy and Theory of Mind**

## **2.1 Introduction**

The current chapter will examine the concepts of cognitive distortions, theory of mind (ToM) <sup>1</sup>, and empathy as these are factors frequently thought to play a role in sexual offending (Keenan & Ward, 2000; Ward, Keenan, & Hudson, 2000). It is expected that relationships will exist between these factors as each appears to involve the ability to draw inferences from one's own and other's behaviour. Additionally, the concept of executive functioning will be investigated as this concept has been implicated in ToM functioning in the non-offending literature and neuropsychological functions are emphasised in the Integrated Theory of Sex Offending (Ward & Beech, 2006). Each of these concepts will be discussed initially in terms of theory and research and then in terms of the possible inter-relationships between these concepts.

### **2.1.1 Cognitive Distortions**

Cognitive distortions can be referred to as propositions used by offenders to justify or explain their offences that are supportive of their behaviour and go against the moral norms of society (e.g., a statement indicating that a sexual interaction with a child is not harmful to that child). The cognitive distortion hypothesis states that by the time offenders come to clinical and research attention, they hold relatively well established

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<sup>1</sup> A list of the acronyms used throughout this thesis is presented in Appendix B

and generalized offence related beliefs that facilitate sexual offences against children (Gannon & Polaschek, 2006). Ward, Gannon and Keown (2005) suggest that child sex offenders are motivated to use cognitive distortions to protect self-esteem, to protect the self from perceived threat (social disapproval), to avoid cognitive dissonance and to protect self-deceptive positivity needs. As will be seen from the description of the main theories relating to cognitive distortions, it is not yet clear whether these thoughts precede the individual's propensity to offend or whether they are post hoc rationalizations for the abuse.

Ward, Hudson and Marshall (1996) argue that a key factor in triggering a sex offence is the engagement of the offender in a cognitively deconstructed state. While in this state the offender is thought to focus on sensation, leaving little cognitive resources for higher order cognitions, including self-evaluation. Ward et al. (1996) argue that engaging in such a process of simplistic thinking creates interpretive voids in which higher level cognitions, particularly relating to the victim's reaction, are avoided and the offender then fills this void with cognitive distortions. These cognitive distortions can lead to the offender viewing the victim as enjoying the offence and actively encouraging it.

Theories of cognitive distortions are single factor theories that have as their explanatory focus specific problematic statements, beliefs, attitudes, and processes exhibited by sex offenders in clinical and research contexts (Ward, Polaschek, & Beech, 2005). This section will begin with an outline of what cognitive distortions are in general, and theories that attempt to explain the role of cognitive distortions in the

aetiology of sex offending with a particular emphasis on the Implicit Theories (IT) perspective.

Beck (1963; 1976) first introduced the idea of general cognitive distortions within a psychodynamic perspective. He proposed that a patient's thinking has a significant influence on his/her subsequent behaviour and emotions. Through the use of Free Association Tests, he found that patients were frequently unaware of their automatic thoughts until they were encouraged to actively focus on them. These thoughts were unlike typically reported ideations in that they surfaced automatically and occurred prior to an emotional reaction. Beck (1963) defined cognitive distortions as systematic errors in logical or realistic thinking. Although these thoughts influenced patients' behaviour, patients were often not explicitly aware of their presence (Beck, 1976). According to Beck these automatic thoughts are distinct, precise and succinct in nature and do not result from reflective thoughts. Such thoughts are reflexive, people do not intentionally initiate them and often find them difficult to terminate.

#### *2.1.1.1 Criminal Cognitive Distortions.*

Cognitive distortions were later applied to the area of forensic psychology based on the observation that criminals, as a group, demonstrated patterns of thinking that were different from those of non-criminals (Walters, 1990; Yochelson & Samenow (1976). Yochelson and Samenow (1976) identified 52 separate thinking errors that underlie the maladaptive behaviour of general offenders and often results in an antisocial lifestyle. Yochelson and Samenow (1976) suggested that prior to committing a crime, an individual undergoes a mental process known as 'corrosion' that serves as a non-rational technique that slowly reduces the inhibitions to crime. During the

commission of a crime, the individual uses a 'cutoff' mechanism to instantaneously eliminate fear as well as boost self-confidence and composure which allows the continuation of the criminal activity. These cognitions then reinforce criminal behaviour.

Walters (1990) later suggested that criminal behaviour results from cognitive patterns, that is, they saw crime as a lifestyle with a corresponding system of beliefs that supply justifications, support, and rationalizations for antisocial behaviour. Walters developed eight cognitive patterns to describe criminal thinking processes:

1. Mollification involves the rationalization of behaviour by placing blame on external factors.
2. Cutoff involves quickly disregarding thoughts that deter from crime.
3. Entitlement involves permitting offending behaviour by a special privileged self attribution.
4. Power-orientation involves the need for utmost control over the environment and others.
5. Sentimentality involves doing something good to offset one's negative feelings about one's behaviour.
6. Super-optimism involves confidence in one's ability to evade the typical negative outcome of one's crime.
7. Cognitive indolence involves using 'mental shortcuts' instead of using more developed and thoughtful mental strategies.
8. Discontinuity involves the lack of perseverance and reliability in both behaviour and thinking.



Within the sexual offending literature, there are two types of theories which attempt to explain the role of cognitive distortions in the aetiology of offending; those focusing primarily on post offence cognitive processes and impression management (e.g., Abel et al., 1984), and those focusing primarily on cognitive structures that are hypothesised to precede the offence, increase one's propensity to offend, and maintain offending behaviour (e.g., Ward, 2000).

#### *2.1.1.2 Abel's Theory of Cognitive Distortions.*

The term cognitive distortion was first introduced to the sex offending literature by Abel and colleagues (Abel et al., 1984). Their theory was developed from the findings of studies, using self-report measures, that sex offenders displayed characteristically distorted ways of thinking about children. The term "cognitive distortion" was used to describe these unusual beliefs about children and sex, such as sex being enjoyable and educational for children. Abel et al. tended to regard cognitive distortions as post offence rationalisations and justifications for their offending behaviours. They argued that the function of cognitive distortions was to justify offenders' continuing sexual abuse of children without feeling guilt, anxiety or negative self-judgement that may stem from the knowledge that they behaved in a manner that harms children and violates important social norms. Adopting a social learning approach, Abel et al. (1984) argued that during normal development an adolescent male needs to review the things that they are sexually interested in and restrict development of interest in things which are deemed inappropriate. However Abel et al. (1984) suggested that some males fail to learn to inhibit sexual arousal to activities or targets that are seen as morally wrong. They then develop into adults

whose sexual interests violate the norms of society and learn to deal with this conflict by developing offence related beliefs that make their offending behaviour seem more acceptable. The theory suggests that these cognitive distortions help reduce the offenders cognitive dissonance. That is, they know the behaviour is wrong and violates social norms and this creates psychological tension, resulting in cognitive dissonance. Cognitive distortions thus serve to reduce this dissonance and allows them continue with their offending behaviour.

The theory focused on seven cognitive distortions about children and sex;

- If children fail to resist advances they must want sex.
- Sexual activity with children is an appropriate way to increase the sexual knowledge of children.
- If children fail to report sexual activity, they must condone it.
- In the future sex between adults and children will be acceptable if not encouraged.
- If one fondles rather than penetrates, the sexual activity with children is acceptable.
- Any children who ask questions about sex really desire it.
- One can develop a close relationship with a child through sexual contact.

By introducing the concept of cognitive distortions to the field of sex offending, Abel et al. engaged in pioneering work. However the theory has been criticised for a number of reasons. It appears to offer only a description of surface-level cognitive distortions rather than discussing the deeper belief systems that the cognitive

distortions may have stemmed from. Furthermore, it did not explicitly define the term and used the term to describe both beliefs and post-offence justifications (Gannon & Polaschek, 2006). The theory also fails to discuss the possible role of cognitive distortions in the aetiology of sex offending and the possibility that the presence of cognitive distortions can increase an individual's likelihood of engaging in sexually abusive behaviours (Gannon & Polaschek, 2006).

#### *2.1.1.3 The Implicit Theories Perspective.*

Contrary to Abel's theory, Ward (Ward, 2000; Ward & Keenan, 1999) explained cognitive distortions in terms of social cognition rather than cognitive dissonance. The Implicit Theory account of cognitive distortions proposes that cognitive distortions exist prior to the abusive behaviour or any deviant sexual preferences. Thus, rather than cognitive distortions being post-offence rationalization, they instead act as pre-existing vulnerability factors. Ward (2000) argues that the offence-supportive statements often articulated by sex offenders are the product of offence-supportive implicit schemas or, as Ward preferred to label them, "implicit theories".

The theory was informed by developmental psychology research, which suggests that much of cognitive development is driven by children's development of implicit theories, similar to scientific theories, in a given domain (Gopnik & Meltzoff, 1997; Wellman, 1990). The 'theory theory' of cognitive development in children proposes that young children come to understand the world around them by acting like a scientist, forming hypotheses, testing them, revising them, and rejecting those that fail to predict behaviour (Gopnik & Wellman, 1994). Children develop a succession of increasingly adequate implicit theories by looking at the evidence available to them, applying this to their existing theories and determining the ability

of the theories to adequately explain and predict the behaviour of others. From an early age knowledge is organized into different theories that facilitate understanding of the world. Such theories allow individuals to explain and understand aspects of their own environment or their own behaviour and cognition, and therefore to make predictions about future events. These predictions help people to control their lives. As the theories have been developed based on past knowledge and are used to interpret future behaviour, they allow people to make inferences about unseen and underlying states.

Ward (2000) applied this 'theory theory' to the area of sex offending given the observation that sex offenders' early experiences are frequently associated with sexual and physical abuse or early adverse experiences (e.g., Burton, 2003; Jonson-Reid & Way, 2001). Ward (2000) suggested that, given this finding, it is plausible to assume that their early theories will focus on understanding and explaining the nature of these problems. Ward (2000) suggests that different types of interpersonal experiences would result in different types of implicit theories. For example, early sexual abuse could result in a belief that it is normal for adults and children to engage in sexual behaviour together and further that children are sexual beings capable of consenting to sex with adults. Alternatively, adverse childhood experiences could lead the offender to view all adults as malevolent and to hold the theory that the world is a dangerous place, in which people cannot be trusted. Thus the offender may believe that he should act in a hostile manner towards others before they have an opportunity to be aggressive towards him.



The implicit theory framework was heavily influenced by the implicit social-cognitive approach. Implicit social cognition refers to how the principles of social knowledge are organised. 'The signature of implicit cognition is that traces of past experience affect some performance, even though the influential experience is not remembered in the usual sense – that is, it is unavailable to self-report or introspection' (Greenwald and Banaji 1995, p.4-5). According to this approach, each individual's belief content and the organization of this content develops from a myriad of life experiences which create and establish networks of associated beliefs bound by reciprocal connections (Collins & Loftus, 1975). A major cause of individual differences lies in the individual's belief content and how this is structured in memory which has been largely shaped by a person's individual life experience. Over time, networks of strongly associated beliefs become frequently activated in unison, leading to the development of schemas or implicit theories (Ward & Keenan, 1999). These implicit theories then guide an individual's predictions, explanations and understanding of their social world (Fiske & Taylor, 1991). Thus schemas allow the individual to predict what is likely to occur in their social world based upon previous experiences and expectations. This happens in a largely unconscious manner.

As schemas provide a view of the world based on pre-existing beliefs, they tend to focus on what is expected rather than what is objectively true. Although people have the ability to analyse their social world in a logical manner when they have enough time and resources and motivation to do so, people generally act as 'cognitive misers' by taking processing shortcuts and making assumptions based on their pre-existing theories (Augoustinos & Walker, 1995). In contrast to effortful and

logical processing when people rely on schemas, their worldview is shaped automatically (Fiske & Taylor, 1991). Schema-supported information is attended to and encoded preferentially (time and energy is not wasted on possibilities that rarely occur) and when there is a limited amount of information or information is ambiguous, schemas provide a context for interpreting the likely cause and mechanisms behind such ambiguities (Dodge & Frame, 1982). This can lead an individual to preferentially attend to and encode schema-consistent information and misinterpret ambiguous social stimuli in a schema-consistent manner (Dodge & Frame, 1982; Fiske & Taylor, 1991). Because schemas operate largely outside the observer's awareness, and naturally predispose the observer to process social information in a schema-consistent manner, they can be quite difficult to alter. Schemas become stronger with time and become self-fulfilling. If a particular schema is rehearsed and supported regularly, it is likely to become chronically accessible, that is, it is likely that such a schema will be used to interpret and guide social behaviour in the future (Dodge, 1993; Dodge & Frame, 1982). However, the use of even quite highly accessible schemas can be influenced by contextual or environmental factors that increase an individual's likelihood of acting like a cognitive miser (Bargh, Lombardi, & Higgins, 1988). Mood and motivational states are also thought to interact with and mediate the activities of information-processing (Ellenbogen, Schwartzman, Stewart, & Walker, 2002). This is probably because primes such as positive or negative affective states reduce the individual's ability to perceive the world carefully and rationally, leading them to interpret the world in a schema-supportive manner (Dodge, 1993; Dodge & Frame, 1982). Within sex offending,

affective states, sexual arousal and intoxication may be core factors that increase cognitive load and reduce offenders' motivation and ability to process information (Ward, 2000).

#### *2.1.1.3.1 Implicit Theories of Sex Offenders.*

As indicated above, research indicates that a substantial number of sex offenders have experienced childhood adversity (e.g., Burton, 2003; Jonson-Reid & Way, 2001), thus Ward (2000) hypothesised that their early theories will focus on explaining and understanding the nature of this adversity. According to the IT framework, ITs develop during childhood to help explain and predict unusual negative occurrences. Once the offender reaches puberty, these theories are then applied to the sexual domain. ITs are proposed to contain different levels of beliefs starting with the most general level with assumptions about the nature of people and the world, middle-level beliefs dealing with categories of entities (e.g., women and children) and finally beliefs attributed to a particular victim. According to Ward, the key beliefs are those at a general level and middle level. They persist and constitute the conceptual foundations of offenders' interpretations and expectations of victims' actions and mental states. A particular theory will contain relatively abstract assumptions about the nature of the victim and specify the kinds of general capabilities a victim has (e.g., able to give consent), describe the types of beliefs and desires typically found in entities of that kind (e.g., children wanting sex) and outline the specific features of his past or current victims (Ward, 2000). Furthermore, ITs can be organized depending on the degree to which they primarily focus on the offender (entitlement and uncontrollability), the victim (sexual objects and nature of harm) and the world (dangerous world). The cohesiveness and content of implicit theories help to explain



the offender heterogeneity. For example, a high risk offender with an extensive offence history and a strong fixation on children is likely to hold the most extensive and well established implicit theories, in particular implicit theories relating to children as sexual objects.

After examining the available literature, based on offender's accounts of their offending, Ward and Keenan (1999) argued that child molesters might hold any combination of the following higher-order, internal, implicit theories:

Children as sexual objects: Offenders who hold this IT see children as sexualized and capable of enjoying sexual relations with adults. These offenders will interpret innocent child behaviour in a sexualized way. Children are thought to possess the knowledge to make informed decisions about sexual activities with adults.

Nature of harm: There are two types of the nature of harm theory. Offenders with one type of this IT conceptualize harm along a continuum in which only physically aggressive acts are viewed as really harmful. Therefore the offender will believe that if physical force was not used, or the victim was unaware of the abuse he/she will not be seriously affected. The second type of nature of harm implicit theory is the belief that sex is a beneficial experience and that any distressing effects of the abuse are due to other factors, such as society's reaction to it, rather than the sexual experience itself. This implicit theory is thought to be a secondary one and used in association with another theory.

Dangerous World: This is based on the belief that the world is a dangerous and hostile place and other people are likely to act in abusive and rejecting ways. Again there are two types of this theory. According to the first type, offenders may



hold the belief that children are hostile and rejecting. Therefore the offender may abuse a child in order to dominate them and control their malevolent intentions. The second type of this implicit theory is based on the belief that adults are unreliable and children dependable. According to this theory, the offender views children as the only safe haven and can provide the offender with a sexual relationship. The offender believes he is incapable of dominance over adults.

Uncontrollability: This is based on the core belief that human beings are essentially uncontrollable and unable to exert their own influence over strong urges and emotions. Sexual desires are viewed as external to the offender and therefore the offender is not responsible for their sexually abusive behaviour. Further reasons they use to explain their behaviour include the influence of drugs or alcohol, or a stressful experience, all assumed by the offender to be beyond their control.

Entitlement: This is based on the core belief that some people are superior to less worthy groups, such as children, and have the right to assert their needs above others. They see themselves as entitled to fulfil their sexual needs with children as they view their own needs as being of greater importance, and the child should permit this.

In a later paper, and using similar methods, Polaschek and Ward (2002) argued that rapists were likely to hold a similar, yet slightly different array of implicit theories. The implicit theories of rapists will be expanded on further later in the thesis. Like child molesters, rapists were proposed to hold implicit theories relating to Dangerous World, Uncontrollability and Entitlement. Unlike child molesters however, rapists were hypothesized to hold 'Women as Sex Objects' IT, and 'Women

are Unknowable/Dangerous' IT. The 'Women as Sex Objects' implicit theory encompasses the view that women are constantly sexually receptive. Because of this women cannot be injured by unwanted sexual activity unless they are physically damaged. Offenders who hold this implicit theory believe that women are gatekeepers to men's sexual gratification.

The 'Women are Unknowable/Dangerous' implicit theory was originally known as 'Women as Unknowable' (Polaschek & Ward, 2002) in which women are seen as inherently different from men. Women are seen to have completely different minds to men. Heterosexual encounters are seen as adversarial and women are seen to deceive men about what they really want. This IT was later relabelled 'Women are Dangerous' based on the findings of Polaschek and Gannon (2004). According to these authors, men who hold this IT view women as inherently malevolent, vindictive, and unpredictable and deliberately set out to harm men.

Qualitative research with sexual murderers suggests that sexual murderers hold these five implicit theories also indicating the similarity between rapists and sexual murderers in terms of the implicit theories they hold about the world and their victims (Beech, Fisher, & Ward, 2005). Ward and Keenan (1999) suggest that it is possible for the offender to hold just one or all of the ITs, but generally ITs tended to cluster into distinct content areas. For example, an individual who believes that children were essentially sexual beings also may view himself as entitled to assert his needs over those of others. However, it is unlikely that he would view the world as dangerous and unpredictable. Furthermore, it is suggested that different subtypes of sexual offenders may differ in terms of the cohesiveness and content of their ITs or

hold different subtypes of a theory and this may account for some of the heterogeneity amongst sexual offenders.

According to the social cognition framework, these implicit theories then dictate what evidence is to be interpreted and how it will be interpreted, particularly in cases when there is scant or ambiguous information. The content of an IT can lead to the selective processing of information such that the offender only attends to offence-supportive information and disregards other contradictory information. Should a discrepancy arise between the evidence and the individual's IT, generally the evidence will be reinterpreted or rejected. In rare cases, when the weight of the counterevidence is too much to ignore, or where there is consistently contradictory evidence, the theory may be modified to fit with the evidence. Occasional anomalous observations can be accounted for by minor adjustments such as 'the child is different from most other children'. Apparent counter-evidence to the theory that sex is beneficial, such as hearing a child crying, can be explained away as an isolated incident (Ward & Keenan, 1999). To help this avoidance of contradictory evidence, offenders also seek environments that support their lifestyle and ITs (e.g., deviant online communities, interacting with other sex offenders), thus strengthening and increasing the accessibility of that IT.

According to this perspective, offenders who lack well integrated offence-supportive ITs (e.g., incest offenders) may show process-related distortions, in which the aim is to discredit or ignore evidence that they have behaved in an abusive manner. Alternatively their offending may be a function of state factors such as stress or intoxication. In these situations, the offender holds adaptive ITs but fails to use



them and as a consequence they behave in a disinhibited, sexually abusive manner (Ward & Keenan, 1999). For example, an offender may be aware of the harmful effects of sexual abuse to children and aware that children are incapable of giving consent to sexual interactions, yet when the offender is intoxicated, he does not rely on these adaptive ITs and continues with his abusive behaviour.

Additionally, some maladaptive beliefs may be culturally entrenched and their manifestation in cultural products such as TV or films may provide an alternative source of information concerning the role of deviant sexual preferences in human activities (Marshall, 1996). Marshall and Barbaree (1990) suggest that patriarch societies legitimize male dominance over women and children and thus produce reinforcement for ITs that stress male entitlement. The effect of media on ITs will be discussed further in chapter five, where the relationship between pornography use and deviant implicit theories will be investigated.

In terms of research support for the theory, there are some promising results particularly from studies using implicit cognition based methodologies. Traditionally, results from self-report studies of cognitive distortions tend to indicate that although there is a difference between offenders and non-offenders in their endorsement of cognitive distortions, this difference emerges as a quantitative rather than a qualitative difference, with offenders generally disagreeing with statements but doing so to a lesser extent than non-offenders (Gannon, Ward, Beech, & Fisher, 2007). However, research employing methodologies based on the implicit social cognition approach have been more promising and lend support to the implicit theory perspective. A number of studies, using the Implicit Association Task (IAT;



Greenwald McGhee, & Schwartz, , 1998) found that child sex offenders show stronger association between children and sex compared with non-sex offenders (Banse, Schmidt, & Clabour, 2010; Brown, Gray, & Snowden, 2009; Gray, Brown, MacCulloch, Smith, & Snowden, 2005; Mihailides, Devilly, & Ward, 2004; Nunes, Firestone, & Baldwin, 2007; Ó Ciardha & Gormley, 2009). The role of the IAT in assessing implicit theories will be examined further.

Overall, the implicit theory perspective offers a good account of the cognitive distortions articulated by sex offenders; rather than focusing on the surface level discourse of the offender, it focuses on the deeper aetiological mechanisms of these cognitions and explains cognitive distortions in terms of the role they play in an individual's vulnerability to offend. Furthermore, as the theory is informed by the area of social cognition, there is a well established theoretical foundation for the theory. Additionally, the framework is accompanied by particular methodologies for assessing implicit cognition making it easier to test the theory in a meaningful way. However, there are some unavoidable limitations of Ward's theory. While it does appear to be supported by some empirical work, the theory has been criticised for not accounting for men who do not show sexual aggressive tendencies until later in adulthood (Gannon, 2009). However the theory does suggest that not all offenders have entrenched deviant ITs and that subgroups of offenders (e.g., incestuous offenders) may have normal ITs in relation to sexuality but fail to use them at the time of the offence. It is likely that these offenders would be more likely to begin sexual offending later in life. The theory could also be criticised for its lack of explanatory depth, in that it suggests that the ITs are developed in childhood and

become sexualised when the child reaches puberty. However the authors do not explicitly state how implicit theories become sexualised. For example, the entitlement implicit theory may have developed in childhood, that is they have developed the belief that they are entitled to have their needs met at they please. However the theory does not make explicitly clear how this develops into having their sexual needs met. It is likely that this developmental period is chosen as it is during this period that adult sexuality tends to develop. Furthermore, the theory suggests that implicit theories develop as a result of adverse early childhood experiences, however, although a significant number of offenders have had such experience, the theory does not account for offenders who did not have negative early experiences. As yet research has not investigated whether those offenders who present with implicit theories have all experienced adverse childhood experiences or whether the implicit theories could transpire in those without such negative experiences or hostile environments in childhood.

In conclusion, the IT theory is a single factor or level II theory and is not intended to be a comprehensive account of sexual offending. Rather the theory sets out how one factor, deviant implicit theories, may increase the likelihood of an individual engaging in sex offending behaviour. The theory appears to do this in a comprehensive manner outlining the different deviant ITs that may be present in different combinations and thus allowing for different subgroups of offenders. Furthermore, it is possible that non-offenders share some of these ITs, but unlike offenders never attempt to sexually abuse. This is a point that will be returned to later in chapter four. If this is the case then these maladaptive ITs may be necessary but

not sufficient for the abuse to occur. Other factors such as deviant sexual preference, insecure attachment and poor social skills could be crucial additional components of the genesis of such crimes. Ward argues, however, that because ITs determine the interpretation of other people's actions and thus constrains the causal inferences drawn concerning their needs and desires, ITs will have a major role in the development of maladaptive behaviour. If a person has a skewed theory about children, he is likely to fail to develop effective intimacy and social skills, and may struggle to understand other people. Thus, notwithstanding some of the limitations mentioned above, it does appear to give a comprehensive account of cognitive distortion in terms of the aetiology of sexual offending from a well established theoretical base.

#### *2.1.1.4 The Schema-Based Model of Sexual Assault (Mann & Beech, 2003).*

Mann and Beech (2003) present a schema based model of cognitive distortions. This model is quite similar to the implicit theory framework as it is informed by the social cognition literature and implicates the five implicit theories of child sex offenders as possible schemas in the model. The theory integrates the literature on cognitive distortions with that from social cognition and cognitive therapy. According to the model, developmental experiences lead to the emergence of dysfunctional beliefs, and these dysfunctional beliefs, together with negative life experiences, lead to information processing difficulties and problems interpreting life events. Although it is noted that deviant schemas are not seen as the most important factors in offending, they can interact with other factors and result in sex offending behaviour.



*2.1.1.5 The Judgement Model of Cognitive Distortions (JMCD; Ward, Gannon, & Keown. 2006).*

The JMCD follows on from the Implicit Theories framework but rather than just focusing on distorted beliefs, also emphasises the role of value and action judgements in cognitive distortions (Ward, Gannon, & Keown. 2006). The theory draws on the literature on rationality that focuses on three types of judgements; beliefs, values and actions (Baron, 2004; Hammond, 1996). Beliefs, values and actions are thought to interact in a dynamic way to help individuals navigate through their social world. An irrational individual makes bad decisions in any of these domains, such that an individual can hold enduring false beliefs not based on sound evidence; engage in faulty decision-making, that is, draws temporary false conclusions based on unsound evidence; or to pursue and endorse ends of little value (Baron, 2004; Hammond, 1996). The theory proposes that beliefs and their associated values can result in sex offending actions and all offense endorsing statements reflect different combinations of beliefs, values and actions. This allows for a broader perspective on cognitive distortions involving more than just the offender's cognitive system but also the values that are associated with the wider environment. Cognitive distortions are statements indicating that offenders base their enduring beliefs on unsound evidence, that they pursue ends of little value and that they act upon the basis of faulty reasoning. They consist of appraisals of what is considered true, of significance, and worth doing (Baron, 2004; Hammond, 1996). The authors note that while there is a difference between an entrenched belief, such as, children are sexual beings, and a situational belief, such as a post offence rationalisation that that particular child was acting in a sexualised manner, the mechanism behind both types of beliefs is faulty



reasoning. It is the pervasiveness of that reasoning and its associated beliefs that differs.

The theorists point out that beliefs are a major focus of the theoretical and empirical work in the area of sex offender's cognitive distortions yet not all offenders appear to hold these false beliefs (Gannon & Polaschek, 2005). According to JMCD not all cognitive distortions are generated by underlying maladaptive beliefs, some may be due to context dependant temporary conclusions drawn from faulty reasoning. They argue that value judgements are qualities which are evaluated as positive or negative, reveal what the individual considers to be of worth or of little value. Offenders are thought to seek the same life experiences and activities that all individuals seek but they lack the necessary skills to achieve these goals in a non-deviant manner. Cognitive distortions resulting from action judgements may take the form of denial and minimization designed to change the way his action and their rationality are viewed (Ward et al., 2006). The three different types of distortions then tend to influence each other, that is, they tend to cluster together in thematic networks (TNs). The TNs referred to in this theory are reflective of the implicit theories outlined in the IT framework outlined above (Polaschek & Gannon, 2006; Ward, 2000; Ward & Keenan, 1999). According to the JMCD, Implicit Theories represent the best way for organising the content of sex offender beliefs but is also possible that the CDs result from denial and minimization for impression management purposes.

#### *2.1.1.6 Extended Mind Theory.*

More recently, Ward and Casey (2010) have criticised both cognitive distortion theories as coming from the internalist perspective and have proposed the extended mind theory (EMT). Extended Mind Theory (Ward & Casey, 2010) claims that the

human cognitive system is not limited to the brain and the skull, but rather the body and the wider world can act as integrated parts of the human cognitive system. According to EMT, the theories mentioned above fail to recognise the importance of the external environment and instead view it as a trigger for cognitive processes or as a source for learning. EMT criticises the IT theory for assuming that all faulty cognition stems typically from internal schematic structures, within the mind of the offender, without taking into account the role of the offender's wider social context as being an integral part of the offender's cognitive system, and thus their cognitive distortions. The IT framework posits that once ITs are formed they persist across time and environments and significantly constrain the interpretation of all future events. Additionally, the internalist theories of cognitive distortions have been criticised for taking the cognitive sandwich view of cognition, where cognitive processes are sandwiched between sensory input and motor output (Ward and Casey 2010). It is important to note however, that the EMT sees a role for implicit theories, but criticises the theory for not going far enough in emphasising the role of the body, physical artefacts and the social world on the cognitive system of the individual. The theory does not deny the existence of the internal representations of the sex offender (e.g., their implicit theories) but sees this approach as incomplete and emphasises the role of both internal and external components in cognitive practices (Ward & Casey, 2010).

The Extended Mind Theory (Ward & Casey, 2010) claims that the human cognitive system is not limited to the brain and the skull, but rather the body and the wider world can act as integrated parts of the human cognitive system. The first

assertion of EMT is that the mind and the body are an integrated whole (Johnson, 2007). The mind is not contained in the skull, and furthermore, physical processes can serve information processing functions. In line with this, perception is seen as an active process that extracts sensory information in order to guide action rather than a passive recording of data by internal cognitive mechanisms (Gibbs, 2006). Furthermore, EMT states that the mind extends beyond the boundaries of the body and into the world. That is, cognitive systems may loop into the world and thus the human cognitive system is made up of a hybrid system incorporating artefacts, sensory motor patterns and neural mechanisms which are manipulated by the organism during cognitive functioning (Ward & Casey, 2010). There are three assumptions of EMT (Ward & Casey, 2010):

Embodiment: This is based on the assumption that the mind and body are a unified whole. The body is seen as a channel between internal and external cognitive elements due to its ability to manipulate tools and the physical environment in order to solve problems and achieve cognitive tasks. The body joins together internal and external worlds and enables an individual to utilize both when performing a cognitive task (Clarke, 2007). Our possession and use of sense organs and our ability to physically orientate ourselves in space are important features of our cognitive functioning.

Human cognitive plasticity: According to this principle, humans have 'soft cells' and demonstrate significant behavioural and cognitive plasticity, making humans able to adapt quickly to changing environments and acquire new cognitive tools as required (Clark, 2007). Clark suggests that humans are cognitive controllers,



that is, they actively co-opt internal and external resources to create problem solving systems in order to achieve our desired goals. It is suggested that humans use task specific devices (TSDs) in their problem solving functioning. A TSD is a 'soft' assembled device comprised of internal and external components, that functions in an integrated manner to solve problems and which can be easily put together and taken apart (Wilson & Clark, 2009). One such example of a TSD would be the use of a statistical package when carrying out data analysis. In this regard, cognition is seen as organism centred (the brain plays an integral role in recruiting resources for cognitive tasks) but not necessarily organism bound (the brain will recruit external resources such as a statistical package as required). It is only when TSDs are integrated with neural mechanisms that they can be seen as part of the cognitive system.

Cognitive extensions: The cognitive system can be seen as a 'coupled system' in which internal and external components play a role in problem solving and the pursuit of goals. According to this assumption, there is no feasible distinction between unconscious cognitive processes that contribute to cognitive functioning and external cognitive elements that are closely integrated within a cognitive process (Clark, 2007). Accordingly, if an external artefact such as a calculator plays a similar role to that of internal cognitive processes and memory, then that artefact should have the same status as the internal processes. Tools such as computers, diagrams, social and cultural institutions, and other people can all play a part in the cognitive system depending on the role they play in the cognitive task (Ward & Casey, 2010). Social and cultural institutions, rather than just taking on a learning role as proposed by reductionist researchers, can be seen as part of the extended mind as they act as



external resources that improve our cognitive functions and change our capacities as learners (Gallagher & Crispy, 2009). Ward and Casey (2010) suggest that the idea of the coupled cognitive system that can loop into the physical and social world can offer a new insight into our understanding of cognitive distortions. Offenders, like all humans, are not limited by the biological boundaries of the skin and skull, and engage both internal and external elements when engaged with a cognitive task (Ward & Casey, 2010). According to the EMT model, cognitive distortions should be viewed in the context of cognitive practices (Ward & Casey, 2010). These are goal directed cognitive activities that are intended to address specific cognitive tasks such as problem-solving, justifying, planning, making inferences and implementation of a cognitive practice depends on the cognitive norms that guide that practice (Menary, 2007). Cognitive practices are socially and culturally entrenched and contain both internal (beliefs, memories, cognitive processes) and external components (cultural institutions, computer programmes). According to the EMT perspective, cognitive distortions can reflect problems in cognitive practices that have both internal resources such as beliefs and attitudes and external resources, such as pornography or an offence supportive support network (Ward & Casey, 2010)

Ward and Casey (2010) suggest that the assumptions of the EMT have four implications in terms of the aetiology and maintenance of cognitive distortions. First, as cognitive distortions are embedded in cognitive practices and are thus context dependant, dynamic and involve both internal and external components. Second, as cognitive practices involve both internal and external components, a considerable amount of distorted thinking resides in the broader social and cultural context in

which the offender lives. Third, typologies of offenders based on cognitive distortions will need to take into account the offender's social environment. Fourth, given that the human cognitive system is physically embodied, impaired physical functioning can increase the propensity for offending. Thus it is suggested that threats to bodily integrity and functioning could increase an individual propensity to offend as it affects their ability achieve their cognitive goals directly (Ward & Casey, 2010). Physical illness, intoxication, and stress might diminish an offender's ability to make appropriate inferences and judgements about their own and other people's mental states. Cognitive practices can endure for a prolonged period of time or they may be 'soft' assembled device used to solve a unique problem. Thus cognitive distortions may be short lived and may not endure past a particular cognitive task, and thus they may be difficult to detect. Whether cognitive distortions are more permanent in nature will depend on the nature of the task, the environment and the degree to which their routines are fixed (Ward & Casey, 2010). It is suggested that an offender's cognitive distortions will vary depending on his environment at the time. For example, if he is surrounded by other individuals with misogynistic attitudes in an overly masculinised environment, then the offender is more likely to show distorted cognitions related to women and this environment serves as part of his cognitive processes.

It is important to note that the EMT is not an external reductionist model and recognises the role of internal representations such as implicit theories in sex offenders but also implicates the role of the body and the external environment in the offender's cognitive system (Ward & Casey, 2010). While 'soft' assembled devices

may influence the development of some cognitive distortions, internal representations continue to play a significant role in the aetiology and maintenance of ITs. Thus the study of ITs does not negate the presence of an EMT but rather only focuses on the internal elements of this extended mind.

### **2.1.2 Theory of Mind**

Theory of Mind (ToM) refers to ability to reflect on the contents of one's own and other's minds and to infer the full range of mental states (beliefs, desires, intentions, imagination, emotions, etc.) that cause action (Baron-Cohen, 2001). The level of an individual's theory of mind reflects their ability to reflect on the contents of one's own or other's minds (Baron-Cohen, 2001).

For most of our social interactions, it is necessary, either implicitly or explicitly, to draw on our knowledge of the internal mental states of others and of ourselves in order to react and behave in an appropriate manner (Ward et al., 2000). Thus, ToM is seen as essential for many aspects of social and behavioural functioning (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997). The development of a representational theory of mind allows people to understand the importance of subjectivity and the awareness that our beliefs, desires, and intentions, and those of others may vary across time and context (Ward et al., 2000). The development of a representational ToM relies on the acquisition of an awareness of false beliefs, that is, that people act on their own beliefs even when these beliefs are false. Thus we can explain the behaviour of others that would generally be difficult to explain based on the premise that an individual holds a false belief and is acting on this false belief (Ward et al., 2000).



Ward et al. (2000) point to the dearth of research on individual differences in children's acquisition of ToM. Previous research has tended to focus on the age at which children pass the false belief test and tends to imply that ToM is an absolute or all or nothing construct such that an individual either has a ToM or they don't. This was likely due to the concept generally being discussed with reference to clinical populations, particularly within the area of Autism Spectrum Disorders. In this respect ToM was discussed as being absent or present. However, recently the concept is being applied to normal populations, and discussion has focused on the varying degrees of sophistication of ToM. Research has shown links between the development of a secure attachment and theory of mind (Fonagy et al., 1997). This type of research would indicate the possible role of individual differences in ToM and the likelihood that ToM occurs along a continuum, rather than a dichotomy of either present or not. Ward et al. (2000) suggest that given the reliance of ToM development on experience, it follows that learning may account for differences in ToM development. A deprived or abusive environment may result in a child not having access to information about mental states, or provided with restricted or incorrect information, resulting in the deficits in the child's ToM. Thus given the heavy reliance on previous learning experience, individuals would be expected to develop ToM quite differently and thus interpret the social world differently.

Ward et al. (2000) suggest that, in terms of sex offenders, deficits in an individual's ToM are likely to cause difficulties in terms of cognition, empathy, and intimacy. They argue that mistaken attributions of belief result in cognitive distortions, mistaken attributions of feelings result in empathy deficits and mistaken



attributions of need or desires result in intimacy deficits. Ward et al. (2000) suggest that there are two types of deficits in sex offenders' ToM. One type involves enduring or trait ToM deficits while the other involves episodic or state ToM deficits. In terms of more enduring deficits, a sex offender may have enduring pervasive difficulties in inferring the mental states of other people which can result in cognitive distortions or empathy deficits. For example, the offender may hold the IT that children enjoy sex or that women enjoy forced sex due to their inability to understand the mental state of others. Thus they may not be able to empathise as they fail to recognise the emotion or perspective take appropriately and may feel genuinely confused about the victim's mental states (Ward et al., 2000). Situational or state ToM deficits involve an individual who generally possesses adequate ToM but depending on context may fail to apply this ToM. This failure may be due to psychological states, physical states or motivational factors, for example stress, intoxication, or strong affective states. These states can impair an individual's cognitive ability and result in the individual failing to use his ToM abilities accurately and appropriately. Once these situational factors are removed, the individual may return to inferring states of other's accurately (Ward et al., 2000). Ward et al. (2010) suggest that, for sex offenders, sexual arousal can act as a strong affective state the results in inaccurate mental state attributions. State ToM deficits may also result from an individual's lack of motivation to use their ability to appropriately infer the states of others or are motivated for some reason not to employ this knowledge in order to avoid negative self-evaluation (Ward et al., 2000).

Elsegood and Duff (2010) in the only study to date investigating ToM in a group of sex offenders found that child sex offenders had deficits in ToM for adults,

compared with a control group. While the study indicated that twice as many child sex offenders as controls demonstrated impaired ToM for adults, most offenders did not show an absolute impairment but rather showed some impairment relative to controls. This would indicate that ToM in this domain may be better conceptualised along a continuum rather than there being absolute presence or absence of ToM. Elsegood and Duff (2010) however failed to find any difference between the child sex offenders and controls in terms of their ToM for children. This finding challenges the idea that child sex offenders possess a global deficit in ToM. Elsegood and Duff (2010) attempt to explain this finding in terms of offender's having the ability to accurately infer mental states but failing to do so, in particular offending circumstances, due to lack of motivation. The inferior ToM skills found among child sex offenders is consistent with reports that child sex offenders are more likely to have experienced childhood adversity (e.g., Burton, 2003; Jonson-Reid & Way, 2001) which is in turn related to ToM deficits (Happé & Frith, 1996).

#### *2.1.2.1 Theory of Mind and Cognitive Distortions.*

The concepts of implicit theories and theory of mind are likely to be interdependent, given that both involve the inference of the mental states of others. Ward et al. (2000) suggest that the cognitive distortions of offenders are partially a consequence of a deficit in their underlying theory of mind. They suggest that any deficits in the child's ability to develop theories regarding the mental states of others may lead to general false beliefs about particular types of people and circumstances. This may then be manifested as cognitive distortions later in life. Ward (2000) and Ward and Keenan (1999) did not explicitly distinguish between the two concepts and at times used the terms interchangeably. As outlined above, Ward (2000) tends to describe

implicit theories as developing according to the 'theory theory' framework in which children's conceptual structures are theories, their conceptual development of theory formation and change, and their semantic development is theory dependent (Gopnik & Meltzoff, 1997; Gopnik & Wellman, 1994). Ward et al. (2000) also conceptualise theory of mind from the same framework. According to this perspective a child's 'theory of mind' develops as a theory and changes in this understanding can be thought of as theory changes (Gopnik & Wellman, 1994; Wellman, 1990). In the course of a child developing an account of the mind, children postulate about mental states such as perceptions, beliefs and desires as a way to explain ordinary human behaviour. Although not explicitly stated in the literature, it is suggested that both implicit theories and theory of mind may be related as they both tend to develop according to the 'theory theory' perspective. That is, they both develop in childhood as the child is acting like a scientist developing and amending theories about the way the world works. Therefore, it is possible that any difficulties encountered by the child in developing these theories may be apparent both in an individual's theory of mind and their implicit theories. Furthermore, it is suggested that ToM refers to the general ability to infer the mental states of others, while implicit theories are self-contained specific theories related to the attributes of groups of people or the world in general. Thus, it is possible that ITs are formed from an individual's ToM being applied to a particular set of people and this leading to a schema about the beliefs and desires of that group of people. This should minimize the necessity that the individual will need to engage their ToM in all circumstances regarding this group of people, rather they can refer to their ITs to determine their mental states. In terms of sex



offenders, an impaired general ability to infer other people's mental states may bias an offender's encoding or interpretation of a victim's behaviour and thus contribute to the generation of cognitive distortions. Research indicates that individuals with ToM deficits are more likely to make internal as opposed to external attributions for negative events (Taylor & Kinderman, 2002). Elsegood and Duff (2010) suggest that this cognitive bias may facilitate the development of cognitive distortions (e.g., adults are hostile).

### **2.1.3 Empathy**

Empathy is a further concept that has been implicated in sex offending and appears to overlap considerably with cognitive distortions. Theories of empathy can be seen as level 2 theories and thus cannot explain sex offending by themselves, but rather they view empathy deficits as one of a number of different factors that can lead to sex offending. Wheeler, George and Dahl (2002) suggest that empathy may interact with other variables in the development and maintenance of sexual aggression.

Empathy is a concept difficult to define. Generally, however, it is viewed as a multidimensional phenomenon, encompassing an understanding of the subjective experience of another, perspective taking, a vicarious sharing of emotional states in response to another's affective cues resulting in feelings of concern (sympathy) which can also lead to self-orientated feelings (personal distress) (Davis, 1980, 1994; Decety & Jackson, 2004). Pithers (1994) describes empathy as the ability to cognitively identify another person's perspective, recognise an affective response in oneself and to be motivated to respond in a compassionate manner based on these perceptions. Davis (1994) suggests that empathy is a multi-component response involving four stages: perspective taking (the ability to adapt the viewpoint of



another), fantasy (the ability to transpose oneself into the feelings of a fictional character), empathic concern (feelings of concern for another person) and personal distress (self-orientated feelings of distress).

The Empathy-Altruism hypothesis states that if you feel empathy towards another person, you will have a selfless motivation to help that person (Batson, 1991). This has been supported by findings that increased empathy has been linked with altruism (Batson, 1991), social bonds (Anderson & Keltner, 2002) and prosocial behaviour (Eisenberg et al., 1989). In contrast empathy deficits have been linked to aggressive and antisocial behaviour (Lovett & Sheffield, 2007; Miller & Eisenberg, 1988). Additionally, low levels of empathy have also been associated with personality characteristics such as exploitativeness and entitlement (Watson & Morris, 1991) while with a lack of empathy is seen as a characteristic of psychopathic behaviour (Clark, 1999). Furthermore, empathy has also been seen as an inhibitor of aggression (Tangney, 1991). Joliffe and Farrington (2007) argue that people are less likely to victimise others if they can appreciate and/or experience the feelings of others. Thus empathy is viewed as a construct which decreases the likelihood that an individual will engage in harmful behaviour towards others.

#### *2.1.3.1 Empathy Deficits in Offenders.*

These findings have led to a proliferation of research on empathy defects amongst offenders in general and sex offenders in particular. However, it is generally found that general empathy deficits are more consistent and stronger for general non-sex offenders than for sex offenders (Joliffe & Farrington, 2004). In terms of sex offending, it has generally been assumed that offenders are able to engage in such sexual offending behaviour as they are unable to feel empathy for their victims given

that empathy is hypothesised to prevent on-going harmful behaviour towards a person in distress (Barsetti, Earls, Lalumière, & Bélanger, 1998; Marshall, Hudson, Jones, & Fernandez, 1995). Finkelhor and Lewis (1988) state that various aspects of male socialization can block empathy towards children. They argue that the absence of empathy plays a role in all forms of sexual abuse. However, there is no clear cut evidence for deficits in empathy within the population of sex offenders.

Marshall, Barbaree, and Fernandez (1995) proposed a staged multidimensional theory of empathy, specifically designed to explain empathic functioning in sex offending. According to this model, empathy occurs in four discernible steps; emotional recognition, perspective taking, emotional replication and response decision. The first stage, emotional recognition, is required to accurately read and identify the emotional state of another. Such emotional signals, particularly those conveyed by the face, communicate basic emotional states or current intentions and play a powerful role in the regulation of social interactions (Eckman & Rosenberg, 2005). It is suggested that this recognition stage is necessary for the other subsequent stages to emerge. Lipton, McDonel, and McFall (1987) found, using vignettes of males and females interacting, that rapists have problems identifying indicators of negative mood states in first date situations. Additionally, Hudson et al. (1993) found that sex offenders were less accurate than controls in identifying emotions, with fear being confused with surprise and anger with disgust. The second stage, perspective taking, involves the ability to understand another person's viewpoint. Marshall et al. (1995) argue that the degree to which the offender sees himself as similar to the victim, the more empathic he will be. The implication of this,

according to Marshall et al, is that sex offenders may see victims as belonging to a group with unfamiliar features, particularly given the finding that most offenders are male and most victims are female (Finkelhor, 1979; 1990). In relation to this stage, Hanson and Scott (1995) found general perspective taking deficits in a group of adult sex offenders compared to controls. However this finding was not replicated in a group of child molesters. Marshall et al. (1995) argue that offenders often appear to have access to a limited range of emotional labels or experiences which can lead to difficulties at stages one and two. Following from this stage, the emotional replication stage involves some level of sharing of the feelings expressed by another, that is, the individual must generate a similar emotion response to that they have just witnessed. This stage can only occur if the individual has accurately progressed through stages one and two and has the ability to experience the appropriate emotion. With regard to emotional replication, Fernandez, Marshall, Lightbody, and O'Sullivan (1999) found that sex offenders had difficulties in identifying how their own child victim felt, compared with a victim of a traffic accident. The last stage, response decision, refers to the observer's decision to show socially orientated behaviour or not on the basis of their own feelings. In relation to response selection, Porter and Critelli (1994) found that non-sexually abusive men used more inhibitory self-talk while listening to an audio-tape of a simulated date rape compared to participants with high self-reported sexual aggression. It was suggested that the sex offender may progress through the first three stages accurately but decide to ignore his feelings and aggress anyway.

Research has shown that offenders tend to be impaired at basic emotional recognition and perspective taking (e.g., Hudson et al., 1993; Lisak & Ivan, 1995;



Malamuth & Brown, 1994). In terms of emotion recognition, Hudson et al. (1993) suggested that rapists and child sex offenders were less accurate than violent non-sex offenders at recognising emotional expressions. Offenders found it difficult to differentiate between fear and surprise, and between disgust and anger. Hudson et al. suggested that this confusion between emotions may cause difficulties in the offender recognising fear in the facial expression of their victims. Thus if the offender also holds cognitive distortions, then the offender may not think that their behaviour is harmful to the victim. Gery, Miljkovitch, Berthoz, and Soussignan (2009) also found that child sex offenders were less accurate than controls in differentiating between surprise and fear, and between disgust and anger. The authors suggested that the misinterpretation in the decoding of basic emotions was possibly biased by selective processing of some facial cues. It was also suggested that because many sex offenders were exposed to childhood adversity (e.g., Burton, 2003; Jonson-Reid & Way, 2001) they may over-interpret expressive signals as threatening and over-identify sadness relative to fear and sadness, as these deficits have been found in abused children (Pollak & Kistler, 2002). Gery et al. (2009) suggest that sex offenders may show a hostile attributional bias when viewing the facial expressions (Gery et al., 2009) in a similar manner to the way in which abused children display a hostile attribution bias towards others (Dodge et al., 1995).

Malamuth, Linz, Heavey, Barnes, and Acker, (1995) suggested that high levels of empathy might inhibit sexually aggressive behaviours in individuals who would otherwise be at a high risk. Wheeler, Williams and Dahl (2002) found that empathy significantly enhanced the confluence model of sexual aggression by



interacting with the factors of 'Hostile Masculinity' and 'Impersonal Sex' to predict sexual aggression. Males with high levels of impersonal sex, high levels of hostile masculinity and low levels of empathy reported higher levels of sexual aggression than any other participants. It was therefore suggested that along with the other two factors, empathy deficits may precede the perpetration of sexual aggression and play a role in the aetiology of aggression.

In addition, empathy development is a commonly defined goal in the treatment programme of sex offenders, with 94% of treatment programmes including a component of empathy training (Freeman-Longo, Bird, Stevenson, & Fiske, 1995). However it has been argued that there is insufficient evidence to support this training (Burke, 2001; Pithers, 1999). In general, research on empathy deficits in sex offenders tends to show equivocal results (Geer, Estupinan, Manguno, & Gina, 2000; Marshall et al., 1995). Some studies have shown that measures of general empathy has successfully discriminated outpatient sex offenders from non-offenders (Marshall, Jones, Hudson, & McDonald, 1993). However, other studies of general empathy have failed to discriminate non-offenders from sex offenders (Marshall et al., 1993), non-offenders from child molesters (McGrath, Cann, & Konopasky, 1998), non-offenders from adolescent and young sex offenders (Monto, Zgourides, & Harris, 1998) and violent sex offenders from non-violent sex offenders (Langevin, Wright & Handy, 1988). Additionally, different result patterns have been found across studies depending on the assessment measures used. For example, several studies using the Interpersonal Reactivity Index have found significantly lower levels of empathy in sex offenders than controls (e.g., Marshall et al., 1993; Pithers, 1994). However the

Questionnaire Measure of Emotional Empathy, the Hogan scale or the Emotional Empathy Scale were unable to discriminate offender groups from controls (e.g., Hildebran & Pithers, 1989; Hoppe & Singer, 1976). Thus the empirical evidence for differences in general empathy between sex offenders and controls appears to be equivocal and heavily influenced by the self-report questionnaire employed.

These ambiguous results in terms of general empathy have led to the assumption that not all sex offenders will have general empathy deficits but rather empathy should be conceptualised in three ways: general empathy, general victim empathy and victim specific empathy (Varker & Devilly, 2000). Marshall et al. (1995) suggest that a lack of empathy among sex offenders may be limited to their feelings towards only women or children (depending on their victim choice) or it may be only towards those people who have been sexually victimised (i.e., other offenders' victims) or it may be restricted only to their own victims.

With regard to general victim empathy deficits, Finkelhor and Lewis (1988) suggest that an inability to empathise with children in general allows child molesters to be able to sexually abuse their victims. Similarly, Barbaree, Marshall and Lanthier (1979) asserted that a failure to recognise and feel compassion for a woman's distress reduces rapists' inhibitions and allows them to become sexually aroused during the attack. In studies which measured participants' empathy for hypothetical victims of sexual assault, sex offenders exhibited lower empathy than non-offenders (McGrath et al., 1998).

In terms of victim specific empathy deficits, Fisher, Beech, and Browne (1999) found that child sex offenders displayed such deficits but not general empathy deficits compared to non-offenders. Furthermore there was no correlation found between general empathy and victim specific empathy. A more recent study indicates that while victim specific empathy was found to improve from pre-treatment to post-treatment and deterioration was related to recidivism, generally no differences were found for general empathy and this was not related to recidivism (Brown, Harkins, & Beech, in press). Fernandez, Marshall, Lightbody, and Sullivan (1999) measured empathy in child molesters toward children who had been accident victims, towards children who had been a victim of sexual abuse by another offender and towards the offender's own victim. The results indicated lower empathy scores, compared with non-offending controls, for victims of sexual abuse, but had similar empathy towards the accident victim. Furthermore, the child sex offenders showed the greatest empathy deficits for their own victims. Fernandez and Marshall (2003) carried out a similar study with rapists, in which they found that rapists showed higher levels of empathy, compared with non-sexual offending controls, to an accident victim, and similar levels of empathy towards a sexual assault victim. Similar to the previous study, the rapists demonstrated the least empathy towards their own victims. These results would suggest that rapists do not possess general empathy deficits but rather have victim specific empathy deficits. The authors concluded that offenders may not be deficit in general empathy but lack empathy only for their own specific victim and this deficit may be more appropriately construed as a cognitive distortion. Marshall, Anderson and Fernandez (1999) also suggest that offenders possess normal levels of



general empathy while also expressing the belief that the victim has not been harmed. Thus apparent empathy deficits may be cognitive distortions about the harmful consequences of their behaviour on the victim. Furthermore, empathy failures might proceed relatively automatically from offence supportive beliefs such as 'all children benefit from sex' and thus the primary mechanism could be cognitive rather than motivational (Varker & Devilly, 2007).

#### *2.1.3.2 Empathy Deficits and Cognitive Distortions*

As noted above, there appears to be a number of similarities between cognitive distortions and empathy deficits. One such similarity is the manner in which both constructs have been subdivided into three subtypes: those applying to the world in general; those applying to groups of victims (e.g., women or children); and those applying to the offender's specific victims.

With regard to victim-specific empathy deficits, there are a number of possible explanations for how these deficits may emerge and the possible relationship between these and cognitive distortions. It is possible that these deficits are similar to the surface level cognitive distortions proposed by Abel and colleagues. Thus, rather than the offender being unaware of the harmful effects of sexual abuse, he minimises the effect in order to prevent any negative self-evaluation and protect self-esteem. As cognitive distortions are thought to involve denial and minimization of harm to the victim, in order to reduce feelings of guilt and shame, and given that the recognition of harm is the first and critical step in the unfolding of an empathic response (Marshall et al., 1995), these cognitive distortions are likely to prevent offenders from feeling empathy for their victims. This would then reflect a victim specific empathy



deficit rather than a general empathy deficit as the offender only engages in denial of minimisation within the offending context (Fernandez & Marshall, 2003). Thus, it is possible that offenders might deliberately suspend empathy towards their own victims in order to accomplish their goal of offending (Marshall et al., 1995). Bumby (2000) also acknowledges the role of cognitive distortions in minimising negative self-appraisal and argues that it is the shame that accompanies the offence that accounts for the unempathetic behaviour and should be targeted in treatment. Fernandez and Marshall (2003) suggest that, if offenders deliberately inhibit empathy towards their own victims in order to eliminate anxiety, guilt and loss of self-esteem, then they would not be expected to show empathy deficits towards women in general which would prevent them from establishing consensual relationships with women. However a number of rapists do have the ability to establish consensual relationships (Marshall, Fernandez, & Cortoni, 1996). They suggest that the lack of empathy for their own victims may be seen as a cognitive distortion related to their specific offending behaviour.

Victim specific empathy deficits may also be explained in terms of implicit theories. Again, the offender may be aware of the harmful effects his behaviour is having on the victim but chooses to continue offending anyway. For example, if he holds the entitlement IT he may be aware of the harmful effects of his behaviour but be emotionally unaffected by this or even pleased by this and continue to offend, that is, the offender fails to progress through Marshall's stage three, emotional replication.

Alternatively, lack of victim specific empathy deficits may be due to the cognitively deconstructed state the offender is engaged in at the time of the offence

(Ward, Hudson, & Marshall, 1996) during which the offender focuses on the present sensation and little attention is given to higher level cognitions. The highly emotive state or sexual arousal involved in offending means that any higher level cognitions are avoided and no attention is given to the effects of his present behaviour on his victim which inhibits the empathic process. Ward et al. (1996) argue that such simplistic thinking creates interpretive voids which the offender may then fill with distortions.

Victim specific empathy deficits may also emerge as the offender fails to effectively recognise the emotional reaction of his victim. This is the first step in the empathic response (Marshall et al., 1995) as the offender must accurately recognise the appropriate emotion before he can engage in empathy for the victim. As outlined above, offenders show deficits in facial emotion recognition (Gery et al., 2009) and this may explain why offenders fail to show general empathy deficits on self-report measures. Rather than the offender having any deficits in terms of taking the perspective of others or replicating their emotion, instead the offender does not recognise the distress or fear on the victims face. The offender could then be assumed to otherwise have a normal empathic reaction. However in certain circumstances he may fail to accurately recognise a particular emotion and thus cannot initiate the appropriate empathic reaction. Thus, in general self-report studies his empathy levels are found to be normal. This emotion recognition deficit may be further exacerbated by the cognitive deconstructed state the offender is in at the time of the offence, as outlined above. Thus, it is possible that individuals showing victim specific empathy deficits have no difficulties with general empathy but for reasons such as emotion

recognition deficits or because of their own self-serving bias they do not show empathy for their own victim and continue with their offending behaviour.

General victim empathy deficits and empathy deficits in general may also be considered cognitive distortions and, in particular, may be related to implicit theories. Offenders who hold implicit theories related to specific groups of people (e.g., children or women) may show specific empathy deficits in relation to these groups of people. For example, offenders who themselves experienced sexual abuse in childhood and whose distress was minimised by others to such an extent that they themselves discounted it, may then experience erroneous learning that can result in ITs related to children and sex and later distort their empathy skills (Ward et al., 2006). This is backed up by the finding that direct experience of being a victim of sexual abuse can result in empathy deficits for some offenders (Simons, Wurtele, & Heil, 2002) particularly if they view their childhood victimisation as consensual. Thus offenders who hold implicit theories that children are sexual beings may fail to show empathy for victims of child sexual abuse as they view sexual interactions between adults and children as being normal and even beneficial to the child. Rather than this being a problem with the individual's overall ability to show empathy the individual is more likely exhibiting deviant schemas relating to children. Additionally, individuals who hold the implicit theory that women are unknowable or dangerous are likely to have empathy deficits in relation to women as they believe that they themselves do not have the capacity to understand the mental states of women which is likely to prevent any perspective taking on the part of the offender.



#### ***2.1.3.3 Empathy Deficits and Theory of Mind.***

More generally, empathy deficits may be accounted for by deficits in ToM (Keenan & Ward, 2000). Ward et al. (2000) suggest the cognitive distortions and empathy deficits common to sex offenders may be the result of a more global deficit of Theory of Mind. As mentioned above, ToM refers to ability to reflect on the contents of one's own and other's minds and to infer the full range of mental states (including emotions) that cause action (Baron-Cohen, 2001). By attributing mental states to ourselves and others, ToM is thought to be the main way in which we understand the behaviour of others (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). A deficit in theory of mind leads to a distortion in the way individuals process information about their own and other's mental states and this can lead to an individual failing to make appropriate inferences in relation to the desires, beliefs and emotions of other people (Keenan & Ward, 1999). In terms of its relationship with empathy, Marshall et al.'s (1995) model of empathy asserts that emotion recognition skills and perspective-taking abilities are essential for the appropriate unfolding of an empathic response, both abilities which are likely heavily influenced by one's theory of mind.

#### ***2.1.3.4 Theory of Mind and Executive Function.***

Baron-Cohen (1995) has argued that a ToM failure is a clinical feature of autism and this deficiency is likely due to some unidentified organic deficit in the brain. Children's ToM development takes place during the preschool years (around 4, children generally have developed an adequate ToM) when children come to understand that beliefs can be true or false and these beliefs can lead to successful or erroneous action (Wellman, Cross, & Watson, 2001). At approximately the same



time, children show a marked improvement in their executive functions. Executive function is an umbrella term that includes the skills necessary for purposeful, goal-directed activity (Anderson, 2002). These include the ability to inhibit impulses, shift attention from one task to another, plan, initiate tasks, and utilize working memory (Pennington & Ozonoff, 1996). Executive functioning has also been implicated with criminality. Morgan and Lilienfeld (2000) found an effect size of 0.62 in a meta-analysis of the relationship between anti-social behaviour and neuropsychological measures of executive function. They generally found medium to large differences between anti-social and control groups. However, they also identified a number of studies with flawed methodological design or equivocal results. While the role of neuropsychological functioning has recently been integrated into theories of sex offending (Ward & Beech, 2006), there are only a small number of research studies in the area. From the studies that have been conducted, the findings tentatively suggest the idea of frontal and/or temporal dysfunctions among sex offenders, but it may be that these dysfunctions are related to criminal characteristics in general and not specific to sex offenders (Joyal, Black, & Dassyla, 2007). Joyal et al. (2007) also suggest that in this area of study, the difference between lower order executive functions, such as inhibition, and higher order functions, such as cognitive flexibility, has been overlooked, and it might be the lower order functions that play an important role in the deficits of offenders. The researchers tentatively supported this contention, using pilot data, in which they found deficits in response inhibition a group of sex offenders.

The shared timetable between ToM development and executive function suggests the possibility of there being an association between the two concepts. German and Hehman (2006) have also found statistically overlapping declines in both ToM and EF with age. Research on typically developing and autistic children also indicates the interdependence of ToM and EF functions (Carlson, Moses, & Brenton, 2002; Hughes, 1998). In addition, there is evidence that the maturation of common brain structures underlying EF and ToM during these developmental stages (Ozonoff, Pennington, & Rogers, 1991). Neuropsychological evidence also indicates that the prefrontal cortex is involved in both EF and ToM functions (Channon & Crawford, 2000). This research suggests that both processes may depend on a common neuro-anatomical system.

ToM is assumed to involve two sets of processes. The first process must involve the representation of mental state knowledge itself and the second process must allow this knowledge to be deployed in prediction and explanation of behaviour (German & Hehman, 2006). It is suggested that the first type of processing, involving the representation of mental states, involves the type of executive function necessary to select the appropriate mental state (German & Hehman, 2006). In a particular context, the perceptual descriptions of another's behaviour act as inputs to the specialised representational system which then uses an executive selection process to determine which mental state will be inferred from the individual's behaviour (German & Hehman, 2006). It is proposed that this selection process has a default condition. As people's beliefs are more frequently true than false, the true-belief content will be the prepotent response. Thus tasks based on false beliefs are made

more difficult as the selection process must overcome this true-belief attribution (German & Hehman, 2006). Thus it is suggested that the inhibitory elements of EF are necessary to reduce the activation level of the true-belief content below the activation point of the false-belief content (German & Hehman, 2006). Henning, Spinath, and Aschersleben (2011) also suggest that a key ability in this false belief reasoning is the ability to hold two conflicting representations of the same situation (i.e., a false belief and a true belief) and to inhibit the prepotent response tendency of one of the two beliefs.

In attempting to explain the association between the two concepts, both expressive and emergence accounts have been suggested (Henning et al., 2011). According to expressive accounts, successful ToM requires executive skills in order to disengage from salient reality cues and from one's own representation of events to represent the mental states of self and others (Hughes & Russell, 1993). The emergence accounts suggest that there is a functional dependence between ToM and EF but suggest different developmental directions. Perner (1998) suggests that some metarepresentational insight into the casual relationship between actions and mental states is necessary for the development of self-monitoring and inhibitory control. The cognitive complexity and control (CCC) theory suggests that the association between the two constructs is due to a domain-general ability to use hierarchical embedded rule systems for reasoning about complex problems. Both ToM and EF involve complex problem solving tasks that require the use of higher order 'if-if-then' rules to integrate lower order conflicting representations (Henning et al., 2011).



#### **2.1.4 The Present Study**

The aim of the present study was to investigate the inter-relationships between the concepts of empathy, implicit theories, theory of mind and executive functions. As indicated above empathy, implicit theories, and theory of mind, all appear to involve some kind of inference making in relation to the emotions, mental states or desires of others. It is likely that ToM, as it involves the process of making judgements on the mental states of others, influences and plays a part in the development of empathy skills and implicit theories. As suggested above, in order for the empathic process to unfold, an individual must correctly identify the emotion of another. Thus empathy is likely influenced by the ToM of emotion, that is, the ability to infer what another is feeling. ToM is also likely necessary for the development of implicit theories. In addition, the author suggests that when ToM has been applied, repeatedly over a period of time, to a specific group of individuals or particular circumstances, clusters of beliefs will form in relation to these people or circumstances and these clusters then lead to a specific IT.

Furthermore, the Integrated Theory of Sex Offending (Ward & Beech, 2006) has suggested the role of underlying neuropsychological functioning in the aetiology of sex offending. One such function outlined is 'action selection and control' which may be seen as similar to the executive function construct outlined above. This fits in nicely with the suggestions that EF and ToM are related constructs that appear to share the same modality. Suggestions have also been made regarding the possible neural substrates of empathy. Research suggests that special neurons within the ventral premotor cortex, known as mirror neurons, discharge when performing a specific action and when observing another individual performing a similar action



(Gallese, Fadiga, Fogassi, & Rizzolatti, 1996). This has also been applied to emotions; such that observing someone experiencing an emotion activates the same brain regions as experiencing that emotion oneself (Wicker, Fadiga, Fogassi, & Rizzolatti, 2003). Thus these neurons may be the basis of our ability to feel empathy as these neurons will fire automatically to link the experience of another to ourselves. Traumatic Brain Injury that has resulted in prefrontal and orbitofrontal hypoactivity has resulted in decreases in empathy (Eslinger, 1998; Varney & Menefee, 1993). The limbic connections in the prefrontal cortex have also been implicated in empathy deficits (Bardenhagen, Bowden, Shields, McKay, Smith, & Vogrin, 1999). Multiple sclerosis has been associated with reduced empathy, particularly in cases with concurrent executive dysfunction (Benadict et al., 2001).

Thus it was hypothesised that ToM predicts both empathy and ITs and this is influenced by an individual's EF. This hypothesis was tested in a group of non-offenders in order to distinguish between these factors without the difficulties that are inherent in forensic populations (dissemination to increase social desirability, literacy difficulties, etc.).

## **2.2 Methodology**

### **2.2.1 Participants**

Seventy one non-offending males participated in the study. The age ranged from 18 to 40 years<sup>2</sup>. Participants were recruited from around Dublin City through recruitment posters and internet forums. Participants were paid ten Euro or offered course credits

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<sup>2</sup> Specific demographic information was not taken for this experiment, however given the recruitment procedure (posters around a university campus) the majority of the participants were undergraduate students. A minority of participants were known to the researcher and came from the 28-33 age group.

for their participation. Two participants reported blue-green colour blindness, therefore only sixty-nine participants completed the Stroop task. Due to time restrictions, or a misunderstanding of the instructions, not all participants completed all measures, with a maximum of three cases missing for each of the measures. Only one participant did not complete more than one measure due to time constraints.

### **2.2.2 Apparatus**

Two tests of theory of mind were applied to the current research question. One task was used to investigate cognitive theory of mind while another investigated affective theory of mind. This was based on the suggestion that inferences one makes regarding the mental states of others may be different for their thoughts and beliefs as opposed to inferences about knowledge and the empathic understanding of their emotional states and feelings. Shamay-Tsoory and Aharon-Peretz (2007) argued that cognitive ToM processes may be distinct from that related to affective ToM and depends in part on separate anatomical substrates. Brothers and Ring (1992) also made a distinction between the two aspects of ToM and referred to 'hot' (affective) and 'cold' (cognitive) aspects of ToM.

#### ***2.2.2.1 Reading the Mind in the Eyes test (RME; Baron-Cohen et al., 2001).***

This measure is presumed to be capable of assessing subtle ToM impairments in otherwise normally intelligent adults (Elsegood & Duff, 2011). Participants are presented with 35 images of adult eye pairs and asked to 'select which word best describes what the person in the picture is thinking or feeling'. One image (Image 22) was removed from the analysis as some participants reported difficulty in evaluating the eyes in this image due to shading. There were 16 female eye pairs and 19 male eye pairs. Each pair of eyes was accompanied with four words representing different

complex mental states. This task was presented in paper and pencil version (please see Figure 1 for an example of a trial in RME task). The order of presentation of the eyes was randomly ordered and the same random order was presented to all participants.

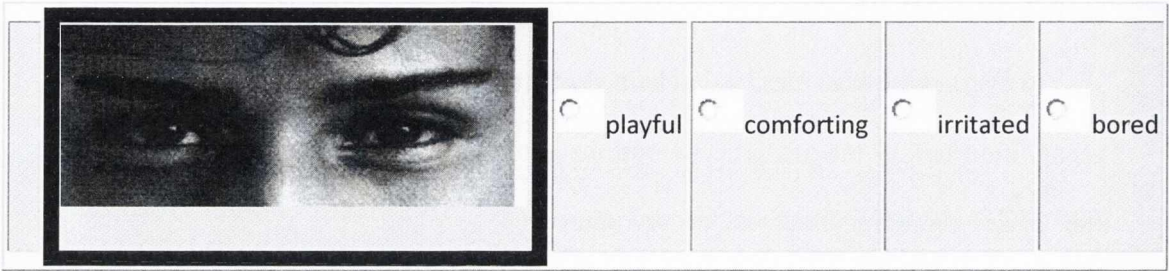
Baron-Cohen et al. (2001) claim that the RME differs from a simple emotion recognition task as the mental state options given in this task are more complex than the basic emotions assessed in an emotional recognition task. By asking the participant to identify the complex mental state, the participant must infer a belief or intention (a cognitive mental state) of the person. The measure is referred to as a 'pure' ToM task as it does not require memory processes, central coherence (the ability to synthesise contextual information) or executive functioning and scores are not related to IQ (Baron-Cohen et al., 2001). The measure has differentiated between adults with subtle social understanding deficits (those with Asperger's syndrome) and normal and clinical controls (Baron-Cohen et al., 2001). The task has shown good validity as it is inversely correlated with scores on the Autistic Spectrum Quotient (AQ) questionnaire (Baron-Cohen et al., 2001). Evidence from neuroimaging suggests amygdala activation during completion of the task in normal but not autistic participants (Baron-Cohen-Ring et al., 2000).

Participants responded to the task by ticking the box they thought best represented the pair of eyes presented. Participants received a score of one for each correct answer and the final score consisted of the total number of correct answers. Normative data taken from 55 normally functioning adult males resulted in a mean of



26.0 (SD = 4.2) (Baron-Cohen et al., 2001). This figure may be influenced by the removal of one image in the current study.

Figure 1: An example of a trial in the Reading the Mind in the Eyes ToM task.



2.2.2.2 The Imposing Memory Task (IMT; Stiller & Dunbar (2007).

This task was originally developed by Stiller and Dunbar (2007). The IMT consists of five short stories, each approximately 200 words in length which describe a social interaction involving several characters. For the purposes of this study only three of the short stories were used due to time constraints. The task was designed to assess participants' ability to correctly infer the mental states of the story characters. Following each story, participants are asked 20 questions, 10 of which require the participant to recall factual information from the story and the remaining 10 require the participant to infer the mental states of the characters in the story. An example of a short story with accompanying questions is presented in Appendix D. The questions all contained various amounts of embedding, either in terms of intentionality for the mentalizing questions, or in terms of different number of elements for the memory questions. Embedding refers to the different levels involved in each sentence. The different levels of memory questions were included to control for the participants comprehension of complex questions and understanding of the procedure and were



not intended to mirror the levels of embeddedness in the mentalizing questions but rather they provide a measure of general memory capacity from the story (Stiller & Dunbar, 2007). The mentalizing questions varied from 2<sup>nd</sup> order intentionality to 7<sup>th</sup> order intentionality. One level of intentionality in this context refers to the mental state of one individual so as the number of characters whose mental state must be inferred increases so does the levels of intentionality. The participant's own mental state is also included and this is seen as the first level of intentionality. Thus a 7<sup>th</sup> order intentionality question would involve tracking the mental states of six story characters as well as the participant's own mental state. The number of words used and people involved in each question was balanced across the mentalizing and factual questions. The types of questions were presented randomly with the same order being presented to all participants. Participants were instructed to read each story twice and then answer the questions following it (responding to whether the statement is true or false) without looking back on the story. Participants were explicitly told not to guess the answers and if the question asked for information that was not easily inferred from the story then they should answer false to the question. Stiller and Dunbar (2007) suggest a weighted score to include the level of intentionality in the analysis. However further investigation using this score indicates that the inclusion of the level of intentionality provides scores similar to those of the raw scores "you don't necessarily need to know the exact intentionality level, just using the raw correct scores is fine" (Dunbar, 2011, personal communication. Participants received a score of one for each correct answer provided. The participants final score was calculated as the number of mentalizing questions they responded to correctly divided by the

total number of questions they responded two correctly (total number included the mentalizing and factual questions). There is no normative data available for this task.

The two measures of ToM included in the current study were viewed as involving different aspects of ToM, reflected in the different tasks involved. For the remainder of this chapter the RME task will be referred to as an affective ToM task as it involves inferring the emotional states of the actor, while the IMT will be referred to as a cognitive ToM task, as it involves inferring the intentions of the characters.

### *2.2.2.3 Emotion Recognition Task.*

This task involved presenting participants with images of faces displaying a facial expression of one of five emotions or a neutral face. The emotions displayed were happiness, sadness, anger, disgust and surprise. A Caucasian male and a Caucasian female model displayed each emotion. The emotions were presented at three levels of intensity of expression, 40% intensity, 70% intensity and 100% intensity for each model (one model of each gender displayed each emotion at the three levels of intensity). Thus there were 36 images presented, six for each emotion and six neutral images. The images were sourced from the Radboud Faces Database (RaFD; Langner et al., 2010). The RaFD is a high quality facial database in which each model is trained to express emotions according to the Facial Affect Coding System. In the present task the models gaze was straight towards the camera and the model faced right angle to the camera. In order to produce the different levels of intensity, the face with the full blown expression of emotion was morphed with the neutral face of the same model using Morphman 4.0 software. Participants were initially presented with the image and asked to respond using the keyboard buttons as to what the emotion was that was displayed on the face by pressing a corresponding keyboard key.

Participants were then presented with a screen asking them to estimate how intense they thought that emotion was using a 1-10 Likert scale. Although the reaction time taken to identify the correct emotion could have been taken as a dependent variable, it was not included as a variable for two reasons. First, past research using this measure used accuracy rates rather than reaction time as the dependent variable for this measure (Gery, Miljkovitch, Berthoz, Soussignan, 2009). Secondly, when reaction time was considered as a variable it was found not to be related any of the other variables under investigation. Therefore, the accuracy rate for recognising the emotion displayed on the face was taken as the dependant variable. Participants received a score of one for each emotion they identified correctly and their final score was the total number of correct responses.

*2.2.2.4 Cognitive and Affective Empathy: The Interpersonal Reactivity Index (IRI; Davis, 1983)*

Cognitive and affective empathy were assessed as two separate components in the current study. Both were measured using the Interpersonal Reactivity Index. The IRI is a 28 item multidimensional questionnaire of empathy (Davis, 1983). It consists of four subscales; Perspective Taking (PT), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD). The Perspective Taking scale evaluates a person's ability to take into consideration the points of view of others. The Fantasy subscale evaluates a person's propensity to identify with fictional characters in books, films, or plays. The Empathic Concern subscale evaluates a person's 'other-oriented' feelings, sympathy and concern for unfortunate others. The Personal Distress subscale evaluates a person's 'self-orientated' feelings and the tendency to feel distressed or anxious when confronted with a negative situation. The Perspective Taking and Fantasy subscales



are proposed to measure the cognitive facet of empathy, while the Personal Distress and Emotional Concern subscales are proposed to assess the affective facet of empathy. Each item is assessed using a 5 point Likert scale ranging from 0 (does not describe me well) to 4 (describes me very well). The scale has shown internal reliability of ranging from 0.71 to 0.77 and test-retest reliability ranging from 0.62 to 0.71 (Davis, 1983). Participant's scores were calculated according to the scoring procedure that accompanied the scale. This involved reverse scoring of some items. Each item was given a score from 0 to 4. The total score for each subscale was calculated as the total scores given for each item included in that subscale. Cognitive empathy was then calculated as the PT and FS scales combined; and affective empathy was calculated as the EC and PD scales combined.

#### *2.2.2.5 WAIS-III Vocabulary subscale (WAIS-III-VOC).*

The WAIS-III-VOC was employed to assess participants overall intelligence as due to time constraints a full battery of IQ tests could not be carried out and of all the WAIS II subscales, the vocabulary score has been found to correlated most highly with general intelligence (Kaufman & Lichtenberger, 1999). The WAIS-III-VOC has demonstrated acceptable levels of reliability (Matarazzo, Wiers, Matarazzo, & Manaugh, 1973) and validity (Feingold, 1984). The procedure involved the researcher asking participants to define up to 33 words. The participant verbalised his response and this was transcribed by the researcher and later scored for correctness based on criteria included in the WAIS-III Administration and Scoring Manual (Wechsler, 1997). Participants received a score of two per item if they defined the word correctly, they received a score of one if they partially defined the word and they received a score of zero if they failed to define the word accurately.



#### *2.2.2.6 Implicit Association Task (Greenwald, McGhee et al. 1998).*

The Implicit Association Task is proposed to measure the strength of associations between concepts and has been used to measure a variety of constructs, such as self-esteem (Greenwald & Farnham, 2000), gender self-concept (Rudman, Greenwald, & McGhee, 2001), and racial stereotypes (McConnell & Leibold, 2001). The IAT has also been used to assess implicit theories of sex offenders, most frequently the 'children as sexual beings' implicit theory (Mihailides, Devilly et al. 2004). The task involves asking participants to categorise words presented on a computer screen, using particular response keys. The speed at which words are categorised when two categories share the same response key is presumed to be indicative of the strength of association between those concepts (Greenwald, McGhee et al. 1998). The IAT has shown adequate psychometric properties. The internal reliability of the Flower/Insect IAT provided a Cronbach's alpha of 0.81-0.93 and an average test-retest reliability of 0.6 (Nosek, Greenwald & Banaji, 2007). The IAT has also shown good validity, with the average correlation between implicit and explicit measures from web based IATs ranging from racial prejudice to political affiliations of  $r = 0.24$ , range  $r = 0.08$ - $r = 0.52$  (Nosek, Greenwald and Banaji, 2007). Additionally, the IAT appears to be somewhat uncontaminated by social desirability or other dissimulation effects (Asendorff, Banse, & Muecke, 2002; Greenwald et al., 2002). Using criterion measures of inter-racial Black-White prejudice, the predictive validity of the IAT significantly exceeded that of self-report measures.

In the current study, the IAT was employed to assess a non-deviant implicit theory. As the premise of this study is to extrapolate the factors implicated in sex offending within a normal population, an IT was chosen based on the ITs that have

been found in the sex offending population. The aim was to choose an IT that was prevalent within a sex offender population and amend it in such a way that the structure was the same but the target (surface content) was non-deviant. The 'Dangerous World' IT was chosen, as it was judged to involve concise targets and attributes, amenable to an IAT design. One variant of this IT is the view that the world is a dangerous place, within which adults are malevolent and are generally hostile. In contrast children are seen as safe and dependable (Ward, 2000). It is possible that this IT could be assessed in terms of offenders by investigating their association between the concepts 'adult' and 'child' and the attributes 'good' and 'bad'. Thus this IT was manipulated for the purposes of this study to be applied to a non-deviant population. The current IAT therefore assessed the domain of evaluation (good vs. bad) in terms of gender (man vs. woman). Throughout the IAT words were presented in the centre of the screen and the participants' task was to categorise these words in terms of whether they belonged to the category (ies) on the left hand side of the screen (by pressing the left-hand response key) or category (ies) on the right hand side of the screen (by pressing the right-hand response key).

The categories used in the present IAT consisted of two target concepts (male and female) and the two attributes (good vs. bad). The task consists of seven blocks. The first block, known as the target concept discrimination task, involves asking participants to sort words into the categories of 'man' and 'woman', that is they press the left-response key if the word presented in the centre belongs to the 'woman' category and they press the right-response key if the word belongs to the 'man' category. The exemplars used for the gender categories consisted of synonyms of

man and woman such as 'bloke' and 'lady', respectively (see Appendix C for the exemplars used for each category). This block consists of 20 trials. The second block, known as the attribute discrimination task, involves participants' sorting the words into the categories of 'good' and 'bad', which also consists of 20 trials. The exemplars used for the evaluation categories consisted of synonyms for good and bad such as 'nice' and 'awful', respectively. Block three consists of the practice trials for the first combined task. This block also consists of 20 trials. This block involves an attribute and concept being matched to the same response key such that, for example, 'woman or good' is presented on the left hand side of screen, and, the alternative combination, 'man or bad' is presented on the right hand side of the screen. Thus the participants must press the left-response key if the word in the centre belongs to either the woman category or the good category and they press the right-response key if the word belongs to the man category or the bad category. The fourth block, referred to as the test combined task, consists of 40 trials and follows the same procedure as block three. Block five, referred to as the reverse target discrimination task, consists of 20 trials. It follows a similar procedure to block one, however the response keys have been reversed such that if the target word belongs to the 'man' category, participants press the left-response key and if the word belongs to the 'woman' category they press the right-response key. Block six, consists of the practice block for the reversed combined task. It is similar to block three, however in this case 'man' and 'good' are matched to the same response key and 'woman' and 'bad' are matched to the alternative response key. Thus, if the word belongs to either the 'man' category or the 'good' category, the correct response would be to press the



left-response key and if the word belonged to the 'woman' category or the 'bad' category, the correct response would be to press the right-response key. Finally, block 7, the test reversed combined task, consists of 40 trials and follows the same procedure as block 6. For a random half of the participants, the positions of block one and block five were reversed, the positions of block 3 and block 6 were reversed and the positions of block 4 and block 7 were reversed in the presentation so as to minimize any order effects. Participants were not given any feedback on their success rates; however the trial would remain on the screen until the correct response was given. The IAT score was the difference in reaction times to categorise words between congruent (block four) and incongruent (block seven) blocks, as calculated using D600 scoring algorithm (Greenwald, Nosek, & Banaji, 2003).

#### *2.2.2.7 Stroop (Stroop, 1935).*

The Classical Stroop Task was employed to assess executive functioning as it is seen as a well validated test of executive control and self-regulatory capacity (Weirs, Beckers, Houben, & Hofmann, 2009). The Stroop stimuli consisted of strings of four X's and the words 'red', 'yellow', 'green' and 'blue' presented in red, yellow, green or blue font colour. For each trial a single colour word printed in a particular font colour was presented in the centre of a screen over a black background. The viewing distance was approximately 50 cm from the centre of the screen. The Stroop task followed a similar procedure to that outlined by Phillips, Bull, Adams, and Fraser (2002). The task consisted of four blocks of trials presented in the same order to all participants. Each block began with eight practice trials in which participants were given feedback as to their success in the trials. If the participant made an error in their responding to these practice trials, they were presented with feedback in the form of a



red X in the middle of the screen. After the practice trials, the participants were then presented with 24 test trials. No feedback was given to participants as to their success rate during the test part of the trial. The task began with a neutral block in which letter strings (XXXX) were presented in one of the four colours in the centre of the screen. Participants were asked to respond as quickly as possible to the presentation by pressing the coloured key (on which matching coloured stickers had been placed) that corresponded to the colour of the string. In the following block, block two, participants were presented with the words red, yellow, green and blue in the colours red, yellow, green and blue and were asked to respond to the meaning of the word, irrespective of the colour of the font in which the word was presented. In the following block, block three, participants were presented with the same words as the previous block. However, in this block participants were asked to name the colour of the font in which the word was presented and ignore the word meaning. In the final block, block four, participants were told that their task would alternate between trials so that in one trial the participant's task would be to name the font colour and in the following task, their task would be to name the word meaning. Participants were given a prompt before each trial detailing their task for the proceeding trial. The reaction time was calculated, by the computer, as the time from the image onset to the participants' response (pressing the coloured response key).

### **2.2.3 Procedure**

All participants completed each of the seven tasks. The tasks were administered in a random order. Participants took approximately 45-55 minutes to complete all tasks. Verbal instructions were presented to the participants prior to each task and additional written instructions were also provided. The researcher remained in the room or in the

vicinity of the room for testing, and participants were given the opportunity for questions or clarifications throughout.

#### **2.2.4 Data analysis**

##### **2.2.4.1 IAT Analysis.**

The IAT score was obtained by applying the D600 scoring algorithm (Greenwald, Nosek, & Banai, 2003). This involved including practice blocks in the final analysis, replacing errors with a 'penalty' score of 600ms. All response latencies above 1000 ms were removed and participants with more than 10% of their trials with a latency below 300ms were removed. One difference score was calculated for the practice block and another difference score was calculated for the test blocks. The difference score for the practice blocks consisted of the difference between the practice block in which 'woman' and 'good' shared the same response key and the practice block in which 'man' and 'good' shared the same response key, divided by the standard deviation of these two blocks combined. Similarly, the difference score for the test blocks consisted of the difference between the test block in which 'woman' and 'good' shared the same response key and the test block in which 'man' and 'good' shared the same response key, divided by the standard deviation of these two test blocks combined. The final D-score involved the average of these two scores. It was initially proposed that a participant would be deemed to hold the gender IT if he received a negative difference score as calculated by Greenwald's D-Score. Using this method was seen as quite arbitrary as a difference of one millisecond would determine the difference between those participants who held an IT and those who didn't. Thus a cutoff based on the participants' standard deviation was applied. Participants whose difference score was at least 0.5 time their standard deviation

below zero were coded as having the implicit theory, whereas participants whose difference score was at least 0.5 times their standard deviation above zero were coded as not having the implicit theory. Both of these variables were entered as dummy variables into the regression model. The difference score was also applied as a continuous measure of the IT. It is possible that IAT artefacts such as order effects may have affected the use of the measure for individual classification. This is generally addressed when looking at group differences by counterbalancing the order of the congruent and incongruent trials across participants. However this does not affect the order effects when using the IAT as an ipsative measure. However, as there was no overall difference found between the reaction times across the two orders, the order effects were not addressed any further. No other methods were used to analyse the data.

#### *2.2.4.2 Stroop Analysis.*

Given the inherent difficulties in reaction time data, that will be addressed later in this thesis; outliers beyond three times the interquartile range were removed from the Stroop data and the emotion recognition task. This conservative cut-off was chosen as it was expected to remove any extreme spurious data points, not due to the process of interest, and to retain as much of the real data as possible. The Stroop Interference score was calculated as the difference between participants' reaction times in the colour-naming block (block three) and the participants' reaction times in the neutral block (block one), as this is a common method of computing the Stroop Interference effect (McLeod, 1991).



#### **2.2.4.3 Overall Analyses.**

Separate linear regression analyses were then carried out on the data, (1) to determine how well the predictor variables predicted affective ToM and (2) to determine how well the predictor variables predicted cognitive ToM.

### **2.3 Results**

Two sets of analyses were carried out to determine how well measures of (1) Cognitive Empathy as assessed through the Perspective Taking and Fantasy subscales of the IRI, (2) Affective Empathy, as assessed through the Empathic Concern and Personal Distress subscales of the IRI, (3) Emotion Recognition Accuracy (ERA), as assessed through the emotion recognition tasks, (4) Gender-Good Implicit Theory, as assessed through the IAT, (5) Executive Function(EF), as assessed through the Stroop task, and (6) IQ, as assessed through the WAIS-III Vocabulary subscale, predicted Theory of Mind (TOM). The first analysis looked at how well these variables accounted for the variation in Cognitive Theory of Mind as assessed by the Imposing Memory Task (IMT). The second analysis looked at how well the variables predicted Affective Theory of Mind as assessed by the Reading the Mind in the Eyes task (RME).

#### **2.3.1 Cognitive Theory of Mind (Imposing Memory Task; IMT)**

##### **2.3.1.1 Correlations between Predictor Variables and Cognitive Theory of Mind.**

Pearson product moment correlation coefficients were initially used to examine the associations between Cognitive Theory of Mind and (1) Affective Empathy, (2) Cognitive Empathy, (3) Emotion Recognition Accuracy (ERA), (4) Gender-Good Implicit Theory, (5) Executive Function, and (6) IQ. The results of Pearson's correlation coefficients are presented in Table 1. A positive correlation was found



between Cognitive ToM and Executive Function ( $r = 0.28, p < 0.05$ ). Cognitive ToM was also shown to be positively correlated with Cognitive Empathy ( $r = 0.25, p < 0.05$ ). None of the other variables were found to be significantly correlated with Cognitive Theory of Mind. Note that since ‘r’ is a direct measure of effect size, according to Cohen's convention, these correlations can be interpreted as being small effect sizes.

Table 1  
*Pearson's Correlations for all Predictor Variables with Cognitive Theory of Mind (IMT Assessed).*

|                                 | 1     | 2     | 3     | 4     | 5     | 6    | 7 |
|---------------------------------|-------|-------|-------|-------|-------|------|---|
| 1. Affective Empathy            | -     |       |       |       |       |      |   |
| 2. Cognitive Empathy            | 0.18  | -     |       |       |       |      |   |
| 3. Emotion Recognition Accuracy | -0.11 | 0.01  | -     |       |       |      |   |
| 4. Gender-Good Implicit Theory  | 0.03  | -0.17 | 0.12  | -     |       |      |   |
| 5. Exexecutive Function         | 0.13  | 0.07  | -0.04 | -0.13 | -     |      |   |
| 6. IQ                           | 0.13  | 0.11  | 0.01  | 0.05  | 0.05  | -    |   |
| 7. Cognitive ToM (IMT)          | -0.14 | 0.25* | 0.2   | -0.14 | 0.28* | 0.16 | - |

\*  $p < 0.05$  (two-tailed)

2.3.1.2 Regression Analysis of Cognitive Theory of Mind.

A hierarchical multiple regression was carried out to assess the amount of variance in Cognitive ToM accounted for by Cognitive Empathy and Executive Functioning (EF), the results of which are presented in Table 2. As there is previous research implicating the relationship between EF and ToM, Executive Function was entered in the first block in the regression model and found to be a significant predictor of Cognitive ToM( $\beta = 0.28, P < 0.05$ ). Cognitive empathy was then added to the model and the new model was found to be statistically significant ( $F(2, 65) = 4.91, p < 0.01$ ) and accounted for 10% of the variance in Cognitive ToM. In the second block,

after accounting for the variance caused by EF, Cognitive Empathy also predicted Cognitive ToM ( $\beta = 0.23, p < 0.05$ ).

Table 2  
*Cognitive Theory of Mind Regression Analysis with Executive Function and Cognitive Empathy as Predictor Variables.*

| Step | Variable           | B        | SE B  | $\beta$ | R <sup>2</sup> | Adjusted R <sup>2</sup> | Change in R <sup>2</sup> |
|------|--------------------|----------|-------|---------|----------------|-------------------------|--------------------------|
| 1    | Constant           | 0.45     | 0.005 |         |                |                         |                          |
|      | Executive Function | 0.000034 | 0.01  | 0.28*   | 0.08           | 0.07                    |                          |
| 2    | Constant           | 0.42     | 0.02  |         |                |                         |                          |
|      | Executive Function | 0.000032 | 0.01  | 0.27*   |                |                         |                          |
|      | Cognitive Empathy  | 0.001    | 0.01  | 0.23*   | 0.13           | 0.10                    | 0.05                     |

\*  $p \leq 0.05$  (two-tailed)

2.3.2 Affective Theory of Mind (Reading the Mind in the Eyes; RME)

2.3.2.1 Univariate Predictors of Affective Theory of Mind.

Pearson’s product moment correlation coefficients were used to examine the associations between Affective Theory of Mind and (1) Affective Empathy, (2) Cognitive Empathy, (3) Facial Emotion Recognition Accuracy (ERA), (4) Gender-Good Implicit Theory, (5) Executive Function, and (6) IQ. The results of Pearson’s correlation coefficients are presented in Table 3. Facial Emotion Recognition Accuracy was the only variable to show a significant correlation with RME assessed ToM ( $r = 0.42, p < 0.05$ ).A simple linear regression indicated that FER significantly predicted 17% of the variance in Affective ToM ( $\beta = 0.43, p < 0.05$ ) as presented in Table 4.

Table 3  
*Pearson's Correlations for all Predictor Variables with Affective Theory of Mind (RME Assessed)*

|                                 | 1     | 2     | 3      | 4     | 5    | 6    | 7 |
|---------------------------------|-------|-------|--------|-------|------|------|---|
| 1. Affective Empathy            | -     |       |        |       |      |      |   |
| 2. Cognitive Empathy            | 0.18  | -     |        |       |      |      |   |
| 3. Emotion Recognition Accuracy | -0.11 | 0.01  | -      |       |      |      |   |
| 4. Gender-Good Implicit Theory  | 0.03  | -0.17 | 0.12   | -     |      |      |   |
| 5. Exexecutive Function         | 0.13  | 0.07  | -0.04  | -0.13 | -    |      |   |
| 6. IQ                           | 0.13  | 0.11  | 0.10   | 0.05  | 0.05 | -    |   |
| 7. Cognitive ToM (IMT)          | -0.02 | 0.08  | 0.43** | -0.02 | 0.17 | 0.23 | - |

\* p < 0.05 (two-tailed), \*\*p < 0.01(two-tailed)

Table 4  
*Affective Theory of Mind Regression Analysis with Emotion Recognition Accuracy (ERA) as a Predictor Variable*

| Variable | B     | SE B | β     | R <sup>2</sup> | Adjusted R <sup>2</sup> |
|----------|-------|------|-------|----------------|-------------------------|
| Constant | 14.03 | 2.80 |       |                |                         |
| ERA      | 0.59  | 0.15 | 0.42* | 0.18           | 0.17                    |

\* p < 0.01 (two-tailed)

**2.3.3 Correlation between Cognitive and Affective Theory of Mind Measures**

A Pearson’s Product Moment Correlation indicated a significant correlation between the two ToM measures, Reading the Mind in the Eyes and the Imposing Memory Task ( $r = 0.31, p < 0.01$ ).

**2.3.4 Within Group Differences for Emotion Recognition**

Further analyses involved investigating the possible differences between participants’ responses to male and female images. Although this construct was not specifically outlined in the hypothesis, whether participants were more accurate at recognising male versus female faces was deemed an interesting question as the differences in male recognition accuracy across male and female faces may have implications for

sex offender research, particularly as research has investigated offender's decoding or female affective cues (e.g., Lipton, McDonel, & McFall, 1987).

Results indicate that there was a significant difference between the participants Facial Emotion Recognition Accuracy ( $t(69) = 5.71, p < 0.001, d = 0.94$ ), with participants correctly identifying the emotion on more male faces ( $M = 9.80, SD = 1.78$ ) than female faces ( $M = 8.31, SD = 1.59$ ).

Results also indicate a significant difference in participants performance on the RME task between the male and female sets of eyes ( $t(68) = 10.68, p < 0.001, d = 1.40$ ). Again participants were more accurate at reading the mind in the eyes of male images ( $M = 13.99, SD = 2.08$ ) than female images ( $M = 10.72, SD = 2.33$ ).

## **2.4 Discussion**

As outlined in the introduction, the concepts of, and relationships between, theory of mind, empathy, implicit theories and executive function have all been implicated in explanations and theories of sex offending. Thus the aim of the present study was to investigate these concepts in a normal male population to determine their relatedness to one-another. In line with this objective, the results of the current study will initially be discussed in terms of the relationships between the concepts, within a normal population, and an attempt will be made to distinguish between the roles of affect and cognition within these constructs. The results will then be discussed in terms of their implications for the sex offending literature. This is a unique contribution to the literature as while previous research has highlighted the differences between cognitive and affective aspects of empathy and separately research has investigated



the relationship between theory of mind and empathy, there has been little integration of these two areas, particularly as applied to sex offending theory.

It was hypothesised that the concepts of empathy, implicit theories, and executive function would contribute to theory of mind. This hypothesis was based on the speculation that ToM, as it involves the process of making judgements on the mental states of others, would be related to empathy and implicit theories. It was also suggested that executive function would play a role in these relationships given the proposed overlap between ToM and executive functioning (German & Hehman, 2006). Overall, the results indicate that, two of the five predictors behaved as expected. Specifically Executive Function and Cognitive Empathy were found to be significant predictors of ToM as assessed by the IMT but they were not found to be predictive of ToM assessed by the RME. From the concepts assessed in this study, Emotion Recognition was found to have the only significant correlation with ToM as assessed by the RME. This is supportive of the notion that the two measures of ToM assessed different aspects of the construct, a point which is further expanded on below. Furthermore, the implicit theory assessed here was found not to be related to either measure of ToM or empathy. A relationship also failed to emerge between cognitive and emotion empathy as was expected. These are interesting findings and suggest that the manner in which affective and cognitive mechanisms are construed may need to be readdressed, particularly in the area of sex offending. However, it should be borne in mind that the current sample consisted of seventy-one normal males. Therefore there may be limited variability in the constructs assessed, as the majority are expected to have fallen within the normal range for each of the

constructs assessed, which may have reduced the likelihood of finding significant results.

#### **2.4.1 Theory of Mind Findings**

An interesting finding in this research was the difference between the two ToM measures. While the two measures were found to be correlated with one-another, this correlation was low compared to what one might expect from two measures purporting to be measuring the same underlying construct. Divergent results were also found across the two measures, in that different constructs were found to be predictive of each. Given these results, it appears that the ToM concept is one that needs further investigation in terms of what abilities it subsumes, what associations it has with other constructs, and further how to assess the construct. It is possible, given the different tasks involved in each measure, that one measure assessed the affective components of this construct while the other assessed the cognitive components of ToM. This conceptualisation of ToM is supported by the findings that cognitive ToM and affective ToM implicate overlapping, yet distinct neurological structures (Shamay-Tsoory & Aharon-Peretz, 2007). Theory of mind is generally referred to as the ability to attribute mental states to oneself or another person (Premack & Woodruff, 1978). Given this very broad definition, it is likely that the construct may subsume a number of different social cognitive constructs. For example, as the current results indicate, cognitive ToM has been implicated in empathy and executive function. This broad definition has also lead to a diverse number of assessment tasks.

##### ***2.4.1.1 Reading the Mind in the Eyes.***

As with any assessment measure, the premise on which it is based is likely to be influenced by the theoretical stance of the developer. One task used in the current

study, Reading the Mind in the Eyes task was developed by Baron-Cohen et al. (2001). Baron-Cohen, as one of the leading and pioneering researchers in the role of ToM in autism, tends to approach the concept from a clinical perspective. However, unlike the traditional view of ToM, as a dichotomy of being present or not, Baron-Cohen views ToM as occurring along a continuum with individual's varying in their ability to mentalize about the mental states of others. Furthermore, Baron-Cohen, along with other researchers (e.g., Kinderman, Dunbar, & Bentall, 1998), have begun to look at ToM in adults, rather than exclusively theorising about children's development. The RME task was designed to be used with adults with normal intelligence who may have mild deficits in social understanding and was specifically designed to be a sensitive measure of adult theory of mind (Baron-Cohen, 2001). The RME 'was conceived as a test of how well the participant can put themselves into the mind of another person and "tune in" to their mental state' (Baron-Cohen, 2001, p. 3). Reflecting the continuum view of ToM, a further advantage of this test is that normal performance is significantly below ceiling which allows for sensitivity to individual differences (Baron-Cohen). However, although the test has been described as a test of advanced ToM, it only implicates the first stage of ToM; attribution of the relevant mental state (e.g., compassion) and it does not include the second stage; inferring the content of that mental state (e.g., compassion for wife's loss) (Baron-Cohen, 2001). That is not to say that RME is not an appropriate assessment measure of ToM, rather it is an assessment measure of one stage of ToM, but not the second stage. Perhaps it is then the second stage, inferring the content of that mental state that is related to cognitive social constructs, specifically empathy. It is possible that the second ToM



measure used in the current study, the IMT, encompasses this second stage, that of inferring the content of the mental state. This may explain the size of the correlation found between the measures and why the IMT was found to have relationships with the other social cognitive constructs as hypothesised.

However, the RME was found to be predicted by emotion recognition. This finding is not surprising given the similarity between the two tasks. The emotion recognition task required participants to judge the emotion portrayed on an actor's face from six basic emotions (happy, sad, surprised, disgusted, fear and neutral). The RME also asked participants to judge the emotion portrayed, however in this case they were asked to do so by looking at an actor's eyes only. Furthermore, the options for participants' responses involved more complicated, subtle emotions, than those given for the emotion recognition task (e.g., guilt, desire). Baron-Cohen et al. (2001) claim that the RME is different from a simple emotion recognition task as basic emotions are recognised universally and across all age ranges, even by very young children (Eckman & Friesen, 1971), but this task does not require the individual to attribute a belief to the person displaying the emotion. However the complex mental states used in the RME requires the participant to attribute a belief or intention to the actor. Baron-Cohen et al. (2001) therefore argue that the task is more cognitive in nature than the mere recognition of basic emotions. Notwithstanding this, emotion recognition was found to be a significant predictor of RME assessed ToM, while it was not found to be related to any other of the concepts under investigation in this study. This result may have emerged as there is no relationship between these concepts and ToM. However, the more likely explanation for this finding is that this



particular ToM construct assesses the attribution of an affective state without taking into account the participant's ability to attribute the content of that mental state or recognise false beliefs. These latter abilities are likely to be more cognitive in nature.

Another finding in relation to the RME measure was that it was not correlated with the executive function measure. Baron-Cohen also argues that the measure (RME) should not be influenced by executive functioning as it does not require abilities such as attention shifting, sequencing, planning (Baron-Cohen et al., 2001). This proposition is reflected in the current results, again suggesting that the measure is more affective than cognitive in nature. The role of executive function on ToM will be discussed further below. Both ToM tasks also appear to be free from IQ as they were not correlated with the IQ measure in the current study, thus indicating they are assessing 'pure' ToM (Baron-Cohen et al., 2001).

#### *2.4.1.2 Imposing Memory Task.*

The second ToM assessment used in the current study, the Imposing Memory Task, was developed by Dunbar and Stiller (2007) as a mechanism for assessing ToM, outside the clinical realm and as a continuous attribute. This measure was specifically developed to address the dearth in procedures for assessment of ToM in normal adults and, specifically, to look at how ToM helps normal individuals function in their complex social worlds. The measure required participants to infer not only the mental state but also the content of the mental states, and possible false beliefs, of characters within specific social situations. The measure appeared to be the better measure of ToM within this context, in which the subtle differences in metalizing ability in a group of normal males, is of interest. As this measure appeared to assess the aspects of ToM that were of interest for the current study (that is the ability to

infer the beliefs of others, including false belief), when referring to ToM for the remainder of this discussion, unless otherwise specified, it is the IMT assessed ToM that is being referred to.

The results indicate that, as hypothesised, empathy, specifically cognitive empathy, and executive function predict ToM. Cognitive empathy assesses the ability to take the perspective of others and to identify with fictional characters. The results indicate that this construct is related to the ability to infer the mental states of others. As ToM is thought to develop in early childhood, during preschool years (Wellman et al., 2001) and cognitive empathy likely to develop later, it is expected that ToM facilitates the later development of cognitive empathy. The general ability to infer the states of others is likely to influence one's ability to take into consideration another person's point of view when it is necessary, and also the ability to identify with fictional characters, particularly given the role of false beliefs in ToM. Thus in order to engage in the cognitive empathy process, one must first have the general ability to infer the mental states of others, and without this ability, it is unlikely that a person will be able to cognitively empathise with others. Interestingly however, ToM was not found to be related to affective empathy. This would suggest that ToM is a cognitively based measure and the ability to infer another's mental states does not necessarily lead a person to feel sympathy for that person or the ability to feel distress themselves. Thus ToM is more likely a cognitive construct, dealing purely in the logic associated with other's belief, while ability to feel emotion for oneself and others involves separate constructs, not influenced by ToM.

It has previously been suggested that there is a relationship between executive function and ToM, particularly given the developmental timetable of the two concepts (Ozonoff, Pennington, & Rogers, 1991). The results of this current study also support this contention. However, the level of relationship between these constructs is unclear. The current results indicate a medium sized correlation ( $r = 0.28$ )<sup>3</sup> between the two constructs.

It has been suggested that executive function is needed in order to select the appropriate mental states of others (German & Hehman, 2006). As people's beliefs are more commonly true than false, inferring of a false belief requires an individual to inhibit a prepotent response, requiring the inhibitory elements of executive function (German & Hehman, 2006). It is interesting that executive function is not related to ToM as assessed by the RME, which does not require the attribution of the content of other's beliefs, but rather just the beliefs themselves. As the RME was not structured around the idea of the false belief, it would not require the inhibition of the false response and, as shown here, would not be related to executive function. The results support the contention of Baron-Cohen, that this particular measure should not be influenced by executive functioning as it does not require abilities such as attention shifting, sequencing, planning (Baron-Cohen et al., 2001). As the RME did not require the inference of false beliefs, it is suggested that it is the aspect of ToM that implicated the ability to infer the content of beliefs, including false beliefs, that is related to executive function. The current findings also suggest that the argument in

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<sup>3</sup> Cohen (1988) suggests that an  $r$  of 0.1 represents a 'small' effect size, an  $r$  of 0.3 represents a 'medium' effect size and  $r$  of 0.5 represents a 'large' effect size.



the literature on the relationship between these concepts should focus on the aspect of ToM under investigation and the measure used to assess it.

#### **2.4.2 Implicit Theory Findings**

The current study failed to show any relationships between the specific implicit theory and the other constructs assessed in this study. There are a number of possible explanations for these results. It is possible that implicit theories are in fact not related to theory of mind, and the suggestions made by Ward et al. (2000) regarding the development of implicit theories in terms of social cognition and the role of ToM in the development of ITs, is false. The suggestion that ToM and Implicit Theories would be related came from the 'theory theory' perspective. However an alternative view of mentalizing ability comes from the view that ToM is the result of an innate module (Baron-Cohen, 2000; Leslie, 1987; 1991). In contrast to the 'theory theory' perspective, proponents of this view suggest that basic mental concepts such as belief and desires are not constructed from evidence during the course of childhood development but rather an innate structure, developed through evolution is dedicated to interpreting behaviour based on the mental states. For example, Leslie (1987; 1991) proposed that there is a distinct ToM module that makes its first appearance with the onset of pretence in 18 month olds. Baron-Cohen (1999) also suggests an Innate Minimalist Modularity Theory which suggests a neuro-cognitive system dedicated to 'mind reading', made up of four discrete subsystems, which together comprise the human mind-reading system. The 'theory theory' perspective argue that while there may exist innate knowledge about the world, there is not a ToM module (Gopnik & Wellman, 1994; Meltzoff & Gopnik, 1993). Thus if one takes this modular view of ToM, the finding of no relationship between ToM and implicit



theories is not surprising. Implicit theories, as they encompass general views about the way the world works, are unlikely to be domain specific but rather be represented across a number of different modalities. Furthermore, as a relationship was found between EF and ToM in the current study, this would lend more support to the modality view of ToM. Thus it is possible that ToM and ITs are qualitatively different constructs, with perhaps ToM encompassing a larger, broader construct devoted to emotional and empathic abilities, whereas implicit theories are more specific social cognitive constructs. Therefore empathy may have more in common with this general ToM construct, as discussed above, than with very specific implicit theories.

Another possible explanation for the results found here is that the current sample does not hold the gender good implicit theory. As the premise of this study was to extrapolate the factors implicated in sex offending within a normal population, an IT was chosen based on the ITs that have been found in the sex offending population. The aim was to choose an IT that was prevalent within a sex offender population and amend it in such a way that the structure was the same but the target (surface content) was non-deviant. The implicit theory under investigation was that men, compared with women, are inherently good. It was suggested that a subgroup of males in the present sample will hold this implicit theory about their own gender, that is, a bias in favour of men and against women. However, difficulties arose when trying to determine which participants, if indeed any, held the IT and which did not, based on IAT results. A number of data analysis methods were investigated to determine which score is a reflection of an individual having an implicit theory (see

method). However this was a difficult task and no one analysis method was deemed completely adequate. One possible explanation for this is that the IAT is not an appropriate measure for identifying whether an individual has an implicit theory or not. The measure is generally used to assess group differences, for example, the difference between a high anxiety group and a low anxiety group on a self-esteem IAT, and has been shown to hold adequate psychometric properties in this domain. However, while it has been used for individual classification purposes (see Fiedler, Messner, & Bluemke, 2006, for a review) and has been suggested for use for diagnostic purposes (Gray et al., 2003); its use in this realm is less well established. While the test-retest reliability is seen as acceptable for research purposes, it would not be appropriate as an individual difference measure that may be diagnostic for an individual person (Nosek et al., 2007). Additionally, Fielder et al. (2006) argued that when an individual's test score is used for individual classification purposes, no randomisation is involved so that an unknown number of uncontrolled factors may have influenced the individual's test performance. Thus it is suggested that the IAT was not an appropriate measure in this context. At the time of study design, it was deemed the most appropriate measure given the proliferation of research on the measure.

Furthermore, if the measure was found to adequately identify whether a participant holds an IT, the personal and specific nature of implicit theories would make it quite difficult to identify an IT that was present in a large group of participants. While it is easy to assess the general construct of ToM within the experimental context, the task is more difficult for ITs. Given that ITs are clusters of

beliefs based on past experience, they may involve a qualitatively different construct from ToM. As they are idiosyncratic they may be difficult to assess with a group comparisons design, as each individual's IT is likely to be unique to that individual. Each participant in the current study is likely to have had different childhood experiences and presented with different evidence, and therefore the specific content of each individual's IT is likely to be exclusive to him. While at a very general level it may be possible to find an IT common to some participants, the percentage of participants it applies to will be low given the current sample size. Within the sex offender population, a number of ITs have been identified that can be generally applied to sex offenders, given the common adversities during childhood and common offending behaviour. Investigating a general cluster of ITs within this study was more difficult given the assumed greater heterogeneity of this sample. This may also explain why research on sex offenders, using qualitative designs has resulted in more clear results than those based on quantitative group measures (Gannon, 2009). Within a qualitative design, the participant gives their own account of their thoughts and beliefs rather than being restricted to the predetermined categories tested within the experimental design.

Overall, these results do not support the assertion that mistaken attributions of belief result in cognitive distortions and mistaken attributions of feelings result in empathy deficits (Ward, et al., 2000). Rather the current findings suggest that a relationship between concepts is dependent on the type of ToM measure used, or the aspect of ToM it taps into. One aspect of theory of mind, that assessed by the IMT, is



associated with the cognitive aspect of empathy and another aspect of ToM, that assessed by the RME is associated with emotional decoding.

### **2.4.3 Empathy Findings**

#### ***2.4.3.1 Emotion Recognition.***

According to the theories and definitions of empathy outlined in the introduction, emotion recognition is an integral aspect of the empathic response. Davis (1983) implicates emotion recognition in her definition as it requires an individual to respond to another's affective cues. More specifically, Marshall et al. (1995) suggests that emotion recognition is the first stage of the empathic response and is necessary for the three subsequent stages to emerge. However, the results of the current study indicate that there is no relationship between participants' emotion recognition accuracy and their self-reported general empathy, as measured by the IRI. Again there are a number of possible explanations for these findings. First, emotion recognition may not in fact be related to empathy and it is possible that while ER involves a lower order affective response, empathy involves much more complex cognitive functions implicating higher order functions such as attributions. It is also possible that emotion recognition may be a precursor to empathy but not actually part of the construct and thus it may be more appropriately considered a catalyst for empathy rather than a component of empathy, similar to the manner in which attention is necessary for perception to occur but attention itself is not considered part of perception (Luck & Ford, 1998).

Alternatively, it is possible that emotion recognition is a component of empathy, and necessary for the empathic response to unfold, as outlined in the staged model of offending (Marshall et al., 1995). However, it is only one aspect of empathy



and other components of empathy were assessed in the self-report measure. Within a naturalistic environment, the empathic response would be a dynamic response, in which emotion recognition would occur in the same context as perspective taking, emotional replication and response decision. However, due the constraints of experimental testing, empathy could only be assessed in the current study as a static construct. Therefore the role of emotion recognition was assessed in isolation and separately participants reported history of empathic responding, constrained by the specific items presented within the measure, involving subjective reporting and requiring explicit self-awareness on the part of the participant. Thus emotion recognition was not implicated in self-reported empathy within this artificial environment but in the natural environment may be the essential first stage in the empathic response.

#### *2.4.3.2 Cognitive and Affective Empathy.*

A further interesting finding is the lack of a correlation between the cognitive components of empathy and the affective components, as assessed through the same self-report measure. The cognitive empathy construct was derived from two scales of the IRI, Fantasy and Perspective Taking. The perspective taking scale evaluates a person's ability to take into consideration the points of view of others while the fantasy subscale evaluates a person's propensity to identify with fictional characters in books, films, or plays. The affective empathy construct was derived from the remaining two subscales, the empathic concern subscale, which evaluates a person's 'other-oriented' feelings and sympathy and concern for unfortunate others, and the personal distress subscale, which evaluates a person's 'self-orientated' feelings and the tendency to feel distressed or anxious when confronted with a negative situation.

As these two subcomponents of empathy do not appear to be related, within this sample at least, this would suggest that empathy may be better defined as two separate constructs. Affective empathy, proposed to involve the ability to feel concern for others and feel distress for oneself in negative situations, is not related to any of the constructs under investigation in the present study. This is perhaps because the current study focused on the cognitive constructs, such as ToM and executive function. In contrast, cognitive empathy may be purely cognitively based and only focuses on one's ability to think appropriately about another person's situation and understand another person's point of view from a logical as opposed to an emotional viewpoint. The current results suggest that while an individual may recognise and correctly understand a person's mental state in a given situation, they may not necessarily follow this with feelings of concern, perhaps because they themselves have difficulties in showing distress in such situations, or they may lack the motivation to show sympathy or concern on behalf of another.

Therefore, these results appear to suggest that rather than looking at empathy as one whole, all-encompassing construct, it should rather be viewed as involving two separate independent constructs; one being the ability to identify and perspective take on the experiences of others, and another the ability to feel the distress or concern for another. While both of these constructs may be present together leading to the empathic response, they have been shown to involve two different mechanisms, one affective and one cognitive. Thus some individuals may be able to engage one of the constructs yet not the other or within different contexts show only one of these

constructs. By focusing on the whole construct we may be negating the differing roles of cognition and emotion within the empathetic response.

#### ***2.4.3.3 Differences in Emotion Recognition across Gender.***

The results of the current study indicate that the participants (all male) are more accurate when recognising the emotion on other male faces as opposed to female faces. These results were found both in terms of the emotion recognition task and the RME task. This finding suggests a general deficiency in males' ability to recognise the facial emotion of females which has implications for research indicating that sex offenders incorrectly identify the emotional expression of women (Hudson et al., 1993).

The current results however appear to be inconsistent with previous research in this area. Research on facial emotion recognition speed and accuracy tends to show a cross gender effect. For example, Hoffman, Suvak, and Litz (2006) found that males were faster than females when naming female faces, whereas females were faster than males when naming male faces. This finding has been explained in terms of an evolutionary perspective which suggests that individuals may attend more strongly to the identity of potential mates, which results in better recognition of opposite sex faces. However, more recent research suggests that the gender difference in expression accuracy is only the case for gender stereotyped emotions, that is, participants are more accurate at recognising happiness, sadness, and fear on female faces, and anger, contempt, and disgust on male faces (Brody & Hall, 1993). Rahman, Wilson, and Abrahams (2004) found that females identify the emotion more male faces than female faces and suggest that, to some degree, emotion on male faces may be easier to read. The current results appear to support this contention as



participants were more accurate at recognising the emotion on male than female faces.

The current findings may also be explained in terms of an evolutionary perspective, albeit in the opposite direction. It is possible that males are more accurate when recognising the emotions of other males, to allow them to be vigilant against potential threats within a potentially hostile environment. Wiens and Ohman (2002) suggested that men might be particularly sensitive to threat relevant facial displays in other men compared to non-threat displays to prepare for or avoid confrontations. Furthermore, cooperation between males may have been necessary from an evolutionary point of view and thus it may have been necessary for males to read the emotion on other male faces for this cooperation to succeed.

Another possible explanation for the current results may be due to differences in facial emotion recognition across in-groups and out-groups. Previous research has shown that people are far more likely to, and more accurate at recognising emotion on faces of in-group members than out-group members (Meissner & Brigham, 2001; Shapiro & Penrod, 1986). This has previously been explained by the multidimensional face space theory (Valentine, 1991) which argues that repeated exposure to in-group members results in learning those dimensions that reflect recurring and enduring features found in faces of in-group members. However, this hypothesis is unlikely to support the current results as males would not have less exposure to male faces as opposed to female faces. However, the differences between in-group and out-group recognition may be due to self-identification. Individuals may be more accurate at facial emotion recognition when they are similar to their own,



thus males in the current study may be more adept at recognising the emotion on other male faces, compared with female faces, as they identify with male faces more and perhaps see the emotion displayed as a reflection of their own emotional expressions.

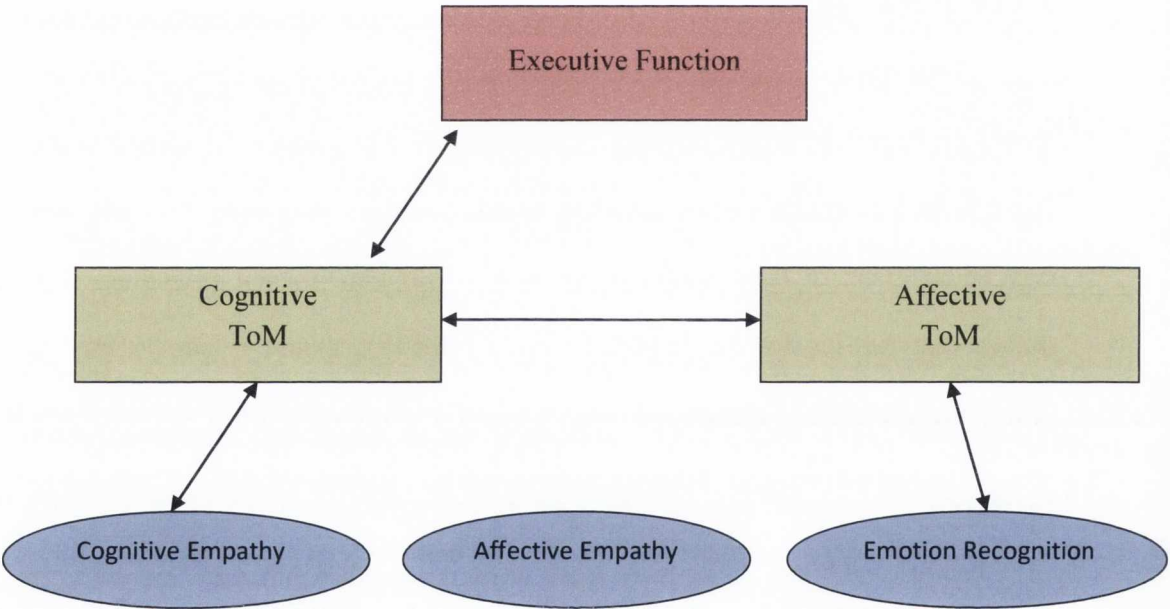
The difference in facial emotion recognition accuracy for male and female faces found in the current study lends support to the suggestion that there are distinct neural regions that code male and female faces separately. This suggestion comes from the observation of visual after-effects when the sex of the face at exposure and post-adaption are the same (Rahman, 2011). Thus participants in this study, and males in general, may engage different neural regions when identifying the emotions in male faces as opposed to female faces.

Thus studies involving the assessment of the emotion recognition of offenders should be cognisant of the possible implications of these results. If offenders are found to be less accurate when decoding female emotions than male emotions, this may be an effect of their gender rather than a symptom of their offending. Any studies that investigate this construct in sex offenders should ensure to use an appropriate comparison group.

Overall it is suggested that empathy involves a number of different constructs and it may be more appropriate to operationalise empathy, not as one general ability, but rather as involving separate affective and cognitive constructs. Furthermore, whereas some aspects of empathy are influenced by a particular type of theory of mind, other aspects may not be influenced by this theory of mind construct. In particular, it is possible that cognitive empathy has more in common with cognitive

ToM than with affective empathy or emotion recognition and emotion recognition has more in common with affective ToM than self-reported cognitive and affective empathy. Thus it may be more appropriate to view cognitive and affective components of both theory of mind and empathy as separate constructs, perhaps involving different underlying neural structures, with cognitive ToM being related to executive functioning. A suggested model of ToM and empathy, based on the current results, is presented in Figure 2.

*Figure 2.* Diagram representing the proposed relationships between cognitive and affective empathy, theory of mind and executive function (Lines represent the relationships found between the concepts/the absence of a line indicates the absence of a relationship between the concepts).



**2.4.4 Findings Applied to Sex Offending**

The current study contributes to the understanding of empathy, executive function, and ToM in the sex offending field. As discussed above, the findings indicate a

relationship between cognitive empathy and theory of mind, and executive function and theory of mind. This is particularly interesting, given the finding that adult sex offenders have general deficits in perspective taking compared with a group of controls (Hanson & Scott, 1995). The current results suggest that when referring to the possible empathy deficits of sex offenders, attention should also be given to the ToM of these offenders, which in turn is affected by the offenders' executive function. Thus any assessment or treatment programmes should aim to address each of these areas, rather than focusing on empathy deficits in isolation. The results also suggest a relationship between affective ToM and emotion recognition. Again this is interesting given the finding that sex offenders have difficulty in accurately decoding facial emotion expressions (Gery et al., 2009; Hudson et al., 1993) and again, the results would indicate that the two constructs should be addressed in sex offender assessment and treatment. General empathy deficits are frequently included in sex offender treatment programmes. The findings of the current study suggest, however, that rather than addressing general empathy deficits, treatment programmes should address the different components of empathy separately, and any programme should also take ToM and executive functioning into account.

#### *2.4.4.1 The Integrated Theory of Sex Offending.*

The current findings support the Integrated Theory of Sex Offending (Ward & Beech, 2006) which emphasises the role of neuropsychological functioning in sex offending. The theory suggests that there are three sets of factors that interact continuously with each other in the aetiology of sex offending, namely, biological factors, ecological niche factors, and neuropsychological factors (Ward & Beech, 2006). Furthermore, genetic factors, together with social learning, result in the development of three



interlocking neuropsychological systems. These neuropsychological systems then interact with genes and the environment to create the clinical symptoms found in sex offenders (Ward & Beech). One of the neuropsychological systems outlined in this theory is the action selection and control system, assumed to help the individual to organise, implement, and evaluate action plans and to control behaviour. This is very similar in definition to the executive function construct assessed in the current study. Executive function is an umbrella term that includes the skills necessary for purposeful, goal-directed activity (Anderson, 1989) including the ability to inhibit impulses, shift attention from one task to another, plan and initiate tasks, and utilize working memory (Pennington & Ozonoff, 1996). Furthermore, ToM, that is the ability to infer mental states to others, may be implicated in the clinical symptoms of sex offenders, particularly empathy. Thus the results of the current study support the contention that neuropsychological functioning can result in clinical symptomology, as executive function has been found to be predictive of ToM. As the results appear to indicate that neuropsychological functioning can be predictive of clinical symptoms, treatment and assessment methods should take into account the offenders' neuropsychological functions, and in particular executive function, when addressing the offender's cognitive symptoms. As cognitive empathy was also found to be predictive of ToM, this would indicate that any theories and treatment relating to empathy deficits in sex offenders should also take into account the role of ToM, and thus executive function. The role of executive functioning is particularly interesting as previous research tentatively suggests an association between sex offending, particularly paedophilia, and executive function (Joyal, Black, & Dassylva, 2007).



However the differences in executive function found between sex offenders and controls may be a reflection of the lack of inhibition and general criminality and may not be a specific feature of sex offending (Joyal et al., 2007). The current research would suggest that executive functioning, rather than IQ, is an integral construct to be taken into account when attempting to account for an offender's cognitive symptoms.

#### *2.4.4.2 Empathy and Implicit Theories.*

The finding that there was no relationship between emotional and cognitive empathy also has implications for the field of sex offending. Within both research and treatment, empathy is generally viewed as one whole concept, with the exception of a small number of studies attempting to identify the different components within empathy (e.g., Gery et al., 2009; Hanson & Scott, 1995; Webster & Beech, 2000). The current findings however suggest , that rather than looking at empathy as one whole concept, we should rather think about affective and cognitive empathy as separate constructs. It is possible that offenders may be lacking in the ability to accurately perspective take, yet show no difficulties engaging in the emotional aspects of empathy, which would not be adequately reflected through a composite general empathy score. Conversely, it is possible that some offenders may be capable of perspective taking, yet may lack the motivation to then engage in the emotional replication process that allows empathy to fully unfold. The offender may also lack the ability to accurately identify emotions yet they may still be capable of empathising if they show no perspective taking deficits. It is possible that within offending circumstances the child may not show outward signs of distress. In this situation, as there are no affective cues, emotion recognition will not lead to an appropriate empathetic response. However, even without this emotion recognition,

the offender may still have the ability to take the child's perspective, which may lead to an awareness of the effect the sexual abuse will have on the child, and may serve as an inhibition to offending, even when emotion recognition is not present.

The different components of empathy have already been addressed in Marshall's multistage model of offending (1995), which describes empathy as involving four sequential stages, namely, emotional recognition, perspective taking, emotional replication, and response decision. However, the current results suggest that rather than empathy being viewed as a necessary sequence of these stages, it should be subdivided into separate components, working independently. The findings suggest there is no relationship, in normal males, between emotional recognition, self-reported cognitive empathy and self-reported affective empathy. Thus it is suggested that when investigating empathy within sex offender populations, these concepts should be addressed separately. Research can then focus on investigating which specific areas offenders are deficient and treatment can then be directed at these particular difficulties. For example, Gery et al. (2009) found that sex offenders have difficulties with facial emotion recognition and it was concluded from this that offenders have empathy deficits. However, while offenders have emotional recognition deficits they may not lack the ability to perspective take and treatment aimed at this may be unnecessary.

Future research should investigate whether there is a difference between controls and sex offenders in either of the three separate constructs, rather than looking at a general empathy score. Treatment methods could then be designed to address the particular deficits found among sex offenders, rather than addressing

empathy as a whole, general concept. Additionally, assessments methods could be developed to investigate what, if any, components of empathy are deficient for the particular offender, and individualised therapeutic plans could be designed to address those particular deficits.

The findings in relation to the role of ToM and empathy support the contention that empathy deficits in sex offenders should be approached from the perspective of being specific to a victim or a group of victims. In recent years it has been argued that offenders do not have general empathy difficulties, but rather they have difficulty showing general victim or victim specific empathy (Varker et al., 2007). The current results indicate that ToM plays an important role in the ability to take another person's perspective. A particular ToM deficit may therefore only apply for particular groups of people or within particular circumstances and thus result in empathy deficits for a specific group of participants or one specific victim. An offender who holds the view that sexual abuse of children is not harmful may be unable to accurately infer the mental states of their victims in an offending situation, and therefore not accurately empathise with their victim or other victims of sexual abuse, yet they may show appropriate empathy skills in other non-offending situations. Fernandez et al. (1999) found that child sex offenders had lower empathy scores than controls for victims of child sex abuse but showed similar levels of empathy for child accident victims. Thus while an individual may believe they are an empathetic person and report this in self-report items, in particular situations they may incorrectly attribute mental states to others and thus fail to engage in the



empathetic process as they are unaware that the victim is in a distressed, negative state.

The current results in relation to the relationship between ToM and implicit theories are inconclusive given the methodological difficulties outlined above. Ward et al. (2000) suggest that there are two types of deficits in sex offenders' ToM; one which involves enduring or trait ToM deficits while the other involves episodic or state ToM deficits. An offender which has more trait-like ToM deficits is likely to have had these deficits since childhood which, according to Ward's (2000) theory may turn into implicit theories, or clusters of beliefs about a specific group of people. For example if an offender continually inferred the mental states of women as 'wanting sex', then they may eventually develop the 'women as sexual objects' implicit theory. In future situations, particularly in situations where evidence is scant or ambiguous, rather than thinking logically about what can be inferred from the persons behaviour, they act like a cognitive miser and refer to their ITs about women to determine the woman's mental state. In this case the offender will ignore evidence not fitting his theory and behave in an IT consistent manner. Furthermore, when sexually aroused the offenders may engage in a cognitively deconstructed state and fail to appropriately perspective take within this situation. In this case the offender is likely to have state or situational ToM deficits and this can result in a lack of perspective taking and may reduce any internal inhibitions to offending. When not in these situations, it would be expected that the offender would return to inferring the states of others more accurately (Ward et al., 2000) and would empathise appropriately with others. Although the current findings are inconclusive, if one were



to take the modular view of ToM as suggested above, and given the current results that it is related to executive functioning, it is possible that the trait ToM outlined by Ward et al. (2000) is indicative of the cognitive ToM construct whereas state ToM may be more appropriately seen as context specific deficits caused by inefficient information processing possibly due to the offenders affective state.

As suggested above it is possible that ToM is a more general modular concept in contrast to individual specific ITs as ITs are based on past experience unique to the individual. They are also specific in nature as they can relate to a specific group of people or circumstances. ToM, on the other hand is a much more general concept as it relates to capacity to attribute belief appropriately in any given situation. Therefore when addressing the ITs of sex offenders, it may be more appropriate to do so from a ToM perspective, particularly when applied to a group of offenders. Sex offenders are likely to have highly individualised ITs, making them difficult to assess as a group. On the other hand, general ToM is likely to be easier to assess within a group setting. Additionally, it may be more appropriate to treat the offenders' general deficits in ToM, rather than their specific ITs, as the exact content of that IT is unlikely to be known by the therapist, given its personal nature.

In conclusion the current study indicates that empathy should be reconceptualised and rather than it being viewed as one general construct it may be more appropriate to consider the three individual constructs of emotion recognition, affective empathy and cognitive empathy. Furthermore it is possible that these constructs may have more in common with the theory of mind construct than with each other. The current findings would suggest that a relationship exists between

cognitive empathy and cognitive theory of mind yet not with the other two factors associated with empathy, whereas emotion recognition was found to be related to affective theory of mind but not affective or cognitive empathy. Thus it is suggested that future research investigate these empathy constructs as independent to each other to determine whether offenders are deficit in one or more of these constructs. Following from this research, it may be more appropriate that treatment programmes specifically target these specific constructs that may be deficient rather than general empathy as appears to be the case at present. Furthermore, given the role of executive functioning in cognitive theory of mind, this may provide support for the integrated theory of sex offending (Ward & Beech, 2005).

### **3 Chapter 3: The Assessment of Sexual Interest and its Relationship with Implicit Theories**

#### **3.1 General Introduction**

The aim of the current study was to investigate the role of cognition, specifically implicit theories relating to normal sexuality, in sexual interest. Specifically, this study investigated both deviant and non-deviant implicit theories in a non-offending population. The role of these implicit theories in sexual orientation was then investigated, with particular emphasis on the role of cognition and affect in sexual interest. A number of challenges were encountered when carrying out this research and therefore the chapter is divided into a number of sections to address each issue separately.

As the theme throughout this thesis is the role of implicit cognition in offending, a number of implicit tasks were employed in the present study to investigate both sexual interest and implicit theories. As implicit cognition measures are generally based on reaction time data, the first challenge for this research was to determine a method of treatment of reaction time data that made it amenable for the analysis to be carried out in this study. Thus the first section of this chapter is devoted to the inherent issues and treatment involved in the analysis of reaction time data. Following from this, section two is devoted to different measures of assessing sexual interest. The section on the treatment of reaction time data is presented before the comparison of sexual interest measures as the most appropriate treatment measure was to be applied to compare the data from the three sexual interest measures. There

are a number of different methods of sexual interest assessment available from self-report to physiological measures. However as we are interested in implicit cognition, three attention based measures of sexual interest were investigated to determine the efficacy of each in assessing sexual orientation. This was necessary in order to later investigate the relationship between sexual interest and cognition. Section three was designed to investigate the role of deviant and non-deviant implicit theories related to sexual orientation in a normal population. Finally, the sections will be integrated in section four which will discuss the role of implicit theories and sexual interest in sexual orientation and an attempt will be made to apply the results found here to a deviant sexual interest and sex offending theories.

## **3.2 Analysis of Reaction Time Data**

### **3.2.1 Introduction.**

The cognitive processes under investigation in the present study cannot be directly observed. Instead the time taken to carry out the cognitive task specifically designed to assess sexual interest is used to infer the effects of the cognitive process of interest. However there are some difficulties inherent with this approach, with one such being the analysis of reaction time data. The difficulties encountered when analysing reaction time data will be outlined below along with some methods that have been suggested to overcome these difficulties. One of the sexual interest measures used in the current study, viewing time, will be subjected to a number of different transformations that have been suggested to overcome reaction time difficulties and the effect of each transformation on the distribution of the data and effect on the overall results will be discussed.



The reaction time data from an individual participant often contain outliers and produce a positively skewed distribution. Thus, as the distribution does not fall into the Gaussian shape, it is difficult to analyze the data using measures based on central tendency such as an Analysis of Variance. Wilcox (1998) has shown that the deviation from the normal distribution reduces the power of statistical tests based on means and can result in a failure to detect a real difference between conditions (type II error). Given the positive skew of reaction time data, the distribution has been termed as an ex-Gaussian distribution (Luce, 1986). That is, reaction time data can be approximated as the sum of two independent random variables, one of which is Gaussian and the other exponential (Luce, 1986). This shape shows the data points rising rapidly on the left, the Gaussian distribution, and then fall slowly with a long tail to the right, the exponential part of the distribution (Luce, 1986). This distribution shape has worked well as a convenient summary of reaction time distributions and appears to fit reaction time distributions quite well (Balota & Spieler, 1999; Heatcote, Popiel & Mewhort, 1991). The mean of the Gaussian distribution is described as  $\mu$  ( $\mu$ ), the standard deviation of the Gaussian is described as the sigma ( $\delta$ ) and the tau ( $\tau$ ) describes both the mean and deviation of the exponential distribution. Thus an approximation of the mean for the ex-Gaussian distribution is  $\mu$  plus  $\tau$  and the variance is tau squared plus sigma squared (Ratcliff, 1979). The use of these parameter estimates can be used to determine whether increases in mean reaction times are due to an increase in the positive skew of a distribution, a shift in the left side of the distribution or both. Additionally a number of authors have argued that the various parameters of the ex-Gaussian distribution are differentially sensitive to the

different types of cognitive processing (Balota & Spieler, 1999; Hockley, 1984). As in other areas that utilize implicit and reaction time measures, the data treatment applied to sex offender assessment procedures, can have a considerable impact on results, although it is an area that receives relatively little attention (Gress, 2007).

The positive skew of the distribution can cause a number of problems when attempting to identify possible outliers in the data. The task of differentiating whether data points on the right hand side of the distribution are reflecting the process of interest or extraneous variables, such as fatigue or distraction, is a difficult task. Hawkins (1980) defines an outlier as 'an observation which deviates so much from other observations as to arouse suspicions that it was generated by a different mechanism' (p.1). This definition further illustrates the difficulty of identifying an outlier in the distribution where the variable of interest may produce some extreme data points. Short reaction times can be recognised more easily than longer reaction times as a cutoff latency has been suggested, beneath which cognitive processes are not thought to operate. Luce (1986) has demonstrated that genuine reaction times fall above the threshold of 100ms and thus data that fall beneath this threshold can be eliminated. However, those outliers that fall in the middle of the distribution are impossible to identify as they are mixed in with genuine reaction times from the variable of interest. The researcher must therefore maintain tight experimental control to prevent the introduction of extraneous variables to the data and also interpret the results cautiously bearing in mind the effects of noise in the experiment (Whelan, 2008). Ratcliff (1993) has suggested that the goal of empirical research should be to

account for the middle 85-95% of observations in reaction time data as these are the data that have most likely come from the variable of interest.

Slow reaction time outliers, resulting from fatigue or distraction, are those that cause the most difficulty as they are mixed in with the positive skew of the data. The difficulty arises when trying to identify which data points genuinely fall on the right hand side of the distribution and are due to the variable of interest and which data points are actual outliers and should be removed from the data. Just one extremely long outlier that has not been adequately identified can increase the mean, inflate the variance and change the shape of the distribution by a large amount (Ratcliff, 1979). However it is impossible to say unambiguously that one particular data point is an outlier and what may be deemed an outlier for one task may not be for another. Nonetheless, it is essential that the researcher take steps to reduce the influence of outliers, by removing them, given their effect on the error variance and thus the power of a statistical test, while maintaining as much of the real data as is possible (Whelan, 2008).

A number of methods have been suggested for achieving this, including, cutoffs, transformations or alternative measures of central tendency, each of which will be discussed below. How each method is applied varies widely depending on the distribution in question. Ratcliff (1993) conducted Monte Carlo simulations on reaction time data and found that of these three methods no one method greatly affected the number of type I errors but statistical power varied considerably across methods.



### *3.2.1.1 Cutoffs/trimming.*

If it can be assumed that the data from the process of interest does not result in positively skewed data then it can be assumed that the skew actually reflects extraneous variables. This means that cutoffs can be employed which will remove the skew from the distribution while leaving the data which fell in the middle of the distribution for analysis. Following his Monte Carlo simulations, Ratcliff (1993) found that when the differences in the conditions is contained in the left Gaussian part of the distribution (the  $\mu$ ) then this method of dealing with outliers maintained the highest power. However, when the differences lay in the right exponential part of the distribution (tau) and there were no outliers in the data, this decreased power as it resulted in real data being discarded. If the differences were in the tau and there were real outliers this method could increase the power; however, if the cutoff used was too large then this decreased the power as again genuine data were deleted.

The primary difficulty posed by this method however is determining what cutoff should be used to trim the data. When choosing a cutoff it must be borne in mind that the process of interest may have been responsible for the extreme score. Although using cutoffs is common practice in the cognitive literature there is little agreement among researchers as to the appropriate cutoff to use. One option is to pick a fixed value, beyond which the real data points would not be expected to fall and remove any data points that fall beyond this value. An alternative method is to choose a cutoff that is based on the variance of the data (e.g., an interquartile range or standard deviation distance from the mean). Ratcliff (1993) suggests that there is always an optimal cutoff but this is dependent on how the distribution shape changes as a function of changes in average reaction time. Ratcliff found that cutoffs based on



the standard deviation may have an adverse effect on power depending on whether the experimental factors had their effects in slow or fast reaction times. However, he argued that when variability amongst participant means was relatively high then cutoffs based on standard deviation resulted in higher power than other methods for dealing with skews.

Miller (1991) found that removing long rather than short reaction times was more likely to cause a bias as the skew was to the right hand side of the data. Ulrich and Miller (1994) suggested that trimming can cause asymmetric biases in statistics such as the mean and standard deviation. They warn against using cutoffs without allowing for these effects. Miller (1991) also recommends that samples of different sizes should not be compared when using cutoffs or, if necessary, to do so with extreme caution. However, Gress (2007) proposes that this difficulty with differing sample sizes can be overcome by examining participants' raw scores individually rather than across test items. Heathcote (1996) warned against the dangers involved with trimming data and asserted that people are most likely to resort to trimming when there is a positive skew in the data and this is when it is most dangerous. Heathcote proposes that it is more likely that extreme scores will be found when the variable of interest produces skewed distribution than when a normal distribution is produced. Thus researchers, who use trimming to correct a skewed distribution, when the skew is produced by the process of interest, inevitably exclude essential data.

#### *3.2.1.2 Transformations.*

Transformations may also be used to transform the ex-Gaussian distribution of reaction time data into a more normal shaped distribution, thus making analysis by central tendency statistics more appropriate. Some transformations can serve to

remove the skew of the data and make the distribution more symmetrical by minimizing the effect of the data points as their value increases. This reduces larger values to a greater extent than it does smaller values. The relative ranking of the data remains the same but the extremity of the larger values is minimised which reduces the skew of the distribution (Hamilton, 1992). Ratcliff (1993) reported that, after cutoffs, reciprocal transformations were the next most powerful approach for minimizing the effects of outliers. Log transformations can also be used. Choosing the correct method of transformation can be difficult as there is no way of knowing whether any particular transformation is the correct one to use. Additionally, even when a particular transformation normalises the data, it is unknown whether valuable data points are attenuated or spurious variables are maintained. Because of this, some researchers advise caution when using transformations to normalise data. For example, Osborne and Overbay (2004) argue that while transformations reduce the skew they also alter the original relationship between the variables in the model. Anderson (1961) also argues that, as this method is nonlinear, it may result in the loss of information about the underlying process. He argues it is possible to get an  $F$  value from the original data but not from the transformed data and vice versa, although the rank ordering of the data is maintained. Alternatively, the opposite may be true where the skew is in fact due to extraneous variables. In this case the transformed data will not reflect the process of interest correctly as the data still contains a proportion of spurious scores (Whelan, 2008). Whelan proposes caution when transforming data as it is possible to eliminate significant effects. Caution should also be used when

interpreting the results of the analyses as the relationships between the variables has been changed (Osborne, 2002).

### *3.2.1.3 Use of Robust Measures of Dispersion and Central Tendency.*

The mean and the standard deviation are not thought to be robust measures of central tendency and variance, particularly given the positive skew of reaction time data (Ratcliff, 1979). While the means from two separate reaction time distributions may be equal, the distributions may in fact be considerably different as the mean may be inflated by the outliers in one distribution and not in another. Additionally, investigating the mean alone could obscure interesting details such as the behaviour of fast and slow responses across conditions of the experiment (Whelan, 2008). Thus, a third option for dealing with outliers is to use alternative parameters for the data which are less susceptible to the effects of a skew.

The mean can be distorted in the direction of the skew by giving extreme values too much weight, and thus not reflective of the typical response of the distribution while the standard deviation can be inflated by a small number of extreme outliers. Alternatively the median and the interquartile range are thought to be less susceptible to extreme outliers and thus more robust measures of central tendency and variation respectively (Whelan, 2008). As the median is less affected by the skew it gives extreme outliers less weight and thus provides a most accurate estimation of the location of the distribution (Whelan, 2008).

Ratcliff (1993) found that when the effect was in the  $\mu$  or the  $\tau$  (Gaussian or exponential part of the distribution) then the median had less power than cutoffs or transformations. However if there was a large degree of variability among participants then the median had more power than other methods. The trimmed mean



and the harmonic mean have also been suggested as alternative central tendency measures as they show the smallest deviation across samples from the same underlying distribution (Ratcliff, 1993). The windsorized mean is also a common robust estimation method (the highest and lowest observations are temporarily censored and replaced with adjacent values from the adjacent data) (Osborne & Overbay, 2004).

A number of researchers however have cautioned against the use of the median as it has been suggested to be a biased estimator when the distribution is skewed as the true population median will in general be underestimated (Whelan, 2008). This should not cause difficulty when the number of trials is the same across conditions as the bias should be even across conditions. This bias has been found to be more extreme as the number of observations decrease or they are different across conditions (Miller, 1998). Thus the median should not be used to compare conditions with different number of trials. Furthermore, Heathcote (1996) argues that the mean, median, and mode do not converge in the case of skewed data thus making the concept of central tendency itself unclear.

Overall, there appears to be little consensus in the research community regarding treatment of skewed data and the robustness of  $F$  and  $t$ -tests to skewed data. For example, Levine and Dunlap (1982) argued that the transformations of a skew did improve the performance of  $F$  while Games (1983), in response, argued that this conclusion was incorrect. The effect of any treatment is often dependent on the type of data at hand. For the current study of sexual interest, we have chosen to treat the data for the following reasons.



1. It can be rarely assumed that reaction times are independently and identically distributed given the impact of fatigue and habituation on reaction time experiments.
2. Wilcox (1998) states that the power of tests comparing means is reduced when the data are skewed, contain outliers, or are heteroscedastic. Since reaction time data are generally skewed and contain outliers, to use the raw data would arguably result in type II errors.
3. Ratcliff (1993) argued that if the differences are in the Gaussian side of an ex-Gaussian distribution and the data contained outliers, the robustness of the F value is considerably reduced.
4. PPG researchers commonly transform raw data into z-scores when assessing for sexual preferences (Earls, Quinsey, & Castonguay, 1987). As attention-based measures of sexual interest are often compared with the penile plethysmography in terms of efficacy, it was deemed appropriate to use a method of analysis similar to that of the PPG.

### **3.2.2 Methodology and Analysis**

#### **3.2.2.1 Method.**

The Viewing Time Task required participants to browse through images of which they would be asked 'some simple questions about the images' when they had completed the task. Participants were presented with 4 practice trials and 48 test trials. Each image was presented once in the test section of the task. The order of test trials was randomised across participants. A cue in the form of a fixation cross was presented for 500 milliseconds prior to each trial. Each trial consisted of a morphed image, presented size 14cm x 18cm, in the centre of the screen. They were instructed

to move from one image to the next by pressing the 'n' key on the keyboard. Participants were instructed to browse through the images at their own pace. The images presented came from six different categories; Adult Female, Adult Male, Adolescent female, Adolescent Male, Child Female, and Child Male. The dependent variable in this instance was the time between the stimulus onset and the participant's response

#### ***3.2.2.2 Data Treatment Methods.***

The current study investigated the effect of the different data treatment methods above on the viewing time measure of sexual interest. The effects of the data treatment were initially examined in terms of group analysis. The effects of the transformations were then investigated in terms of the outcomes of analysis of variance tests.

The following data treatments were applied;

1. The data were initially examined with no treatment applied to the raw data (Raw Mean).
2. Cutoffs were applied to the data, that is, data three times the interquartile range beyond the 75<sup>th</sup> and 25<sup>th</sup> percentile were removed (Trimmed Mean). This conservative cut-off was chosen as it was expected to remove any extreme spurious data points, not due to the process of interest, and to retain as much of the real data as possible.
3. The data were reciprocal transformed (Reciprocal Mean)
4. The data were also log transformed (Log Transformed)

5. The median of the distribution was also used as the central tendency measure (Median).
6. The data were also converted to z scores based on the participants' overall mean. That is, for each individual, the block mean response time was subtracted from the overall trial response time and divided by the overall standard deviation (The overall mean and standard deviation was calculated on all categories excluding the preferred adult gender category) (Z-score).
7. This particular method was chosen as it addressed the issue of offenders having generally long or short reaction times. Finally a z score was calculated with the data trimmed to 3 times the IQR in an attempt to remove any spurious reaction times while maintaining as much of the real data as possible (Trimmed z-score).

#### ***3.2.2.3 Impact of the Data Treatment on the Shape of the Distribution.***

Each method was investigated in terms of how it changed the shape of the original data distribution through the use of skewness, kurtosis figures and whether the data was significantly different from the normal Gaussian distribution as measured by the Kolmogorov-Smirnov test of normality. Tables 5-7 below describe the shape of the distribution for each of the data treatment methods.

Table 5  
*Skewness Values for Each Data Treatment Method*

|                 | Adult<br>Female | Adult<br>Male | Adolescent<br>Female | Adolescent<br>Male | Child<br>Female | Child<br>Male |
|-----------------|-----------------|---------------|----------------------|--------------------|-----------------|---------------|
| Raw Mean        | 2.50            | 2.30          | 2.76                 | 2.76               | 3.16            | 3.00          |
| Trimmed Mean    | 2.53            | 2.29          | 2.74                 | 2.90               | 3.16            | 3.00          |
| Reciprocal Mean | 1.54            | 1.26          | 1.78                 | 1.35               | 1.41            | 1.34          |
| Log Transformed | 0.45            | 0.90          | 0.49                 | 0.90               | 0.66            | 0.82          |
| Median          | 2.35            | 2.10          | 2.45                 | 2.98               | 3.22            | 3.01          |
| Z-score         | -0.76           | -1.05         | -3.67                | -3.66              | -0.16           | -3.76         |
| Trimmed z-score | -0.58           | -0.81         | -0.77                | -0.58              | -0.35           | 0.15          |

Trimmed mean denotes the raw mean with data points above and below three times the interquartile range removed. z-score denotes the difference between the category mean (excluding the category of interest) and the category of interest divided by the overall standard deviation (excluding the category of interest). Trimmed z-score denotes the z-score with data points above and below three times the interquartile range removed.

Table 6  
*Kurtosis Values for Each Data Treatment Method*

|                 | Adult<br>Female | Adult<br>Male | Adolescent<br>Female | Adolescent<br>Male | Child<br>Female | Child<br>Male |
|-----------------|-----------------|---------------|----------------------|--------------------|-----------------|---------------|
| Raw Mean        | 6.59            | 4.24          | 8.35                 | 7.84               | 11.17           | 9.88          |
| Trimmed Mean    | 6.69            | 4.22          | 8.24                 | 8.63               | 11.17           | 9.83          |
| Reciprocal Mean | 2.63            | 1.91          | 3.68                 | 1.74               | 2.04            | 2.06          |
| Log Transformed | -0.07           | 0.46          | 0.29                 | 0.54               | 0.55            | 0.64          |
| Median          | 5.44            | 3.25          | 6.11                 | 9.30               | 11.51           | 9.96          |
| Z-score         | -0.38           | 0.77          | 17.53                | 17.18              | 0.80            | 18.59         |
| Trimmed z-score | 0.50            | 0.66          | 0.11                 | 0.14               | 1.01            | -0.55         |



Table 7

*Shape of the Data Distribution for Each Data Treatment Method*

|                 | Adult<br>Female | Adult<br>Male | Adolescent<br>Female | Adolescent<br>Male | Child<br>Female | Child<br>Male |
|-----------------|-----------------|---------------|----------------------|--------------------|-----------------|---------------|
| Raw Mean        | X               | X             | X                    | X                  | X               | X             |
| Trimmed Mean    | X               | X             | X                    | X                  | X               | X             |
| Reciprocal Mean | X               | X             | X                    | X                  | X               | X             |
| Log Transformed | ✓               | X             | ✓                    | X                  | ✓               | ✓             |
| Median          | X               | X             | X                    | X                  | X               | X             |
| Z-score         | X               | X             | X                    | X                  | ✓               | ✓             |
| Trimmed z-score | ✓               | ✓             | ✓                    | ✓                  | ✓               | ✓             |

✓denotes that the data is normally distributed, that is, the data distribution it is not significantly different from the normal distribution as measured by the Kolmogorov-Smirnov test of normality. X denotes that the data is not normally distributed, that is, the data distribution is significantly different from the normal distribution as measured by the Kolmogorov-Smirnov test of normality.

**3.2.2.4 Impact of the Data Treatment on Group Analysis**

The effect of data treatment on the outcome of group analyses was investigated. Following the treatment of the data, a 2x2x3 ANOVA was carried out on the data set. The within group factors were the age of the individual depicted in the stimulus (child, adolescent or adult) and the gender of the individual depicted in the stimulus (male or female). The between group factor was the sexual orientation of the participant. It was hypothesised that a threes way Age x Gender x Sexual Orientation interaction would emerge, with heterosexual males showing longer viewing times to the Adult Female categories and homosexual males showing longer viewing times to the Adult Male categories. The more specific nuances of the hypotheses will be dealt

with later in the chapter when investigating the most appropriate measure of sexual interest. However, in this instance we are interested in how treatment methods impact on the broad hypothesis.

Table 8  
*Three Way-Interaction, Between- Group and Within-Group Differences for Each Data Treatment Method*

|                     | 3-way<br>Interaction | Effect<br>size  | Adult<br>Female | Adult<br>Male | Heterosexual<br>Age Effect | Homosexual<br>Age Effect |
|---------------------|----------------------|-----------------|-----------------|---------------|----------------------------|--------------------------|
| Raw Mean            | $F=4.45$             | $\eta_p^2=0.12$ | n/s             | n/s           | $t=2.29$                   | n/s                      |
| Trimmed Mean        | $F=3.88$             | $\eta_p^2=0.11$ | n/s             | n/s           | $t=2.03$                   | n/s                      |
| Reciprocal<br>Mean  | $F=9.80$             | $\eta_p^2=0.23$ | n/s             | n/s           | $t=-3.01$                  | $t=2.66$                 |
| Log<br>Transformed  | $F=12.08$            | $\eta_p^2=0.27$ | n/s             | n/s           | $t=3.88$                   | $t=-3.70$                |
| Median              | n/s                  |                 | n/s             | n/s           | n/s                        | n/s                      |
| Z-score             | $F=12.50$            | $\eta_p^2=0.28$ | $t=4.33$        | $t=5.49$      | $t=4.15$                   | $t=4.22$                 |
| Trimmed z-<br>score | $F=21.46$            | $\eta_p^2=0.39$ | $t=4.70$        | $t=5.72$      | $t=4.26$                   | $t=4.45$                 |

3-way Interaction denotes a significant Age x Gender x Sexual Orientation Interaction.  $\eta_p^2$  denotes the partial eta squared effect size of this interaction. Adult Female denotes the difference found between the heterosexual and homosexual on their response time to the adult female stimuli. Adult Male denotes the difference found between the heterosexual and homosexual on their response time to the adult male stimuli. The Heterosexual Age Effect denotes the difference found for the heterosexual group between the adult female images and the child female images. The Homosexual Age Effect denotes the difference found for the homosexual group between the adult male images and the child male images. n/s indicates a significant difference was not found for this interaction.

### 3.2.3 Discussion

Results from the different data treatment methods above indicate that the z-score method which involves removing outliers beyond three times the interquartile range may be the most appropriate treatment for the type of data used in the current study. This particular method of data treatment was chosen as it takes into account an individual’s general processing time. This method resulted in a normal distribution of

the data for all the categories involved as indicated by the Kolmogorov-Smirnov test of normality. Both the kurtosis and skewness for the data treated in this way fell within the acceptable values of plus or minus two, and generally fell very close to zero. This treatment method was also promising in terms of the group results. The results of the ANOVA analysis indicated a three way interaction as hypothesised, with the largest effect size of all the treatment methods. The results in terms of the between-group and within-group differences on the adult images were also found as expected. Not only did the results support the hypothesis, they are also consistent with previous research investigating sexual interest (e.g., Harris et al., 1996). Thus this treatment method was deemed the best of all the treatment methods mentioned above and will be applied to the data for each of the measures addressed in the current chapter.

In terms of the traditional methods of dealing with reaction time data, each appears to have had different effects on the shape of the data and the results of the group analysis. Initially the shape of the distribution of the raw data was investigated and, as generally found with reaction time data, the data did not fall into a normal distribution. The data distribution was slightly positively skewed and resulted in some large kurtosis values. The non-normality of the data may have led to the unusual group results found. While a three way interaction emerged for the raw data, the source of this interaction was not as expected. No differences emerged between the viewing times for the two adult categories as was hypothesised. Therefore the shape of the raw data for this measure was not amenable to comparison of means analysis and unusual results were found. If the shape of the data was not examined and the

different data treatment methods investigated, the results of group analyses may have been taken as the 'true' results and this may have led to inaccurate conclusions being drawn from the data, particularly in terms of where the source of the three way interaction lay. The data were however treated in a number of different ways as suggested by Ratcliff (1993).

The data were initially trimmed to remove outliers in an attempt to remove any fast or slow reaction times which were due to inattention, distraction, fatigue, etc. and which would not reflect the variable of interest, that is, sexual interest. A cutoff point was chosen based on the dispersion of the individual participant's response as this is recommended when there is a large variability among participant means (Ratcliff, 1979). A cutoff of three times the interquartile range was chosen. This treatment appeared to have little effect on the normality of the data, as the skewness and kurtosis values were very similar to those for the raw data and the Kolmogorov-Smirnov test also indicated that the distribution shape was significantly different from the normal distribution. Unsurprisingly the group analyses resulted in similar findings as those for the raw data as the removal of outliers had very little effect on the overall shape. This may have been due to the large trimming value chosen. A smaller value was not chosen as it was expected that the task may have resulted in some 'real' large data points as the instructions to the participants was to browse through the images (see method in next section of this chapter). If a smaller cutoff was chosen, this may have resulted in data points due to the process of interest being removed and may have introduced an asymmetrical bias into the central tendency statistics as proposed by Ulrich and Miller (1994).



The data was also subjected to transformations in an attempt to make the viewing time data into a more normal shaped distribution, and therefore allowing for analysis by central tendency statistics. Both the log and reciprocal transformations had positive effects on the skewness and kurtosis of the data. The skewness values for each of the categories in both transformations falling within the  $\pm 2$  range. In terms of kurtosis values, the log transformation appeared to have a better effect on the shape as again the values fell within the  $\pm 2$  range. Reciprocal transformations resulted in slightly higher kurtosis values, although none exceeding four. Additionally, the reciprocal transformation did not result in a normal distribution as measured by Kolmogorov-Smirnov test of normality. However, log transformations resulted in four of the six categories, being normally distributed. As the positive skew was removed from the data by the log transformations, the results of the group analyses were more in line with the hypotheses. A three-way interaction emerged, with a larger effect size than that found for the raw data, with no transformations. Significant differences were also found between the two adult categories for the homosexual and heterosexual groups. However, between-group differences failed to emerge where expected. As Anderson (1961) suggests, it is possible that although the rank ordering of the original data remains the same, as the method of transformation is non-linear, it can result in the loss of information about the process of interest, and this may explain why the between-group effects did not emerge as expected.

As it has been suggested that the mean is not a robust measure of central tendency for reaction time data (Ratcliff, 1979), the median was also investigated as

an alternative central tendency measure. The median was chosen as it is less influenced by the presence of outliers. However for the present data set, there appeared to be little difference between the distribution of the median values and the distribution of the raw mean values. The median resulted in very similar skewness and kurtosis values to the mean, and the median values also failed to fall into a normal distribution. Unsurprisingly then the median also resulted in type II errors for the group analyses. However, it should be borne in mind that these are only type II errors based on the assumption that these differences existed as hypothesised. This may be due to the median being underestimated and lends support to the argument that, in terms of reaction time data, the concept of central tendency itself is questionable (Heathcote, 1996).

Thus the method in which the category of interest was assessed in relation to the participants' overall reaction times was considered the more appropriate data treatment method rather than in investigating each category in isolation. This meant that each individual's data distribution was transformed into a normal distribution by taking into account the participants' overall reaction time to the measure and their individual variation across all the tasks. It was expected that this would address the issues of individuals having comparatively slow or fast reaction times in general. Therefore any results due to participants generally having shorter or longer processing speeds are negated and the differences found are due to the process of interest, in this case, sexual interest. This may be particularly important in the forensic field where offenders are often compared to non-offenders and thus processing speed or IQ levels may be different across the two groups. This method of

data treatment also mirrors that used for analyzing physiological measures of sexual interest as it allows for individual differences in response sets (Earls, Quinsey, & Castonguay, 1987). Outliers three times the interquartile range were also removed to address confounding variables, such as fatigue, distraction, boredom, that do not reflect the construct of interest. Removing the extreme outliers from the z score transformation had a significant effect on the data distribution, unlike when a similar method of trimming was applied to the raw data. The z-scores without any outliers removed resulted in some high values for kurtosis and skewness and did not fall into a normal distribution. However, when the outliers were removed from the z-score transformation, all the categories fell within the acceptable range for skewness and kurtosis, and the results of the Kolmogorov-Smirnov test indicated that the distribution was not significantly different from the normal distribution. Although the z-score transformation with and without trimming resulted in between- and within-group differences as hypothesised, that with the outliers removed resulted in the highest effect size for the overall three-way interaction.

The finding that the z-score transformation was the most appropriate data treatment measure is further supported by research which applies a similar method in the treatment of data from a physiological assessment of sexual interest (Earls, Quinsey, & Castonguay, 1987). Furthermore, the method takes into account an individual's response set and therefore allows for participants who may be comparatively fast or slow on the reaction time measures. In conclusions, the current findings indicate that while the raw data and traditional transformations potentially lead to type II errors, the data treatment method based on ipsative responding results



in clear results as hypothesised. This method will therefore be applied to the data sets from the other measures used in the current chapter.

### **3.3 Assessment of sexual interest**

#### **3.3.1 Introduction**

As the overarching aim of this thesis was to investigate constructs in the normal population and apply the findings to possible implications for sex offender theory, a number of implicit sexual interest measures were investigated in terms of how well the measures can differentiate sexual interest in stimuli depicting different ages and genders across heterosexual and homosexual men. The study was also designed to identify the issues inherent in the measurement of sexual interest and the implications these may have for the forensic field. The measure found to be the most superior method was then used in a later investigation of the role of cognition in sexual interest.

Atypical sexual interest, together with antisociality, are the two main dimensions of sex offender risk (Doren, 2004; Hanson & Morton-Bourgon, 2004; Seto & Lalumiere, 2000). A number of theories that focus specifically on the development of deviant sexual preference have been outlined in chapter one of this thesis. Additionally, deviant sexual interest constitutes a significant component of multifactorial theories of sexual offending outlined earlier. Ward and Beech (2006) suggest that deviant sexual preferences result from the interaction of three neuropsychological systems; the motivation/emotion system, the perception and memory system and the action selection and control systems. Specifically, adult attachment and mood difficulties, together with deviant schemas may lead to deviant sexual fantasies and sexual pre-occupation. When these difficulties are present



alongside a failure to regulate sexual desire this may result in the individual using sex to meet their emotional needs (Ward & Beech, 2006).

The assessment of sexual interest is informed by different theories of sexual arousal. One such theory, proposed by Singer (1984), presents a model of the process of sexual arousal, in which he identifies three independent, yet generally sequential, components of the erotic response. The first stage, “the aesthetic response”, he proposes, is an emotional reaction to spotting an attractive face or figure. This emotional response produces an increase in attention toward the object of attraction. The second stage, “the approach response”, progresses from the first and involves a physical approach towards the object of attraction. The third stage, “the genital response”, rests on the premise that with both closer proximity and increased attention, physiological reactions will result in genital tumescence.

#### *3.3.1.1 Viewing Time Measure of Sexual Interest.*

A number of different methodologies have been utilised to indirectly assess sexual interest. These methodologies can be divided into two camps; those that rely on physiological measures of sexual arousal (e.g., penile plethysmography; Freund, 1975) and response latency measures reflecting information processing (Banse, Schmidt, & Clarbour, 2010). One such response latency method is the viewing time (VT) assessment measure. This method covertly measures relative viewing times on a range of visual stimuli. It is likely that it is influenced by Singer’s (1984) first stage of sexual response, the aesthetic stage, in which an attractive object receives increased attention from the attracted individual. This method is based on the assumption that a person will look at stimuli they consider attractive longer than they would stimuli they deem as less attractive or neutral stimuli. This was first observed

by Rosenzweig (1942) and later by Zamansky (1956) who found that homosexual males looked longer at male nudes than female nudes, whereas the reverse was true for heterosexual males. A number of different explanations have been put forward to explain this phenomenon. For example, Freund (1990), drawing on evolutionary theory, postulates that viewing time may be a measure of sexual interest as it reflects the initial stage of courtship, locating and evaluating an appropriate partner.

The viewing time method has been shown to differentiate between groups based on their sexual interest (Abel, Huffman, Warberg, & Holland, 1998; Abel, Jordan, Hand, Holland, & Phipps, 2001; Abel, Jordan, Rouleau, Emerick, Barboza-Whitehead, & Osborn, 2004; Banse, Schmidt, & Clabour, 2010; Harris et al., 1996; Worling, 2006) and correlates well with self-reported ratings of sexual attraction (Glasgow, Croxen, & Osborne, 2003; Harris et al., 1996; Landolt, Lalumière, & Quinsey, 1995; Quinsey, Ketsetzis, Earls, & Karamanoukian, 1996) and phallometry (Quinsey et al., 1996). However, the method is not without its critics. Smith and Fischer (1999) were unable to demonstrate discriminant validity in a sample of adolescent sex offenders and adolescent non-offenders using the VT aspect of the AAIP (Abel Assessment for Interest in Paraphilias). Additionally, Fischer and Smith (1999) found only weak support, in terms of the measure's psychometric properties, for its use with adults.

Although there have been a number of different methods developed for measuring viewing time, there has been no standardised methodology employed, thus making comparisons across studies difficult. Some inconsistencies found across studies involve both the methodology employed and the latency that is taken as the

measure of viewing time or dependent variable. Abel et al. (1998) and Gray and Plaud (2005) had participants view the slides twice, in two blocks, first to familiarise themselves with the slides and a second time to rate their sexual arousal to each slide on a seven point Likert scale. The time taken to rate each slide was taken as the viewing time. Gress (2005) presented each image 10 times asking a different question, pertaining to sexual interest, with a similar Likert rating for each presentation of the image. Harris et al. (1996) and Quinsey et al. (1996) provided the slides in random order and asked participants to pay close attention to the slides as they would be asked questions later. Participants then reviewed the same slides again and on the second viewing, rated how sexually attractive they found the person in the image, using a 10 point Likert scale. The inconsistency across the measures lies in which viewing time is taken as the dependent variable, the time taken by participants to browse through the images or the time taken to rate the attractiveness of the image. It is possible that the differences in methodologies may result in different cognitive processes, particularly given that one task involves participants appraising images, including those of children, in terms of sexual attraction while another tasks merely asks participants to browse through images. Thus one measure may be more akin to sexual interest than the other.

#### ***3.3.1.2 Information Processing Tasks.***

An alternative attention based method of assessing sexual interest would be to utilise the impact increased attention has upon information processing tasks (IPTs). These methods are based on the premise that the discrimination of sexual interest is a product of impaired decision making when a sexually attractive stimulus is present, compared to when a sexually unattractive or neutral stimulus is present.



A number of these attention based tasks have been developed in recent years and applied to the area of sexual interest. The choice reaction time (CRT) has been shown to differentiate groups in terms of sexual interest in non-forensic populations (Wright & Adams, 1994, 1999) and forensic populations (Mokros et al., 2010). However, Gress (2007) found the CRT differentiated between reaction times for female stimuli in a group of adult sex offenders and juvenile non-sex offenders but not in a sample of university students. Giotakos (2006) found a combination of viewing reaction time and an incidental learning task could serve as an unobtrusive measure of males' sexual interest, particularly that of extra-familial child molesters. Beech et al. (2008) employed a Rapid Serial Visual Presentation task and found an interference effect for child images in a group of child sex offenders. However, recently the task has failed to significantly differentiate between juvenile sex offenders and non-sex offenders (Crooks, Rostill-Brookes, Beech, & Bickley, 2009).

The information processing task employed here is the Pictorial Modified Stroop Task (Ó Ciardha & Gormley, 2009). The traditional modified Stroop task requires the colour of a word to be correctly identified and responded to, while ignoring the semantic content of the word. In a modified Stroop, when the target word is highly emotional to the participant, the latency in responding to the colour naming task is generally longer than when a neutral word is presented. The modified Stroop task has been used to investigate a wide variety of research questions, including, the responses of cocaine addicts towards images related to cocaine use (Hester, Dixon, & Garavan, 2006). The task has also been applied to a variety of emotional disorders and demonstrated attentional bias, for example, to threatening



information (Mathews & McLeod, 1994; Williams, Mathews, & McLeod, 1996) and trauma related stimuli in PTSD patients (Cisler et al., 2011). The Stroop task has also been applied to the forensic domain. For example, the interference of aggression stimuli has been investigated (Smith & Waterman, 2003, 2005). More specifically, an interference effect for words related to sexual offending was found among sex offenders and violent offenders (Smith & Waterman, 2004). In the present task, pictures are used rather than words as it is expected that images would show greater ecological validity than mere lexical representations. In addition, images in general have been found to produce a larger interference effect than words (; Hester et al., 2006; Stormark & Torkildsen, 2004). It is also suggested that images differentiate between the age categories more clearly than words (Ó Ciardha & Gormley, in press). Ó Ciardha and Gormley (in press) found that the measure proved effective in discriminating preferred sexual interest both in a group of non-offenders and a group of child sex offenders.

Gaither (2001) provided less support for the VT or information processing tasks in the assessment of sexual interest. This study assessed the ability of PPG, VT (while subjectively rating images), CRT, and 'reaction time to a secondary task' (RTST) to measure sexual interest. The secondary task employed in this study involved pressing a keypad when a tone is presented. Results indicated that, not only did the experimental measures have poor predictive validity and not highly correlated with one another, but they were also not highly correlated with self-reported sexual arousal or with penile responses, although the latter two measures were highly positively correlated with one another.

### *3.3.1.3 The Present Study.*

The aim of the present study was to scrutinize two different methodologies used within the viewing time paradigm and an information processing task, the Pictorial Modified Stroop Task, and to subsequently investigate their ability to identify the sexual orientation of non-offending men. In one viewing time methodology, participants will be asked to simply browse through stimuli while their viewing time to each stimulus is covertly measured. In an alternative methodology participants will be asked to rate their sexual attraction to the images as they browse them. It is expected that the two viewing time tasks will result in different results as the cognitive task for the participant differs. The task which requires a subjective rating of sexual attractiveness may make the task more explicit in nature, increasing presentation effects and thus adding noise to the basic attentional mechanism of stimulus appraisal. In particular, asking participants to rate the sexual attraction of child images is expected to trigger additional cognitive processes other than sexual attraction. Therefore, it is expected, that the method in which the dependent measure of viewing time is taken when participants browse the images without a subjective rating (Harris et al., 1996), will emerge as the most robust measure of assessing sexual interest, as it is presumed that their cognitive load would be quite low in this task, thus producing less noise and freeing up more resources for sexual interest to emerge. It should be noted that while sexual orientation is not seen as akin to deviant sexual interest and different cognitive processes may apply in the two groups, the use of a non-offending sample is important in this context as it allows for the methodologies to be tested on a population who would be expected to be more honest in relation to their sexual interest compared to a forensic population (Sewell &

Salekin, 1997). The sample allows for a comparison across adult gender categories and age categories where a clear preference would be expected.

In line with previous research in the area (Freund, McKnight, Langevin, & Cibiri, 1972), it is hypothesised that longer reaction times (viewing times for the VT tasks and colour naming for the Stroop task) will emerge for the adult category of interest than all other categories and significant differences will emerge between the adult category of interest and the opposite gender category and the child category of interest. Additionally, it is hypothesised that the heterosexual participants will show longer reaction times to adult female images than homosexual participants and the opposite pattern of results will emerge for the adult male images.

### **3.3.2 Method**

#### **3.3.2.1 Participants.**

Thirty-five non-offending males participated in the study, 11 homosexual males and 24 heterosexual males. Participants were classified according to their sexual orientation based on their self-reported primary attraction to one gender. The mean age for the homosexual men was 28.64 years ( $SD = 9.29$ ) and the heterosexual men was 26.58 years ( $SD = 9.93$ ). There was no significant difference found in participant age across the two groups. Ninety-one percent of the participants were currently in or had completed third level education. Participants were recruited from around Dublin City through recruitment posters and internet forums. Participants were paid ten Euro or offered course credits for their participation. The data from one of the heterosexual participants on the Pictorial Modified Stroop task was ignored as he reported green-blue colour blindness.



### 3.3.2.2 *Stimuli/Apparatus.*

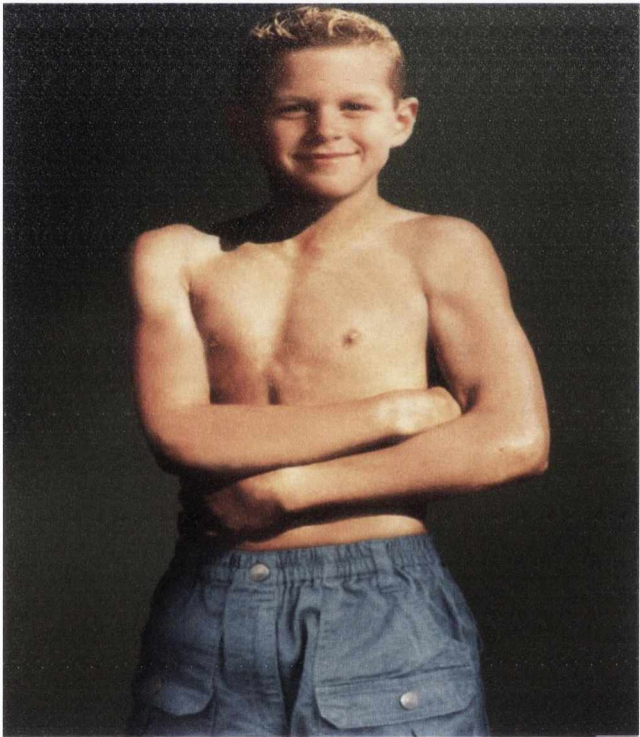
A questionnaire was employed in which participants were asked if they were primarily attracted to males, females or both. Participants' self-reported sexual orientation was not confirmed through any additional measures. Participants were also asked to state whether they were colour-blind, their age and educational achievement.

The images used for the Pictorial Modified Stroop Task and both viewing time tasks were of males and females from 5 age groups ranging from young child to adult. All the images consisted of a single frontal view of an individual in a bathing suit. Thirty-three of the images were taken from the Not Real People (NRP) image set by Laws and Gress (2004). The NRP image set comprises of computer-modified images in which images are developed by compiling and morphing three or more images plus additional modifications such as hair, eye and body colour, simple pose modifications and clothing. Each image has been digitally clothed in bathing suits and corresponds to a Tanner secondary sexual characteristic category (Tanner, 1973). The Tanner (1973) stages reflect the five pubertal stages of primary and secondary sexual development (e.g., size of breasts, genitalia and development of pubic hair) rather than chronological age. Tanner stage I reflects prepubescence, stage II reflects early pubescence, stage III reflects intermediate pubescence, stage IV reflects late pubescence and stage V reflects full sexual maturity. Given the limited number of adult stimuli from the NRP set, six further adult male and nine adult female images were employed for the three tasks. These were developed using the same process as employed for the NRP image set for use in a previous presentation of the Stroop Task (Ó Ciardha & Gormley, 2009). For each sexual interest task, six images were used for



each of the Tanner 1, 2, 3 and 4 stages (three for each gender category) and twelve images were used for the adult male and adult female categories (Tanner stage 5). Figure 3 below presents an example of an NRP child image used in the tasks. All forty-eight images were used for each of the three sexual interest tasks. The experiment was administered on an iMac desktop computer running Mac OS X and SuperLab software. All the tasks were presented using SuperLab software.

*Figure 3:* Image from the Male Tanner 3 category of the ‘Not Real People’ stimulus set.



**3.3.2.3 Procedure.**

A mixed factorial design was employed in this study. All participants completed eight computer tasks in total and a short questionnaire. The Two Implicit Association Tasks (IATs) discussed in section 3.4.2.3 of the current chapter were administered

along with the three sexual interest tasks. Participants initially completed a short demographic questionnaire outlining their age, educational achievement, colour-blindness and sexual preference. They then completed all five computerised tasks, the order of which was pseudo-randomised across participants, such that the Stroop task and the two viewing time tasks were never presented consecutively, and they were always separated by the two IATs. Additionally, Viewing Time Method 1 always immediately preceded Viewing Time Method 2 and the traditional Stroop task always preceded the Pictorial Stroop task. The viewing time order was maintained to prevent participants from realising that VT 1 was a measure of sexual interest. It should be noted that since VT2 always comes after VT1, it could be susceptible to habituation and/or order effects. Potential habituation effects are minimised by the fact that, although the same images are used across both procedures, they are only used once in each version. Thus, given that there are 48 trials in each task, it is unlikely that a participant could habituate to an individual picture, although habituation to a stimulus category remains possible. Each participant was tested individually. Each viewing time measure took approximately 8 minutes and the Pictorial Stroop Task took approximately 10 minutes. Along with the additional cognitive tasks, the study took approximately 45-50 minutes to complete. After informed consent was given, the participant was seated in front of a computer monitor. A female researcher remained in the room during the experiment but did not observe the participants when they were carrying out the tasks. The same researcher tested all participants.

#### *3.3.2.3.1 Viewing Time Method 1 (VT1).*

Participants were informed that their task was to browse through images and they would be asked 'some simple questions about the images' when they had completed

the task. Participants were presented with 4 practice trials and 48 test trials. Each image was presented once in the test section of the task. The order of test trials was randomised across participants. A cue in the form of a fixation cross was presented for 500 milliseconds prior to each trial. Each trial consisted of a morphed image, presented size 14cm x 18cm, in the centre of the screen. They were instructed to move from one image to the next by pressing the 'n' key on the keyboard. Participants were instructed to browse through the images at their own pace. Following completion of the task the participants were told that they would not be asked questions regarding the images but instead asked to rate their attractiveness consistent with the VT2 procedure. The dependent variable in this instance was the time between the stimulus onset and the participant's response

#### 3.3.2.3.2 *Viewing Time 2(VT2).*

Participants were presented with 48 test trials using the same stimuli as VT 1. A cue in the form of a fixation cross was presented for 500 milliseconds prior to each trial. Each trial consisted of one morphed image accompanied by the question 'How sexually attractive do you find the individual in the picture on a scale of 1 (Extremely sexually unattractive) to 7 (Extremely sexually attractive)'. This was presented in large font above each image. A range of Likert scale type answers (1-7) were presented to the right of each image. Participants were instructed to view each slide and reply to the question by using the numbered section on the left hand side of the keyboard, corresponding to their answer. After the participant responded, the slide was removed and the next slide presented. Each slide was accompanied by an identical question and identical Likert type responses. The presentation order of the images was randomised across participants. The dependent variable in this instance



was the time between the stimulus onset and the participant's response (i.e. the time taken for the participant to rate the sexual attractiveness of the stimulus).

#### *3.3.2.3.3 The Pictorial Modified Stroop Task.*

This task followed the procedure of Ó Ciardha and Gormley (2009). In each block images were presented in four colours; red, yellow, green or blue. The participants' task was to respond by pressing a button on the keyboard corresponding to the correct colour of the image. This task employed the morphed images over which a coloured filter was placed. Stimuli were grouped according to age and gender and included a control category of large cats. The images were presented in five blocks: adult male, adult females, child male, child female and large cats. Although a neutral category of cats was used in the design it was not used in the analysis. This category was originally included as it was expected the scores would be analysed in relation to this neutral category. However, as it was not deemed appropriate to include a neutral category in VT2, this neutral category was not included in the Stroop analysis in order to maintain consistency in the type of analysis carried out across all three measures. Block order was randomised across participants and trial order was randomised within blocks. No feedback was given regarding correct responses throughout the test. The reaction time was recorded by the computer as the time from the image onset to the participants' response (pressing the coloured response key). The dependent variable in this instance was the time it took participants to name the colour of the filter which was superimposed on the image.

### **3.3.3 Results**

For the purposes of this study, two different analyses were carried out on the data. First, group analyses were carried out to determine the measures' abilities to



differentiate between the groups and stimulus categories based on participants' sexual orientation. Secondly, idiosyncratic analysis was carried out to determine the ability of the measures to classify participants' sexual interest based on their individual scores.

To facilitate the first analysis it was important to overcome the difficulties of non-normality inherent in reaction time data. This treatment method was chosen from the outcome of analyses in the earlier part of this chapter. Each individual's mean response time to a stimulus category was calculated in relation to their overall reaction time and their reaction time variance ( i.e., the block mean response time was subtracted from the overall trial response time and divided by the overall variance. The overall mean and standard deviation was calculated on all categories excluding the preferred adult gender category). Transforming the data in this way, consistently addressed the problem of non-normality across the three measures. Using the criteria of values for kurtosis and skewness falling between +2 and -2, all but two of the six categories on all three measures met these criteria. The Kolmogorov-Smirnov test of normality indicated that fourteen of the eighteen categories fell into a normal distribution after this treatment method was applied.

In line with the hypothesis that there would be longer reaction times for the adult age categories of interest for each orientation group, the following group analyses were carried out for each measure;

1. A three-way interaction was hypothesised to emerge between the sexual orientation of the participant, age of stimulus and gender of stimulus.

2. Further two-way age by gender interactions were hypothesised to emerge and in the opposite direction for the heterosexual and homosexual groups.
3. Following from this, it was hypothesised that there would be a difference found in reaction times to the adult and child category of interest and this age difference would not emerge for the opposite gender category.
4. Differences between the adult male and adult female categories for both the heterosexual and homosexual group were also expected. Previous research has shown, using phallometric assessment, gender differences for the adolescent and child categories (Freund & Costell, 1970). However, there is a lack of replication of this type of research with non-offending men, particularly in relation to attention-based methods. Thus given the dearth of research in the area, these differences were assessed for all three attention based measures although no specific pattern of results was expected.
5. Finally, analysis involved the assessment of between group differences for the adult and adolescent categories. This was carried out in order to show the measures' ability to discriminate between groups in terms of their sexual orientation.

#### ***3.3.3.1 Group Analyses.***

Group analysis involved conducting a 2 x 3 x 2 factorial ANOVA on the mean reaction time (viewing time for each VT measure and time taken to name the colour of the filter for the Stroop task) for each stimulus category across each of the three

sexual interest measures. The between group factor was the sexual orientation of the participant (heterosexual and homosexual). The within group factors were the gender of the stimulus (male and female) and the age of the stimulus (child, adolescent and adult). The between-group, age, and gender effects were analysed for each method irrespective of whether significant interactions emerged as it allowed for consistent analysis across the three measures. Even if no interaction was found, it would be of interest which categories the measures discriminated between. Bonferroni corrections were applied to decrease the likelihood of Type I error. The adjusted alpha level was thus set to 0.008. Tables 9 and 10 present the results of the post hoc analyses for each sexual interest measure. This facilitates the comparison of the three methods across all the main analyses conducted. To show the direction of differences found in the post-hoc analysis, Table 11 presents the means and standard deviations for each stimulus category across the three measures.

#### 3.3.3.1.1 *Viewing Time Method 1.*

A significant three way interaction emerged in participants' viewing times between stimulus age, stimulus gender and group sexual orientation for Viewing Time Method 1,  $F(2, 33) = 21.46, p < 0.01, \eta_p^2 = 0.39$ . Further analysis identified a significant age by gender interaction for both the heterosexual group [ $F(2, 23) = 22.56, p < 0.001, \eta_p^2 = 0.50$ ] and the homosexual group [ $F(2, 10) = 6.91, p < 0.01, \eta_p^2 = 0.408$ ] as depicted in Figure 4 and Figure 5 respectively.

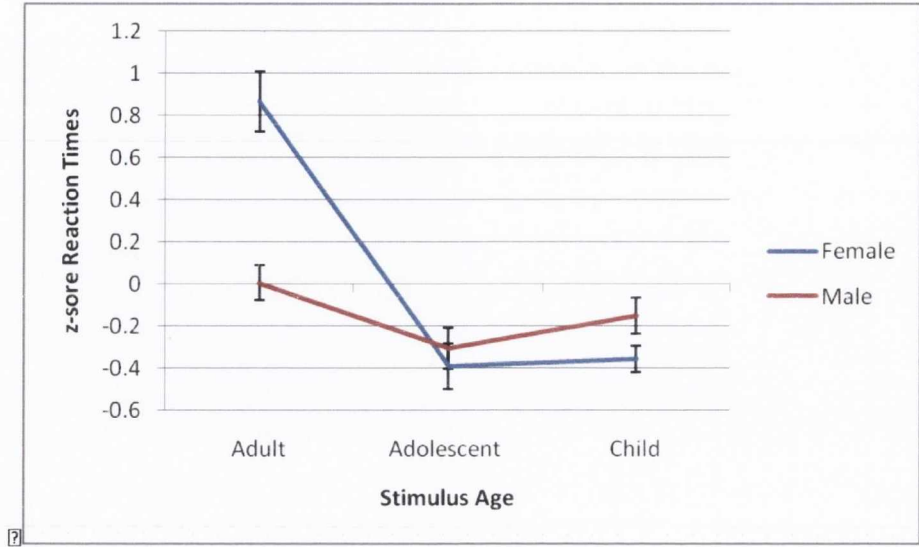


Figure 4. Heterosexual mean reaction time z-score of each stimulus category for Viewing Time Method 1 (Error bars represent one standard error).

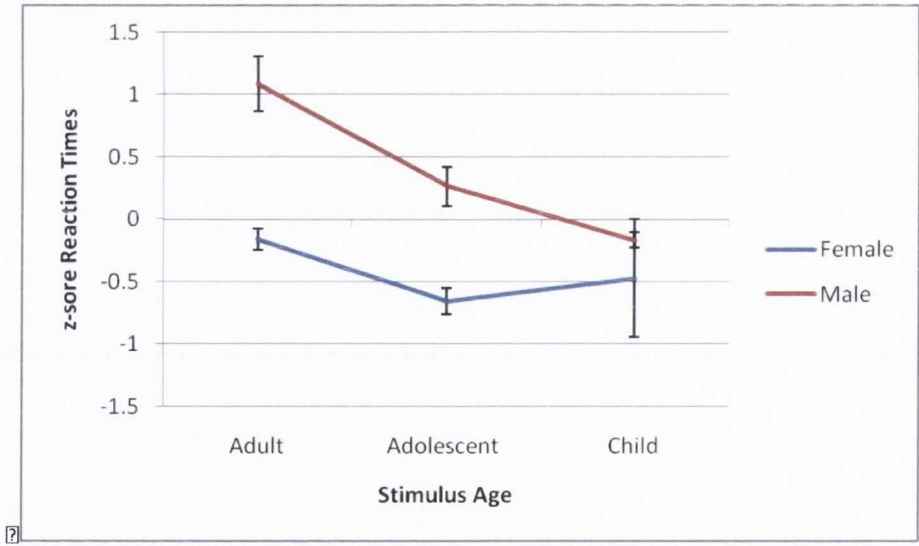


Figure 5. Homosexual mean reaction time z-score of each stimulus category for Viewing Time Method 1 (Error bars represent one standard error).

Post hoc analyses involved a number of paired samples t-tests. For the heterosexual participants the impact of gender was only significant at the adult level



of age. There were no significant gender effects in the heterosexual group for the adolescent or child images. For the homosexual participants the impact of gender was significant at the adult and adolescent level of age with no significant gender for the child images. Age effect analysis indicated a significant impact of age at the female level but not the male level for the heterosexual participants. The homosexual participants showed a significant impact at the male but not the female level of age. All of these effects were found in the expected directions.

Between group differences indicated that the heterosexual men viewed adult female images significantly longer than did homosexual participants. Additionally, the homosexual men viewed adult male images significantly longer than did heterosexual. Homosexual men also had significantly longer viewing times to the adolescent male images than did heterosexual participants.

#### 3.3.3.1.2 *Viewing Time Method 2.*

A significant three-way interaction was found between stimulus age, stimulus gender and group sexual orientation for Viewing Time Method 2,  $F(1.84, 33) = 4.56, p < 0.05, \eta_p^2 = 0.12$ . A significant age by gender interaction was found for the heterosexual group; ( $F(1.58, 23) = 5.9, p < 0.01, \eta_p^2 = 0.20$ ) as depicted in Figure 6. There was no significant age by gender interaction found for the homosexual group; see Figure 7.

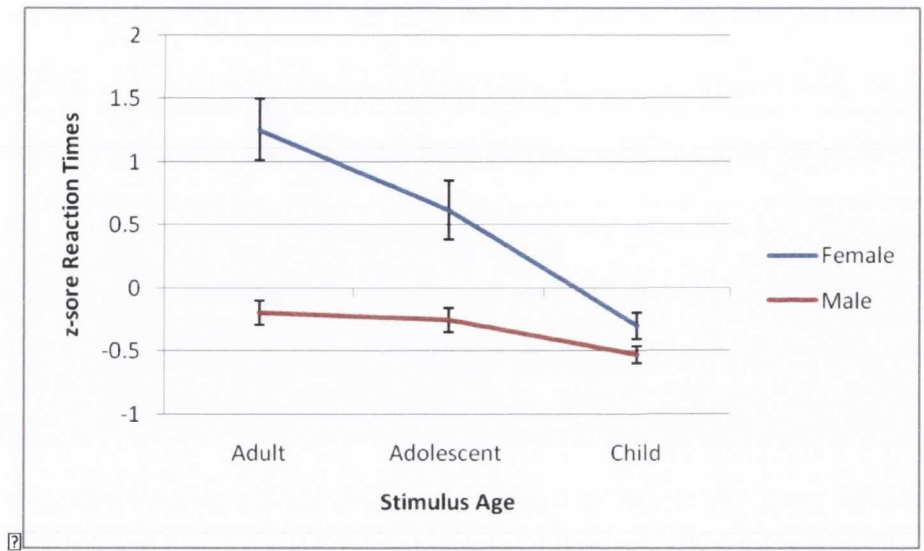


Figure 6. Heterosexual mean reaction time z-score of each stimulus category for Viewing Time Method 2 (Error bars represent one standard errors).

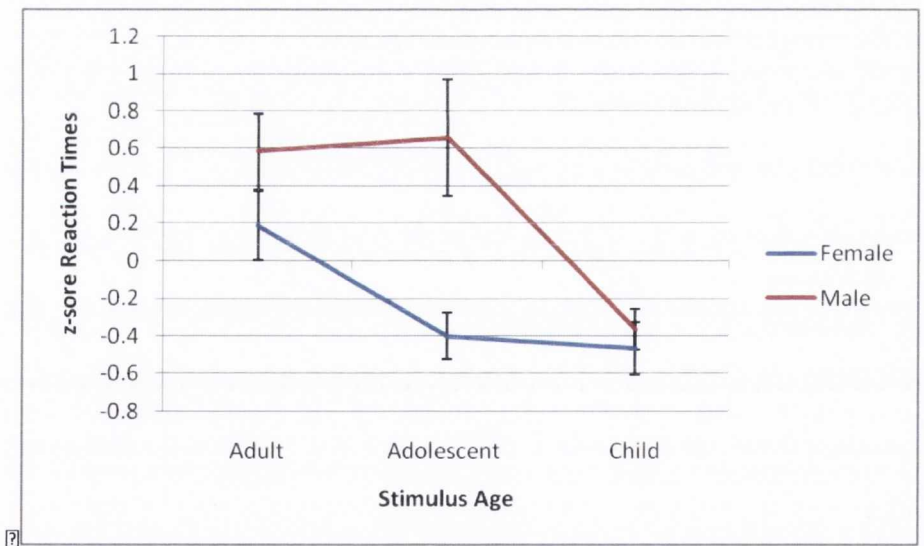


Figure 7. Homosexual mean reaction time z-score of each stimulus category for Viewing Time Method 2 (Error bars represent one standard errors).

For the heterosexual participants the impact of gender was significant at both the adult and adolescent level of age, with female stimuli being viewed longer than

male stimuli with no significant gender effects found for the child images. For the homosexual participants there was no significant impact of gender at any age category. Age effect analysis indicated a significant impact of age at the female level and the male level for the heterosexual participants, that is, these participants had longer viewing time to the adult stimuli compared with the child stimuli for both genders. The homosexual participants showed a significant impact of age at the male level but not the female level. Between group differences indicated that the homosexual group viewed adult male images significantly longer than did the heterosexual group. It was also found that heterosexual men viewed the adolescent female images significantly longer than the homosexual participants.

#### *3.3.3.1.3 Pictorial Modified Stroop Task.*

A significant three way interaction emerged in participants' reaction times between stimulus age, stimulus gender and group sexual orientation for the Pictorial Stroop Task,  $F(1.79, 33) = 3.91, p < 0.05, \eta_p^2 = 0.11$ . Further analysis identified a significant age by gender interaction for the heterosexual group [ $F(2, 23) = 3.37, p < 0.05, \eta_p^2 = 0.13$ ] as depicted in Figure 8. There was no significant age by gender interaction for the homosexual group.

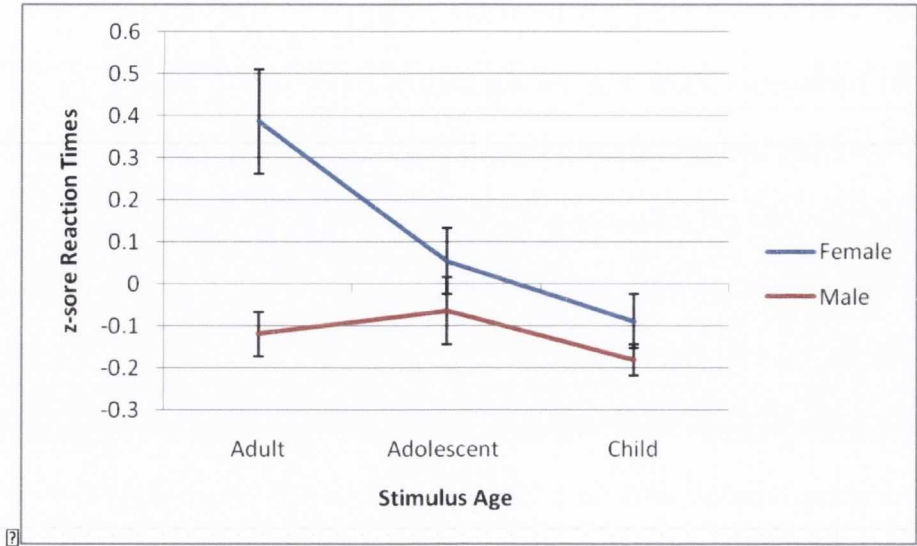


Figure 8. Heterosexual mean reaction time z-score of each stimulus category for Pictorial Modified Stroop Task (Error bars one represent standard error).

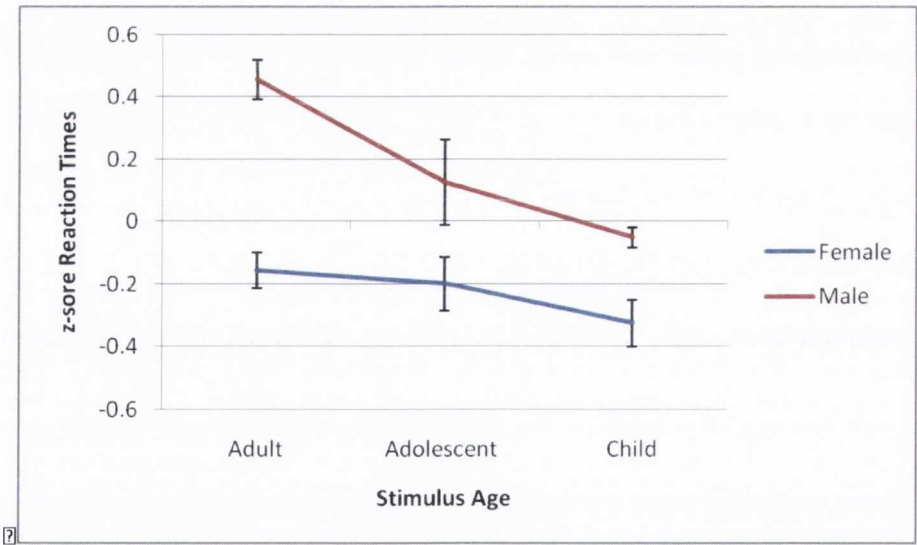


Figure 9. Homosexual mean reaction time z-score of each stimulus category for Pictorial Modified Stroop Task (Error bars one represent standard error).



As depicted in Figure 9, for the heterosexual participants the impact of gender was significant at the adult level of age only. As depicted in Figure 9, for the homosexual group, the impact of gender was significant at the adult and child level but not significant at the adolescent level of age. There were no significant age effects found for the heterosexual group. For the homosexual group a significant age effect was found for the male images, between the adult male and child male images. The group differences indicated that the two groups differed significantly in their reaction time to adult female images and adult male images in the expected direction.

Table 9

*Hypotheses and Effect Sizes of 3-way Interaction and Between Group Differences for Each Sexual Interest Method*

| Analysis                            | Hypothesised Result    | Sexual interest measure          |                                 |                                 |
|-------------------------------------|------------------------|----------------------------------|---------------------------------|---------------------------------|
|                                     |                        | VT1                              | VT2                             | Stroop                          |
| <b>3 way interaction</b>            | Significant            | $F = 21.46$<br>$\eta_p^2 = 0.39$ | $F = 4.56$<br>$\eta_p^2 = 0.12$ | $F = 3.93$<br>$\eta_p^2 = 0.11$ |
| <b>Adult Female b/g differences</b> | Significant            | $t = 6.17$<br>$d = 1.72$         | n/s <sup>a</sup>                | $t = 2.94$<br>$d = 1.08$        |
| <b>Adult Male b/g differences</b>   | Significant            | $t = 5.72$<br>$d = 2.06$         | $t = 4.07$<br>$d = 1.48$        | $t = 6.52$<br>$d = 2.45$        |
| <b>T4 Female b/g differences</b>    | No specific hypothesis | n/s                              | $t = 2.82$<br>$d = 1.03$        | n/s                             |
| <b>T4 Male b/g differences</b>      | No specific hypothesis | $t = 3.17$<br>$d = 1.15$         | n/s                             | n/s                             |
| <b>Child Male b/g differences</b>   | No specific hypothesis | n/s                              | n/s                             | n/s                             |
| <b>Child Female b/g differences</b> | No specific hypothesis | n/s                              | n/s                             | n/s                             |

Note. n/s = non-significant result; b/g = between group differences.  $\eta_p^2$  = partial eta square. d = Cohen's d effect size. t = t-test value. a Result found is contrary to the hypothesis. T4 = Tanner 4.

Table 10

Hypotheses and Effect Sizes of 2-way Interactions and Within-Group Differences for Each Sexual Interest Method

| Analysis                            | Hypothesised Result      | Sexual interest measure |                       |                       |                               |                             |  |
|-------------------------------------|--------------------------|-------------------------|-----------------------|-----------------------|-------------------------------|-----------------------------|--|
|                                     |                          | VT1                     | VT2                   | Stroop                |                               |                             |  |
| Gender*age interaction              | Heterosexual Significant | Heterosexual F =22.56   | Heterosexual F = 2.90 | Heterosexual F =3.37  | Heterosexual n/s <sup>a</sup> | Homosexual n/s <sup>a</sup> |  |
|                                     |                          | $\eta_p^2 = 0.50$       | $\eta_p^2 = 0.41$     | $\eta_p^2 = 0.20$     | $\eta_p^2 = 0.13$             |                             |  |
| Adult gender differences            | Significant              | t = 4.26                | t = 4.45              | t = 4.85              | t = 3.25                      | t = 5.50                    |  |
|                                     |                          | d = 1.52                | d = 2.28              | d = 1.62              | d = 1.13                      | d = 3.18                    |  |
| T4 gender differences               | No specific hypothesis   | n/s                     | t = 3.13              | n/s                   | n/s                           | n/s                         |  |
|                                     |                          |                         | d = 2.05              | d = 0.99              |                               |                             |  |
| Child gender differences            | Not significant          | n/s                     | n/s                   | n/s                   | n/s                           | t = 3.35 <sup>a</sup>       |  |
|                                     |                          |                         |                       |                       |                               | d = 1.59                    |  |
| Male age differences <sub>b</sub>   | Significant              | n/s                     | t = 5.04              | t = 3.28 <sup>a</sup> | n/s                           | t = 6.60                    |  |
|                                     |                          |                         | d = 2.38              | d = 0.88              | d = 1.75                      | d = 3.16                    |  |
| Female age differences <sub>b</sub> | Significant              | t = 8.26                | n/s                   | t = 5.09              | n/s                           | n/s                         |  |
|                                     |                          | d = 2.28                |                       | d = 1.70              |                               |                             |  |

Note. n/s = non-significant result; T4 gender differences = Tanner 4 gender differences. t = t-test value.  $\eta_p^2$  = partial eta square. d = Cohen's d effect size. <sup>a</sup> Result found is contrary to the hypothesis. <sup>b</sup> Age differences represent the difference between the adult and the child category.

Table 11

*Z-score Mean and Standard Deviation of Reaction Times per Stimulus Category*

|              | Sexual interest measure |              |              |              |              |              |
|--------------|-------------------------|--------------|--------------|--------------|--------------|--------------|
|              | VT1                     |              | VT2          |              | Stroop       |              |
| Stimulus     |                         |              |              |              |              |              |
| Category     | Heterosexual            | Homosexual   | Heterosexual | Homosexual   | Heterosexual | Homosexual   |
| Adult Female | 0.87 (0.69)             | -0.16 (0.29) | 1.26 (1.19)  | 0.19 (0.62)  | 0.39 (0.59)  | -0.16 (0.19) |
| Adult Male   | 0.01 (0.41)             | 1.09 (0.71)  | -0.19 (0.44) | 0.58 (0.67)  | -0.12 (0.26) | 0.16 (0.20)  |
| T4 Female    | -0.39 (0.54)            | -0.65 (0.35) | 0.62 (1.15)  | -0.40 (0.41) | 0.05 (0.38)  | -0.20 (0.29) |
| T4 Male      | -0.30 (0.48)            | 0.27 (0.53)  | -0.25 (0.47) | 0.66 (1.03)  | -0.06 (0.38) | 0.12 (0.45)  |
| Child Female | -0.35 (0.31)            | -0.47 (0.36) | -0.30 (0.52) | -0.46 (0.47) | -0.09 (0.31) | -0.32 (0.24) |
| Child Male   | -0.15 (0.43)            | -0.17 (0.21) | -0.53 (0.32) | -0.36 (0.36) | -0.18 (0.18) | -0.05 (0.11) |

Note. Standard Deviation is presented in parentheses after the mean. T4 Female = Tanner 4 Female; T4 Male = Tanner 4 Male

### 3.3.3.2 Mean Attractiveness Ratings.

Analysis of mean attractiveness indicated that, as expected, there were significant differences found between the two group's self-reported attraction to the adult female images [ $t(12.77) = 6.34, p < 0.001$ ] and adult male images [ $t(32.27) = 10.03, p < 0.001$ ]. There were also significant differences found between the heterosexual and homosexual groups' self-reported sexual attraction to adolescent female images [ $t$



(33) = 2.04,  $p < 0.05$ ] and adolescent male images [ $t(33) = 3.79$ ,  $p < 0.001$ ]. These differences were found in the expected direction. Interestingly, however, a significant difference was found between the two groups' rated sexual attraction to their preferred adult gender [ $t(33) = 2.20$ ,  $p < 0.05$ ]. Heterosexual participants reported more sexual attraction to adult female images ( $M = 5.39$ ,  $SD = 0.69$ ) than homosexual participants reported to adult male images ( $M = 4.89$ ,  $SD = 0.47$ ). There were no significant differences found in the attractiveness ratings for the preferred adolescent category.

Analysis of the differences in reaction times between the two sets of adult images indicate no difference in reaction time between the NRP set and the Ó Ciardha and Gormley (2009) set for Pictorial Stroop task or VT2. However, participants had longer reaction times to the Ó Ciardha and Gormley (2009) set ( $M = 3599$ ,  $SD = 4409$ ) than the NRP adult set ( $M = 2976$ ,  $SD = 3459$ ) for VT1;  $t(34) = 3.10$ ,  $p < 0.01$ . Additionally, participants rated the Ó Ciardha and Gormley (2009) set ( $M = 4.30$ ,  $SD = 0.83$ ) as more attractive than the NRP set ( $M = 1.76$ ,  $SD = 0.83$ );  $t(34) = 12.87$ ,  $p < 0.001$ .

### 3.3.3.3 *Individual analyses.*

The first type of individual analysis involved investigating the correlations between the participants' response time to each image and their self-reported rating of sexual attraction to the image on a 7 point Likert scale. The second type of analysis involved determining the ability of each measure to correctly classify participants in a manner consistent with their self-reported sexual orientation using three methods of analyses. First, a simple method of classification involved calculating the difference between reaction times to the preferred adult category and the opposite adult category. As this

method was seen as minimal (i.e. even a small difference of one millisecond between the adult male and adult female reaction times would result in a correct classification), further analysis involved using a specific cutoff for correct classification. The second method required participants response time for their preferred category to fall beyond 0.5 times their standard deviation from their overall response time in order for them to be correctly classified (overall mean and standard deviation excluded reaction times to the category of interest). This figure was chosen for use in this study as there are no accepted cutoff criteria proposed in this area. For both of these analyses the sensitivity and specificity of the measures are presented. Sensitivity refers to the proportion of homosexuals correctly identified and specificity as the relative rate of heterosexual correctly identified. The third analysis, Area under a Receiver Operating Characteristic Curve (AUC) analysis, was also carried out on the difference scores to determine how well the scores correctly classified based on sexual orientation. All analyses were carried out on the response time data with outliers beyond 3 times the interquartile range removed. Results across the three empirical measures are presented in Table 12.

#### *3.3.3.3.1 Viewing Time Method 1.*

Using the difference score as a classification method, VT1 correctly classified 28 of the 35 participants (80%). Seventy-five percent of the heterosexual participants and 91% of the homosexual participants were correctly classified, using this method, resulting in a sensitivity of 0.95 and a specificity of 0.63. When using the threshold of 0.5 times the standard deviation distance from the overall mean, 25 of the 35 participants (71%) were correctly classified. This cutoff method correctly classified 67% of the heterosexual participants and 91% of the homosexual participants,

resulting in a sensitivity of 0.94 and a specificity of 0.56. Analysis indicates an Area under the Receiver Operating Characteristic Curve (AUC) of  $AUC = 0.92$  ( $p < 0.001$ ). Additionally, 20 of the 35 participants (71%) showed significant correlations between self-reported ratings of attraction and raw viewing time. Moderate to large significant correlations were found for these 20 participants, ranging from 0.3 to 0.76.

#### 3.3.3.3.2 *Viewing Time Method 2.*

Using the difference score to classify participants, 25 of the 35 participants (71%) were correctly classified for VT2. Seventy-nine percent of the heterosexual participants and 55% of the homosexual participants were correctly classified, using this method, resulting in a sensitivity of 0.79 and a specificity of 0.56. When the same cutoff threshold of 0.5 times the standard deviation distance from the overall mean was employed, 22 of the 35 participants (63%) reached this threshold for VT2. This method correctly classified 75% of the heterosexual participants and 36% of the homosexual participants, resulting in a sensitivity of 0.72 and a specificity of 0.40. Analysis indicates an Area under the Receiver Operating Characteristic Curve (AUC) of  $AUC = 0.76$ , ( $p < 0.05$ ). Twenty-six of the 35 participants (74%) showed significant correlations, ranging from 0.29 to 0.65.

#### 3.3.3.3.3 *Pictorial Modified Stroop Task.*

Using the difference score to classify participants, 30 of the 34 participants (88%) were correctly classified by the Stroop task. Eighty-three percent of the heterosexual participants and 100% of the homosexual participants were correctly classified, using this method, resulting in a sensitivity of 1 and a specificity of 0.73. This dropped to 8 of the 34 participants (24%) being correctly classified by their sexual orientation when using the threshold of 0.5 times the standard deviation away from the overall

mean. This cutoff method correctly classified 17% of the heterosexual participants and 18% of the homosexual participants, resulting in a sensitivity of 0.36 and a specificity of 0.09. Analysis indicates an Area under the Receiver Operating Characteristic Curve (AUC) of  $AUC = 0.98$  ( $p < 0.001$ ). Finally, 13 out of 34 (38%) significant correlations between reaction time and self-reported attraction were found, ranging from 0.29 to 0.84.

Table 12  
*Percentages of Correct Classification, ROC Analysis and Correlations between Reaction Time and Self-Report for Each Sexual Interest Measure*

| Sexual Interest Measure | Number correctly classified (diff score) | Sensitivity and Specificity (diff score) | Number correctly classified (0.5 SD cutoff) | Sensitivity and Specificity (0.5 SD cutoff) | Receiver Operating Characteristic | Percentage and strength of significant correlations |
|-------------------------|------------------------------------------|------------------------------------------|---------------------------------------------|---------------------------------------------|-----------------------------------|-----------------------------------------------------|
| Viewing Time Method 1   | 83%<br>Het: 18/24<br>Hom: 10/11          | Sensitivity:0.91<br>Specificity:0.75     | 62%<br>Het: 16/24<br>Hom: 10/11             | Sensitivity:0.91<br>Specificity:0.67        | 0.92                              | 71%<br><br>$r = 0.3-0.76$                           |
| Viewing Time Method 2   | 71%<br>Het: 19/24<br>Hom: 6/11%          | Sensitivity:0.55<br>Specificity:0.79     | 54%<br>Het: 18/24<br>Hom: 4/11              | Sensitivity:0.36<br>Specificity:0.75        | 0.76                              | 74%<br><br>$r = 0.29-0.65$                          |
| Pictorial Stroop Task   | 88%<br>Het: 19/23<br>Hom: 11/11          | Sensitivity:0.83<br>Specificity:1.00     | 18%<br>Het: 4/23<br>Hom: 2/11               | Sensitivity:0.18<br>Specificity:0.17        | 0.98                              | 38%<br><br>$r = 0.29-0.84$                          |



#### 3.3.4 Discussion

The aim of the present study was to compare the ability of three attention based measures of sexual interest to identify the sexual orientation in a sample of non-offending men. As hypothesised, VT1 produced the results most consistent with expectations based upon the idea that sexual interest in a stimulus influences attentional mechanisms. This emerged both in terms of stimulus category differentiation and individual classification.

VT2 produced less consistent results than VT1. The heterosexual results were generally in line with the hypotheses, with the exception of the male age effects. However, the method showed less promise with the homosexual group. An age by gender interaction failed to emerge for this group and the group were poorly classified, particularly using a cutoff criteria. Similar inconsistencies in results were also found by Smith and Fischer (1999) using a similar methodology. The measure did, however, result in a high number of correlations between self-reported sexual attraction and viewing time. It is suggested that some of these inconsistent results, particularly for the homosexual participants, may have resulted from methodological limitations, including the attractiveness of the stimuli employed, and the order of presentation of both viewing time tasks, which will be outlined later in the discussion.

An interesting result found for both viewing time methodologies was the size and similarity found in the effect sizes for the age effects for both groups. This consistency in effect sizes is quite an interesting finding and may indicate that age effects are the most stable effects when investigating the ability of these measures in assessing sexual interest. Arguably this is the case since other factors, such as a participants' comparison of self with other adult males, may impact when

investigating adult gender differences. This is a significant observation given the importance of these measures in assessing age effects when applied to the forensic setting.

The Pictorial Modified Stroop task also resulted in some ambiguous patterns. Again an age by gender interaction failed to emerge for the homosexual group, and the heterosexual group failed to show an age effect for the female stimuli. However, the largest effect sizes across all methods emerged within the homosexual group. In terms of individual classification, the measure showed excellent classification ability in terms of AUC analysis and classification based on a difference score. However, the classification ability dropped considerably when a cutoff criterion was used. The inconsistency in the Stroop results is likely to be due to the inclusion of child images in the analyses. The results from the between group differences and AUC classification are based on adult images only and indicate that the method shows good discriminatory ability when looking at sexual orientation alone. However, when other younger age categories are included, in terms of classification using a cutoff criterion or the age by gender interaction, this ability reduced significantly. This would appear to indicate that additional cognitive processes may be at work when participants are responding to these younger stimuli. Thus the measure may be good at identifying gender preference but poor at identifying age preference. This highlights the limitation of using a sample based on sexual orientation to determine the efficacy of measures proposed to be used with a sexually deviant sample, a point that will be returned to later in the discussion. The results relating to the measures

ability to discriminate with regard to the adult gender categories are similar to those of Ó Ciardha and Gormley (in press).

Overall, VT1 emerged as the only measure to consistently differentiate, in line with the hypotheses, in terms of group effects, correlations with self-reported attraction and individual classification. However, a number of methodological issues were identified in the presents study and the results should be interpreted in light of these. One such limitation was the difference in the rated attractiveness of the preferred adult gender category. The heterosexual group rated the adult female images as more sexually attractive than the homosexual group rated the attractiveness of the adult male images. While this may have affected participant responses in terms of adult orientation, it is less likely to have had an effect on the age effects given the finding that for both viewing time tasks; very similar effect sizes were found for age effects for both orientation groups. A further concern was the order of presentation of the tasks. VT1 always preceded VT2. This was to ensure that the participants were not aware that VT1 was a measure of sexual interest in order to minimise any presentation effects. It remains possible however that habituation or orders effect could have negated the potential for VT2 to differentiate sexual interest in a manner similar to VT1. However, as each stimulus is presented only once for VT1 and once for VT2, it was thought that this would minimise habituation effects for VT2. Habituation may also have affected responses on the Stroop task, despite the precaution of randomising the presentation of the viewing time tasks and the Stroop task and separating their presentation with the four additional IAT tasks. Additionally, as the study involved a number of other cognitive tasks, namely four



IATs and a traditional Stroop task, this may have led to fatigue effects on the part of the participants. The number of cognitive tests involved may have fatigued participants given the study as a whole took approximately 45-50 minutes to complete. Overall, although fatigue and habituation may have impacted on the Stroop results, it should be noted that given the randomisation of presentation of the two VT tasks and the Stroop task, these confounds would have had a similar effect on VT1 which despite this still resulted in clear and consistent findings. Furthermore, it is not clear how such confounds might have impacted, but conceivably the most likely influence would have been to increase noise and therefore make it more difficult to find effects. Given that some strong effects were still found, albeit not as consistently as was expected, this would suggest that systematic variation strong enough to produce effects was still in evidence.

An additional problem with the present study was the sample employed. First, a small sample size was used and results should be interpreted in light of this. Furthermore, sexual orientation is different in nature to sexual deviancy and different processes of sexual interest may apply to sexually deviancy than to gender based sexual orientation. However, this sample was chosen as it was expected that participants would be unlikely to lie and more likely to show a clear sexual preference, thus reducing the amount of noise and allowing for a clearer comparison of the methodologies. A further aspect that may have influenced results is volunteer bias. Research has indicated that volunteers for sexuality research may differ significantly from non-volunteers in terms of personality factors (Bogaert, 1996) levels of sexual guilt (Strassberg & Lowe, 1995) and sexual experience (Plaud,



Gaither, Hegstad, Rowan, & Devitt, 1999). Additionally, research indicates that a minority of men report some sexual interest in children. For example, Ahlers et al. (2011) reported paedophilic sexual arousal patterns of 9.5% and 3.8% in sexual fantasies and real-life sociosexual development, respectively, in a community sample of men. As with all sexuality research, results should thus be interpreted in light of this.

Furthermore, the participants in the present study indicated a clear sexual attraction to one gender. However, research on sex offending has shown that a large proportion of male child sex offenders do not show an exclusive sexual interest in children, and often show an equal or larger sexual interest in adult females (Barsetti, Earls, Lalumière, & Bélanger, 1998; Lang, Black, Frenzel, & Checkley, 1988). Additionally, this group of participants would not be expected to deny their sexual interest, however the transparent nature of the viewing time measure may be less applicable in a forensic setting where dissimulation may be high. Thus, an information processing task, in which the object of the task is less transparent, may be more suitable. However it may be possible to pick up on faking due to spurious patterns in the data.

The adolescent categories caused some difficulty when interpreting the results. Both viewing time tasks showed between and within group effects for the adolescent images. The adolescent category incorporated images of boys and girls from Tanner stage 4 (average 13.1 years) (Tanner, 1973). However, in the present study the Tanner four categories included only three stimuli for each gender, thus reducing the variability of the categories and increasing the likelihood of significant

effects. This is currently a controversial topic given recent debate regarding the inclusion of hebephilia into the upcoming DSM-V. Hebephilia is proposed to denote the erotic preference for pubescent children (roughly 11 or 12-14) (Blanchard et al., 2009). Despite this debate however, empirical research on the sexual interest of non-offending men to pubescent males and females is considerably lacking. A study on the erotic preference of the non-deviant male in the 1970s indicates that attraction profile of 'normal' heterosexual men could be rank ordered with adult females having the highest ranking, followed by adolescent females, both categories showing a positive erotic appeal (Freund & Costell, 1970). Perhaps this pattern could also be applied to homosexual men also. More recently, Lykins et al. (2010) found that gynephillic men show higher genital arousal to adolescent females than to a neutral category. The differences between arousal to adolescent images and adult images however were not reported. Despite the lack of empirical evidence this pattern of attraction appears to be something accepted clinically. For example, Howes states that:

Though there is virtually no published research (and certainly nothing current) identifying the extent to which 'normal' non-offending adult males are sexually aroused by minor pubescent females, based on their experience many phallometric testing facilities no longer use young teenage girls as stimuli.  
(R. Howes, personal communication, August 12, 2010)

However, given the limitations identified herein, these results in relation to adolescent images should be interpreted with caution.

The difference in results found between viewing time methods indicates the importance of standardisation of these measures. While there are a number of studies published indicating the efficacy of viewing time as a sexual interest measure, there are large differences between the methodologies employed in each study. Notwithstanding the limitations mentioned, the results indicate that the two viewing time procedures described here result in different patterns of results, indicating that they may be tapping into separate constructs, albeit both related to sexual interest or tap into the same construct with different precision. This may result from there being two very different tasks involved in both measures. In VT1, participants are asked to browse through stimuli of males and females of varying ages. However in VT2, participants are asked to rate their attraction to these images, including those of children. This is likely to result in different cognitive and information processes which may explain the inconsistencies in results found in the present study. A standardisation of the procedure utilised is important, as it allows for direct comparison across studies, and also ensures that the most robust methodology is used in clinical settings to reduce the number of false positives and false negatives resulting from the measure.

The current findings highlight the effect of different methods of classification and the importance of using a number of different methods to determine the measures ability to assess sexual interest. As the results of the Stroop indicated, classification based on ROC analysis or difference scores alone, indicated excellent classification ability of the measure. However, the ANOVA analysis illustrated the effect of child images, making its applicability to sexual interest questionable. This would suggest

when assessing the validity of a measure, any method of classification should include an additional discriminatory component. Thus, rather than just looking at the differences between gender categories, the classification could take into account reaction times to all the age and gender categories.

As VT1 where participants are asked to browse through images was found to be the most consistent method in terms of assessing the constructs, it will be this methodology that is referred to in the remainder of this chapter when referring to sexual interest.

### **3.4 Deviant and Non-Deviant Implicit Theories**

#### **3.4.1 Introduction**

As discussed in chapter two, theories of cognitive distortions have much to offer the understanding of sexual offending. These theories suggest that the statements that offenders use to explain, minimize, or justify their offending, are products of some type of cognitive mechanisms that serve to facilitate sexual offending (Gannon & Polaschek, 2006). The Implicit Theory account of cognitive distortions (Ward, 2000) appears to be the most comprehensive and valid account of cognitive distortions, as it attempts to explain the underlying mechanisms of the distortions and how they play a role in offending, while also taking the heterogeneity of the offending group into account. According to this theory, the statements, or cognitive distortions, are products of underlying, deviant implicit theories. These theories are hypothesised to have developed during childhood, when children develop theories, based on their own experience, about the way the world works. The 'theory theory' of children's cognitive development suggests that a child's understanding of the world develops by them acting like a scientist in which they form their own hypotheses, test them and



refine them in such a way as it helps them predict behaviour (Wellman, 1990). These implicit theories are thought to be relatively enduring and are used by individuals to predict, explain and understand their social world (Fiske & Taylor, 1991). Ward (2000) suggests that, as a significant amount of sex offenders have experienced childhood adversity (Burton, 2003), they develop deviant implicit theories as a consequence of this adversity. These implicit theories then dictate how evidence is interpreted in future situations, particularly in situations where information is scant or ambiguous.

As outlined in Chapter two, Ward and Keenan (1999) suggest five ITs common amongst child sex offenders, the most common of which being the 'Children as sexual objects' IT. The general assumption of this IT is that people are sexual beings, primarily motivated by the desire for pleasure (Ward & Keenan, 1999). Children are thought to share this characteristic and be capable of enjoying and desiring sex. This IT holds that children possess the knowledge to be able to make informed decisions about sexual activity with adults (Ward & Keenan, 1999). This IT can lead to the interpretation of children's behaviour as being sexual. For example, a child sitting on an offender's knee is interpreted as sexual by the offender. As sexual desire is seen as an intrinsic part of the child's nature, the offender does not see the harm in sexually abusing the child, and may actually view the abuse as beneficial for the child (Ward & Keenan, 1999).

#### ***3.4.1.1 The Assessment of Implicit Theories.***

A number of researchers have attempted to assess the prevalence of implicit theories in sex offenders and compare them to control groups. Implicit theories can be studied through their cognitive products, that is, the outcomes of the cognitive processing

involved in ITs.. These products can be studied qualitatively by asking offenders to account for their offending in their own words and coding their responses for the presence or absence of implicit theories. Using this methodology, Marziano, Ward, Beech and Pattison (2006), found that 18 of the 22 child sex offenders in their study endorsed cognitive distortions fitting each of the five Implicit Theory categories outlined by Ward and Keenan (1999). Sternmac and Segal (1989), using a vignette study, found that child sex offenders differed from controls groups, and perceived more benefits to the child as a result of sexual contact, greater complicity on the child's part for such behaviour, less responsibility on the adult's part for the initiation of the behaviour, and less need for punishment of the adult.

Cognitive products have also been studied quantitatively through the use of self-report measures. One such measure, the Abel-Becker Cognition Scale (ABCS; Abel, Becker, & Cunningham-Rather, 1984a) was developed to assess the cognitive distortions of child sex offenders. Although studies generally indicate the measure is capable of discriminating between child sex offenders and community controls, mixed results are found when other offenders are used as the control group. The Beckett Children and Sex also differentiated well between child sex offenders and non-offenders (Fisher, Beech, & Browne, 1999). Research using the MOLEST scale (Bumby, 1996) found that offenders against children reported a significantly greater number of cognitive distortions than non-sexually offending and rapist controls (Bumby, 1996). Results however suggest a quantitative rather than a qualitative difference between offenders and controls, and while a difference is found between the two groups, offenders are generally found to disagree with the statements on

cognitive distortion scales but they do so to a lesser degree than controls (Hayashino et al., 1994).

Although self-report questionnaires have shown some ability to differentiate child sex offenders from controls, there are a number of limitations to this explicit approach. First, self-report measures assume self-awareness on the part of the respondent. Some of the cognitions assessed with these measures, particularly the implicit cognitions, may not be explicitly available for the respondent to report. The individual may lack insight into their own beliefs and behaviours. Furthermore, self-report relies heavily on the honesty of the respondent. Although there is a risk of impression management with all participants, sex offenders are likely to have more motivation to deny or minimise their beliefs and behaviours (Cooper, 2005). While researchers have attempted to control for social desirability statistically, it has been argued that this does not necessarily increase validity and may negate important aspects of the respondents' personality (Tan & Grace, 2008). Self-report also requires the respondent to speculate and 'norm' themselves to others, which can be difficult (Gray & Snowden, 2010).

An alternative measure of assessing implicit theories is through the Implicit Association Task (Greenwald et al., 1998) (see Chapter 2 Method). The implicit nature of the task is particularly advantageous given the implicit nature of the theories. It also reduces the effects of social desirability and levels of self-awareness in these investigations. As discussed earlier, this method was developed from the social cognition framework and thus serves the assessment of the social cognitive processing, inherent in Implicit Theories, quite well. In terms of the IAT procedure,



participants would be expected to have shorter reaction times when 'sex' is matched with their target of interest compared with trials in which 'sex' is matched with a target in which they have no interest. For example, a heterosexual non-deviant male would be expected to have shorter reaction times when woman and sex are matched on the same response key compared to when man and sex are matched on the same response key. Gray and Snowden (2010) argue that implicit measures are not only a 'bona fide' pipeline to measure explicitly held views, rather they offer a method to probe associations available earlier in cognitive processing and possibly different associations than those identified through self-report. These associations may or may not be available to conscious awareness and may or may not be explicitly endorsed by the person (Olson, Fazio & Hermann, 2007) but they nonetheless influence our behavior (Gawronski, LeBel & Peters, 2007).

The most common Implicit Theory assessed by the IAT is the "children as sexual beings" IT (Marziano, Ward, Beech, & Pattison, 2006). A number of researchers have used the IAT to assess associations between children and sex, all with varying methodologies, in particular, the categories of targets and attributes they use, and the exemplars that make up these categories. However, these studies appear to differ slightly in terms of the what they are purporting to measure; some researchers purporting to measure the 'children as sexual beings' IT, others purporting to be measuring deviant sexual interests, while others tend to interchange between sexual interest and deviant interest as the outcome variable of interest. This is a central issue in the present chapter as it will be argued that sexual interest and implicit associations with sexual targets consist of different, if highly related,



concepts. This will be discussed in more depth in the following section. For the moment the previous studies carried out in this area will be outlined.

Mihildes, Devilly and Ward (2004) used the IAT to investigate the 'children as sexual beings' IT among a sample of child sex offenders, using the 'child'/'not child' target dimension rather than the child/adult dimension. The researchers found that 25 incarcerated male child sex offenders showed faster reaction times to the trials in which child and sex words shared the same button, compared with child and not sex. The difference between conditions was very large (895 ms). However a difference was also found for controls (other non-sex offenders) who showed a difference of 513 ms. The groups were distinguishable as the difference was larger for the child sex offenders. This was interpreted as a greater association between child and sex in the child sex offender group. One flaw in the design and a possible explanation for the unexpected results in relation to the non-sex offenders may have been the use of the 'not child' category. This category may have been difficult to define and included exemplars such as 'rifle' and 'lids'. This appears to satisfy one, but not two of the principles of good IAT construction, that is, that categories are formed of contrasting pairs and that stimuli should be easily classifiable into one of four coherent categories (Nosek et al., 2007).

Gray, Brown, McCullach, Smith, and Snowden (2005) also investigated the 'Child-Sex' IAT using a group of child sex offenders ( $n = 18$ ) and control group of non-sexual offenders ( $n = 60$ ). They found a group differences in the speed of response, resulting in a large effect size (Cohen's  $d=0.83$ ). The authors also found an Area Under the Curve of 0.73. While this indicates a moderate ability to distinguish

child sex offenders from offending controls, it is not as high as direct measures of sexual interest such as the PPG (AUC of 0.86; Blanchard & Bogaert, 1996). Brown, Gray and Snowden (2008) investigated the ability of the IAT to distinguish between pedophiles ( $n = 54$ ) and hebophiles ( $n = 21$ ) compared with community controls. Using the shortened version of the IAT, results showed the pedophile group had implicit cognitive associations between child and sex and the offender control group had implicit cognitive associations between adult and sex. The hebophiles did not show associations between children and sex and their associations appeared to be similar to controls. The results showed the IAT's potential ability to differentiate different sex offenders' cognitions. This strengthens the possibility of using the IAT in understanding child sex offenders at both group and individual level.

Nunes, Firestone, and Baldwin (2007) again used the 'Child-Sex' IAT to compare child sex offenders ( $n = 27$ ) with control offenders. They administered 6 IATs; three using the target dimension of 'me/not me' and three using the target dimension of 'adult/child', each with the attribute dimensions of 'pleasant/unpleasant', 'powerful/weak', and 'sexy/not sexy'. The only IAT to show a difference between the offender and control group was the 'adult/child' – 'sexy/not sexy' IAT, with the child sex offenders showing an association between 'child' and 'sexy' compared with controls. The authors also found that this IAT was correlated with the offenders' risk of reoffending as measured by the STATIC 99 (Hanson & Thornton, 2000) ( $r=0.43$ ). Those participants who showed a stronger implicit association between sex and children had a greater risk scores for sexual offending.

Given these results it has been argued that the IAT may have some ability to predict future offending.

Steffens, Yundina, and Panning (2008) investigated the 'Child-Erotic' IAT in a group of offenders, 30 of whom were labeled as 'non-exclusive pedophiles', individuals who have sexually offended against children but who did not meet the criteria required for a diagnosis of pedophilia, and 16 of whom were labeled 'exclusive pedophiles', individuals who have offended against children and also meet the criteria for a diagnosis of pedophilia. They found the 'child-erotic' association was larger for offenders classed as 'exclusively pedophiles' than for other offenders. They also found the 'child-erotic' association to be larger for those offenders who were in danger of relapse. Overall the 'child-erotic' association of all offenders did not differ from that of the non-offending group.

Brown, Gray, and Snowden (2009) used the 'Child-Sex' IAT to compare child-sex associations between pedophilic-type offenders and hebophilic-type offenders. The results indicated that only the pedophilic-type offenders showed a child-sex association and this effect was found irrespective of their denial of their offence history. This result would appear to indicate the measure may be resistant to faking and has an ability to correctly classify even when an offender denies the offence.

Banase, Schmidt, and Clarbourn (2010) also investigated the 'Child-Sex' IAT in a group of child sex offenders ( $n = 38$ ), non-sex offenders ( $n = 37$ ) and community controls ( $n = 38$ ) as part of their battery of implicit and explicit measures: the Explicit and Implicit Sexual Interest Profile (EISIP). The EISIP contained four self-report



measures of sexual interest, three IATs designed to assess associations between sexual excitement (using the attributes of 'sexually exciting' and 'sexually unexciting') and 'men/women', 'women/girls', and men/ boys', along with four different viewing time measures of sexual interest. The entire EISIP test battery demonstrated impressive discriminatory validity, with an Area Under the Curve of 0.95. However, the IAT results were less promising. When the child sex offenders were compared with both control groups combined, the 'boys/men' IAT produced a small AUC of 0.62, the 'girls/women' IAT produced a large AUC of 0.72, and the 'children/adult' IAT produced a moderate to large AUC of 0.71.

The ability to differentiate in terms of sexual orientation has also been investigated through the 'gender-sex' IAT. Using this particular IAT, Snowden, Wichter, and Gray (2008) found that heterosexual men had slower reaction times when 'male' and 'sexually attractive' shared the same response key compared to when 'female' and 'sexually attractive' shared the same response key. They also found an impressive Area Under the Curve of 0.97.

Although the 'Child-Sex' IAT has been developed to assess deviant sexual interest in groups of offending participants, one unexpected finding in previous studies has been the presence of an association between children and sex in control groups that was stronger than expected (Nunes et al., 2007), that is they did not find a significant within-group difference for the non-offending participants. Studies have also shown the task misclassifies many control participants, with one study showing an AUC of 0.73 (Gray et al., 2005). This effect may be due to a number of possible reasons. It may be that the methodology employed may not have adequate levels of



sensitivity and specificity to ensure no incorrect classifications. This is likely to be the case as no one measure can be 100% accurate. It is also possible that the 'child-sex' effects found in 'normal' participants may be due to there being a low prevalence rate of deviant child sex associations in the 'normal' male population. The majority of people who have experienced adversity in childhood and have been sexually abused themselves as a child do not go on to be offenders. It is possible that a proportion of these individuals hold an implicit theory related to children and sexuality because of their own victimisation. However they do not go on to offend as they do not have any other risk factors for offending, such as a sexual interest in children. Research from modified Stroop studies have indicated that a deviant 'child-sex' IAT effect is not necessarily indicative of deviant interest or cognitions but may also be a result of being a victim of child abuse (Gawronski, 2009). Early experience of sexual activity may conceivably result in an association between children and sex within that particular participant. For example, studies have shown victims of sexual violence to show attentional bias towards words relating to the abuse they themselves suffered (Dubner & Motta 1999; Foa, Feske, Murdock, Kozak, & McCarthy 1991). Thus the context in which the constructs become associated may impact on whether the effect is due to deviant ITs or as a consequence of past victimisation. In these cases different associations may be activated but yield similar IAT results.

The purpose of the current study is to investigate an 'Age-Sex' and a 'Gender-Sex' IAT effect in a non-offending sample of heterosexual men and homosexual men. The 'Age-Sex' IAT is being investigated as previous studies use this IAT to compare offenders to non-offenders but they fail to explicitly show the pattern of results from

non-offenders on this task. The aim of the current study is to determine how non-offenders respond to the measure, that is, do they clearly show an adult-sex association in contrast to a child sex association. The 'Gender-Sex' IAT is being investigated to determine whether an implicit theory related to gender manifests and can be measured in the same manner as deviant implicit theories and furthermore to investigate this association in relation to sexual interest. The final section of the current chapter will discuss what the measure is potentially measuring and the possible relationship between cognitions related to sexuality and sexual interest. The current section will therefore focus on the measures' differentiation and classification ability. With regard to the 'Age-Sex' IAT, it was hypothesised that a significant within-group effect would emerge in the present sample in which participants will have faster reaction times when 'adult' and 'sex' are matched to the same response key compared to when 'child' and 'sex' are matched to the same response key. The aim of the 'Gender-Sex' IAT is to determine the ability of the measure to accurately differentiate between groups based on sexual orientation and the sensitivity and specificity of the measure in terms of individual classification.

### **3.4.2 Method**

#### **3.4.2.1 Design.**

A mixed factorial design was employed with the heterosexual males and homosexual males completing both experimental tasks; the 'Gender-Sex' Implicit Association Task and the 'Age-Sex' Implicit Association Task.

#### *3.4.2.2 Participants.*

See section 3.3.2.1. One heterosexual participant was removed from the IAT analyses as they were not a native English speaker and had difficulty understanding some of the exemplars used in the IAT procedure.

#### *3.4.2.3 Apparatus/Stimuli.*

The two IATs were administered on an iMac desktop computer running Mac OS X and SuperLab software. Both tasks were presented using SuperLab software. The two IATs consisted of the categories; 'man', 'woman', 'child', 'adult', 'sex', and 'furniture'. The exemplars used in all categories consisted of words. The sex category consisted of exemplars taken from Mihailides et al. (2004), Nunes et al. (2007), and Gray et al. (2005) stimuli. The exemplars for the remaining categories consisted of synonyms for each of the category titles. Both IATs required four sets of experimentally manipulated stimuli: two sets of target concepts (semantically congruent and opposed), and two sets of attribute concepts (also semantically congruent and opposed). An example of an exemplar from the man category was 'bloke'; from the woman category was 'lady'; from the sex category was 'orgasm' and from the furniture category was 'furniture'. The full list of exemplars from each category is provided in Appendix E.

The 'Age/Sex' IAT consisted of the two concepts used were child and adult. The exemplars used were seven words relating to children and seven semantically opposed words related to adults. The two attributes used were sex and furniture, with seven exemplars in each category of attribute. The 'Gender/Sex' IAT consisted of the concepts man and woman. The exemplars used were seven words related to man and

seven semantically opposed words related to woman. The two attributes used were sex and furniture, with seven exemplars in each category of attribute.

#### *3.4.2.4 Procedure.*

The procedure for the general Implicit Association Task is outlined in Chapter Two. Each IAT consisted of seven blocks. Block one consisted of 28 trials, in which the participants were asked to categorise the stimuli into the categories of man or woman for the Gender-Sex IAT and child and adult for the Age-Sex IAT. Block two also consisted of 28 trials in which participants were asked to sort the stimuli into the categories of sex and furniture. Block three consisted of the practice trials for the first combined task and consisted of 28 trials. During this block, participants were asked to sort words into the categories of 'man or sex' or 'woman or furniture' for the 'Gender-Sex' IAT and the categories of 'adult or sex' or 'child or furniture' for the 'Age-Sex' IAT. Block four consisted of the test combined block, with the same instructions as the previous block and consisted of 56 trials. Block five consisted of 28 trials and required participants to categorise the words again into the categories of man or woman. For this task the position of the category labels to the left or right response key were switched from those assigned in block one. Block six consisted again of 28 trials as practice for the second combined task in which participants were asked to sort the word into the categories of 'woman or sex' or 'man or furniture' for the 'Gender-Sex' IAT and into the categories of 'child or sex' or 'adult or furniture' for the 'Age-Sex' IAT. Block seven consisted of the second test combined block, followed the same procedure as the previous block and consisted of 56 trials. The presentation of blocks three and four, and blocks six and seven were counterbalanced across all participants for both IATs. As mentioned in section 3.3.2.3 the two IATs



were always presented between the presentation of the two viewing time tasks and the presentation of the Stroop task.

### 3.4.3 Results

#### 3.4.3.1 Gender-Sex IAT.

The raw data including errors were transformed to produce a D score (Greenwald, Nosek, & Banaji, 2003). The D score includes the data from the practice trials together with the test trials for the combined blocks. Errors are penalised (block mean plus 600ms) and extremely long reaction times are removed (over 10 000ms). The overall IAT effect is then calculated as the difference between the congruent and incongruent blocks (block mean when woman and sex were matched on the same response key minus block mean when man and sex were matched on the same response key), divided by the participants' variance.

A two-way ANOVA was initially carried with the D-score as the dependent variable. The between-group factor was the sexual orientation of the participant (heterosexual and homosexual) and the within-group factor was the order of presentation of the blocks (congruent block first and incongruent block second). There was no main effect found for the order variable and the interaction between order and orientation was not significant. The order variable was therefore dropped from all further analyses. A significant main effect was found for orientation,  $F(1, 33) = 11.42, p < 0.005$ . A comparison of the two groups from the Gender-Sex IAT can be seen in Figure 10. As indicated, heterosexual men had a lower D score ( $M = -0.23, SD = 0.37$ ) than homosexual men ( $M = 0.18, SD = 0.33$ ),  $t(32) = -3.32, p < 0.005, d = 1.24$ . Thus the heterosexual men responded quicker when women and sex

were matched on the same response key while homosexual men responded quicker when men and sex were matched on the same response key.

?

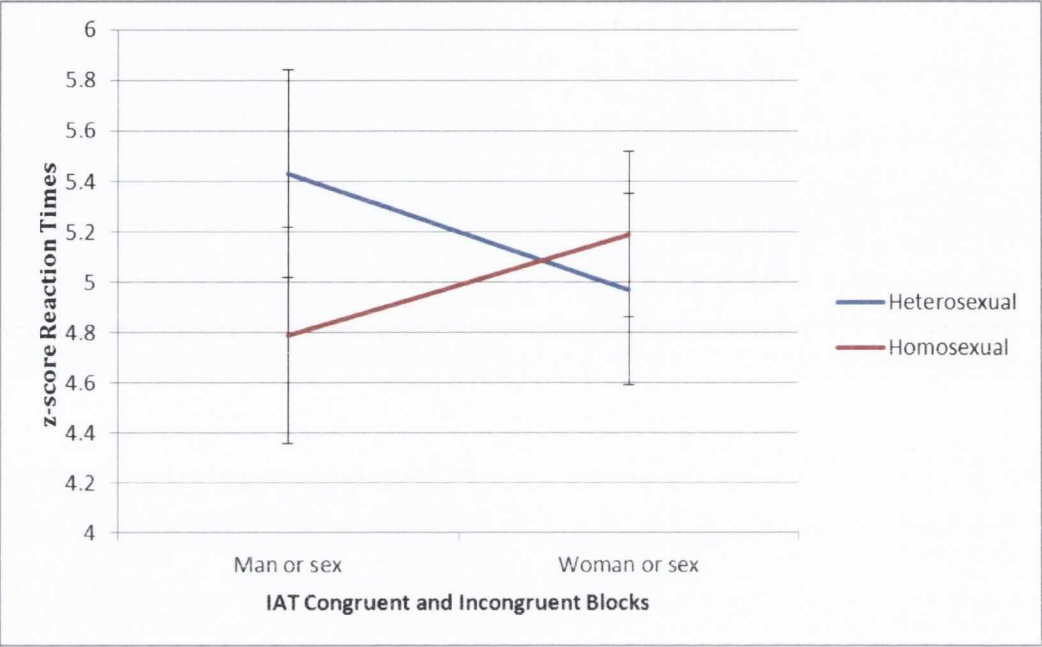


Figure 10. z-score reaction times for ‘man or sex’ and ‘woman or sex’ blocks by heterosexual and homosexual participants on the Gender-Sex IAT.

The above analysis indicated that the Gender-Sex IAT can significantly differentiate between groups based on their sexual orientation. The ability of the measure in terms of individual classification was then investigated. Figure 11 plots the hit rate (sensitivity) versus the false alarm (1 – specificity) for the Gender-Sex IAT. This method produced an Area Under the Curve of 0.82 ( $SE = 0.086$ ), which differed significantly from chance level of 0.50 ( $p < 0.01$ ).

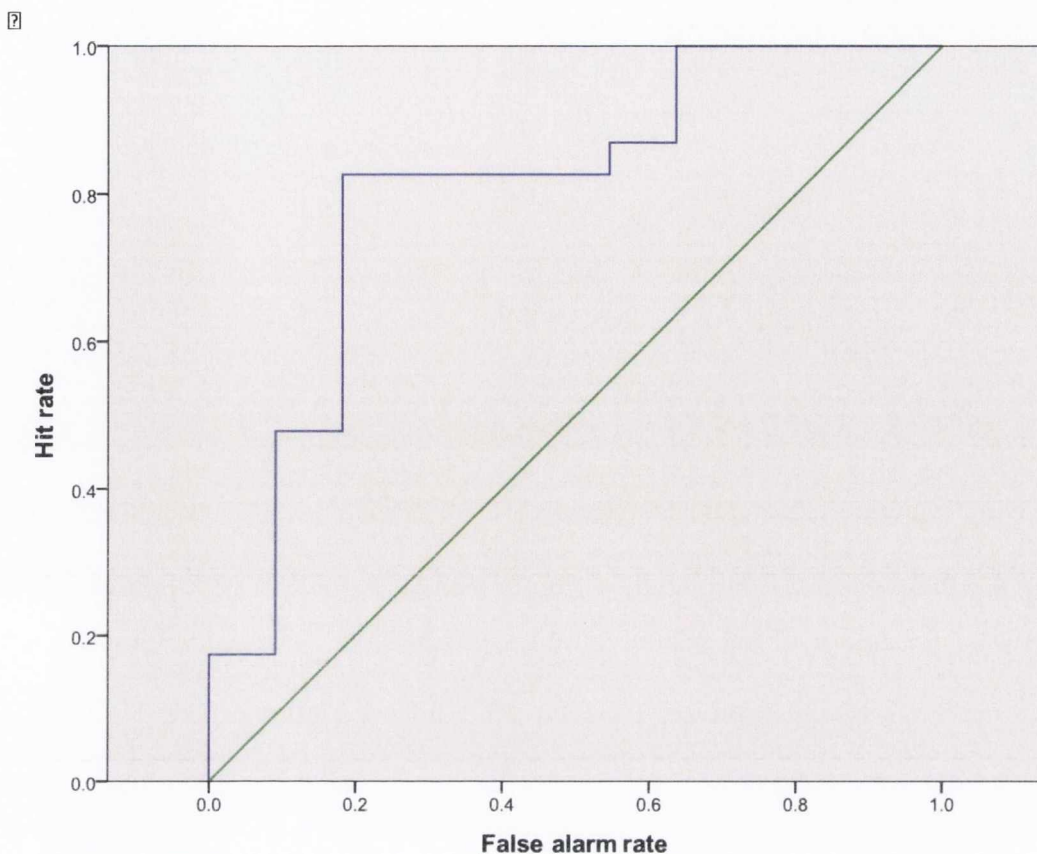


Figure 11. Receiver operating characteristic of the ability of the Gender-Sex IAT to predict sexual orientation (blue line).

### 3.4.3.2 Age-Sex IAT.

Analysis for this IAT required looking at possible within group differences for the whole group. To ensure there were no effects of order or sexual orientation a two way ANOVA was initially carried out, with the D score as the dependent variable. Again sexual orientation was entered as the between-group factor and order of block presentation was entered as the within group factor. Results indicate there was no main effect of order, no main effect of sexual orientation, and the order by sexual orientation interaction was not significant. Analyses then involved investigation of the within-group effects to determine if the participants showed shorter reaction times when adult and sex were matched on the same response key compared to when child

and sex were matched on the same response key. Two scores were calculated in a manner consistent with the D-score which produces one overall difference score (Greenwald, Nosek, & Banaji, 2003), to ensure there was one for the congruous trials and one for the incongruous trials. The block means for both the practice and test block for the congruent block were combined and divided by the participants' overall variance for the two combined blocks. The same procedure was used to determine the score for the incongruent block. As with the D-score transformation, reaction times were truncated at 10 000ms and errors were penalised prior to analysis. The results indicated no difference in participants' reaction times to the congruent and incongruent blocks.

#### **3.4.4 Discussion**

The results of the Age-Sex IAT indicate that there was no difference in the speed of the participants' responses when child and sex were matched to the same response key compared to when adult and sex were matched to the same response key. This does not support the hypothesis, as it had been expected that non-offending men would show faster reaction times when adult and sex are matched to the same response key than when child and sex are matched on the same response key. This pattern of results was expected as it was thought that it would be indicative of non-deviant age sex associations, that is, that children are not associated with the sex construct but adults are. The results however did not support this contention. There are a number of possible explanations for these results.

First, the lack of a within group effect may indicate that the participants do not have a stronger association between adult and sex than between child and sex. This would indicate that there is an equally strong association between adult and sex



and child and sex or an equally weak association between child and sex and adult and sex. Alternatively, the results may signify that the IAT measure is not capable of identifying these associations. This is unlikely to be the case however, as a number of studies, as outlined in the introduction, have identified, using the IAT, participants who have deviant sexual interest in children (e.g., Gray et al., 2005). Thus, if the IAT is able to identify deviant sexual interest, it is likely that the measure can also identify non-deviant sexual interest.

The most parsimonious explanation for the results found may be due to the manner in which the IAT was constructed. The use of an 'adult' category may have been ambiguous. Outside of the forensic domain, one would not expect individual's to have associations between sex and adults or sex and children. Perhaps more appropriate target categories would have been man or woman. It is likely that a normal individual would show an implicit association between sex and the gender they are attracted to rather than the general category of adults. If the respondent is not bisexual, as was the case for all the participants in this study, then respondents would not be attracted to 50% of that target category. However, if the target categories were matched to the participants' sexual orientation, it is more likely that an IAT effect would emerge, as the target categories would be clearer in terms of sexual interest.

Similar results to those found in the present study have been found previously but they have received relatively little attention. For example, Nunes, Firestone, and Baldwin (2007) found that non-sex offending controls did not show a significant difference between the congruent and incongruent trials on the 'sex-child' IAT. Given the use of the IAT measure to investigate sex associations in those who have

engaged in deviant behaviours, this finding should be investigated further. As outlined in the introduction, the Age-Sex IAT has been used in a number of studies comparing offenders and controls in terms of their sexual interest. As the D-score is generally used in these studies, this would indicate that the within-group effects are seldom investigated. However, in order to develop the assessment measure further within the forensic field, and if the measure may be used for theorising about deviant sexual interest, this measure should be investigated further in terms of non-deviant sexual interests. If it is the case, as outlined above, that the IAT failed to find a within group difference because of the ambiguity surrounding the 'adult' category, then this should be addressed in order to determine if a clear IAT effect can be said to be indicative of normal sex associations. Further investigations could investigate the concepts of man and woman, compared to boy or girl, to determine whether these concepts would lead to a clear non-deviant IAT effect. This approach has been taken by Banse, Schmidt, and Clarbours (2010) in which they examined the boy/man IAT and the girl/woman IAT. By using these target categories, it may be possible not only to be contrasting a deviant association with a genuine non-deviant association, but it also allows for investigation of gender-specific deviant associations, such as with offenders who primarily offend against boys or primarily offend against girls.

The results of the Gender-Sex IAT support the hypothesis. As expected heterosexual men had shorter reaction times when woman and sex shared the same response key compared to when man and sex share the response key, whereas homosexual males had shorter reaction times when man and sex were matched to the same response key, compared to when woman and sex were matched to the same

response key. These results can be interpreted to mean that heterosexual males hold an association between woman and sex, and homosexual males hold an association between man and sex, and the IAT is capable of measuring these associations. It is possible that these associations are indicative of enduring and persuasive schemas participants hold in relation to what is an appropriate sexual target. These results may be seen as similar to those studies with sex offenders which indicate that those who have engaged in deviant sexual behaviours against children hold deviant sexual associations between children and sex (e.g., Nunes et al., 2007; Gray et al., 2005).

These results appear to suggest that the IAT is tapping into a construct related to sexual orientation as it shows an ability to differentiate between groups based on this criterion. Furthermore, the Age-Sex IAT showed good individual classification ability, with an Area Under the Curve of 0.82. While these results are promising, they are not as high as physiological measures of sexual interest, such as the PPG, or attentional measures of sexual interest as assessed in the current study. While an AUC of 0.82 is good for a classification measure, this would mean that the measure would still have misclassified a number of participants. These misclassifications may have been due to the noise in the experiment caused by confounding variables. However even when this noise is taken into account, the measure still does not show the level of accuracy that might be expected if the measure was tapping directly into the construct sexual orientation.

Although a number of researchers have used the terms sexual interest and 'sex related cognitions' interchangeably when using the IAT as an assessment measure, the issue of what is being assessed by the measure is still unclear. If the measure is



directly assessing sexual interest, it would have been expected that more of the participants would have been correctly classified according to the measure. The remainder of this chapter will attempt to elucidate further what is being measured by the IAT and its relationship to sexual interest by investigating the IAT results together with measures that assess sexual interest.

### **3.5 The Relationship between Implicit Theories and Sexual Interest**

#### **3.5.1 Introduction**

As seen in the previous section, the IAT has been shown to differentiate groups based on sexual orientation and shows good individual classification ability based on this criterion. These results clearly support previous research in this area and indicate that the measure is tapping into a construct closely related to sexuality. However, what is not clear is what this construct entails. There appears to be confusion in the literature about what the results of the 'Child-Sex' IAT represent. Some researchers suggest that the task is measuring deviant cognitions, or more specifically, the 'child as a sexual being' implicit theory (Mihailides et al., 2004). Other researchers discuss the results in terms of the measure having assessed deviant sexual interest (e.g., Gray et al., 2005) or use the terms deviant sexual interest and deviant cognition interchangeably, suggesting that these are the same construct and the participants' responses on the IAT reflect this all-encompassing construct. Therefore, it is not yet clear what this task is actually measuring. Furthermore, although the measure has shown adequate sensitivity and specificity, an AUC of 0.73 (Gray et al, 2005) indicates that the measure incorrectly classified a number of participants. This may indicate that the measure is not classifying participants based on sexual interest but



rather some other construct related to sexuality. The aim of this current section is to attempt to operationalise the construct under investigation with the IAT, particularly in terms of its relationship with those constructs being assessed by sexual interest measures such as the viewing time measure and the modified Stroop task discussed earlier.

Thus the purpose of this study was twofold. The main aim was to extrapolate what the IAT is measuring; whether the construct is sexual interest or rather cognitions/implicit theories related to sexuality. It is likely that the two concepts are highly related but distinct concepts and the use of the terms interchangeably in previous IAT studies serves to confuse the matter. Following from this, the second aim of the current study was to investigate the incremental validity of the IAT, that is, does the inclusion of the IAT increase the prediction of sexual orientation when used with other measures.

As mentioned in the first chapter of this thesis, a number of theories of sexual offending cite physiological sexual arousal to children and cognitions that justify sex with children as separate factors that play a role in the aetiology of sex offending (e.g., Hall & Hirschman, 2002). The Integrated Theory of Sex Offending (Ward & Beech, 2006) suggests that offence supportive attitudes and deviant sexual preferences are separate clinical factors that result from the interaction of biological factors, ecological niche factors, and neuropsychological factors. As these theories cite these constructs as separate factors in sex offending, it is likely that, while the factors may co-occur for some individuals, they are separate and distinct constructs. It has been argued that cognitive distortions result from underlying implicit theories,

one of which being the 'children as sexual beings' IT (Ward & Keenan, 1999), therefore it will be argued here that the implicit theory related to sexual targets is a separate construct to sexual interest, although it is likely to play a significant role in sexual behaviour, deviant or otherwise. It will be argued that the two constructs are likely to impact on each other, such that, if someone has a deviant cognition that children are sexual beings, capable of making decisions with regard to sex, then this may lead the individual to view children in a sexual way and they may eventually becoming sexually aroused to children. Alternatively, an individual who has a sexual interest in children may not originally have held the 'children as sexual beings' IT, yet, in order to rationalise their arousal patterns may develop this deviant cognition, that then becomes strengthened as their offending behaviour continues.

This study will explore the constructs of sexual interest and cognitions related to sexuality in non-offending men, specifically it will investigate sexual interest to adult men and woman and the implicit theories of 'men as sexual' or 'women as sexual'. It is suggested that the two constructs are separate and distinct, but are highly related, and together play a role in an individual's sexual orientation. Although the relationship between these two constructs are being investigated in a non-offending population, it is postulated that the findings may be extrapolated to a deviant population.

For the purposes of this discussion, sexual interest will be termed an emotion, although likely with cognitive elements, and the implicit theory related to the sexual target will be deemed a cognition. Lieblum and Rosen (1988) have defined sexual desire as a subjective *feeling* state that can be triggered by internal and external cues.

Although sexual interest, as assessed here, is not sexual desire, it is likely to involve the evaluation aspect of sexual desire and is suggested to involve more affective processes than cognitive processes or at least lower order processes than that involved in the IAT. Spiering and Everaerd (2007) also view sex to be among the emotions. Thus sexual interest may involve more primitive lower order processes while the cognitions related to sexual targets are higher order cognitive processes as they set out the associations we hold between gender and their sexual attractiveness. This discussion will begin by outlining the relationship between cognition and emotion in general and then discuss this relationship in terms of normal sexuality.

In terms of the brain regions involved in affect and cognition, Pessoa (2008) argues that, although there is a considerable degree of functional specialisation in which specific brain regions are thought of as either 'affective' and 'cognitive', discussing areas of the brain in terms of them being exclusively cognitive or exclusively affective is problematic as brain regions viewed as affective are also involved in cognition, brain regions viewed as cognitive are also involved in emotion, and thus cognition and emotion are integrated in the brain. Pessoa (2008) argues that not only do emotion and cognition strongly interact in the brain but they are often integrated so that they jointly contribute to behaviour. Gray, Braver, and Raichle (2002) also argue that at some stage during processing, functional specialisation is lost and emotion and cognition merge and equally contribute to the behaviour. Phelps (2006) points to some instances when affect and cognition merge, such as when the attentional blink is reduced when emotions are high, when arousal enhances episodic memory, or when fear affects the preserved processing of stimuli.



This general relationship between cognition and affect can also be applied to the area of sexuality. The relationship is reflected in the finding that rape supportive attitudes were significantly correlated with coercive sexual fantasies, imagined sexual aggression and sexual aggression in college men (Dean & Malamuth, 1997). Additionally, evidence from the field of neuroscience of desire suggests that sexual desire recruits not only the limbic emotional system, but also higher order cognitive brain areas such as those activated during simulation, theory of mind and self-representation (Gizewski, Krause, Karama, Baars, Send, & Forsting, 2006). It may be this self-representation that is involved in triggering the implicit theory related to the appropriate sexual target for the individual. Thus sexual interest and cognitions/implicit theories related to sexuality are two possible constructs that interact to determine sexual behaviour.

A number of theories of sexual arousal also implicate the role of cognition in the unfolding of the erotic response. Barlow (1986) has proposed a cognitive-affective model of sexual arousal based on the perception of physiological arousal and the cognitive processing of erotic cues. Barlow's model involves three broad areas of cognition and emotional processes (1) cognitive schemata and emotional processes, (2) differences in cognitive processing of sexual stimuli and (3) cognitive, affective, and behavioural responses to their sexual arousal experience and performance. It is the role of cognitive schemata or implicit theories that are of interest in the current study.

Furthermore, Janssen, Everaerd, Spiering, and Janssen (2000) proposed a conceptual model in which sexual arousal is viewed as dependent on the interaction



between automatic and attentional processes, that is, different levels of cognitive processing can differentially affect subjective and physiological components of sexual arousal. Physiological sexual arousal can be activated automatically after which strategic or attentional processes may lead to the subjective experience of sexual arousal. Janssen (2007) suggests that a complete emotional experience consists of awareness of bodily responses (e.g., 'I feel sexually aroused') plus the cognitive appraisal of the stimulus as emotional ('this is a sexually arousing stimulus'). The first stage is likely to involve sexual interest and the second stage the implicit theory or association between the sex and the target or gender.

Spiering and Everaerd (2007) divided sexual memory into explicit memory (e.g., recollections of sexual encounters, attitudes towards sex, sexual fantasies and knowledge about sexual rewards and costs) and implicit memory (e.g., innate sexual reflexes, learned sexual scripts and classically conditioned sensations). Explicit and implicit memories meet in working memory and create an immediate conscious experience (LeDoux, 1996). Matches between the stimulus and positive explicit and/or implicit long term memories trigger additional attention to the positive aspects of the stimulus, leading to increased sexual arousal while negative implicit and explicit memories indicate a focus on negative information leading to avoidance or a discontinuation of attentional processes (Barlow, 1986; Spiering & Everaerd, 2007). It is possible that the implicit theory related to a sexual target is part of an individual's implicit sexual memory in which they hold the enduring association between the gender and sexual attraction. A by-product of the increase in attentional processes for a positive match is Sexual Content-Induced Delay, an attentional bias

associated with preferred sexual content (the hesitancy caused in decision making when erotic material is presented) (Geer & Bellard, 1996; Geer & Melton, 1997). SCID is hypothesised to occur when a salient sexual stimulus triggers attentional processes that then interfere with or limit attentional processes to other tasks causing a delay in task processing. The amount of attention that is attracted by a sexual stimulus is related to the emotional valence of the stimulus. Stimuli that have the potential of eliciting more arousal, dependent on matches with sexual memory, attract more attention compared to less arousing stimuli. It is SCID that is proposed to be engaged in attention-based measures of sexual interest outlined earlier in the chapter.

The second aim of the study was to investigate the incremental validity of the IAT when assessing sexual interest. According to the theories outlined above sexual behaviour is likely to include a cognitive element. Thus, it follows that the inclusion of a measure of this cognition, through the IAT, with attention-based measures of sexual interest should increase the classification ability of the tasks. Banse, Schmidt, and Clarbours (2010) investigated the 'Child-Sex' IAT along with a battery of implicit and explicit measures (EISIP) in a group of child sex offenders and controls. The entire EISIP test battery demonstrated impressive discriminatory validity, with an Area Under the Curve of 0.95. The IAT measures were found to significantly correlate with the Screening Scale for Paedophilic Interests (Seto & Lalumière, 2001), suggesting some convergent validity.

While the theories outlined above indicate the role of cognition in normal sexual interest and arousal, there is a dearth of research in this area within the forensic literature. The aim of the current study was to investigate the relationship

between sexual interest and cognition in a non-offending population as it is important that we are informed on the normal functioning of these constructs before we hypothesise on how they may function in a deviant population. Although it is likely that deviant sexual interest follows the same pathways of normal sexual interest, this may not be the case. However it is beyond the scope of this thesis to examine the role of deviant cognitions within an offending population. Thus the current study attempted to investigate the interaction between the two constructs while using assessment methods of sexual interest and cognitions that are currently used within forensic populations.

The methodology is outlined in the previous section.

### **3.5.2 Results**

Analyses involved using the Gender-Sex IAT, the Viewing Time Method 1 assessment of sexual interest and the Modified Stroop Task to help identify sexual orientation. Viewing Time Method 1 was chosen as the viewing time method for this analyses as it appeared superior to Viewing Time Method 2 both in terms of group differentiation and individual classification based on sexual orientation as outlined in section two of the current chapter. The modified Stroop task was also investigated as it is possible that there are different attentional processes involved in this assessment of sexual interest and this method may show a different relationship to the IAT measure than the viewing time measure. The two methods are hypothesised to involve different attentional processes as the viewing time requires an appraisal of the stimulus with response times generally not being as rapid as is the case in reaction time tasks in which a participant is asked to respond 'as quickly and accurately' as



possible to a secondary task. The Stroop task on the other hand does involve the rapid response to a secondary task (in this case naming the colour of a filter on a screen) while sexual interest is hypothesised to cause an interference in the speed of this response.

#### **3.5.2.1 Correlations between the measures.**

Pearson's product moment correlation were calculated to determine if the D score on the Gender-Sex IAT, the difference score on the Stroop task and the difference score on the Viewing Time Method 1 task were related to each other. The results indicated that there were no significant correlations between the measures. Nonetheless point-biserial correlations indicated a significant correlation between sexual orientation and the gender-sex IAT ( $r = 0.51, p < 0.005$ ); a significant correlation between sexual orientation and the viewing time difference score ( $r = -0.41, p < 0.05$ ); and a significant correlation between sexual orientation and the Stroop difference score ( $r = -0.62, p < 0.001$ ).

#### **3.5.2.2 Logistic Regression.**

Simple Logistic Regression Analyses indicate that each measure is a unique predictor of sexual orientation. Table 13 shows the amount of variance in sexual orientation is predicted by each of the three measures. Regression analysis indicated that responses on the Gender-Sex IAT successfully predicted 83% of the heterosexual participants (the model misclassified 4 heterosexuals as homosexuals) but only successfully predicted 46% of the homosexual group (6 of the homosexual participants were misclassified as heterosexual) [ $B = 4.02, p < 0.01$ ]. The viewing time difference score successfully predicted 96% of the heterosexual participants (the model misclassified 1 heterosexual as homosexual) but only successfully predicted 36% of the



homosexual group (7 of the homosexual participants were misclassified as heterosexual) [ $B = -0.002$ ,  $p < 0.05$ ]. The difference score on the Stroop measure successfully classified 96% of the heterosexual participants (the model misclassified only 1 heterosexual as homosexual) and successfully predicted 91% of the homosexual group (one of the homosexual participants was misclassified as heterosexual) [ $B = -0.97$ ,  $p < 0.05$ ].

A forced entry Logistic Regression was then carried out to determine if a combination of the three measures improved the predictability of whether a participant was heterosexual or homosexual. In one regression analysis the IAT D score was entered as the predictor variable in the first block, the viewing time score was entered as the predictor variable in the second block and finally the Stroop score was entered as the predictor variable in the third block. Results indicate that combined the IAT and viewing time score showed a better predictability than either score alone. Taken together, the two measures correctly classified 84% of all the participants. Twenty of the heterosexual participants were correctly classified and eight of the homosexual participants were correctly classified using both the IAT and viewing time scores combined. When the Stroop was then entered in step three, although 100% of the participants were correctly classified, the model was no longer significant. The inclusion of the Stroop measure did not improve the model as by itself the Stroop measure predicted more of the variance than the other two measures together. Table 13 presents the results of the regression model. A number of other forced regression analyses were carried out, in which the order of the measures entered was altered. However results indicated that combination of the Stroop

measure with the other two measures did not improve the model's predictive ability. Only the combination of the IAT and VT together explained more of the variance in sexual orientation than the measures in isolation. This is likely due to the Stroop measure by itself having a very good classification ability and correctly classifying all but one of the heterosexual and one of the homosexual group.

Table 13

*Binary Logistic Regression of the IAT, VT and Stroop in the Prediction of Sexual Orientation*

| Step | Variable     | B      | exp(B)  | SE      | Correctly Predicted |              |
|------|--------------|--------|---------|---------|---------------------|--------------|
|      |              |        |         |         | Homosexual          | Heterosexual |
| 1    | Constant     | -0.67  | 0.51    | 0.44    |                     |              |
|      | IAT score    | 4.02*  | 55.52   | 1.54    | 82% (19)            | 46% (5)      |
| 2    | Constant     | -0.72  | 0.50    | 0.51    |                     |              |
|      | IAT score    | 3.77*  | 43.50   | 1.70    |                     |              |
|      | VT score     | -0.02* | 1.00    | 0.001   | 91% (21)            | 73% (8)      |
| 3    | Constant     | -78.64 | 0.001   | 4252.53 |                     |              |
|      | IAT score    | 157.48 | 2.49e68 | 7634.20 |                     |              |
|      | VT score     | -0.03  | 0.97    | 1.47    |                     |              |
|      | Stroop score | -2.99  | 0.50    | 126.61  | 100% (22)           | 100% (11)    |

\*  $p \leq 0.05$  (two-tailed)

### 3.5.3 Discussion

The primary aim of the current study was to attempt to elucidate what is being measured by the Gender-Sex IAT and its relationship with sexual interest. This was

done by comparing the Gender-Sex IAT with two attention based measures of sexual interest, the modified Stroop task and the viewing time task. The secondary aim was to determine whether the inclusion of the IAT with additional measures would increase the prediction of sexual orientation.

Each of the measures individually showed a good ability to classify participants according to their sexual orientation. The Stroop was the best measure, with an AUC of 0.98, followed by the viewing time task, with an AUC of 0.92. Finally the IAT did not show as high a classification ability as the two sexual interest measures, yet it did show a good ability with an AUC of 0.82. An interesting result found was the lack of a correlation between the three measures. It is possible that as the measures involved different types of tasks and the potential effect of noise within all three measures, this correlation failed to emerge. However, it is also possible that each of the three measures used in this current study assess unique and distinct concepts, albeit all related to sexual orientation.

The findings of the regression analyses indicate that, similar to the AUC results, each measure alone significantly predicts whether a participant is heterosexual or homosexual based on the results of that measure alone. The results of the hierarchical logistic regression indicate that, taken together, the viewing time task and IAT task have better predictive ability than either task by itself. However, the inclusion of the Stroop task did not improve the predictive ability. This is likely due to the high predictive ability of the Stroop alone. Taken by itself, the Stroop measure correctly classified ten of the eleven homosexual participants and twenty-two of the twenty-three heterosexual participants. Therefore the inclusion of other measures

with lower predictive ability would be unlikely to improve the Stroop's predictive ability. Even when the viewing time task and the IAT were taken in combination, they did not reach the same predictive ability as the Stroop task alone.

It could be suggested from the high classification ability of the Stroop measure that the measure is tapping into a construct more directly related to sexual orientation that subsumes both sexual interest and cognitions matching sex to a particular gender. As seen in the previous section, while the measure performs very well when discriminating in terms of sexual interest, it performs less well when younger age categories were included in the analysis. This may indicate that the measure could be more appropriately thought of as a measure of sexual orientation and involves both the assessment of sexual interest and the matching of man or woman as sexual. As the participants may not hold cognitions matching children to sex or not sex, age effects failed to merge for this measure.

The findings suggest that the IAT together with the viewing time measure produce more accurate data about sexual orientation than either measure alone. Using the viewing time alone, eight participants were misclassified whereas when the IAT was included in the model, only five participants were misclassified. These results would suggest that the assessment of sexual orientation would benefit from the use of more than one measure, perhaps because they are tapping into different constructs related to sexual orientation. This would be beneficial in a forensic setting in which the accurate assessment is important for risk assessment and treatment. By using two measures, this may provide more accurate information on the functioning of the offender. Furthermore as the viewing time measure has been criticised because of its



transparent nature, the inclusion of the IAT, which is expected to be more resistant to faking, may reduce some of the dissimulation amongst offenders. The incremental validity of the IAT has been supported in the forensic field in which it was shown to improve the predictive ability of a battery of tests (Banse et al., 2010). The use of different measures is thought to probe different aspects of attitudes (Olson & Fazio, 2003). Thus the use of different assessment measures may serve as an important research tool to explore the constructs involved in sexual orientation, and perhaps sexual deviancy.

As the IAT measure is an existing measure proposed to measure attitudes and cognitive associations between targets and attributes, this measure may assess the cognitive elements of sexual orientation. More specifically, the IAT may assess the implicit theory an individual holds between their target gender and sex. The viewing time measure, on the other hand, may assess a lower order appraisal processes involved in sexual interest that results in increased attention to stimuli representing the gender of interest. Given the current results, it is proposed that although these two constructs are not correlated, they both together play a role in an individual's sexual orientation. This is similar to the suggestion that deviant sexual interest and deviant cognitions are separate factors that may interact to increase an individual's risk of offending (Hall & Hirshman, 2002).

Rahman (2005) suggests that sexual orientation is a dispositional sexual attraction towards persons of the opposite sex or of the same sex. It is thought to be dispositional as it is comprised of a target selection and a preference mechanism sensitive to gender, motivational approach behaviours towards the preferred gender

and internal cognitive processes biased towards the preferred target (such as fantasies). This definition implicates the role of target selection, which may be seen as akin to the implicit theory relating to gender and sex, and implicates a preference mechanism, that may be seen as akin to the sexual interest as measured by the viewing time task. Thus the present results support this particular definition of sexual orientation.

Pessoa (2005) argues that not only do cognition and emotion strongly interact in the brain but they are often integrated so they jointly contribute to behaviour. The current results may suggest that sexual interest and cognitions interact as affective and cognitive processes to result in sexual orientation and thus the choice of gender for sexual behaviour. These findings also support the theories of sexual arousal outlined in the introduction which tend to implicate both cognition and emotion in sexual behaviours. Given the findings of the current study, it is possible that sexual orientation involves the combination of an implicit schema related to gender and sex, and a lower order sexual interest mechanism. For example, Janssen et al. (2000) proposed a model of sexual arousal in which there is an interaction between automatic and attentional processes. It is proposed that this automatic process may reflect the gender implicit theory whereas the attentional processes may reflect the appraisal mechanism of the viewing time task. Furthermore, perhaps both sexual interest and implicit theories are implicated in implicit sexual memory that meets with explicit sexual memory to create an immediate sexual response as suggested by Spiering and Everaerd (2007).

A further finding in the current study indicates that the Stroop measure is not related to the IAT or the viewing time measure and does not contribute to the predictive ability of either. It is likely that the measure does not contribute to the predictive ability of either method as by itself the measures showed excellent predictive ability and left little variance to be accounted for. Thus it is likely that the Stroop is assessing a different construct more closely related to sexual orientation which may include both sexual interest and appraisal of the image as sexual. This concept alone can predict sexual orientation to a very high degree. Given the task involved in the Stroop, it is likely that this construct is more automatic and requires less attentional mechanisms than the viewing time task. These results may reflect Sexual Content Induced Delay (SCID). SCID is proposed to be a by-product of the increased attention to a positive match with sexual memory. Thus the increased reaction times to the naming of the coloured filter, when the gender of attraction was presented, is a product of an attentional bias, SCID (Geer & Bellard, 1996).

As outlined previously, Ward and Beech (2006) suggest that deviant sexual preferences result from the interaction of three neuropsychological systems; the motivation/emotion systems, the perception and memory systems, and the action selection and control systems. This theory presents a model of deviant sexual preference which involves both deviant cognitions and deviant sexual desire. Specifically the authors suggest that adult attachment and mood difficulties, together with deviant schemas may lead to deviant sexual fantasies and sexual pre-occupation. When these difficulties are present alongside a failure to regulate sexual desire this may result in the individual using sex to meet their emotional needs (Ward & Beech,



2006). While this theory is specifically focused on deviant behaviours it is possible that in non-deviant individuals, non-deviant schema interact with sexual interest for sexual arousal to occur and this involves the interaction of normally-functioning motivation/emotion systems, perception and memory systems, and action selection and control systems.

The lack of a relationship between the measures is not surprising as different implicit measures and explicit measures often show no correlation when purporting to measure the same construct (Fazio & Olson, 2003). Fazio and Olson have suggested the MODE model to explain the relationship between implicit and explicit measures. They suggest that attitudes can influence behaviour through their spontaneous processes or through more deliberate processes. In terms of spontaneous processes, these are thought to be more automatic in nature, whereas deliberative processes require cognitive resources, motivation, and time in which to deliberate (Fazio & Olson, 2003). In the current study the viewing time measure may have involved a more deliberative process whereas the Stroop and IAT were tapping into automatic constructs and this may explain the lack of relationships between the measures.

While the current thesis is limited given the nature of the sample, little can be said directly about deviant sexual interest. However in general, the sex offending literature is lacking a theoretical base for deviant sexual interest. Deviant sexual preferences are noted as a factor in a number of theories yet no attempt is made to investigate what the mechanism represents and the possible role of cognition and deviant implicit theories in this construct. As a number of theories relating to normal sexuality have been suggested, by applying these to sex offenders, they may go some



way to explaining how deviant sexual preferences operate. Rather than solely looking at measures in terms of whether they correctly classify offending groups, there is a necessity to investigate the underlying mechanisms further to determine what role they may play in the offending process. There has been a number of different attention-based sexual interest tasks developed in recent years, all drawing on existing measures in the general psychology literature. Each of these measures have been investigated in terms of how well they differentiate groups of offenders and little more attention is given to the mechanisms underlying them. While it is important to have adequate measures to assess those who engage in deviant sexual behaviours, there is also a need to understand and treat these offenders. By only focusing on whether the measure has good predictive ability, the underlying mechanisms and the role of cognition and emotions in these mechanisms are being ignored. Without understanding these concepts fully, it is difficult to treat them. Despite there being a significant amount of research and theories suggested for normal sexual preference, very little of this has been applied to the sex offending literature. It is possible that marrying together the two fields of research, on normal sexual interest and deviant sexual preference, may lead to a greater understanding on the functioning of deviant sexual interest and the impact of cognitions on this. However, the current research only allows for investigation within a non-deviant sample and further research is necessary to attempt to apply these theories to an offending sample of men.

In conclusion, the appraisal of an image, as evidenced in the viewing time measure, may involve a lower order sexual interest construct whereas the implicit

theory, as evidenced by the IAT, may involve higher order cognitive functioning. Whereas the constructs are not related, they both play a role in an individual's sexual orientation. Should this be applied to the sex offending field, it could be suggested that a deviant sexual interest in children together with a cognitive association between children and sex may lead to a pervasive sexual offending against children. Similar to the multifactorial theories of sex offending, it is possible that an offender will only have one of these two constructs yet still offend against children, but the combination of both constructs is likely to lead to a more pervasive sexual attraction to children akin to orientation. It is possible that offenders who exhibit both constructs will have a more extensive offence history than those offenders with only one of the two constructs. Thus these results may have implications for the sex offending field and highlight the necessity of investigating the constructs and mechanisms related to sexuality, including deviant sexuality, further.

## **4 Chapter 4: The Relationship between Implicit Theories, Pornography Use and Rape Proclivity**

### **4.1 Introduction**

The current chapter will investigate the relationships between deviant implicit theories, pornography use, and an individual's proclivity for sexual aggression against adults. The relationship between pornography use and aggression is a contentious issue. As will be outlined below, the research surrounding the possible relationship is equivocal. However, it is generally understood that not all those who view violent pornography behave in a sexually aggressive manner, while not all sexual aggressors view violent pornography, and recent research in the area tends to suggest that there are moderating factors that play a role in the relationship between pornography use and sexual aggression (e.g., Hald Malamuth, & Yuen, 2010). In line with the central theme of this thesis, the role of implicit theories will be investigated in this regard. That is, implicit theories will be investigated as possible moderating factors in the relationship between pornography use and aggression. Specifically, this chapter will investigate three implicit theories commonly found among rapist samples in a normal male population, and investigate the role of these implicit theories and pornography use in an individual's propensity for sexual aggression. The introduction will begin with an outline of the relationship between pornography use and sexual aggression. The role of implicit theories in sexual aggression will then be outlined. Finally, I will integrate these two areas and investigate the interactive role of implicit theories together with pornography use in the propensity for sexual aggression.

#### **4.1.1 The relationship between pornography and sexual aggression**

At both the population and individual level, there appears to be equivocal results in terms of the relationship between pornography and aggression. Furthermore this relationship has been investigated via a number of methodologies, including experimental and survey designs. The relationship became the subject of much debate in the United States in the 1960s when pornography became more popular or more widely available; leading to two widely cited governmental reports. Today, with an apparent increase in both the availability and diverse types of pornography on the internet, this is a relationship that still remains unclear. Lam and Chan (2007) have suggested that easily available pornographic materials are among the most widely used material or searched topics on the internet.

The US Commission on Obscenity and Pornography (1970) reviewed the research available at the time, and concluded that sexually explicit media had no known adverse effects on behaviour. However, the report was criticised for ignoring the role of violent pornography (e.g., Malamuth & Briere, 1986; Dienstbier, 1977). Following this, the Attorney General's Commission on Pornography (1986) reported that research shows a causal relationship between exposure to sexually violent material and aggressive behaviour towards women. However, this report was criticised for over-exaggerating findings from a small number of studies investigating aggression in the laboratory (Linz, Donnerstein, Linz, & Penrod, 1987; Malamuth, 1989). Rather than citing the rather large body of research here, attention will focus mainly on a number of meta-analyses carried out in the area and specific attention will be paid to pornography use among sex offending populations.



Allen and colleagues (1995) carried out two separate meta-analyses, one of which focused on experimental studies, and another which concentrated on non-experimental studies. The first meta-analysis, Allen, D'alessio, and Brezgel (1995a), involved 33 experimental studies (n=2040), in which non-sexual aggression was measured in a laboratory setting using prototypical analogue measures of aggressive behaviour. Overall the results indicated a small, positive association between pornography and aggressive behaviour. However, a finding that appears to be emerging from studies in the area is that an interaction factor was found to be moderating this relationship. Allen et al. (1995) found that the type of pornography acted as a moderating variable. Exposure to nudity was found to decrease laboratory aggression, whereas exposure to non-violent sexual behaviour and violent sexual behaviour significantly increased aggression. Furthermore, violent pornography was found to generate more aggression than nonviolent pornography. However, a number of problems in the use of experimental studies have been identified. Allen et al. (1995a) found, using the Buss shock paradigm, there were no differences in aggression against a female confederate versus a male confederate and no difference in effect size between male and female participants after exposure to pornography. Seto, Maric and Barbaree (2001) also criticise this aggression measure for lacking in 'real-world' validity as it measures aggression in the absence of negative consequences or a non-aggressive alternative.

Allen, Emmers, Gebhardt, and Giery (1995b), in a meta-analysis of 24 non-experimental studies (n=4268), found almost no relationship between pornography use and self-reported sexual aggression. However, Hald, Malamuth and Yuen (2010)

have raised doubts about the conclusion of the Allen et al. (1995b) meta-analysis, given the types of studies included and suggested there may be some statistical error in the manner in which the meta-analysis was carried out. Hald et al. (2010) subsequently carried out a meta-analysis on nine non-experimental studies (n=2309). The analysis included studies using measures of attitudes supporting violence against women, rather than specifically an individual's likelihood of raping. The results indicated a small but significant relationship between pornography use and attitudes supporting violence against women. Again, type of pornography was found to have a moderating effect on the relationship, such that, the relationship was significantly stronger for violent pornography than for non-violent pornography, although significant effects were shown for both types. The study also found that the association between non-violent pornography and attitudes supportive of violence against women was moderated by individual differences in risk for sexual aggression. Individuals who were classified as being at a relatively high risk for sexual aggression were particularly influenced by pornography, as reflected by their negative attitudes towards women. This meta-analysis indicates that the results for non-experimental studies are consistent with those of experimental studies. Overall, Hald et al. (2010) concluded that although only a small significant association was found in the meta-analysis, this may translate into considerable social and practical significance across a larger population. However the inclusion of studies that use beliefs accepting of sexual violence against women as analogous to likelihood of raping is questionable. Although the two variables are related (Bohner, Reinhard, Rutz, Sturm, Kerschbaum, & Effler, 1998) they are two separate constructs.

Demare, Lips, and Briere (1993), using Structural Equation Modelling, found that their most successful model indicated that anti-women attitudes and use of sexually violent pornography are correlated phenomena that nevertheless have separate influences over hypothetical and actual sexual aggression. Of these two variables, sexually violent pornography was found to be the most powerful, having direct effects on self-reported likelihood of sexual force and rape as well as actual rape and coercive sexual behaviour. Anti-women attitudes, however, had direct effects only on likelihood of sexual force and rape.

The Hierarchical-Mediational Confluence Model of sexual aggression (HMC; Malamuth, 1986; Vega & Malamuth, 2007) suggests two possible pathways to sexual coercion; (1) the Hostile Masculinity (HM) pathway refers to a constellation of personality traits, including a hostile orientation, typically towards women, and satisfaction obtained through dominating, controlling and humiliating women and (2) the Impersonal Sex (IS) pathway which describes a non-committal, game playing orientation toward sexual activity and willingness to engage in such acts without closeness or commitment (Malamuth, 1998; 2003 Malamuth et al, 1995). Malamuth et al. (2000) and Vega and Malamuth (2007) found that pornography use was a significant additional predictor of sexual aggression after controlling for these other risk factors, and the frequency of pornography use was only a risk factor for individuals assessed to be 'at a relatively high risk' for perpetrating sexual aggression. That is, an interaction was found, in which individual's assessed to be at a high risk for sexual aggression show a large effect between pornography use and sexual



aggression, whereas men assessed as being low risk showed a small association between the two variables.

#### *4.1.1.1 Pornography Use and Sexual Offending.*

As with much of the research in this area, the research carried out with offenders also tends to be contradictory. For example, Condran and Nutter (1988) found no difference between sex offenders and a control group in their consumption of pornography, while other studies have indicated that non-offenders report more pornography use than sex offenders (Cook, Fosen, & Pacht, 1971). In contrast, Abel (1985) and Marshall (1988) found a significant proportion of offenders reported being influenced to sexually offend as a result of viewing pornography. However, Marshall (1988) found that the type of pornography that was related to sexually aggressive behavior involved adult consensual sex. Therefore it has been suggested that the pornography content may be less important in relation to sexual aggression, and individuals with a propensity to sexual aggression may exhibit deviant fantasies which may be elicited from consensual pornography (Marshall, Seidman, & Barbaree, 1991; Marshall et al., 1988; 2000). Marshall (1988; 2000) and Howitt (1995) have shown that some individuals, particularly those with paraphilias or a propensity towards violence, may use materials not classified as pornographic to activate pre-existing deviant sexual fantasies.

Kingston, Federoff, Firestone, Curry, and Bradford (2008) examined the effect of pornography use on recidivism rates, as measured through the Static-99 (Hanson & Thornton, 2000), in a sample of child sex offenders. The results showed a significant interaction between violent (including sexual) recidivism and pornography use. They also found that individuals who viewed deviant pornography were more



likely to recidivate when compared with individuals who did not view deviant pornography, and this difference was consistent across levels of risk. However general pornography consumption increased the risk for aggression only among men who already scored high on general and specific risk factors for sexual aggression. In contrast, for men assessed to be at low risk for sexual aggression, pornography had no effect on their risk level. The authors suggested that a potential explanation for this interaction between type of pornography and risk factors comes from findings of priming studies. These studies have shown that men with earlier risk factors may interpret pornographic material differently than individuals with lower risk factors. For example, it has been suggested that pornography activates and reinforces inappropriate schema and perhaps develops sexual preoccupation (Malamuth et al., 2000), both of which are individual risk factors for sexual aggression (Hanson & Morton-Bourgon, 2004).

#### *4.1.1.2 Possible Explanations for the Relationship between Pornography and Sexual Aggression.*

Pornography's effect on arousal to rape related stimuli has been suggested to explain the relationship between pornography and sexual aggression. The "sexual preference hypothesis" (Lalumiere & Quinsey, 1994) asserts that men who engage in sexually deviant behaviour do so because they prefer this to socially acceptable behaviours. A number of studies have indicated that rapist on average experience greater sexual arousal to scenarios involving rape than non-offending populations (Lalumiere & Quinsey, 1994; Hall, Shondrick & Hirschman, 1993). Research has also shown that within non-offending populations, repeated exposure to non-violent pornography produces a satiation effect, that is, significantly reduced sexual arousal upon

subsequent stimuli presentation (Schafer & Colgan, 1977; Zillman & Bryant, 1984). In contrast, when content involving rape or violence is presented to a non-offending population, subsequent depictions of rape scenarios result in greater arousal compared with having viewed consenting pornographic material (Malamuth, 1981; Malamuth & Check, 1981; Marshall, Seidman, & Barbaree, 1991). There have been a number of theories suggested to explain the pornography-aggression relationship.

Laws and Marshall (1990) applied operant conditioning theories to explain the role of pornography in sex offending. They postulated that when viewers masturbate to orgasm while watching pornography it reinforces their sexual response to the depicted content. It is suggested that this conditioned response might shift in a deviant direction as the individual becomes habituated to the depicted content and successively views minor variations in the content, such as, viewing pornography that becomes progressively more deviant or violent.

Social Learning Theory (Bandura, 1973; 1977) suggests that learning occurs through modelling and imitation of a role model. Accordingly, a behaviour is learned depending on the functional determinants received by the model and the viewers' evaluation of the probability that they would receive the same determinants for similar behaviour. According to this theory, violent pornography could increase subsequent aggressive behaviour as it portrays the behaviour as rewarding to the model in the depicted content. Malamuth, Haber, and Feshback (1980) found following a scene in which a woman is raped and appears to become sexually aroused and experience pleasure, non-offending men showed a reduction of inhibitions against admitting such behaviour themselves.

Berkowitz's (1997) cognitive neo-associationistic model implicates automatic processes in the relationship between media violence and subsequent aggression. Media violence is suggested to automatically prime aggressive thoughts and feelings which subsequently prime aggressive action tendencies. This theory suggests that viewing violent pornography primes aggression-related concepts and makes these constructs more accessible and therefore more likely to be used when interpreting ambiguous situations, which may in turn result in subsequent aggressive behaviour. Support for this model comes from priming studies in which sexuality related mechanisms are primed, through sexually explicit images, which activate relevant deviant schema (Anderson, 1997; Bargh, Lombardi, & Higgins, 1988). Paul and Linz (2008) investigated the relationship between prior exposure to barely legal images (i.e. individuals who were falsely portrayed to be younger than 18 years of age) and the construction of associated cognitive structure involving sexuality, arousal and youth. Using a lexical decision task, their results indicated that men and women exposed to the barely legal images are faster at recognising sexual words after being primed with neutral depictions of girls than were people originally shown adult pornographic material.

#### ***4.1.2 The Role of Implicit Theories in Sexual Aggression.***

As outlined in the previous chapters, cognitive distortions have been implicated in a number of theories of sex offending. Specifically in terms of adult sex offending, the Quadripartite Model of Sexual Aggression (Hall & Hirschman, 1991), implicate cognition along with three other factors, physiological sexual arousal, affective dys-control and personality traits, in the commission of rape. According to this theory when cognition is the more dominant factor pushing the individual to sexually offend,



rape is more likely to occur in situations where offence-relevant stimuli mitigate or justify rape, or where legal or societal inhibitions are low (e.g., date rape). The implicit theories theory of offending (Ward, 2000; Ward & Keenan, 1999) perhaps gives the most comprehensive view of the role of cognition in offending. This theory looks at offenders' offence supportive beliefs and hypothesises as to how they are structured in memory. As outlined earlier, the implicit theories related to rape are; (i) 'Woman as sex objects', in which women are viewed as constantly sexually receptive and created to meet the sexual needs of men<sup>4</sup>; (ii) 'Women as dangerous', in which women are seen as inherently malevolent and vindictive and seek to deceive men about what they really want, (iii) 'Entitlement', in which the offender believes that his needs should be met on demand, especially his sexual needs and men are assumed to be inherently superior to women, (iv) 'Uncontrollability', in which the offender believes that men's sexual energy can be difficult to control and women play a key role in this loss of control and (v) 'Dangerous World', in which the world is seen as a hostile and dangerous place where other people are out to harm and exploit in order to promote their own interests (Polaschek & Ward, 2002; Polaschek & Gannon, 2004).

These implicit theories are very similar to rape myths that have been studied in sex offender and normal populations for a number of years. Rape myths have been defined as 'psychological releasers or neutralisers, allowing potential rapists to turn off social prohibitions against injuring or using others when they want to commit an

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<sup>4</sup> The 'women as sex objects' implicit theory is differentiated from the 'women as sexual beings' implicit theory investigated in the previous chapter as the former represents the belief that females are constantly sexually receptive and are objectified in sexual terms whereas the latter represents the belief that woman represent a sexual target for the individual but they are not seen as constantly sexually receptive.



assault' (Burt, 1978, p282). Rape myth acceptance has been correlated with rape proclivity (or a propensity for sexual aggression) (Malamuth, 1981; Malamuth & Check, 1984). Rape myths are broadly considered to deny, trivialise or justify sexual violence (Bohner, Reinhard, Rutz, Sturm, Kerschbaum, & Effler, 1998; Burt, 1980). Given the above definition, rape myths are likely to be the same, or very similar, constructs as cognitive distortions.

Bohner et al. (1998) investigated the causal pathway between rape myth acceptance (RPA) and rape proclivity (RP) by counterbalancing the order in which participants received the RMA and RP scales. Their results indicated that the correlation between the two variables was significantly higher when RMA was presented to participants first rather than last. The authors concluded that anti-victim attitudes influence the behavioural inclination to commit rape rather than vice versa (Bohner et al., 1998). Bohner, Jarvis, Eyssel and Siebler (2005) replicated these finding and furthermore found that men who had previously engaged in sexually coercive behaviour showed a higher correlation between RMA and RP than men who had never engaged in such behaviour.

Marolla and Scully (1986) found that rapists displayed more acceptance of rape myths, using the Rape Stereotype Scale. However, there is also contradictory evidence in the area. For example, Segal and Stermac (1984) administered the Attitudes Towards Women Scale (ATW; Spence, Helmreich & Stapp, 1973) and found that rapists could not be statistically discriminated from control groups, even when socioeconomic status is controlled for.

#### 4.1.3 *Rationale for the Current Study.*

Overall, it appears that for most individuals, pornography has no adverse effects on their propensity for sexual aggression. However, research appears to indicate that for a subgroup of people, or a particular type of pornography, there exists a relationship between pornography and sexual aggression (Hald et al., 2010; Kingston et al., 1998). Therefore, it has been suggested that dispositional or situational variables may act as moderating factors in this relationship. Given the importance cognition and in particular, implicit theories in sexual aggression, it was hypothesized, in the current study, that implicit theories related to rape would play a role in the relationship between pornography and sexual aggression. It is suggested that pornography may strengthen existing implicit theories, through the objectification and negative portrayal of women in some types of pornography, perhaps by strengthening implicit theories and making them chronically accessible.

The Extended Mind Theory (Ward & Casey, 2010), outlined in chapter two, may contribute to the understanding of the possible role of pornography use in the prevalence of implicit theories and subsequently sexual aggression. The central tenet of EMT is that there is no separation between the thinking agent and the world. It is based on the assumption that individuals actively utilize and incorporate external resources in their problem solving routines, and the brain draws on both external and internal representations when engaged in cognitive tasks (Clark, 2007). In terms of sex offending, EMT suggests that cognitive distortions involve internal and external components, and as a result of this, a significant cause of distorted thinking resides in the wider social and cultural context of the offender. This may be of particular relevance in the role pornography may play in the offender's cognitive system.

Pornography may be implicated in an individual's cognitive practices and affect an individual's views of sexual interactions and females in general. EMT does not deny the existence of the implicit theories outlined above, but also claims that there are external components, such as pornography, along with these internal components that make up an individual's cognitive system. Thus, the interaction of deviant pornography and implicit theories may result in cognitive practices in which women are viewed as sexual objects and there is an acceptance of violent or coercive sex. The individual may then engage in flawed cognitive tasks such as interpreting, explaining and guiding action as the norms applied are inappropriate (Ward & Casey, 2010). The Judgement Model of Cognitive Distortions (Ward, Gannon, & Keown, 2006) also allows for a broader perspective on cognitive distortions as involving more than the individual's cognitive system, but also the fundamental values that are associated with the wider environment. If violent or objectifying pornography is freely available and availed of in the wider environment, this may lead individuals to hold distorted values regarding sexual aggression and draw temporary false conclusions, based on the pornographic depiction rather than sound evidence, such as women are not harmed by rape or deserve to be raped.

Additionally, as was found in previous studies (e.g., Allen et al., 1995), the type of pornography was also hypothesized to moderate the relationship between pornography use and propensity for sexual aggression. Previous studies have investigated the role of violence in moderating this relationship. The role of non-consent, and objectification, rather than violence alone, will be investigated in the current study as it is possible that it is not just the role of violence in pornography that



that increases an individual's likelihood of rape. This suggestion is based on the rationale that rape is, by definition, a coercive act; however, overt violence may not always be present during the offence. Therefore an individual may show a sexual preference for coercive sex, or sex where one of the partners is powerless, rather than violent sex and this is reflected in the type of pornography they use. Groth (1979) argues that rape as a pseudo-sexual act, complex and multi-determined, but addressing issues of hostility (anger) and control (power) more than passion (sexuality). Groth (1979) argues that the defining element of rape is lack of consent rather than the presence of violence. Furthermore, Beech, Ward, and Fisher (2006) suggest that based on their endorsement of ITs, rapists could be subdivided into those who are violently motivated, those who are sexually motivated and those who are sadistically motivated. Therefore, much of the research investigating the role of pornography on sexual aggression may be overlooking the role of other types of deviant pornography as moderating factors, as it tends to focus on the role of violence in pornography rather than the role of consent or power. If an individual is sexually attracted to coercive sex they may not specifically seek out violence in pornography but rather seek out pornography in which the sexual encounter is non-consensual or where one of the partners is portrayed as powerless. Thus this research investigated violent pornography, objectifying pornography and pornography involving non-consensual sex, as separate types of pornography, to determine which type would be more predictive of propensity for sexual aggression.

Polaschek and Ward (2002) suggest that as cognitive distortions can often not discriminate rapists from controls, it may be that a subgroup of non-offenders may



also endorse rape supportive cognitive distortions and these may contribute to an individual's proclivity for rape. Whether or not a male will rape is seen as a consequence of their capacity to inhibit or control their deviant sexual preferences generated by these beliefs. However, it may be possible that a significant amount of normal men hold these distorted views about women and sexual interactions, yet they do not go on to offend as they do not hold additional risk factors for sexual aggression such as a sexual preference for coercive or violent sex. However, the minority who do have a deviant sexual preference may seek out pornography that depicts this type of content and it is these individuals that may go on to offend. Thus the aim of the current study was to investigate the relationship between implicit theories and an individual's rape proclivity and to investigate the possible role of pornography use in this relationship. As the implicit theories, 'women as sex objects', 'entitlement' and 'women as dangerous' were found to be the most commonly occurring implicit theories amongst rapists, at 70%, 68% and 65%, respectively (Polaschek & Gannon, 2004), these three theories were investigated in the current study.

## **4.2 Methodology**

### **4.2.1 Design**

A repeated measures design was used in this study, in which all participants were presented with all measures. Data on a number of additional measures were collected along with the variables of interest to this study. These measures were not included in the analysis as they were not directly related to the current research question<sup>5</sup>.

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<sup>5</sup> Additional measures were included in the study design as it was expected that a larger study would be conducted in which additional variables related to general aggression and general attitudes

However they are included in this methodology as their inclusion in the design affected the order in which measures were presented. The measures of interest in the current study are; the pornography use questionnaire, the self-report Implicit Theory measure, the rape proclivity measure and the sentence recall task. The sentence recall task, outlined below, implicitly assessed the three implicit theories and involved two blocks: sentence presentation and sentence recall. The measures were presented in one of two orders. In one order, participant completed the tasks in the following order; (1) First Sentence Presentation ('women as dangerous' and 'entitlement' themed sentences), (2) Word Completion Task, (3) First Sentence Recall Task ('women as dangerous' and 'entitlement' themed sentences), (4) Pornography Use Questionnaire, (5) second Sentence Presentation ('women as sexual beings' and 'hostility' themed sentences), (6) General Aggression Scale, (7) Second Sentence Recall ('women as sexual beings' and 'hostility' themed sentences), (8) Self-report Implicit Theories Scale, (9) Attitudes Towards Women Scale, and finally (10) a Rape Proclivity Scale. In the second order, the presentation and recall of the 'women as sexual beings' and 'hostility' themed sentences were presented first and the presentation and recall of the 'women as dangerous' and 'entitlement' themed sentences was presented second. The order of the remainder of the tasks remained the same. The outcome variable was the participants' rape proclivity as measured by the modified Bohner scale (see below). Participants' scores on the implicit theory

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towards women would be included. However, due to difficulties with participant recruitment the study was reduced in order to maintain the power of the regression model. Therefore only the variables that were theoretically relevant and directly related to the research question were included in the analysis which maintained the proportion of participants to predictor variables at approximately 10:1. The additional variables that were included, but not analysed, included a general aggression measure, a 'hostile attributions' sentence recall task, a word completion task, and an 'attitudes towards women' measure.

themed sentence recall tasks, the self-report assessment of the implicit theories, and frequency and type of pornography use, were taken as the independent variables.

#### **4.2.2 Participants**

Participants consisted of ninety-seven heterosexual males. They were contacted through an email shot sent to a number of university departments and to individuals known to the researcher. Participants were incentivized to complete the survey through course credits or entry to a draw to win MP3 player. As it was thought that demographic information regarding age may have provided identifying information, this information was not collected.

#### **4.2.3 Measures**

##### ***4.2.3.1 Rape Proclivity Scale (Bohner et al., 1998).***

The proclivity towards sexual aggression scale consisted of a modified version of the Bohner et al. (1998) scale. The Bohner et al. (1998) scale is a measure of rape proclivity based on five realistic scenarios in which an acquaintance rape is described, but the word “rape” is never used. Participants are presented with a short scenario and asked to imagine themselves in the situation of the male protagonist and answer three questions for each of the scenarios. The questions read as follows and were responded on a five point scale; (i) ‘How aroused would you be in this situation?’ This question response ranged from 1 ‘not at all aroused’ to 5, ‘highly aroused’, (ii) ‘How likely would you be to act in the same way in this situation?’ This question response ranged from 1, ‘certainly not’ to 5, ‘certainly yes’, and (iii) ‘How much do you think you would enjoy getting your own way in this situation?’ This question response ranged from 1, ‘not at all’, to 5, ‘very much’. The intermittent points were not labelled for any of the question responses.



The original Bohner scale consists of five acquaintance rape scenarios. Prior to study design, a consultation was held with three potential male participants to ascertain their opinions of the scales. Feedback on this particular scale highlighted the lack of a stranger-rape situation. Therefore the scale was modified to include a stranger-rape scenario. Additionally, given the length of the experiment, the Bohner scale was modified to include only two of the original acquaintance-rape scenarios. Altogether the scale consisted of three scenarios, two acquaintance rape scenarios and one stranger rape scenario, with the three accompanying questions. The additional stranger rape scenario read as follows;

‘You are walking home late at night. There is a woman up ahead of you. You catch up with her and start to chat to her. She ignores you and starts to walk faster. As you pass a dark alley, you grab her arms and drag her down the alley. She starts to scream. You throw the woman to the ground and force her to have sex with you.’

The existing acquaintance rape scenarios read as follows;

‘You have gone out a few times with a woman you met recently. One weekend you go to a film together and then back to your place. You have a few beers, listen to music, and do a bit of petting. At a certain point your friend realizes she has had too much to drink to be able to drive home. You say she can stay over with you, no problem. You are keen to grab this opportunity and sleep with her. She objects, saying you are rushing her and anyway she is too drunk. You don’t let that put you off, you lie down on her and just do it.’



‘A while back, you met an attractive woman in a disco and you would like to take things a bit further with her. Friends of yours have a holiday home so you invite her to share a weekend there. You have a great time together. On the last evening you are ready to sleep with her, but she says no. You try to persuade her, insisting it’s all part of a nice weekend. You invited her, after all, and she did accept. At that she repeats that she doesn’t want to have sex but then puts up hardly any resistance when you simply undress her and have sex with her.’

The unmodified version of the rape proclivity measure has been shown to be unrelated to social desirability (Bohner et al., 1998). Furthermore, the proportion of respondents indicating some likelihood of raping was found to be higher for this measure than the Malamuth Rape Proclivity (Malamuth, 1981) questionnaire, a more explicit self-report measure of participants’ likelihood of raping if they were assured of not being caught (Bohner et al., 1998). The internal consistency of this measure was found to be satisfactory to high (Bohner et al., 1998; 2006; Eyssel Bohner, & Siebler, 2006), and it has been found to have significant correlations with self-reports of sexually aggressive behaviour (Bohner Siebler, & Schmelcher, 2005). A Cronbach’s alpha of .81 for the German version and .76 for the English version of this scale has been found (Gerger, Kley, Bohner, & Siebler, 2007).

Three outcome variables were collected from this measure. The first variable, known as RP Arousal, consisted of the mean of the participant’s responses to question (i). The second variable, known as RP Behaviour, consisted of the mean of the participant’s responses to question (ii). The third variable, known as RP Enjoyment, consisted of the mean of the participant’s responses to question (iii).

These three variables were assessed separately, rather than one whole rape proclivity variable, as previous studies have shown that each variable can results in different findings (Bohner et al., 1998).

#### *4.2.3.2 The Pornography Use Scale.*

The pornography questionnaire assessed frequency of, and age of first use<sup>6</sup>, of the following four types of pornography;

1. Sexually explicit material depicting adult men and women consensually involved in pleasurable, non-violent, non-degrading sexual interactions.
2. Sexually explicit material where one of the participants is objectified or portrayed as powerless, where no violence is involved and the activity appears consensual.
3. Sexually explicit material where any type of physical force is used or threatened but the activity appears consensual (e.g., spanking).
4. Sexually explicit material that depicts non-consensual activity where physical force may or may not be used.

The independent variable taken from this measure consisted of the amount of times each type of pornography was used per month by the participant. Type 1 above reflects the consensual pornography variable, type 2 reflects the objectifying pornography variable, type 3 reflects the violent pornography variable and type 4 reflects the non-consensual pornography variable. The complete scale is presented in Appendix F.

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<sup>6</sup> The 'age of first use' variable was due to be included in the larger study. However, given the small sample size, it was not included in the current analysis as frequency of use was deemed to be the more important variable related to pornography use.

#### *4.2.3.3 The Implicit Theories Measure; Sentence Recall.*

The implicit theories of 'women as sexual objects', 'women as dangerous' and 'entitlement' were assessed through a sentence recall task. This task followed a similar procedure to that of Gannon and Rose (2009). It involved the initial presentation of ambiguous sentences. Each sentence was ambiguous as it was constructed in such a way that it could be interpreted in an implicit theory supportive manner or in a neutral manner.

In order to develop the sentences used in this task a pilot study was conducted in which a group of 12 male participants were asked to give possible meanings to sentences. The sentences were initially constructed in a manner such that the sentence could be interpreted in an implicit theory congruent manner and could also be interpreted in a neutral manner. Participants were then asked how they interpreted the sentence. Based on the results of this study, the sentences chosen for the main study were those that were equally interpreted as IT congruent or neutral by the pilot study participants. The length of each sentence and reading ease was also controlled for across the sentences.

For the main study, at time one, participants were asked to read through the ambiguous sentences. They then completed another unrelated task (either a word completion task or a self-report aggression scale). At time two, participants were presented with the implicit theory congruent and neutral interpretations of the sentences in random order. Sentences were never reproduced in their original format. Participants were asked whether they recognised the sentence as being similar in meaning to those presented earlier, with a yes or no response.

For approximately half of the participants, five ambiguous sentences reflecting the 'women as dangerous' and three ambiguous sentences reflecting the 'entitlement' implicit theory were presented first. For the recall task there were 16 sentences presented, 8 in an IT congruent manner and eight in a neutral manner. Later in the experiment, these participants were then presented with five ambiguous sentences reflecting the 'women as sexual beings' implicit theory and three ambiguous sentences designed to assess hostile attribution bias. Upon the recall task, participants were again presented with sixteen sentences, five congruent with the 'women as sexual beings' implicit theory, three congruent with a hostile interpretation and eight neutral sentences. The remaining participants were presented with the 'women as sexual beings' and 'hostile' sentences in the first presentation and the 'women as dangerous' and 'entitlement' sentences in the second presentation. An example of an ambiguous sentence and the two possible interpretations of the sentence are presented below. The complete list of the ambiguous sentences, with their possible interpretations, is presented in Appendix G.

Time one presentation: *'When Sally went to the bar she was looking for a good time.'*

IT congruent interpretation: *'When Sally went to the bar she was planning on having sex.'*

Neutral Interpretation: *'When Sally went to the bar she was planning on enjoying the evening.'*

Three independent variables were taken from this measure; the women as sexual objects' IT (WASO implicit), the 'women as dangerous' IT (WAD implicit)



and the 'entitlement' IT (entitle implicit). For each variable, the number of neutral sentences that were recalled was subtracted from the number of implicit theory congruent sentences that were recalled.

#### ***4.2.3.4 Self-Report Implicit Theories Scale.***

As there are no existing self-report measures assessing the specific implicit theories of interest in the current study, a self-report measure was designed to specifically tap into the 'women as dangerous', 'women as sexual beings' and 'entitlement' implicit theories. In order to develop the scale, items were taken from a number of existing rape myth acceptance scales, cognitive distortion scales and the literature detailing the nature of implicit theories. Specifically, items were taken from the RAPE scale (Bumby, 1996), the Illinois Rape Myth Acceptance (IRMA; Payne, Lonsway, & Fitzgerald, 1999), the Rape Myth Acceptance Scale (RMAS; Burt, 1980), and from the work of Polaschek and Gannon (2004) and Ward, Gannon, and Keown (2006) in which they outline these implicit theories. Eighteen items were selected, six tapping into each of the three implicit theories. Participants are asked to indicate the degree to which they agree or disagree with the items. The response was a six item Likert scale, ranging from -3 to +3. The end points on the Likert scale were anchored: -3 was labelled 'strongly disagree' and +3 was labelled 'strongly agree'. An example of an item reflecting the 'women as a sexual object' questionnaire is presented below. The complete Implicit Theory scale is presented in Appendix H.

*'Although most women wouldn't admit it, they generally find being physically forced into sex a real 'turn-on.'*

#### *4.2.3.5 Factor analysis of the implicit theories questionnaire.*

An exploratory factor analysis was carried out on the eighteen items as responded to by 97 non-offending males, to determine the underlying factors of the scale. The data used in this analysis was that collected for the current study. Thus the sample consisted of 97 non-offending males. Given the small sample size the results of this analysis should be interpreted with caution. However it was necessary to conduct this analysis in order to determine which factors the scale was measuring and to determine which variables should be included in the regression analysis.

Prior to conducting the analysis, the data were assessed for suitability. The correlation matrix indicated that many of the correlations between the items were 0.3 and above. The Kaiser-Meyer-Olkin Measure of sampling accuracy was 0.84, exceeding the recommended value of 0.6 (Kaiser, 1970; 1974; as cited in Field, 2008). The Bartlett's test of sphericity (Bartlett, 1954; as cited in Field, 2008) was statistically significant, supporting the factorability of the correlation matrix. Principal component analysis indicated five components with eigenvalues above one, explaining 37%, 47%, 56%, 62% and 68% of the accumulative variance, respectively. An inspection of the scree plot, however, indicated only one factor before the elbow. A three factor solution was investigated; however the factors did not appear to represent coherent theoretically relevant categories. Therefore, the questionnaire was deemed to be assessing one factor rather than the three separate implicit theories outlined above. It is suggested that this factor assesses a general misogynistic attitude in which violence against women is accepted and gender interactions are seen as adversarial. The reliability analysis was then calculated for this one factor scale

which revealed a Cronbach's alpha of 0.88. The factor score for the one factor was taken as the independent variable.

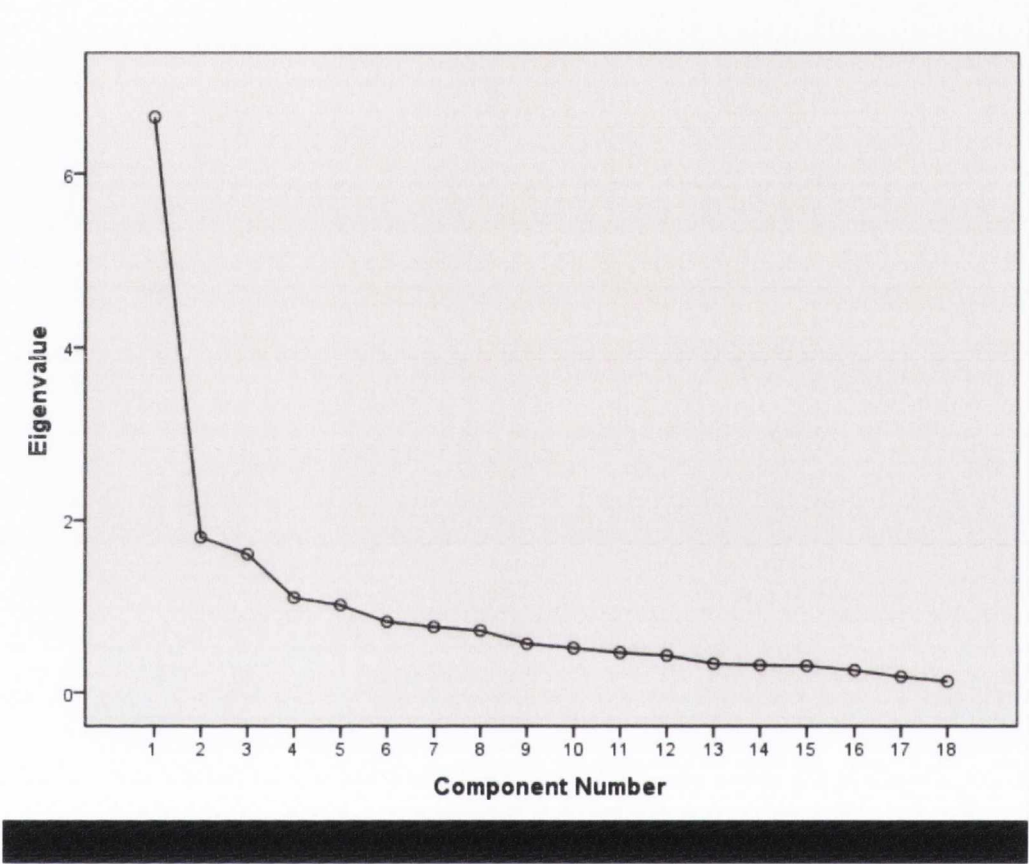


Figure 12. Scree plot for the Implicit Theory scale factor analysis

4.3 Results

As it was deemed that each of the three questions on the rape proclivity scale are tapping into different constructs related to rape proclivity (RP Arousal, RP Enjoyment and RP Behaviour), separate analyses were carried out for each of the of the three questions. Therefore three sets of analyses were carried out to investigate each Rape Proclivity measure. The data were initially assessed and found to meet the

assumptions necessary to carry out a regression analysis. The relationship between the predictor variables and each RP measure was assessed initially through correlations and then through regression analyses. The variables assessed were (1) frequency of consensual pornography use, (2) frequency of objectifying pornography use, (3) frequency of violent pornography use, (4) frequency of non-consensual pornography use, (5) 'women as sexual beings' IT assessed through sentence recall (WASO implicit), (6) 'women as dangerous' IT assessed through sentence recall (WAD implicit), (7) 'entitlement' IT assessed through sentence recall (entitle implicit), and (8) the implicit theory questionnaire.

#### **4.3.1 Rape Proclivity Arousal**

Pearson's product-moment correlation coefficients were calculated to explore the relationship between RP Arousal and the predictor variables. The results are presented in Table 14. Both objectifying and violent pornography use were found to be significantly correlated with RP Arousal ( $r = 0.21, p < 0.05$ ;  $r = 0.22, p < 0.05$ , respectively), indicating small effect sizes. The implicit theories self-report variable showed the highest correlation with RP Arousal ( $r = 0.28, p < 0.01$ ), indicating a small effect size. None of the sentence-recall assessed Implicit Theories were found to be significantly correlated with the RP Arousal measure.



Table 14

*Pearson's Correlations for Pornography Type and Frequency and Endorsement of Implicit Theories with RP Arousal*

| Variable                         | 1 | 2      | 3      | 4      | 5     | 6    | 7     | 8     | 9      |
|----------------------------------|---|--------|--------|--------|-------|------|-------|-------|--------|
| 1. Consensual P.                 | - | 0.37** | 0.36** | -0.08  | 0.02  | 0.11 | 0.22* | -0.08 | 0.08   |
| 2. Objectifying P.               |   | -      | 0.72** | 0.15   | 0.05  | 0.12 | 0.16  | 0.08  | 0.21*  |
| 3. Violent P.                    |   |        | -      | 0.33** | -0.01 | 0.06 | 0.04  | 0.18  | 0.22*  |
| 4. Non-consensual P.             |   |        |        | -      | 0.08  | 0.05 | -0.10 | 0.05  | 0.03   |
| 5. WASO Implicit                 |   |        |        |        | -     | 0.11 | -0.08 | 0.35* | 0.12   |
| 6. WAD Implicit                  |   |        |        |        |       | -    | 0.19  | 0.04  | -0.08  |
| 7. Entitle Implicit              |   |        |        |        |       |      | -     | 0.01  | 0.09   |
| 8. Self-report Implicit theories |   |        |        |        |       |      |       | -     | 0.28** |
| 9. RP Arousal                    |   |        |        |        |       |      |       |       | -      |

\* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed). P = pornography. WASO implicit = 'Women as sexual objects' IT assessed through the sentence recall task. WAD = 'Women as dangerous' IT assessed through the sentence recall task. Entitle = Entitlement IT assessed through the sentence recall task.

A simultaneous multiple regression was carried out to assess the amount of variance in RP Arousal accounted for by the explicitly assessed implicit theories, violent pornography and objectifying pornography. The results indicate that, after accounting for the other variables in the model, the self-report implicit theories measure was the only significant predictor of Arousal RP ( $\beta = 0.31$ ,  $p < 0.05$ ) and explained 11% of the variance in RP arousal. Results of the regression are presented in Table 15. As there are 36 correlations carried out here, applying a Bonferoni correction would mean that the significance level would be 0.001. None of the correlations found reached this significance level. However the regression model indicates only one significant predictor of RP Arousal, the Implicit Theories Measure.

Table 15

*Regression Analysis for RP Arousal including Pornography Use and Implicit Theories as Predictor Variables*

| Variable                      | B    | SE(B) | $\beta$ | $R^2$ | Adjusted $R^2$ |
|-------------------------------|------|-------|---------|-------|----------------|
| Constant                      | 1.67 | 0.09  |         |       |                |
| Objectifying P.               | 0.03 | 0.02  | 0.20    |       |                |
| Violent P.                    | 0.01 | 0.03  | 0.01    |       |                |
| Implicit theories self-report | 0.26 | 0.09  | 0.31*   | 0.14  | 0.11           |

\*  $p < 0.05$ . P = pornography.

#### 4.3.2 Rape Proclivity Behaviour.

Pearson's product-moment correlation coefficients were calculated to explore the relationship between RP Behaviour and the predictor variables. The results are

presented in Table 16. None of the pornography measures were found to be significantly correlated with RP Behaviour. Furthermore, none of the implicitly assessed Implicit Theories (sentence recall tasks) were found to be significantly correlated with RP Behaviour. However, the implicit theory self-report measure demonstrated a medium to large correlation with RP Behaviour ( $r = 0.46, p < 0.01$ ). A simple regression indicated that the explicitly assessed implicit theories predicted the 20% of the variance in RP Behaviour ( $\beta = 0.46, p < 0.05$ ). Results of the regression are presented in Table 17.

Table 16

*Pearson's Correlations for Pornography Type and Frequency and Endorsement of Implicit Theories with RP Behaviour*

| Variable                           |   |   |   |   |   |   |   |   |        |
|------------------------------------|---|---|---|---|---|---|---|---|--------|
|                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9      |
| 1. Consensual P. -                 |   |   |   |   |   |   |   |   | 0.03   |
| 2. Objectifying P. -               |   |   |   |   |   |   |   |   | 0.06   |
| 3. Violent P. -                    |   |   |   |   |   |   |   |   | 0.12   |
| 4. Non-consensual P. -             |   |   |   |   |   |   |   |   | 0.08   |
| 5. WASO Implicit -                 |   |   |   |   |   |   |   |   | 0.10   |
| 6. WAD Implicit -                  |   |   |   |   |   |   |   |   | -0.14  |
| 7. Entitle Implicit -              |   |   |   |   |   |   |   |   | 0.05   |
| 8. Implicit theories self report - |   |   |   |   |   |   |   |   | 0.46** |
| 9. RP Behaviour -                  |   |   |   |   |   |   |   |   |        |

\* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed). P = pornography. WASO implicit = 'Women as sexual objects' IT assessed through the sentence recall task. WAD = 'Women as dangerous' IT assessed through the sentence recall task. Entitle = Entitlement IT assessed through the sentence recall task.

Table 17

*Regression Analysis for RP Behaviour including Pornography Use and Implicit Theories as Predictor Variables*

| Variable                      | B    | SE B | $\beta$ | R <sup>2</sup> | Adjusted R <sup>2</sup> |
|-------------------------------|------|------|---------|----------------|-------------------------|
| Constant                      | 1.26 | 0.04 |         |                |                         |
| Implicit theories self-report | 0.22 | 0.04 | 0.46*   |                |                         |
|                               |      |      |         | 0.21           | 0.20                    |

\*  $p < 0.01$  (two-tailed).

**4.3.3 Rape Proclivity Enjoyment.**

Pearson’s product-moment correlation coefficients were calculated to explore the relationship between RP Enjoyment and the predictor variables. The results are presented in Table 18. Again, none of the pornography variables or the implicitly assessed Implicit Theories significantly correlated with RP Enjoyment. The self-report implicit theories measure was significantly correlated with the RP Enjoyment measure ( $r = 0.37, p < 0.01$ ). A simple regression analysis was carried out and found that the explicitly assessed implicit theories predicted the 13% of the variance in RP Enjoyment ( $\beta = 0.37, p < 0.05$ ). Results of the regression are presented in Table 19.



Table 18

*Pearson's Correlations for Pornography Type and Frequency and Endorsement of Implicit Theories with RP Enjoyment*

| Variable                         |   |   |   |   |   |   |   |   |        |
|----------------------------------|---|---|---|---|---|---|---|---|--------|
|                                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9      |
| 1. Consensual P. -               |   |   |   |   |   |   |   |   | 0.12   |
| 2. Objectifying P.               |   | - |   |   |   |   |   |   | 0.11   |
| 3. Violent P.                    |   |   | - |   |   |   |   |   | 0.06   |
| 4. Non-consensual P.             |   |   |   | - |   |   |   |   | -0.02  |
| 5. WASO Implicit                 |   |   |   |   | - |   |   |   | 0.11   |
| 6. WAD Implicit                  |   |   |   |   |   | - |   |   | 0.02   |
| 7. Entitle Implicit              |   |   |   |   |   |   | - |   | 0.02   |
| 8. Implicit theories self-report |   |   |   |   |   |   |   | - | 0.37** |
| 9. RP Enjoyment                  |   |   |   |   |   |   |   |   | -      |

\* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed). P = pornography. WASO implicit = 'Women as sexual objects' IT assessed through the sentence recall task. WAD = 'Women as dangerous' IT assessed through the sentence recall task. Entitle = Entitlement IT assessed through the sentence recall task.

Table 19

*Regression Analysis for RP Enjoyment including Pornography Use and Implicit Theories as Predictor Variables*

| Variable                      | B    | SE B | $\beta$ | R <sup>2</sup> | Adjusted R <sup>2</sup> |
|-------------------------------|------|------|---------|----------------|-------------------------|
| Constant                      | 1.57 | 0.07 |         |                |                         |
| Implicit theories self-report | 0.26 | 0.07 | 0.37*   | 0.14           | 0.13                    |

\*  $p < 0.01$  (two-tailed).

4.3.4 Correlations between the Three Rape Proclivity Measures.

Pearson's product moment correlations were carried out to determine how similar the three RP measures were to each other. The results showed some large correlations between the measures. The RP Arousal variable and the RP

Enjoyment variable showed a correlation coefficient of 0.59 ( $p < 0.01$ ). The RP Arousal variable and the RP Behaviour variable showed a correlation of 0.57 ( $p < 0.01$ ). Finally the RP Enjoyment variable and the RP Behaviour variable show the highest correlation of 0.65 ( $p < 0.01$ ).

#### **4.4 Discussion**

The aim of the current study was to investigate the relationship between pornography use and reported propensity for sexual aggression and, specifically, to examine the role of implicit theories related to rape in this relationship. Previous research has shown that there exists a relationship between pornography and sexual aggression, particularly violent pornography (Hald et al., 2010). However, given some of the ambiguities and inconsistencies in the research, there is a growing consensus that there are interacting factors that moderate this relationship, and it is possible that pornography has this effect only on individuals who are already at risk of offending (e.g., Kingston et al., 2005). Furthermore, rape supportive attitudes and beliefs have been found to be related to propensity for sexual aggression (Malamuth, 1991; Bohner et al., 1998). As with the pornography research, the relationship between sexual aggression and rape supportive attitudes has been found within non-offending samples, in which rape proclivity is assessed (e.g., Bohner et al., 1998), and among sex offender populations (e.g., Marolla & Scully, 1996). The current study attempted to integrate both fields of research, by looking at the possible role of rape supportive attitudes, specifically implicit theories related to rapists, as a moderator in the relationship between pornography and sexual aggression. As with previous research, there was a relationship found between specific types of pornography use and the rape proclivity measure, and between rape implicit theories and the

rape proclivity measure. Overall, however, the results indicated that, when looking at both variables together, rape implicit theories was the only unique predictor of the rape proclivity measure. The specific results found will be outlined below. The relationship between sexual aggression and pornography will be discussed first, followed by the relationship between sexual aggression and rape supportive attitudes. These results will then be integrated in the discussion of the overall sexual aggression regression model.

#### **4.4.1 The Implicit Theories Questionnaire.**

The implicit theories questionnaire was originally designed to investigate the three implicit theories, 'women as sexual objects', 'women as dangerous', and 'entitlement' implicit theories. Items were specifically chosen to reflect each of these ITs separately. However, the results of the factor analysis indicate that the measure reflects one general factor, and for this one factor, it reports good internal consistency with a Cronbach's alpha of 0.88<sup>7</sup>. This may suggest that in a non-offending population at least, implicit theories may be best described as one larger construct, perhaps reflecting a general misogynistic attitude supportive of sexual aggression against women, rather than three separate implicit theories. This finding is consistent with research that investigates general rape supportive attitudes (Bumby, 1996; Burt, 1980). The results indicate that these implicit theories can be found in the normal population and are related to reported rape proclivity within this population. Although participants generally disagreed with the statements, some did so to a lesser extent than others and for these individual, there was a significant relationship with the rape proclivity measure. The general

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<sup>7</sup>Kline (1999) suggests that factors are considered reliable when the Cronbach's alpha values are 0.7 or higher.



negative scoring on this measure may have been influenced by social desirability effects.

#### **4.4.2 The relationship between Rape Proclivity and Pornography.**

The results in terms of the relationship between pornography use and proclivity to rape are less consistent than those for rape supportive attitudes. This is in line with the general research area, in which the results tend to be equivocal in terms of the relationship between the two variables. In terms of previous research, some studies indicate that there is no relationship between the two concepts (e.g., Allen et al., 1995), whereas other research indicates there is indeed a relationship (e.g., Hald et al., 2010). The results of the current study indicates that both frequency of pornography use in which one of the actors is objectified in some way, and the frequency of pornography use in which there is physical force used, are related to the rape proclivity measure. Both of these types of pornography are related to the rape proclivity arousal variable, yet there was no relationship found between pornography use and participants' rating of the likelihood of engaging in similar sexually coercive behaviour, or enjoying such behaviour. This may suggest that an individual can be sexually aroused by sexual aggression yet not wish to engage in such behaviour because of the presence or absence of additional factors, such as, for example, fear of arrest or victim empathy. This contention is supported by the finding that non-offending men show sexual arousal to rape related stimuli (Malamuth, 1981; Malamuth & Check, 1981; Marshall et al., 1991). The potential arousal to such situations may therefore be reflected in the type of pornography they choose to use. These individuals may choose to use of violent or objectifying pornography as they are attracted to and aroused by the use of force or objectification in sexual interactions, yet would not actually engage in such



behaviour. The finding that the use of non-consensual pornography was not related to any of the rape proclivity variables suggests that it is the use of physical force or objectification that these individuals find sexually attractive rather than the non-consensual aspect of the depictions.

The view of rape involving elements of power and hostility, as well as the use of violence, is reflected in the finding that the rape proclivity measure was related the use of pornography where one of the actors is objectified or portrayed as powerless where no violence is involved, as well as the use of pornography where there is some physical force involved. Both these types of pornography showed a similar small to medium sized correlation with rape proclivity. There was no relationship found between the use on consensual pornography and the rape proclivity measure. These results are similar to previous findings of the U.S. Attorney General's Commission on Pornography (1986) in which they show a relationship between exposure to sexually violent material and aggressive behaviour towards women. The differences in the findings across the different types of pornography may explain why the majority of men who use pornography are not sexually aggressive, yet there is a relationship found for a subgroup of men. These findings may suggest that the type of pornography plays a significant role in this relationship. Although previous research suggests that this moderating factor is the use of violence, the current findings suggest that it may be the use of violence and the objectification or portrayal of one of the actors as powerless that increases the risk of rape proclivity.

The current findings are novel as research tends to generally focus on violent or non-violent pornography. The assessment of the four different types of pornography in the current study was based on the assumption that rape is not

solely a violent or sexual act, but also implicates issues such as hostility and power. It was expected that there would be a relationship found between the use of pornography where the interaction is non-consensual, where violence may or may not be present, and rape proclivity. However, there was a low response rate for the use of this type of pornography. It is possible that social desirability had such a confounding impact on the results, an effect failed to emerge for this particular type of pornography. It is also possible, however, that the use of this type of pornography is not prevalent in this population. The questions relating to the use of pornography that involves objectification or physical force as it does not involve non-consensual interactions may have been less affected by this social desirability effect and thus a relationship was found with the rape proclivity measure. Additionally, the use of the term 'physical force' rather than 'violence' may have reduced the presentation bias of this measure. However a limitation of the study involves the definitions used. The definitions for both objectifying and violent pornography did not specify that the use of physical force and objectification would be towards the female in the interaction. The definition was based on the assumption that, in general, pornography tends to objectify women and portrays women as powerless (MacKinnan, 1987).

#### **4.4.3 The Relationship between Rape Proclivity and Deviant Implicit Theories.**

The results in terms of the relationship between proclivity to rape and attitudes supportive of rape are similar to previous studies in the area (e.g., Bohner et al., 1998; 2005). Given that the role of implicit theories in sex offending is the central tenet of this thesis, this study chose to specifically focus on the implicit theories of rapists and their relationship with rape proclivity. The implicit theories under

investigation were (i) 'Woman as sex objects', in which women are viewed as constantly sexually receptive and created to meet the sexual needs of men; (ii) 'Women as dangerous', in which women are seen as inherently malevolent and vindictive and seek to deceive men about what they really want, (iii) 'Entitlement', in which the offender believes that his needs should be met on demand, especially his sexual needs and men are assumed to be inherently superior to women (Polaschek & Gannon, 2004; Polaschek & Ward, 2002). The implicit theories were assessed both implicitly and explicitly. The implicit measure was expected to show effects as it was thought to reflect the implicit nature of the theories, and circumvent the issues of social desirability, particularly given the nature of the construct under investigation. The measure was taken from Gannon and Rose (2009), in which the measure was capable of identifying the interpretive bias of female sex offenders, particularly their beliefs about dangerousness and power. Gannon and Rose (2009) found the measure statistically differentiated female sex offenders from offending female controls. However, in the current study, the measure showed no relationship between the sentence recall measures and the rape proclivity measure. There are a number of possible explanations for these results. First, the correlations may not have emerged as the measure is incapable of assessing these particular implicit theories or it is incapable of detecting implicit theories with male participants. Alternatively, perhaps the implicit theories did not emerge because of methodological issues with the measure. Overall, the study involved a number of questionnaires which may have fatigued the participants and affected their recall to the subsequent presentation. Furthermore, only three sentences were used to assess one implicit theory and five sentences used to assess each of the other two



implicit theories. The small number of sentences involved may have limited the ability of the measure to detect the implicit theories. A further possibility is that these implicit theories are not related to rape proclivity. Beech et al. (2006) have suggested that the 'women are dangerous' implicit theory is not as prevalent among rapists as previously thought.

However, the explicit self-report measure of implicit theories provided contradictory results. This measure was specifically designed to assess these particular implicit theories, and did show clear relationships with proclivity to rape. It was expected that this questionnaire would evaluate each of the implicit theories as separate factors. However, the results of the factor analysis indicated that the measure was tapping into one factor, and thus this implicit theory factor was examined as one variable rather than three. Thus, it is suggested that the beliefs that women are inherently sexual, and because of this, unless they are physically hurt cannot be harmed by rape; that women are malevolent and out to hurt men; and that men are entitled to have his sexual needs met whether the woman is a willing participant or not, can be subsumed as a general misogynistic construct, involving beliefs supportive of sexual aggression against women. The implicit theory measure was found to significantly correlate with each of the three rape proclivity variables. This indicates that individuals who hold these rape supportive beliefs are more likely to engage in sexual aggression than individuals who do not hold these beliefs.

This finding is not surprising given that if individuals who hold these rape supportive attitudes may view women as constantly sexually receptive they would not view the woman as being harmed in the rape situations, particularly the acquaintance rape situations reported here. Therefore, they may be more likely to



report engaging in the same manner as the protagonist in these situations. It is also not surprising that individuals who hold this misogynistic view would also indicate a higher likelihood of engaging and being aroused by coercive sexual behaviour where the male exerts his control irrespective of the effects of the woman. Polaschek and Gannon (2004) suggest that this type of view is deeply rooted in the traditional patriarchal view of men's superiority.

#### **4.4.4 The Integration of Deviant Implicit Theories and Pornography in the Prediction of Rape Proclivity.**

The results indicate that for the three rape proclivity variables, the implicit theories questionnaire was the only significant predictor in each of the regression models. Across the variables, the correlation between the questionnaire and the rape proclivity measure ranged from 0.28 to 0.46. Although the use of violent pornography and the use of objectifying pornography were also correlated with the RP arousal variable, the implicit theories measure accounted for this variance, and was the only variable to contribute unique variance to the model. It is suggested that together, the use of violent and objectifying pornography, and the presence of implicit theories may tap into the general view of heterosexual encounters being adversarial and an acceptance of violence and control in sexual encounters. However, the general implicit theory measure added more variance to the model indicating that, this variable encompasses more than an acceptance of aggression or the imbalance of power in sexual interactions, but perhaps also a general misogynistic attitude, not specifically focused on sexual encounters, in which women are seen as vindictive and inferior to men. . Thus attitudes, rather than pornography use, was the only predictor, out of the constructs assessed in the current study, and accounted for approximately eleven percent of the variance of

an individual's likelihood to rape. These results partially support Demare, Lips, and Briere (1993) who found that anti-women attitudes and use of sexually violent pornography are correlated phenomena that nevertheless have separate influences over hypothetical and actual sexual aggression. However, Demare et al. (1993) found that anti-women attitudes had direct effects only on likelihood of sexual force and rape, whereas violent pornography had an effect on likelihood of sexual aggression and past sexual aggressive behaviour. As past sexual aggression was not included in this study, no conclusion can be drawn regarding this effect. Additionally, Demare et al. (1993) used a measure of general negative attitudes to women whereas the measure used in the current study investigated specific attitudes related to rape.

The Extended Mind Theory (Ward & Casey, 2010) suggests that the mind extends beyond the skin and skull and extends into the physical and social world. According to this perspective, it is possible that pornography may play a part in an offender's cognitive system. Although there was no relationship found between pornography use and implicit theories in the current study, to test EMT comprehensively, the short term influence of pornography on an individual's cognitive system should be investigated. While it has been shown in experimental studies that pornography increases aggression in the short-term, it has also been shown that this effect dissipates with time. For example, Allen et al. (1996) found that a short debriefing after participation in pornography research is sufficient to defuse any negative effects of short term exposure to pornography. Roskos-Ewoldsen, Klinger, and Roskos-Ewoldsen (2007) conducted a meta-analysis with 63 studies ( $n=21087$ ) and demonstrated that violent media primes aggressive related concepts in men although the effects were temporary and dissipated over

time. EMT would suggest that pornography may become part of an individual's cognitive system in the short term. However in the long term, the use of pornography as a cognitive extension dissipates and pornography is only used as a cognitive extension in situations where pornography is immediately available. For example, if the pornography used is violent, then this may increase the likelihood of the individual being sexually aggressive as, in the short term, they see sexual aggression as being reinforcing and an acceptable way to behave. When the individual is not viewing pornography then it is no longer part of his cognitive system and the individual may revert to his general views about sexual aggression. With regard to the multifactorial theories of sexual aggression, the current findings would suggest that deviant attitudes regarding gender and sexual interactions predict between 14 and 21 percent of the variance in the rape proclivity measure, depending on the outcome variable used. This would suggest that while attitudes do play a role in an individual's risk for sexual aggression, it is only one factor and a number of other factors may also interact to increase this risk. Additionally, these attitudes predicted likelihood of sexual aggression, and it is likely there are a number of additional factors that interact with these attitudes that would lead to actual sexual aggression. It is possible that an individual may hold these implicit theories and this increases their likelihood for offending. However, as they do not hold additional risk factors such as deviant sexual interest or emotional regulation problems, they do not engage in actual sexual offending.

#### **4.4.5 Limitations of the results.**

As mentioned above, it is expected that social desirability may have had an effect on the current results, given the nature of the questions in terms of pornography



use, attitudes towards rape, and likelihood of engaging in sexually aggressive behaviours. It was hoped that this was addressed as much as possible through the use of an anonymous online survey for data collection. Additionally, it is possible that if the participants had been primed with sexual stimuli they may have been more likely to report their rape supportive attitudes. The ability to generalise the results is also limited, given the volunteer bias inherent in sexuality research, as outlined in chapter one of this thesis. Furthermore in pornography research, it has been suggested that participants may try to guess the experimental hypothesis and attempt to confirm it (Seto, Maric, & Barbaree, 2001). Additionally, the lack of demographic data may limit the generalisability of the results. It is expected that given the recruitment procedure involved a vast majority of the participants would have consisted of young male third level students. Experimenter demand may also affect this type of research as questioning the frequency of particular types of pornography may implicitly suggest that that type of pornography is 'acceptable' for consumption (Seto et al., 2001). It should be noted that the order in which the tasks were presented may have affected the current findings. Although the presentation of the sentence recall tasks were counterbalanced across participants, the order of the remaining tasks remained the same for all participants. More specifically the implicit theory questionnaire always preceded the rape proclivity measure. This may have resulted in a higher correlation between the two constructs as the completion of the implicit theory measure makes these attitudes cognitively accessible and therefore increase reported rape proclivity. This suggestion comes from the findings of Bohner and colleagues (1998; 2005) in which the order in the rape myth acceptance measure and rape proclivity measure were randomised across participants. These researchers found that the correlation



between rape myth acceptance and rape proclivity was significantly larger when participants completed the rape myth acceptance scale first rather than last. They argue that this is indicative of a causal impact of rape myth acceptance on rape proclivity as a relationship should always be heightened if the causal variable is made accessible before assessing the variable that is causally affected (Schwarz & Strack, 1981).

Overall however the results of the current study indicate that individuals who hold deviant implicit theories also report a higher likelihood, arousal to, and enjoyment of sexual aggression. Although violent and objectifying pornography were related to reported rape proclivity, this variance was accounted for by the implicit theories questionnaire. It is concluded that it is the presence of misogynistic implicit theories accepting of violence against women, rather than pornography use, which predicts an individual's response to a rape proclivity measure.

## **5 Chapter 5: Discussion**

The aim of this thesis was to investigate the constructs that have been implicated in sex offending theories using a non-offending male population. It was expected that by investigating the normal functioning and inter-relationships between these concepts, this could be applied to the sex offender literature, particularly in terms of the methodology used to assess, and the theoretical underpinnings, of these constructs. The concepts of empathy, theory of mind, executive functioning, sexual interest and propensity for sexual aggression were all investigated. However, the overarching theme of the thesis was the concept of implicit theories, and each of the above constructs was investigated in terms of how they related to this concept. The research empirically established the relationships between cognitive and affective constructs that have been proposed to play a role in sex offending, but have generally been investigated in isolation. In particular, the research investigated the manifestation of implicit theories in a non-offender population and relationship with additional factors thought to play a role in sex offending. Furthermore, this research provides strong evidence for the role of theory of mind in empathy and suggests that this construct may be of particular importance to the cognitive factors implicated in sex offending.

The purpose of the present studies was to investigate the concept of implicit theories and their relation to other constructs highlighted in the sex offending literature. Since their conceptualisation in the sex offending literature ten years ago (Ward & Keenan, 1999; Ward, 2000), there has been substantial research conducted on how implicit theories manifest within the sex offender population (e.g., Polaschek & Gannon, 2004; Gray et al., 2005; Dawson, Barnes-

Holmes, Gresswell, Hart, & Gore, 2009). However past the initial suggestion that implicit theories develop through normal cognitive development during childhood, there has been little attention given to the presentation of implicit theories in the non-offending population. The current study investigated the presentation of both normal and deviant sexuality related implicit theories within a sample of non-offending men. Specifically, non-deviant implicit theories were investigated in terms of their relationship to theory of mind, empathy, executive function, and sexual interest, whereas deviant implicit theories were investigated in terms of their relationship with rape proclivity. These results can further the understanding of implicit theories and specifically their role as a single factor in sex offending and how they may interact with additional factors to increase an individual's risk of sexual offending.

The discussion will outline the overall results found in each of these studies, in the order they were presented in the thesis. Some of the limitations will be discussed along with each study and a discussion on the merits and disadvantages of the use of a non-offending sample is included in the implications for the research. The results will then be discussed in terms of their methodological implications for the assessment and research with sex offenders and finally in terms of the implications of the current results for theories of sex offending.

## **5.1 Study one.**

Chapter two outlines a study investigating the role of theory of mind, implicit theories, and empathy. The results found have implications for the conceptualisation of empathy within the sex offending literature and the role theory of mind in this construct. Specifically, it was found that self-reported cognitive empathy was related to cognitive theory of mind but not affective

empathy or emotion recognition, whereas self-reported affective empathy was related to affective theory of mind but not related to emotion recognition. While previous literature has addressed the issue of the different aspects to the affective and cognitive component of empathy and separately researchers have investigated the role of theory of mind in empathy, there has been very little research integrating these two areas. The current research presents a model of empathy that suggests that we move away from the idea of conceptualising empathy as a unified construct and view it as involving a number of different independent constructs, some of which implicate affective or cognitive theory of mind. Marshall et al. (1995) present a model of empathy that involves four discernible steps; emotional recognition, perspective taking, emotional replication and response decision. The current results suggest that cognitive empathy, affective empathy, and emotional recognition are three unrelated components. While the focus of discussion within the empathy research is whether empathy is better conceptualised as an affective construct, a cognitive construct or both, most researchers appear to accept the 'both' argument (Jolliffe & Farrington, 2003). However, given the current findings it may be more appropriate to consider the three independent constructs; emotional recognition involving the ability to recognise the emotion in another's appearance, cognitive empathy as involving the ability to perspective take, and affective empathy as involving the ability to feel concern for others less fortunate and engage in 'self' orientated and 'other' orientated feelings based on this concern.

The study's results were also consistent with the view that ToM can be subdivided into cognitive ToM and affective ToM (e.g., Shamay-Tsoory & Aharon-Peretz, 2007). While executive function was found to be related to



cognitive ToM, it was not found to be related to affective ToM, suggesting that the two constructs may implicate different neurological structures, with affective ToM involving different structures to those implicated in executive functioning. The results also indicate that cognitive empathy is significantly related to cognitive theory of mind, whereas emotional recognition is related to affective theory of mind. Affective empathy was found not to be related to either of these ToM constructs. However, one difficulty with this research is the type of measures used to assess these constructs. Both cognitive and affective empathy were assessed through a self-report measure and the resultant data are therefore open to the biases inherent in self-report data, such as social desirability and assumption of self-awareness. The emotion recognition task involved a more implicit task, and therefore the differences in responses between the explicit and implicit tasks may reflect differences in the nature of the task rather than constructs under investigation. Furthermore, a difficulty encountered across all domains of psychology lies in the validity of the tasks used. In the current study, the relationship found between emotion recognition and affective theory of mind was likely due to the similarity of both tasks and while this may reflect the similarity between both constructs, future research should attempt to refine such tasks further to ensure they are specifically measuring the construct it is purporting to measure, with minimal overlap with other constructs.

These results partially support previous research which suggests that both theory of mind and empathy are related constructs with overlapping yet distinct neuronal networks (Vollm et al., 2005). However this research takes this contention further and suggests that different aspects of empathy are related to theory of mind differently. A progression of this study would be to investigate the

different components of empathy and their associated neuronal structures and how these overlap with the underlying structures involved with theory of mind. The results of this study indicate that cognitive theory of mind may involve some of the same structures involved with the cognitive aspects of empathy whereas the affective theory of mind may implicate some of the same structures involved with emotional recognition. It has been suggested that, whereas theory of mind and empathy both rely on networks involved with making inferences about the mental states of others, empathy involves additional networks involved in emotional processing such as the amygdala (Vollm et al., 2005). However, given the current findings, it may be more appropriate to view cognitive empathy and emotional recognition as separate components each of which have more in common with their equivalent of ToM than with each other. Therefore it remains to be seen, if investigated further from a neuropsychological perspective, whether cognitive empathy and cognitive theory of mind would implicate neural structures involved in making inferences about the mental states of others whereas emotion recognition and affective theory of mind would implicate structures involved in emotional processing.

The current findings have implications for the sex offending field in terms of research and treatment. The independence of the three aspects of empathy found here, would suggest that the current focus of treatment on general empathy deficits could be misleading. It may be more appropriate, given the current findings for both research and treatment to conceptualise empathy as involving at least three separate constructs, namely emotional recognition, affective empathy, and cognitive empathy. Should this approach be taken, it may transpire that offenders are deficient in only one of these constructs and function normally in

terms of the other constructs. Although research has begun to investigate emotional recognition by itself with sex offenders (Gery et al., 2009), these findings have been equated with deficits in general empathy. Future research should investigate these constructs independently and approach the study not as an investigation into empathy but rather an investigation of that particular construct. Following this, treatment programmes should attempt to address the constructs where specific deficits have been identified. Furthermore, the findings in terms of the relationship with theory of mind suggest that this is an area that may have a lot to offer the sex offender literature, particularly in terms of cognitive symptomology. Where there have been a few studies theorising in relation to theory of mind deficits in sex offenders, only one study that I am aware of has sought to investigate this construct (Elsegood, 2010).

The results also indicated that one particular implicit theory, the 'gender-good' IT, was not found to be related to theory of mind or empathy as hypothesised. This result may have been indicative of the methodological difficulties of the task or that no relationship exists between theory of mind and implicit theories. Because of the methodological difficulties with the assessment measure, it was unclear whether the implicit theory may not have been accurately identified by the measure in the population, or whether this particular implicit theory was not present in the population. Unfortunately, because of these difficulties, only tenuous conclusions can be drawn from this particular result. According to the 'theory theory' view of cognitive development, when a child is cognitively developing, they develop theories, similar to scientific theories, which explain how the world works (Wellman, 1990; Gopnik & Meltzoff, 1997). Ward et al. (2000) suggests that, according to this perspective, implicit theories and



theory of mind develop in a similar manner. If it is concluded that no relationship exists, this opposes the view of Ward et al. (2000) that both implicit theories and theory of mind develop in a similar manner and that the 'theory theory' could explain both developments. Perhaps an alternative perspective on theory of mind may be more appropriate in terms of the results found here. An alternative perspective to the 'theory theory' suggests that mentalizing ability is the result of an innate module (Leslie, 1987; 1991; Baron-Cohen, 2000). That is, basic mental concepts such as belief and desires are not constructed from evidence during the course of childhood development but rather an innate structure is dedicated to interpreting behaviour based on the mental states (Leslie, 1987; 1991). The finding in terms of the relationship between theory of mind and executive function provides further support to the modality view of ToM. Thus it is possible that ToM and ITs are qualitatively different constructs, with perhaps ToM encompassing a more general, modular construct devoted to emotional and empathic abilities whereas implicit theories refer to more specific social cognitive constructs. Therefore, empathy, particularly cognitive empathy, may have more in common with this general ToM measure than with very specific implicit theories.

## **5.2 Study two.**

Study two investigated the concepts of sexual interest and implicit theories. A number of interesting findings also emerged from this study, particularly in relation to the assessment of sexual interest. The results found inform and impact on research on the implicit assessment of sexual interest. In recent years there has been a proliferation of research on implicit, attention-based measures of sexual interest (e.g., Wright & Adams, 1994; 1990; Ó Ciardha & Gormley, 2009). This is mainly because they are seen as more economical, easier to administer and less



intrusive measure of sexual interest than physiological measures. Three attention-based measures of sexual interest were investigated in the current thesis; two different viewing time methodologies and a pictorial Stroop task. The results indicated that the different methodologies resulted in different patterns of responding across two groups of heterosexual and homosexual men. Overall, a viewing time methodology, in which participants were asked to browse through images, consistently differentiated between the groups viewing times of stimuli of varying ages and gender. This is particularly important as there has been little independent research carried out on this measure. The measure has been largely ignored by the research community as it is available as a commercial measure with some controversial questions raised regarding the research carried out into its efficacy. However, despite these controversies, the current study indicates that the measure shows an acceptable level of sensitivity and specificity. Furthermore, studies tend to be grouped together in terms of attention-based measures of sexual interest, particularly viewing time tasks, with little attention given to methodologies underlying the measure. However, as shown here, the methodology employed can have a considerable impact on the results that emerge. This is of particular importance when applied in a clinical setting where the correct identification of sexual preference can have a significant impact on the offender.

The importance of using an appropriate data treatment method was also highlighted in this study and a suitable data treatment method for use in future studies is suggested. As the attention-based measures of sexual interest are based on the participant's reaction time to stimuli, the data tends to emerge, much like general reaction time data, with a positive skew. This lack of normality in the data

distribution causes difficulties when attempting to analyse the data using measures based on central tendency, such as the ANOVA. Despite this, the distribution of the data appears to be ignored in much of this research. The effect of each of these data treatment methods, on the shape of the data distribution and the results of a three way analysis of variance, was investigated. The results indicated that each of the different data treatment methods had different effects on the data distribution and this in turn produced different effects in terms of the ANOVA analysis. Overall, one data treatment method consistently addressed the distribution of the data, while also resulting in the pattern of results in terms of the ANOVA and post-hoc analyses as hypothesised. As this analysis measure was similar to that applied to physiological measures of sexual interest (e.g., Earls, Quinsey, & Castonguay, 1987), and it took into account an individual's response set, this was further support for the use of this method when analysing data from the attention based methods of sexual interest. The consistent application of a data treatment is important in this area to reduce the likelihood of type I and type II errors and to ensure that results across studies can be accurately compared. The current results would indicate that a method which employs z-scores and removes any outliers using a conservative cutoff may be the most appropriate method to use.

Chapter three also provided interesting results with regard to the presentation of particular implicit theories within the non-offending population, and the use of the Implicit Association Test in identifying these. Previous research in the area has tended to focus on presentation and ability of the IAT to identify the 'child as a sexual being' implicit theory in child sex offenders (e.g., Nunes et al., 2007). The present research indicates how the non-deviant version of this implicit theory may present itself and investigates relationship between this type

of implicit theory and sexual interest. It was proposed that non-offending men will hold an association between the gender they are attracted to and sex, that is, that heterosexual men would hold a 'women as sexual beings' implicit theory, and homosexual men would hold a 'men as sexual beings' implicit theory. The results supported this hypothesis. The IAT successfully discriminated between the heterosexual and homosexual men. This indicates that a version of this implicit theory exists in the normal population which suggests that the structure of the implicit theory may be normal yet it is the target (male/female/child) that is deviant among sex offenders. Thus, it is not the structure of the implicit theory that should be addressed in treatment but rather the target of the IT. Cognitive therapy should attempt to address the target of the implicit theory and attempt to change it from being a deviant to a non- deviant target.

The study also investigated the relationship between sexual interest, as assessed through the attention-based task, and the gender-sex IAT. The results indicated that no relationship existed between participants' performance on the IAT measure and their performance on the viewing time or Stroop measures. This result may be an artefact of the differences in the tasks involved and the level of noise in each measure. Alternatively, these results may indicate that, within this context at least, sexual interest and an implicit theory related to sex are unrelated constructs. Although this finding was contrary to the hypothesis, this result links in well with the multifactorial theories of sex offending in which cognitions related to offending and sexual interest are conceptualised as two separate constructs. Although these findings may seem unusual, sexual interest may be seen as a lower-order affect whereas the IAT measure assesses a higher order, perhaps learned, cognitive association between a particular gender and sex. This



study also indicated that, taken together, the viewing time measure and the IAT were better able to predict an individual's sexual orientation. Therefore, sexual interest and cognitions related to gender are two independent constructs that together predict an individual's sexual orientation. Applying this to the forensic field, deviant sexual interest may be a risk factor for sexual offending, and deviant cognitions may be a separate risk factors, but the combination of both constructs may result in a more pervasive sexual attraction to children akin to orientation and this may in turn increase an individual's risk of offending.

### **5.3 Study three.**

The third study presented here investigated the role of pornography type and the presence of implicit theories on rape proclivity, in a sample of non-offending men. This study provided a unique contribution to this research area as it integrated two research areas in their impact on sexual aggression, namely pornography use and implicit theories. Furthermore, it provided support for the presence of deviant implicit theories within the non-offending population and how these increase an individual's likelihood to engage in sexual aggression. Previous research has suggested that the relationship between sexual aggression and pornography use is moderated by a third variable, related to an individual's risk for sexual aggression (Hald et al., 2010). The current research sought to investigate this further using the presence of deviant implicit theories as the risk factor. A self-report measure tapping into the three implicit theories common amongst rapists was significantly correlated with rape proclivity. Frequency of deviant pornography use was also significantly correlated with rape proclivity. However, when these factors were entered into the regression model, the self-report implicit theory measure was the only significant predictor of likelihood of sexual aggression. Therefore, although



sexual aggression and use of deviant pornography are related constructs, the presence of this rape-supportive misogynistic attitudes accounts for all the variance in rape proclivity cause by pornography use and accounted for additional unique variance. This supports previous research in the area indicating the relationship between deviant attitudes and propensity for sexual aggression (Bohner et a., 1998). As with previous research in this area, given the sensitivity of the variables under investigation, the results are likely to be influenced by presentation bias and floor effects in responding and therefore the results found are likely due to a small number of participants reporting deviant behaviour and attitudes. Notwithstanding these difficulties, this research contributes to the area of research investigating the role of pornography in sexual aggression as the results indicate that it is the misogynistic, rape supportive attitudes that underlie sexual aggression rather than type of pornography use.

The multifactorial theories of sex offending suggest that there are a number of factors that may lead to and play a role in the aetiology and maintenance of offending, with deviant beliefs being one of these factors. The current results suggest that those individuals in the sample for whom there was a link between rape proclivity and deviant attitudes and beliefs, are at an increased risk for sexual aggression. However, as there have no additional risk factors present, such as emotional regulation difficulties, they do not go on to offend. Furthermore, although the implicit theories scale was found to be a significant predictor of rape proclivity, it accounted for approximately one third of the variance, indicating that there are a number of additional factors that play a role in this variable.

Overall, whereas the findings of the studies carried out here provided support for some hypotheses but not for others, the findings have implications for

methodologies employed and research with the sex offending groups and possible implications for theories of sex offending. These implications will be outlined below, however the limitations of the sample used, as outlined in the introduction should be borne in mind when discussing the possible implications of the results found.

#### **5.4 Implications for methodology and research.**

The current thesis has implications for future research with sex offenders, and in particular, it provides support for the use of different measures to assess the constructs implicated in sex offending theory. One important implication is the finding that the viewing time measure in which participants are asked to browse through images is an appropriate and effective measure of sexual interest and a data treatment measure which removes outliers and converts category scores into z-scores was found to be the most appropriate way to normalize the reaction time. This has implications for future research using attention based measures of sexual interest. However these results are based on the sexual preferences of non-offending participants. For a comprehensive view, this assessment measure should be investigated within an offending population to determine how well the measure can detect deviant sexual interest. Furthermore, as the measure is potentially open to faking, future research should investigate the ability to fake this measure and whether this type of responding can be identified through the response data.

The results also suggest that the use of the IAT measure may not be an appropriate measure with which to identify the presence of one particular implicit theory within a group of participants. It is more appropriately used to compare two groups on their difference scores between the congruous and incongruous

tasks rather than using a single difference score to identify whether an individual holds a particular association.

This research also has implications for the study of theory of mind. The results indicate that this construct is related to both executive function and cognitive empathy. As suggested for the sexual interest measure, further research on these constructs should be carried out in a population of offenders. Further research could focus on ToM and its relationships with the cognitive factors implicated in sex offending. Additionally given the relationship to EF, perhaps EF rather than IQ should be the focus of studies with offenders, particularly given its relationship with concepts such as impulsiveness, also implicated in offending. The results also suggest that ToM can be conceptualised as either cognitive or affective and two separate measures should be employed to assess each. Thus researchers should be clear in terms of the type of ToM they are proposing to assess, and choose an appropriate assessment based on this. Furthermore, the results indicated that when investigating the empathy, the concept should be divided into its component parts, as emotional recognition, cognitive empathy and affective empathy may involve different underlying processes and are likely to result in different patterns of results.

Study three involved the development of a self-report measure specifically designed to assess the three most commonly occurring deviant implicit theories amongst rapists. This measure showed good reliability, higher than that shown for previous measures of general rape supportive attitudes. However further research is required to develop this measure further with a larger sample to determine the psychometric properties of the measure. Furthermore, the research indicates that some of the current non-offending sample indicated deviant rape supportive



attitudes, as assessed by this scale. This should be interpreted with caution however, as it is difficult to identify one score on the scale that is indicative of the presence of deviant implicit theories.

The results relating to sexual interest indicate that a non-offending sample may have some interest in pubescent images. This is an important area, particularly given the suggestion that hebephilia be introduced to the DSM-V. The results indicated that for both viewing time methodologies, effects emerged for the pubescent categories, indicating sexual interest in this category. However, these results should be interpreted with caution, as the small number and type of stimuli used for this category may have caused these differences to emerge, and therefore the effect is due to methodological issues rather than the participants showing a sexual interest in pubescent images. This is currently quite a contentious issue given the suggestion that hebephilia be introduced to the DSM-V. Hebephilia is proposed to denote the erotic preference for pubescent children (roughly 11 or 12-14) (Blanchard et al., 2009). The current results could possibly suggest that sexual interest in pubescent images (average 13.1 years) may be part of the non-offending male sexual response. However, there is a dearth of research in this area, and the methodological concerns highlighted here suggest that much more research is required before any conclusions can be drawn with regard to this age group. While attraction to adolescents appears to be something that is recognised in clinical practice, very few empirical studies have investigated using either phallometry or attention-based measures. The current findings indicate that more research is needed to determine what the 'normal' response is, in order to determine what 'deviant' interest entails. This would be important both in terms



of clinical diagnoses and the use of normal comparison groups for research purposes.

Additionally, the results indicated that men are generally more accurate when identifying the emotion on male rather than female faces. This finding should be borne in mind when investigating offenders' responding on such a task, as their response may be indicative of general male recognition ability, rather than a deficit in the offender. These findings should be borne in mind when comparing the responses of offenders to non-offenders on tasks outlined above.

### **5.5 Theoretical Implications.**

The current results may also have theoretical implications for the field of sex offending. The Implicit Theory framework suggests that sex offenders hold particular clusters of beliefs about the nature of the world, themselves and their victims. These beliefs tend to be deviant in nature and may play a role in the aetiology and maintenance of deviant sexual behaviour. The present results would suggest that a proportion of non-sex offenders may also hold these deviant beliefs but do not sexually offend. Furthermore, these implicit theories are related to an individual's propensity for sexual aggression. This provides further evidence for the contention that deviant ITs are one risk factor that increases an individual's likelihood for sexual aggression but, by themselves, ITs are not sufficient to explain sex offending behaviour. This would provide further evidence for the multi-factorial view of offending. That is, the IT framework is a single factor theory which may explain some but not all of the underlying factors for offending and it is possible that these implicit theories are held by men in the normal population.

One particular implicit theory noted to be common among child sex offenders is the 'child as a sexual being' IT (Ward & Keenan, 1999). The current study investigated whether a non-deviant version of this is identifiable in a group of heterosexual and homosexual men. The current results suggest that non-offenders hold similar ITs in that they hold ITs indicating that men or women are sexual beings, depending on their sexual orientation. This would suggest that the general structure of the IT is not deviant (a target as a sexual object), but rather the target of the IT (child) is deviant among sex offenders. Furthermore, the results indicated that the IT was not related to sexual interest although in combination with sexual interest it better predicted sexual orientation. This provides further support for multifactorial theories of offending. It suggests that in a non-offending population, although sexual interest and implicit theories relating to sex are not related, together they make a better prediction of an individual's sexual orientation than either construct alone. This pattern may also emerge for sex offenders, that is, sexual interest and deviant ITs are separate, unrelated factors, that together interact to predict the level at which attraction to children is entrenched in the offender. It is possible that the two factors in combination may result in more paedophilic or fixated type offenders, whereas the presence of only one of these factors may result in a regressed type of offender.

The current results also provide support for an aspect of the Integrated Theory of Sex Offending (Ward & Beech, 2006). The results indicated that executive functioning significantly predicted an individual's ToM. Therefore it is possible that ToM may influence some of the cognitive factors implicated in sexual offending and although it was not found to be related to implicit theories in the current study, it was found to be related to cognitive empathy. Thus, the

results provide some evidence for neuropsychological functioning impacting on clinical symptoms prevalent amongst offenders, albeit with a non-offending population.

## **5.6 Implications for future research.**

Taken together, the above findings appear to indicate that there are merits to using a non-offending sample in this domain. One advantage to the use of such a sample is that it highlights some of the methodological issues accompanying the assessment measure used in sex offender research. For example, the current study highlighted important methodological issues in the assessment of sexual interest. It is imperative that any measure be as accurate as possible in its identification of sexual interest. The aim of any measure should be to have an acceptable balance between sensitivity and specificity. This is generally dependant on the context in which sexual interest is being assessed. While it is important to correctly identify deviant sexual interest for risk assessment and treatment purposes, the misidentification of deviant sexual interest can have a detrimental effect on the individual, particularly in jurisdictions where such assessment measures may be admissible in determining the guilt of an individual. Therefore, we are ethically bound to use the most accurate assessment measure as is available. While there has been a proliferation of attention-based measures of sexual interest, it is not always clear what is the purpose of these new developments, particularly as much of these developments are proposed to be built on the same underlying processes, that is that increased attention will be paid to sexually salient stimuli which will result in longer reaction times to the task under conditions where sexually salient stimuli are presented. Perhaps rather than focusing on the development of new methodologies, more attention should be given to refining already existing



attention-based methods, and further investigating the underlying mechanisms upon which is thought such methods operate. By understanding the deeper mechanisms involved in the measure, this may help to improve the sensitivity and specificity of the measure. By assessing this measure among non-offenders, we can overcome, to an extent, the difficulties associated with sex offenders, in particular the faking of responses. Therefore the noise in the experiment is reduced and more of the variance in the task can be said to be due to the construct of sexual interest. Through the use of non-offenders in the current study, it was possible to identify the differing levels of sensitivity and specificity of three different measures. Furthermore, the relationship between sexual interest and a cognitive construct was investigated in an attempt to identify some of the mechanisms underlying such measures. While this has provided some interesting results, the use of such a sample can only take us so far. The use of a non-offending sample is useful at the initial stage of investigation, but it does not provide the complete picture. Deviant sexual interest may manifest in some ways differently to normal sexual interest, that is, different processes of sexual interest may apply to sexual deviancy than to gender based sexual orientation. Research on sex offending has shown that a large proportion of male child sex offenders do not show an exclusive sexual interest in children, and often show an equal or larger sexual interest in adult females (Barsetti, Earls, Lalumière, & Bélanger, 1998; Lang, Black, Frenzel, & Checkley, 1988). Therefore, the use of a non-offending population is recommended for theoretical purposes; however, the measures must also be assessed thoroughly within an offending population.

Furthermore, the studies outlined here highlight a number of relationships between constructs of interest in the sex offending field. The conclusions drawn



from such results are based on the assumption that although different levels of responding may be found for these constructs across the offending and non-offending population, the manifestation of the constructs in both populations, involve the same underlying mechanisms, that is, there are quantitative differences rather than qualitative differences in these mechanisms. In order to determine whether this is the case, it is necessary to take this research further and investigate the manifestation of such constructs within an offending population. However, I would argue that there is merit in initially assessing such constructs within a normal population so we understand how these constructs function normally. It is important that there is sufficient knowledge regarding the normal presentation of such constructs before we can hypothesize on their deviant presentation.

As outlined above, the current research provides evidence for the role of ToM in some of the cognitive symptoms of offenders. This theory of mind construct may be conceptualized as a higher order modular construct and deficiencies in such a construct may be evidenced in clinical symptoms, such as lack of empathy. It is argued that it may be more appropriate to focus on broader deficits among sex offenders, such as ToM deficits, rather than on surface level symptoms. Perhaps given the nature of the research topic, there is too much focus on individual risk factors or specific clinical symptoms that can be addressed in treatment. It is possible that by focusing on these factors we are merely describing surface level behavior, rather than investigating the deeper underlying causes of behavior. Steps towards a deeper, more comprehensive view of offending have been made, particularly through the Integrated Theory of Sex Offending (ITSO; Ward & Beech, 2006). However, it is over five years since this the publication of

the theory and in the interim there has been little in the way of empirical research to investigate the tenets of the theory. The suggestion that much of the clinical symptoms of sex offenders may be the result of neuropsychological functioning appears to make intuitive sense. However, before this can be developed further empirical research needs to be carried out on these claims. It is possible that these questions can be initially addressed by taking a normative approach and investigating the three subsystems outlined by Pennington (2002) and their relationship to the normal functioning of the constructs implicated in sex offending behavior. The current research, such as the relationship between theory of mind and executive functioning found here and in previous studies, will provide support for the conceptual aspects of this theory. Future research could benefit from using magnetic reasoning methodologies to map areas in the brain to the specific clinical factors found among offenders to investigate how the constructs are related to specific neuropsychological systems. Through methodically researching the mechanisms underlying these constructs, rather than focusing on surface symptomology, gradually a comprehensive understanding of offending may be developed. This would require a more integrated approach to research. Rather than studies being carried out in isolation, integration and communication among researchers may lead to a more direct research agenda to investigate the underlying mechanisms to offending and the role of neuropsychological functioning. This integrated approach to research appears to have been taken up by researchers on the implicit theories framework, such that ten years after the theory's initial publication, a debate can be held by the leading theorists with regard to the conceptualization of implicit theories, backed up by research employing diverse samples and methodologies. This is one example

where together the theory and research have moved the discourse away from a mere description of the surface level clinical features to a deeper understanding of the underlying processes.

## **5.7 Conclusions.**

The studies outlined here have implications not only for the implicit theory framework, as was the main focus of the study, but also for the conceptualisation of additional cognitive factors implicated in sex offending, specifically sexual interest, empathy and theory of mind. One particular implication is for the role of theory of mind in empathy. Given the current findings, it may be more appropriate to conceptualise empathy not as one coherent construct but rather as involving a number of independent unrelated constructs, namely emotion recognition, affective empathy and cognitive empathy. This would suggest that rather than suggesting that offenders have general empathy deficits and attempting to address this general deficit in treatment, attention should be given to the role of each of the constructs separately in the offending process. Wherever deficits are identified, these should specifically be identified and targeted in treatment.

The studies provide support for the implicit theory framework by indicating that a normal manifestation of the most common implicit theory implicated among sex offenders, can be identified within a non-offending population with a non-deviant target. Furthermore the research has indicated that deviant implicit theories can be identified within the non-offending population and is a significant predictor of an individual's propensity for sexual aggression.

Finally, given the findings in these studies, it is suggested that there is merit in investigating constructs implicated in sex offending from a normative perspective. The current studies have highlighted the relationships between

constructs, and direct future research in terms of the constructs to investigate and the methodologies to employ in future studies.



## References

- Abel G. G. (1985). *Use of pornography and erotica by sex offenders*. Paper presented to the United States Attorney General's Commission on Pornography, Houston, TX.
- Abel, G. G., Becker, J. V., & Cunningham-Rathner, J. (1984). Complication, consent, and cognitions in sex between children and adults. *International Journal of Law and Psychiatry*, 7, 89-103.
- Abel, G. G., Huffman, J., Warberg, B., & Holland, C. L. (1998). Visual Reaction Time and Plethysmography as Measures of Sexual Interest in Child Molesters. *Sexual Abuse: A Journal of Research and Treatment* 10(2), 81-95.
- Abel, G. G., Jordan, A., Hand, C. G., Holland, L.A., & Phipps, A. (2001). Classification models of child molesters utilizing the Abel Assessment for sexual interest<sup>TM</sup>. *Child Abuse & Neglect* 25(5), 703-718.
- Abel, G. G., Jordan, A., Rouleau, J. L., Emerick, R., Barboza-Whitehead, S., & Osborn, C. (2004). Use of visual reaction time to assess male adolescents who molest children. *Sexual Abuse: Journal of Research & Treatment*, 16, 255-265
- Abel, G. G., Mittleman, M., & Becker, J. V. (1985). Sexual offenders: Results of assessment and recommendations for treatment. In M. Ben-Aron, S. Hucker, and C. Webster (Eds.), *Clinical Criminology: The Assessment and Treatment of Criminal Behavior* (pp. 191-205). Toronto: Clarke Institute of Psychiatry, University of Toronto.
- Abel, G. G., Osborn, C. A., & Twigg, D. A. (1993). Sexual assault through the life span: Adult offenders with juvenile histories. In H. E. Barbaree, W. L. Marshall, & S. M. Hudson (Eds.), *The juvenile sex offender* (pp. 104-117). New York: Guilford.
- Ahlers, C. J., Schaefer, G. A., Mundt, I. A., Roll, S., Englert, H., Willich, S. N., & Beier, K. M. (2011). How unusual are the contents of paraphilias? Paraphilia-associated sexual arousal patterns in a community-based sample of men. *Journal of Sexual Medicine*, 8(5), 1362-1370.
- Allen M, D'Alessio D, & Brezgel K. (1995a). A meta-analysis summarizing the effects of pornography II: Aggression after exposure. *Human Communication Research* 22, 258-283.

- Allen M, Emmers T, Gebhardt L, & Giery MA. (1995b). Exposure to pornography and acceptance of rape myths. *Journal of Communication*, 45, 5-25.
- Allen, M., D'Alessio, D., Emmers, T.M. & Gebhardt, L. (1996). The role of educational briefings in mitigating effects of experimental exposure to violent sexually explicit material. *Journal of Sex Research*, 33 (1996), 135-141.
- Anderson, C.A. (1997). Effects of violent movies and trait irritability on hostile feelings and aggressive thoughts. *Aggressive Behaviour*, 23, 161-78.
- Anderson, C. & Keltner, D. (2002). Open peer commentary: The role of empathy in the formation and maintenance of social bonds. *Behavioral and Brain Sciences*, 25(1), 21-22.
- Anderson, N.H. (1961). Scales and statistics: Parametric and nonparametric. *Psychological Bulletin*, 58, 305-316.
- Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. *Child Neuropsychology*, 8, 71-82.
- Asendorpf, J. B., Banse, R., & Muecke, D. (2002). Double dissociation between implicit and explicit personality self-concept: The case of shy behavior. *Journal of Personality and Social Psychology*, 83, 380-393.
- Attorney General's Commission on Pornography: Final Report*. (1986). Washington, DC: U.S. Dept of Justice.
- Augoustinos, M. & Walker, I. (1995) *Social cognition: an integrated introduction*, London: Sage.
- Balota, D. A., & Spieler, D. H. (1999). Word frequency, repetition, and lexicality effects in word recognition tasks: Beyond measures of central tendency. *Journal of Experimental Psychology: General*, 128, 32-55.
- Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Banse, R., Schmidt, A. F. & Clarbour, J. (2010). Indirect measures of sexual interest in child sex offenders: A multimethod approach. *Criminal justice and Behavior*, 37, 319-335.
- Barbaree, H. E., Marshall, W. L., & Lanthier, R. D. (1979). Deviant sexual arousal in rapists. *Behaviour Research and Therapy*, 17, 215-222.

- Bardenhagen, F J, Bowden, S C, Shields, R B, McKay, V, Smith, P J & Vogrin, S.(1999).Psychosocial and neuropsychological outcomes in two high - functioning males 20 years after traumatic brain injury. *Neurocase*, 5: 325–43.
- Bargh, J. A., Lombardi, W. J., & Higgins, E. T. (1988). Automaticity of chronically accessible constructs in person \* situation effects on person perception: It's just a matter of time. *Journal of Personality and Social Psychology*, 55, 599–605.
- Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, 54, 140–148.
- Barnes, G., Malamuth, N., & Check, J. (1984). Psychoticism and sexual arousal to rape depictions. *Personality and Individual Differences*, 5, 273-279.
- Baron, J. (2004). Normative models of judgment and decision making. In D. J. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 19–36). Malden, MA: Blackwell Publishing Ltd.
- Baron-Cohen, S. (1995). *Mindblindness: an essay on autism and theory of mind*. Boston: MIT Press/Bradford Books.
- Baron-Cohen, S. (2001). Theory of mind and autism: A review. *International Review of research in Mental Retardation*, 23, 169-184.
- Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of theory of mind: evidence from very high functioning adults with autism or Asperger Syndrome. *Journal of Child Psychology and Psychiatry*, 38, 813-822.
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition*, 21, 37-46.
- Baron-Cohen, S., Ring, H., Bullmore, E., Wheelwright, S., Ashwin, C., & Williams, S. (2000). The amygdala theory of autism. *Neuroscience and Behavioural Reviews*, 24, 355-364.
- Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The 'Reading the Mind in the eyes' test revised version: A study with normal adults, and adults with Asperger Syndrome or High-Functioning autism. *Journal of Child Psychiatry and Psychiatry*, 42, 241-252.
- Barsetti, I., Earls, C. M., Lalumière, M. L., & Bélanger, N. (1998). The differentiation of intrafamilial and extrafamilial heterosexual child molesters. *Journal of Interpersonal Violence*, 13, 275-286.



- Batson, C. D. (1991). *The Altruism Question: Toward a Social-Psychological Answer*. Hillsdale, NJ: Erlbaum
- Beck, A. T. (1963). Thinking and depression: 1. Idiosyncratic content and cognitive distortions. *Archives of General Psychiatry*, 9, 324-333.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International
- Beech, A., & Fisher, D. (2004) Treatment in Prison and Probation Settings. In Kemshall, H. & G. McIvor (Eds.), *Research Highlights in Social Work: Sex Offenders: Managing the Risk* (pp. 137-164). London: Jessica Kingsley Publications.
- Beech, A., Fisher, D. & Ward, T. (2005). Sexual murderers' implicit theories. *Journal of Interpersonal Violence*, 20, 1366-1389.
- Beech, A. R., Kalmus, E., Tipper, S. P., Baudouin, J., Flak, V., & Humphreys, G. W. (2008). Children induce an enhanced attentional blink in child molesters. *Psychological Assessment*, 20(4), 397-402.
- Beech, A., Ward, T., & Fisher, D. (2006). The identification of sexual and violent motivations in men who assault women: Implications for treatment. *Journal of Interpersonal Violence*, 21, 1635-1653.
- Berkowitz L. 1997. Some thoughts extending Bargh's argument. In: Wyer R.S. Jr. (Ed): *Advances in Social Cognition, Vol. X: The Automaticity of Everyday Life*, (pp 83-94). Mahwah, NJ: Erlbaum,
- Blanchard, R., & Bogaert, A. F. (1996). Homosexuality in men and number of older brothers. *American Journal of Psychiatry*, 153, 27-31.
- Blanchard, R., & Bogaert, A. F. (1998). Birth order in homosexual versus heterosexual males and females. *Annual Review of Sex Research*, 8, 27-67.
- Blanchard, R., Lykins, A. D., Wherrett, D., Kuban, M. E., Cantor, J. M., Blak, T., Dickey, R. & Klassen, P. E. (2009). Pedophilia, hebephilia, and the DSM-V. *Archives of Sexual Behavior*, 38, 335-350.
- Bogaert, A. F. (1996). Volunteer bias in human sexuality research: Evidence for both sexuality and personality differences in males. *Archives of Sexual Behavior*, 25(2), 125-140.
- Bogaert, A. F., Bezeau, S., Kuban, M., & Blanchard, R. (1997). Pedophilia, sexual orientation, and birth order. *Journal of Abnormal Psychology*, 106, 331-335.



- Bohner, G., Jarvis, C. I., Eyssel, F., & Siebler, F. (2005). The causal impact of rape myth acceptance on men's rape proclivity: Comparing sexually coercive and noncoercive men. *European Journal of Social Psychology*, 35, 819-828.
- Bohner, G., Reinhard, M.-A., Rutz, S., Sturm, S., Kerschbaum, B., & Effler, D. (1998). Rape myths as neutralizing cognitions: Evidence for a causal impact of anti-victim attitudes on men's self-reported likelihood of raping. *European Journal of Social Psychology*, 28, 257-268.
- Bohner, G., Siebler, F., & Schmelcher, J. (2006). Social norms and the likelihood of raping: Perceived rape myth acceptance of others affects men's rape proclivity. *Personality and Social Psychology Bulletin*, 32, 286-297
- Brody, L. R., & Hall, J. (1993). Gender and emotion. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions* (pp. 447-461). New York: Guilford Press.
- Brothers, L., & Ring, B. (1992). A neuroethological framework for the representation of minds. *Journal of Cognitive Neuroscience*, 4, 107-118.
- Brown, A., Gray N. S., & Snowden R. J. (2009) Implicit measurement of sexual associations in child sex abusers. Role of victim type and denial. *Sexual Abuse: A Journal of Research and Treatment*, 21, 166-180.
- Brown S., Harkins, K., & Beech, A.R. (in press). Victim specific and general empathy: Associations with actuarial risk, treatment outcome and sexual recidivism. *Sexual Abuse: A Journal of Research and Treatment*. doi: 10.1177/1079063211423944
- Bryant, J., & Miron, D. (2003). Excitation-transfer theory and three-factor theory of emotion. In J. Bryant, D. Roskos-Ewoldsen, & J. Cantor (Eds.), *Communication and emotion: Essays in honor of Dolf Zillmann* (pp. 31-59). Mahwah, NJ: Lawrence Erlbaum Associates.
- Bumby, K.M. (1996). Assessing the cognitive distortions of child molesters and rapists: Development and validation of the MOLEST and RAPE scales. *Sexual Abuse: Journal of Research and Treatment*, 8(1), 37-54.
- Bumby, K.M. (2000). Empathy inhibition, intimacy deficits, and attachment difficulties in sex offenders. In D.R. Laws, S.M. Hudson, & T.Ward (eds.), *Remaking Relapse Prevention with Sex Offenders: A Sourcebook* (pp.143-166). Thousand Oaks, CA.: Sage Publications.
- Burke, D.M., (2001). Empathy in sexually offending and nonoffending adolescent males. *Journal of Interpersonal Violence* 16, 222-233.

- Burt, MR. (1978). *Attitudes supportive of rape in American culture*. House Committee on Science and Technology, Subcommittee Domestic and International Scientific Planning:, Analysis and Cooperation, Research into Violent Behavior: Sexual assaults. (Hearing, 95th Congress, 2nd session, January 10-12, (1978) (pp. 277-322). Washington, D.C.: U.S. Government Printing Office.
- Burt, M. R. (1980). Cultural myths and supports for rape. *Journal of Personality and Social Psychology*, 38, 217-230
- Burton, D. L. (2003). Male adolescents: Sexual victimization and subsequent sexual abuse. *Child and Adolescent Social Work Journal*, 20, 277-296
- Carlson, S. M., Moses, L. J., & Brenton, C. (2002). How specific is the relationship between executive functioning and theory of mind? Contributions of inhibitory control and working memory. *Infant and Child Development*, 11, 73-92.
- Carter, R. (2007). *Ain't Nothin' Like the Real Thing: Sexual Fantasy and Modus Operandi in Adult and Juvenile Sexual Offenders*. (Doctoral dissertation). Retrieved from Pacific University Common Knowledge.
- Channon, S., & Crawford, S. (2000). The effects of anterior lesions on performance on a story comprehension test: Left anterior impairment on a theory of mind task. *Neuropsychologia*, 38, 1006-1017.
- Cisler, J. M., Wolitzky-Taylor, K. B., Adams Jr, T. G., Babson, K. A., Badour, C. L., & Willems, J. L. (2011). The emotional Stroop task and posttraumatic stress disorder: A meta-analysis. *Clinical Psychology Review*, 13, 817-828.
- Clark, L. A. (1999). Dimensional Approaches to Personality Disorders Assessment and Diagnosis. In C. R. Cloninger (Ed.) *Personality and Psychopathology* (pp. 219-244). Washington, American Psychiatric Press.
- Clark, A. (2007). Soft selves and ecological control. In D. Spurrett, D. Ross, H. Kincaid, & L. Stephens (Eds.), *Distributed cognition and the Will*. Cambridge, MA: MIT Press.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences*, 2nd ed. Hillsdale, NJ: Erlbaum.
- Collins, A. M., & Loftus, E. F. (1975). A Spreading Activation Theory of Semantic Processing. *Psychological Review*, 82, 407-428.
- Commission on Obscenity and Pornography. (1970). *The report of the Commission on Obscenity and Pornography*. Washington, DC: U.S. Government Printing Office.



- Condon M.K., & Nutter D.E. (1988). A preliminary examination of the pornography experience of sex offenders, paraphiliacs, sexual dysfunction patients, and controls based on Meese Commission Recommendations. *Journal of Sex & Marital Therapy*, 14(4), 285-298.
- Connolly (2004). Developmental Trajectories and Sexual Offending: An Analysis of the Pathways Model. *Qualitative Social Work*, 3(1), 39-59.
- Cook RF, Fosen RH, & Pacht A. 1971. Pornography and the sex offender: Pattern of previous exposure and arousal effects of pornographic stimuli. *Journal Applied Psychology* 55, 503-511.
- Cooper, S. (2005). Understanding, treating, and managing sex offenders who deny their offence. *Journal of Sexual Aggression*. 11, 85-94.
- Cossins, A. (2000). *Masculinities, sexualities and child sexual abuse*. The Hague, Netherlands: Kluwer Law International.
- Crooks, V. L., Rostill-Brookes, H., Beech, A.R., & Bickley, J. (2009). Applying Rapid Serial Visual Presentation to Adolescent Sexual Offenders: Attentional Bias as a Measure of Deviant Sexual Interest? *Sexual Abuse: A Journal of Research and Treatment* 21(2): 135-148.
- Davis, M. (1980). A multidimensional approach to individual differences in empathy. *Catalogue of Selected Documents in Psychology* 10, 85.
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidisciplinary approach. *Journal of Personality and Social Psychology* 44, 113-126.
- Davis, M. H. (1994). *Empathy: A Social Psychological Approach*. Dubuque, IA.: Brown & Benchmark
- Dawson, D.L., Barnes-Holmes, D., Gresswell, D.M., Hart, A.J. & Gore, N.J. (2009). Assessing the Implicit Beliefs of Sexual Offenders Using the Implicit Relational Assessment Procedure: A First Study *Sexual Abuse: A Journal of Research and Treatment*, 21, 57 - 75.
- Dean, K., & Malamuth, N. (1997). Characteristics of men who aggress sexually and of men who imagine aggressing: Risk and moderating variables. *Journal of Personality and Social Psychology*, 72, 449-455.
- Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, 3, 406-412.
- Demare' D, Lips HM, & Briere J. (1993). Sexually violent pornography, anti-women attitudes and sexual aggression: A structural equation model. *Journal of Research in Personality* 27, 285-300.

- Dienstbier, R.A. (1977). Sex and Violence: Can Research Have It Both Ways? *Journal of Communication* 27(3), 176–188.
- Dodge, K. A. (1993). Social-cognitive mechanisms in the development of conduct order and depression. *Annual Review of Psychology*, 44, 559-584.
- Dodge, K. A. & Frame, C. L. (1982). Social cognitive biases and deficits in aggressive boys. *Child Development*, 53, 620–635.
- Dodge, K.A., Pettit, G.S., Bates, J.E., & Valente, E., (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology*, 104, 632–643.
- Donnerstein, E., Linz, D., and Penrod, S. (1987). *The Question of pornography: Research findings and policy implications*. New York: The Free Press.
- Drossman, D. A., Li, Z., Lesennan, I, Toomey, T. C., & Hu, Y. J. B. (1996). Health status by gastrointestinal diagnosis and abuse history. *Gastroenterology*, 110, 999-1007.
- Dubner, A. E., & Motta, R. W. (1999). Sexually and physically abused foster care children and posttraumatic stress disorder. *American Psychological Association*, 7 (3), 367–373.
- Earls C. M., Quinsey, V.L., & Castonguay, L.G. (1987). A comparison of three methods of scoring penile circumference changes. *Archives of Sexual Behavior*, 16(6), 493-500.
- Eisenberg, N., Fabes, R. A., Miller, P. A., Fultz, J., Shell, R., Mathy, R. M., et al. (1989). Relation of sympathy and personal distress to prosocial behavior: A multimethod study. *Journal of Personality and Social Psychology*, 57, 55–66.
- Ekman, P. & Rosenberg, E. L. (1998). *What the Face Reveals: Basic and Applied Studies of Spontaneous Expression Using the Facial Action Coding System*. New York: Oxford University Press.
- Ellenbogen, M. A., Schwartzman, A. E., Stewart, J. & Walker, C. D. (2002). Stress and selective attention: The interplay of mood, cortisol levels, and emotional information processing. *Psychophysiology*, 39, 723-732.
- Elsegood, K., & Duff, S.C. (2010). Theory of Mind in men who have sexually offended against children: A UK comparison study between child sex offenders and non-offender controls. *Sexual Abuse: A journal of research and treatment*, 22(1), 112-131.
- Eslinger, P. J. (1998). Neurological and neuropsychological bases of empathy. *European Neurology*, 39, 193–199.



- Eyssel, F., Bohner, G., & Siebler, F. (2006). Perceived rape myth acceptance of others predicts rape proclivity: Social norm or judgmental anchoring? *Swiss Journal of Psychology*, 65, 93-99.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, 54, 297-327.
- Feingold, A. (1984). Reliability of score differences on the WAIS, WISC-R and WAIS-R. *Journal of Clinical Psychology*, 40, 1080-1083.
- Felitti V.J., Anda R.F., Nordenberg D., Williamson D.F., Spitz A.M., Edwards V., Koss M.P., & Marks J.S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14, 245-258.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood: II. Psychiatric outcomes of childhood sexual abuse. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(10), 1365-1374.
- Fernandez, Y. M., & Marshall, W. L. (2003). Victim empathy, social self-esteem, and psychopathy in rapists. *Sexual Abuse: A Journal of Research & Treatment*, 15(1), 11-26.
- Fernandez, Y. M., Marshall, W. L., Lightbody, S., & Sullivan, C. (1999). The Child Molester Empathy Measure: Description and examination of its reliability and validity. *Sexual Abuse: A Journal of Research and Treatment*, 11, 17-31.
- Fiedler, K., Messner, C. & Bluemke, M. (2006). Unresolved problems with the "I", the "A", and the "T". *European Review of Social Psychology*, 17, 74-147.
- Field, A. (2009) *Discovering Statistics Using SPSS*. Sage: London.
- Finkelhor, D. (1979). *Sexually Victimized Children*, Macmillan, New York.
- Finkelhor, D. (1984). *Child sexual abuse: New theory and research*. New York, NY: The Free Press.
- Finkelhor, D. (1990). Early and long-term effects of child sexual abuse: An update. *Professional Psychology* 21, 325-330.
- Finkelhor, D., Araj, S. K., Baron, L., Browne, A, Peters, S. D., & Wyatt, G. E. (1986). *A sourcebook on child sexual abuse*. Beverly Hills, CA; SAGE.

- Finkelhor, D., & Lewis, I. A. (1988). In R. A. Prentky & V. L. Quinsey (Eds.), *Human sexual aggression: Current perspectives. Annals of the New York Academy of Sciences* (528, p. 64-78). New York: The New York Academy of Sciences.
- Fischer, L. & Smith, G. (1999). Statistical Adequacy of the Abel Assessment for Interest in Paraphilias. *Sexual Abuse: A Journal of Research and Treatment*, 11(3), 195-205.
- Fisher, D., Beech, A., & Browne, K. (1999). Comparison of sex offenders to nonoffenders on selected psychological measures. *International Journal of Offender Therapy and Comparative Criminology*, 43, 473-491.
- Fiske, S.T., & Taylor, S.E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.
- Foa, E.B., Feske U, Murdock, T.B., Kozak, M.J., & McCarthy, P.R. (1991). Processing of threat-related information in rape victims. *Journal of Abnormal Psychology*, 100, 156-162.
- Fonagy, P., Redfern, S., & Charman, T. (1997). The relationship between belief-desire reasoning and a projective measure of attachment security (SAT). *British Journal of Developmental Psychology*, 15, 51-61.
- Freeman-Longo, R.E., Bird, S. Stevenson, W.F. & Fiske, J.A. (1995). 1994 *Nationwide survey of treatment programs & models: Serving abuse reactive children and adolescent & adult sexual offenders*. Brandon, VT: Safer Society Press.
- Freund, K. (1975). The present state of the phallometric test of erotic preference. *European Journal of Behavioural Analysis & Modification*, 1(1), 27-28.
- Freund, K. (1990). Courtship disorder. In W. L. Marshall, D. R. Laws, & H. E. Barbaree (Eds.), *Handbook of sexual assault: Issues, theories and treatment of the offender* ( pp. 195-297). New York: Plenum.
- Freund, K. & Costell, R. (1970). The structure of erotic preference in the nondeviant male. *Behaviour Research and Therapy*, 8, 15-20. doi:10.1016/0005-7967(70)90029-X
- Freund, K., McKnight, C. K., Langevin, R., & Cibiri, S. (1972). The female child as a surrogate object. *Archives of Sexual Behavior*, 2(2), 119-133.
- Gaither, G. A. (2001). *The reliability and validity of three new measures of male sexual preferences*. Unpublished manuscript, University of North Dakota, Grand Forks.

- Gaither, G.A., Franklin, M.D., Hegstad, H.J., & Plaud, J.J. (1997, August). *The Sexual Sensation Seeking Scale: Relationships to other sensation seeking measures*. Paper presented at the meeting of the American Psychological Association, Chicago, IL.
- Gallagher, S., & Crispy, A. (2009). Mental institutions. *Topoi*, 28, 45–51.
- Games, P. A. (1983). Curvilinear transformation of the dependent variable. *Psychological Bulletin*, 93, 382-387.
- Gannon, T. (2009) Social cognition in violent and sexual offending: an overview. *Psychology, Crime & Law*, 15 (2-3), 97-118.
- Gannon, T.A. & Polaschek, D.L.L. (2005) Do child molesters deliberately fake good on cognitive distortion questionnaires? An information processing-based investigation. *Sexual Abuse - A Journal of Research and Treatment*, 17 (2), 183-200.
- Gannon, T. A., & Polaschek, D. L. L. (2006). Cognitive distortions in child molesters: An examination of key theories and research. *Clinical Psychology Review*, 26, 1000-1019.
- Gannon, T. A., & Rose, M. R. (2009) Offence-related interpretative bias in female child molesters: A preliminary study. *Sexual Abuse: A Journal of Research and Treatment*, 21, 194- 207.
- Gannon, T., Ward, T., Beech, T., & Fisher, D. (2007). *Aggressive Offenders Cognition. Theory, Research and Practice*. Chichester, UK: John Wiley.
- Gallese, V., Fadiga, L., Fogassi, L. and Rizzolatti, G. (1996). Action recognition in the premotor cortex. *Brain*, 119, 593-609.
- Gawronski, B. (2009). Ten frequently asked questions about implicit measures and their frequently supposed, but not entirely correct answers. *Canadian Psychology*, 50, 141–150.
- Gawronski, B., LeBel, E. P., & Peters, K.P. (2007). What do implicit measures tell us? Scrutinizing the validity of three common assumptions. *Perspectives on Psychological Science*, 2, 181-193.
- Geer, J. H. & Bellard, H. S. (1996). Sexual content induced delays in unprimed lexical decisions: Gender and context effects. *Archives of Sexual Behavior* 25(4), 379-395.
- Geer, J.H., Estupinan, L.A., Manguno, M., & Gina, M., 2000. Empathy, social skills, and other relevant cognitive processes in rapists and child molesters. *Aggression and Violent Behavior* 5, 99–126.



- Geer, J. H. & Melton, J. S. (1997). Sexual content-induced delay with double-entendre words. *Archives of Sexual Behavior* 26(3), 295-316.
- Gerger, H., Kley, H., Böhner, G., & Siebler, F. (2007). The acceptance of modern myths about sexual aggression (AMMSA) scale: Development and validation in German and English. *Aggressive Behavior*, 33, 422-440.
- German, T.P. & Hehman, J.A. (2006). "Representational and executive selection resources in 'theory of mind': Evidence from compromised belief-desire reasoning in old age." *Cognition*, 101, 129-152.
- Gery, I., Miljkovitch, R., Berthoz, S., & Soussignan, R. (2009). Empathy and recognition of facial expressions of emotion in sex offenders, non-sex offenders and normal controls. *Psychiatry Research*, 165(3), 252-262.
- Gibbs, R. W. (2006). *Embodiment and cognitive science*. New York, NY: Cambridge University Press.
- Giotakos, O. (2006). A combination of viewing reaction time and incidental learning task in child molesters, rapists, and control males and females. *Annals of General Psychiatry*, 5 (supplement 1), S114.
- Gizewski, E.R., Krause, E., Karama, S., Baars, A., Send, W., & Forsting, M. (2006). There are differences in cerebral activation between females in distinct menstrual phases during viewing of erotic stimuli: a fMRI study. *Journal of Experimental Brain Research*, 174, 101-108.
- Glasgow, D. V., Osborne, A., & Croxen, J. (2003). An assessment tool for investigating paedophile sexual interest using viewing time: An application of single case methodology. *British Journal of Learning Disabilities*, 31 (2), 96-102.
- Gopnik, A., & Meltzoff, A. N. (1997). *Words, thoughts, and theories*. Cambridge: MIT Press.
- Gopnik, A., & Wellman, H. M. (1994). The theory theory. In L. A. Hirschfeld & S. A. Gelman (Eds.), *Mapping the mind: Domain specificity in cognition and culture* (pp. 257-293). New York: Cambridge University Press.
- Gordon, A., & Porporino, F. J. (1990). *Managing the treatment of sex offenders: A Canadian perspective* (Research Report No. B-05). Ottawa, ON: Correctional Service of Canada. Retrieved from [www.csc-scc.gc.ca](http://www.csc-scc.gc.ca).
- Gray, J. R., Braver, T. S., & Raichle, M. E. (2002). Integration of emotion and cognition in the lateral prefrontal cortex. *Proceedings of the National Academy of Sciences USA*, 99, 4115 - 4120.



- Gray, N. S., Brown, A. S., MacCulloch, M. J., Smith, J., & Snowden, R. J. (2005). An implicit test of the associations between children and sex in paedophiles. *Journal of Abnormal Psychology, 114*, 304-308.
- Gray, S. & Plaud, J. (2005). A comparison of the Abel Assessment for Sexual Interest and penile plethysmography in an outpatient sample of sexual offenders. *Journal of Sexual Offender Civil Commitment: Science and the Law, 1*, 1-10.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4-27.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79*, 1022-1038.
- Greenwald, A. G., McGhee, J. L., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464-1480.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197-216.
- Gress, C. L. Z. (2005). Viewing time measures and sexual interest: Another piece of the puzzle. *Journal of Sexual Aggression, 11*, 117-125.
- Gress, C. L. Z. (2007). *Delays in attentional processing when viewing sexual imagery: The development and comparison of two measures*. Unpublished manuscript, University of Victoria, Victoria, Canada.
- Groth, A. N. (1979). *Men Who Rape*. New York: Plenum Press.
- Groth, A. N., & Birnbaum, H. J. (1978). Adult sexual orientation and attraction to underage persons. *Archives of Sexual Behavior, 7*, 175-181.
- Groth, A. N., Hobson, W., & Gary, T. (1982). The child molester: Clinical observations. In J. Conte & D. Shore (Eds.), *Social work and child sexual abuse*. New York: Haworth.
- Hald, G.M., Malamuth, N.M., & Yuen, C. (2010) Pornography and attitudes supporting violence against women: Revisiting the relationship in nonexperimental studies, *Aggressive Behavior, 36*, 14-20.
- Hall, G. C. N., & Hirschman, R. (1991). Toward a theory of sexual aggression: A quadripartite model. *Journal of Consulting and Clinical Psychology, 59*, 662-669.

- Hall, G. C. N., & Hirschman, R. (1992). Sexual aggression against children: A conceptual perspective of etiology. *Criminal Justice and Behavior*, 19, 8–23.
- Hall, G.C.N., Shondrick, D.D., & Hirschman, R. (1993). The role of sexual arousal in sexually aggressive behavior: a meta-analysis. *Journal of Consulting and Clinical Psychology*, 61 1091-1096.
- Hamilton, L.C. (1992). *Regressions with graphics: A second course in applied statistics*. Monterey, CA.: Brooks/Cole.
- Hammond, K. R. (1996). *Human judgment and social policy: Irreducible uncertainty, inevitable error, unavailable injustice*. New York: Oxford University Press.
- Hanson RK & Morton-Bourgon K. (2004). *Predictors of Sexual Recidivism: An Updated Meta-Analysis*, Ottawa: Public Safety and Emergency Preparedness Canada.
- Hanson, R. K., & Scott, H. (1995). Assessing perspective-taking among sexual offenders, nonsexual criminals, and nonoffenders. *Sexual Abuse: A Journal of Research and Treatment*, 7, 259–277.
- Hanson, R. K., & Thornton, D. (2000). Improving risk assessments for sex offenders: A comparison of three actuarial scales. *Law and Human Behavior*, 24, 119-136.
- Happe, F., & Frith, U. (1996). Theory of mind and social impairment in children with conduct disorder. *British Journal of Developmental Psychology*, 14, 385–398.
- Harris, G. T., Rice, M. E., Quinsey, V. L. & Chaplin, T. C. (1996). Viewing time as a measure of sexual interest among child molesters and normal heterosexual men. *Behaviour Research and Therapy* 34(4): 389-394.
- Hawkins, D. (1980). *Identification of Outliers*. Chapman and Hall. London.
- Hayashino, D.S., Wurtele, S.K., & Klebe, K.J. (1995). Child molesters: An examination of cognitive factors. *Journal of Interpersonal Violence*, 10(1), 106-116.
- Heathcote, A. (1996) RTSYS: A computer program for analysing response time data. *Behaviour Research Methods, Instruments & Computers*, 28, 427-445.
- Henning A., Spinath F.M., & Aschersleben G. (2011). The link between preschoolers' executive function and theory of mind and the role of

epistemic states. *Journal of Experimental Child Psychology*, 108(3), 513-531.

- Herman, J. I. (1990). Sex offenders: A feminist perspective. In W. I. Marshall, D. R. Laws, & H. E. Barbaree (Eds.), *Handbook of sexual assault: Issues, theories, and treatment of the offender* (pp. 177-193). New York: Plenum.
- Hester, R., Dixon, V., & Garavan, H. (2006). A consistent attentional bias for drug-related material in active cocaine users across word and picture versions of the emotional Stroop task. *Drug and Alcohol Dependence*, 81(3), 251-257.
- Hildebrand, D., & Pithers, W. (1989). Enhancing offender empathy for sexual-abuse victims. In D. Lewis (Ed.), *Relapse prevention with sex offenders* (pp. 236-243). New York: Guilford Press.
- Hockley, W. E. (1984). Analysis of response time distributions in the study of cognitive processes. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 10, 598-615.
- Hofmann, S. G., Suvak, M., & Litz, B. T. (2006). Sex differences in face recognition and influence of facial affect. *Personality and Individual Difference*, 40, 1683-1690.
- Holmes, R.M. & Holmes S.T. (1996). *Profiling violent crimes: An investigative tool*, (2nd ed.) . Thousand Oaks, CA: Sage.
- Hooper, C. A., & Kalanski, A. (2006). Rewriting 'the paedophile': A feminist reading of *The Woodsman*. *Feminist Review*, 83, 149-155.
- Hoppe, C. M., & Singer, R. D. (1976). Overcontrolled hostility, empathy and egocentric balance in violent and non-violent psychiatric offenders. *Psychological Reports*, 39, 1303-1308.
- Howitt, D. (1995). Pornography and the paedophile: Is it criminogenic? *British Journal of Medical Psychology*, 68, 15-27.
- Hudson, S. M., Marshall, W. L., Wales, D. S., McDonald, E., Bakker, L. W., & McLean, A. (1993). Emotional recognition skills of sex offenders. *Annals of Sex Research*, 6, 199-211.
- Hughes, C. (1998). Finding your marbles: Does preschoolers' strategic behavior predict later understanding of mind? *Developmental Psychology*, 34, 1326-1339.
- Hughes, C., & Russell, J. (1993). Autistic children's difficulty with mental disengagement from an object: Its implications for theories of autism. *Developmental Psychology*, 29, 498-510.



- Janssen, E. (Ed). (2007). *The Psychophysiology of Sex*. Bloomington, IN: Indiana University Press.
- Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000) Automatic processes and the appraisal of sexual stimuli: towards an information processing model of sexual arousal. *Journal of Sex Research*, 37, 8-23.
- Johnson, M. (2007). *The Meaning of the Body: Aesthetics of human understanding*. Chicago: University of Chicago Press.
- Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression & Violent Behavior*, 9, 441 – 476.
- Jolliffe, D., & Farrington, D. P. (2007). The relationship between low empathy and self-reported offending in *Legal and Criminological Psychology*, 12, 265-286
- Jonson-Reid, M., & Way, I. (2001). Adolescent sexual offenders: Incidence of childhood maltreatment, serious emotional disturbance, and prior offenses. *American Journal of Orthopsychiatry*, 71, 120–130.
- Joyal, C. C., Black, D. N., & Dassylva, B. (2007). The neuropsychology and neurology of sexual deviance: A review and pilot study. *Sexual Abuse: A Journal of Research and Treatment*, 19, 2, 155-175.
- Kafka, M. P. (1997). A monoamine hypothesis for the pathophysiology of paraphilic disorders. *Archives of Sexual Behavior*, 26, 343–358.
- Kafka, M. P. (2003). The monoamine hypothesis for the pathophysiology of paraphilic disorders. In R. Prentky, E. Janus, M. Seto, & A. W. Burgess (Eds.). *Understanding and managing sexually coercive behavior*. Annals of the New York Academy of Sciences, vol. 989 (pp. 86–94).
- Kaufman, A.S., & Lichtenberger, E.O. (1999). *Essentials of WAIS-III assessment*. New York: Wiley.
- Keenan, T. & Ward, T. (2000). A theory of mind perspective on cognitive, affective, and intimacy deficits in child sexual offenders. *Sexual abuse: A journal of research and treatment*, 12 (1), 49-60.
- Kelly, P., Koh, J., & Thompson, J. M. (2006). Diagnostic findings in alleged sexual abuse: Symptoms have no predictive value. *Journal of Paediatrics and Child Health*, 42, 112-117.
- Kinderman, P., Dunbar, R., & Bentall, R. (1998). Theory-of-mind deficits and causal attributions. *British Journal of Psychology*, 89, 191-204.



- Kingston DA, Fedoroff P, Firestone P, Curry S, Bradford JM. 2008. Pornography use and sexual aggression: The impact of frequency and type of pornography use on recidivism among sexual
- Knight, R. A., Carter, D. L., & Prentky, R. A. (1989). A system for the classification of child molesters: Reliability and application. *Journal of Interpersonal Violence*, 4, 3–23.
- Knight, R. A., & Prentky, R. A. (1990). Classifying offenders: the development and corroboration of taxonomic models. In W. L. Marshall, D. R. Laws, & H. E. Barbaree (Eds.), *Handbook of sexual assault: issues, theories, and treatment of the offender* (pp. 23–52). New York: Plenum.
- Lalumière, M.L. & Quinsey, V.L. (1994). The discriminability of rapists from non-sex offenders using phallometric measures: A meta-analysis. *Criminal Justice and Behavior*, 21, 150-175.
- Lam C.B. & Chan D.K.S. (2007). The use of cyberpornography by young men in Hong Kong: Some psychosocial correlates. *Archives of Sexual Behaviour* 36, 588–598.
- Landolt, M. A., Lalumière, M. L., & Quinsey, V. (1995). Sex differences in intra-sex variations in human mating tactics: An evolutionary approach. *Ethology and Sociobiology* 16(1), 3-23.
- Lang, R.A., Black, E.L., Frenzel, R.R., & Checkley, K.L. (1988). Aggression and erotic attraction toward children in incestuous and pedophilic men. *Annals of Sex Research*, 1, 417-441.
- Lang, R. A., & Frenzel, R. R. (1988). How sex offenders lure children. *Annals of Sex Research*, 1,303-317.
- Langevin R, Wright P, & Handy L (1988). Characteristics of sex offenders who were sexually victimized as children. *Annals of Sex Research*, 2(3), 227-253.
- Langner, O., Dotsch, R., Bijlstra, G., Wigboldus, D. H. J., Hawk, S. T., & van Knippenberg, A. (2010). Presentation and validation of the Radboud Faces Database. *Cognition and Emotion*, 24(8), 1377-1388.
- Laws, D., & Gress, C. (2004). Seeing things differently: The viewing time alternative to penile plethysmography. *Legal & Criminological Psychology*, 9, 183-196.
- Laws, D. R., & Marshall, W. L. (1990). A conditioning theory of the etiology and maintenance of deviant sexual preference and behavior. In W. L. Marshall, D. R. Laws, & H. E. Barbaree (Eds.), *Handbook of sexual assault:*

- Issues, theories, and treatment of the offender* (pp. 209-229). New York: Plenum.
- Laws, D. R., & Marshall, W. L. (1991). Masturbatory reconditioning with sexual deviates: An evaluative review. *Advances in Behavioural Research and Therapy*, 13, 13-25.
- LeDoux, J.E. (1996) *The Emotional Brain*. New York, Simon and Schuster.
- Seto, M. C., & Lalumière, M. L. (2001). A brief screening scale to identify pedophilic interests among child molesters. *Sexual Abuse: A Journal of Research and Treatment*, 13, 15-25.
- Leiblum, S. R., & Rosen, R. C. (1988). *Sexual desire disorders*. New York: The Guilford Press.
- Lesennan, J. (2005). Sexual abuse history: Prevalence, health effects, mediators, and factors. *Child Abuse & Neglect*, 14, 19-28.
- Leslie, A.M, (1987) Pretence and representation: the origins of "theory of mind". *Psychological Review*, 94, 412-426.
- Leslie, A, (1991) The theory of mind impairment in autism: evidence for a modular mechanism of development? In Whiten, A, (Ed) *Natural theories of mind*. Oxford: Basil Blackwell.
- Levine, D. W., & Dunlap, W. P. (1982). Power of the F test with skewed data: Should one transform or not? *Psychological Bulletin*, 92, 272-280.
- Linz, D., Donnerstein, E., & Penrod, S. (1988). The Effects of Long-Term Exposure to Violent and Sexually Degrading Depictions of Women. *Journal of Personality and Social Psychology* 55(5), 758-768.
- Lipton, D.N., McDonel, E.C., & McFall, R.M. (1987). Heterosocial perception in rapists. *Journal of Consulting and Clinical Psychology*, 55, 17-21.
- Lisak, D., & Ivan, C. (1995). Deficits in intimacy and empathy in sexually aggressive men. *Journal of Interpersonal Violence*, 10, 296-308.
- Lovett, B.J., & Sheffield, R.A. (2007). Affective empathy deficits in aggressive children and adolescents: A critical review. *Clinical Psychology Review*, 27, 1-13.
- Luce, R. D. (1986). *Response times: Their role in inferring elementary mental organization*. New York: Oxford University Press.
- Luck, S. J., & Ford, M. A. (1998). *On the role of selective attention in visual perception*. Proceedings of the National Academy of Sciences, U.S.A., 95, 825- 830.

- Lykins, A. D., Cantor, J. M., Kuban, M. E., Blak, T., Dickey, R., Klassen, P. E., & Blanchard, R. (2010). Sexual Arousal to Female Children in Gynephilic Men. *Sexual Abuse: A Journal of Research and Treatment*, 22(3), 279-289.
- MacKinnon, C. (1987). *Feminism Unmodified*, Cambridge, Massachusetts, and London, England: Harvard University Press.
- MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An integrative review. *Psychological Bulletin*, 109, 163-203.
- MacMillan, H. L., Jan E. Fleming, J. E., David L. Streiner, D. L., Lin, E., Boyle, M. H., Jamieson, E., Duku, E. K., Walsh, C. A., Wong, M. Y., & Beardslee, W. R. (2001). Childhood Abuse and Lifetime Psychopathology in a Community Sample. *American Journal of Psychiatry* 158, 1878-1883.
- Maes, M., De Vos, N., Van Hunsel, F., et al. (2001a). Pedophilia is accompanied by increased plasma concentrations of catecholamines, in particular epinephrine. *Psychiatry Research*, 103, 43-49.
- Malamuth, N. (1981) Rape Fantasies as a function of exposure to violent-sexual stimuli. *Archives of Sexual Behavior*, 10, 33-47.
- Malamuth NM. (1986). Predictors of naturalistic sexual aggression. *Journal of Personality and Social Psychology*, 50, 953-962.
- Malamuth, N. (1989). Sexually violent media, thought patterns and antisocial behavior. In G. Comstock (Ed.), *Public Communication and Behavior*, Vol. 2 (pp. 159-204). New York: Academic Press.
- Malamuth, N. (1989) The Attraction to Sexual Aggression Scale: Part II. *Journal of Sex Research*, 26, 324-354.
- Malamuth, N. (1998). The confluence model as an organizing framework for research on sexually aggressive men: Risk moderators, imagined aggression and pornography consumption. In R. Geen and E. Donnerstein (Eds.) *Aggression: Theoretical and empirical reviews*. (pp. 229- 245). New York: Academic Press.
- Malamuth, N. (2003). Criminal and non-criminal sexual aggressors: Integrating psychopathy in a hierarchical-mediational confluence model. In R. A. Prentky, E. Janus, & M. Seto (Eds.), *Understanding and Managing Sexually Coercive Behavior. Annals of the New York Academy of Sciences*, Vol. 989. (pp. 33-58). New York: New York Academy of Sciences.



- Malamuth, N., Addison, T., & Koss, M. (2000). Pornography and sexual aggression: Are there reliable effects and can we understand them? *Annual Review of Sex Research, 11*, 26-91.
- Malamuth, N.M., & Briere, J. (1986). Sexual violence in the media: Indirect effects on aggression against women. *Journal of Social Issues, 42*, 75-79.
- Malamuth, N. M., & Brown, L. M. (1994). Sexually aggressive men's perceptions of women's communications: Testing three explanations. *Journal of Personality and Social Psychology, 67*, 699-712.
- Malamuth, N., & Check, J. (1981). The effects of mass media exposure on acceptance of violence against women: A field experiment. *Journal of Research in Personality, 15*, 436-446.
- Malamuth, N., Haber, S., & Feshbach, S. (1980). Testing hypotheses regarding rape: Exposure to sexual violence, sex differences, and the "normality" of rapists. *Journal of Research in Personality, 14*, 121-137.
- Malamuth, N.M., Linz, D., Heavey, C.L., Barnes, G., & Acker, M. (1995). Using the confluence model of sexual aggression to predict men's conflict with women: A 10-year follow-up study. *Journal of Personality and Social Psychology, 69*, 353-369.
- Marolla, J., & Scully, D. (1986). Attitudes toward women, violence and rape: A comparison of convicted rapists and other felons. *Deviant Behaviour, 7*, 337-355.
- Marshall WL. (1988). The use of sexually explicit stimuli by rapists, child molesters, and nonoffenders. *Journal of Sex Research, 25*, 267-288.
- Marshall, W. L. (1989). Invited essay: Intimacy, loneliness & sexual offenders. *Behavior Research and Therapy, 27*, 491-503.
- Marshall, W.L. (1996). Assessment, treatment and theorising about sex offenders: Developments during the past twenty years and future directions. *Criminal Justice and Behaviour, 23*(1), 162-199.
- Marshall, W.L. (1997). Pedophilia: Psychopathology and theory. In D.R. Laws & W. Donohue (Eds.), *Sexual deviance: Theory, assessment, and treatment* (pp. 152-174). New York: Guilford Press.
- Marshall WL. (2000). Revisiting the use of pornography by sexual offenders: Implications for theory and practice. *Journal of Sexual Aggression, 6*, 67-77.
- Marshall, W.L., Anderson, D., & Fernandez, Y. (1999). *Cognitive behavioural treatment of sexual offenders*. John Wiley & Sons.



- Marshall, W.L., & Barbaree, H.E. (1990). An integrated theory of the etiology of sexual offending. In W.L. Marshall, D.R. Laws & H.E. Barbaree (Eds.), *Handbook of sexual assault: Issues, theory and treatment of offenders*. New York: Plenum Press.
- Marshall, W.L., Barbaree, H.E., & Fernandez, Y.M. (1995). Some aspects of social competence in sexual offenders. *Sexual Abuse: Journal of Research and Treatment*, 7(2), 113-127.
- Marshall, W. L., Fernandez, Y. M., & Cortoni, F. (1996). Rape. In V. VanHasselt & M. Hersen (Eds.), *Handbook of psychological approaches with violent offenders* (pp. 245–266). New York: Plenum.
- Marshall, W. L., Jones, R., Hudson, S. M., & McDonald, E. (1993). Generalized empathy in child molesters. *Journal of Child Sexual Abuse*, 2, 61–68.
- Marshall, W. L., & Marshall, L. E. (2000). The origins of sexual offending. *Trauma, Violence, and Abuse*, 1(3), 250–263.
- Marshall WL, Seidman BT, & Barbaree HE. (1991). The effects of prior exposure to erotic and nonerotic stimuli on the rape index. *Annals of Sex Research*, 4, 209–220.
- Marziano, V., Ward, T., Beech, A., & Pattison, P. (2006). Identification of five fundamental implicit theories underlying cognitive distortions in child abusers: A preliminary study. *Psychology, Crime and Law*, 12, 97-105.
- Matarazzo, R. G., Wiens, A. N., Matarazzo, J. D., & Manaugh, T. S. (1973). Test–retest reliability of the WAIS in a normal population. *Journal of Clinical Psychology*, 29, 194–197.
- Mathews, A., & MacLeod, C. (1994). Cognitive approaches to emotion and emotional disorders. *Annual Review of Psychology*, 45, 25-50.
- McConnell, A. R., & Leibold, J. M. (2001). Relations among the Implicit Association Test, discriminatory behavior, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology*, 37, 435-442
- McGee H, Garavan R, deBarra M, Byrne J, & Conroy R. (2002). *The SAVI Report. Sexual Abuse and Violence in Ireland. A national study of Irish experiences, beliefs and attitudes concerning sexual violence*. Dublin: Liffey Press.
- McGrath, M. , Cann, S., & Konopasky, R. (1998). New measures of defensiveness, empathy, and cognitive distortions for sexual offenders against children. *Sexual Abuse: A Journal of Research and Treatment*, 10, 25-36.

- Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law*, 7, 3-35.
- Menary, R. (2007). *Cognitive integration: Mind and cognition unbounded*. Basingstoke, Palgrave Macmillan
- Mihailides, S., Devilly, G. J., & Ward, T. (2004). Implicit cognitive distortions and sexual offending. *Sexual Abuse: A Journal of Research and Treatment*, 16, 333-350.
- Miller, J. (1988). A warning about median reaction time. *Journal of Experimental Psychology: Human Perception and Performance*, 14, 539-543.
- Miller, J. (1991). Reaction time analysis with outlier exclusion: Bias varies with sample size. *The quarterly journal of experimental psychology*, 43(4), 907-912.
- Miller, P.A., & Eisenberg, N. (1988). The relation of empathy to aggressive and externalizing antisocial behaviour. *Psychological Bulletin*, 103, 324-344.
- Mokros, A., Butz, M., Dombert, B., Santtila, P., Bäumel, K.-H., & Osterheider, M. (2010). Judgement of age and attractiveness in a paired comparison task: Testing a picture set developed for diagnosing paedophilia. *Legal and Criminological Psychology*. Article available ahead of print. doi:10.1348/135532510X514104
- Monto, M., Zgourides, G., & Harris, R. (1998). Empathy, self esteem, and the adolescent sexual offender. *Sexual Abuse: A Journal of Research and Treatment*, 10, 127-140.
- Morgan, A. B. & Lilienfeld, S. O. (2000) A meta-analytic review of the relation between antisocial behavior and neuropsychological measures of executive function. *Clinical Psychology Review*, 20, 113- 136.
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review (pp. 265-292). In J. A. Bargh (Ed.), *Automatic processes in social thinking and behavior*. Psychology Press.
- Nunes, K. L., Firestone, P., & Baldwin, M. W. (2007). Indirect assessment of cognitions of child sexual abusers with the implicit association test. *Criminal Justice and Behavior*, 34, 454-475.
- Ó Ciardha, C., & Gormley, M. (2009). Comparing two implicit cognitive measures of sexual interest: a pictorial modified Stroop task and the Implicit Association Test. In D. Thornton & D. R. Laws (Eds.), *Cognitive*

*Approaches to the Assessment of Sexual Interest in Sexual Offenders.*  
Chichester, UK: Wiley.

- Ó Ciardha, C., & Gormley, M. (in press). Using a pictorial modified Stroop task to explore the sexual interest of sexual offenders against children. *Sexual Abuse: A Journal of Research and Treatment*.
- Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of racial prejudice: What are we measuring? *Psychological Science*, 14, 636-639.
- Olson, M. A., Fazio, R. H., & Hermann, A. D. (2007). Reporting tendencies underlie discrepancies between implicit and explicit measures of self-esteem. *Psychological Science*, 18, 287-291.
- Osborne, J. (2002). Notes on the use of data transformations. *Practical Assessment, Research & Evaluation*, 8(6).
- Osborne J.W. & A. Overbay. (2004). The power of outliers (and why researchers should ALWAYS check for them). *Practical Assessment, Research and Evaluation* 9, 6.
- Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1991). Executive function deficits in high functioning autistic children: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry*, 32, 1081-1105.
- Paul, B., & Linz, D. (2008). The Effects of Exposure to Virtual Child Pornography on Viewer Cognitions and Attitudes Toward Deviant Sexual Behavior. *Communication Research*, 35 (1), 3-38.
- Payne, D. L., Lonsway, K. A., & Fitzgerald, L. F. (1999). Rape myth acceptance: Exploration of its structure and its measurement using the Illinois Rape Myth Acceptance Scale. *Journal of Research in Personality*, 33, 27-68.
- Pennington, B. F. (2002). *The development of psychopathology: Nature and nurture*. New York: Guilford Press.
- Pennington, B. F., & Ozonoff, S. (1996). Executive functions and developmental psychopathology. *Journal of Child Psychology and Psychiatry*, 37, 51-87.
- Perner, J. (1998). The meta-intentional nature of executive functions and theory of mind. In P. Carruthers & J. Boucher (Eds.), *Language and thought* (pp. 270-283). Cambridge, UK: Cambridge University Press.
- Pessoa, L. (2008) On the relationship between emotion and cognition. *Nature Reviews Neuroscience*, 9(2), 148-58.



- Phelps, E.A. (2006) Emotion and cognition: Insights from studies of the human amygdala. *Annual Review of Psychology*, 24 (57), 27-53.
- Phillips, L. H., Bull, R., Adams, E., & Fraser, L. (2002). Positive mood and executive function: Evidence from Stroop and fluency tasks. *Emotion*, 2(1), 12-22.
- Pithers, W.D. (1994). Process evaluation of a group therapy component designed to enhance sex offenders' empathy for sexual abuse survivors. *Behavioural Research Therapy*, 32, 365-570.
- Pithers, W.D. (1999). Empathy: Definition, enhancement, and relevance to the treatment of sexual abusers. *Journal of Interpersonal Violence* 14, 257-284.
- Plaud, J. J., Gaither, G. A., Hegstad, H. J., Rowan, L., & Devitt, M. K. (1999). Volunteer bias in human psychophysiological sexual arousal research: To whom do our research results apply? *Journal of Sex Research*, 36(2), 171-179.
- Polaschek, D. L. L., & Gannon, T. A. (2004). The implicit theories of rapists: What convicted offenders tell us. *Sexual Abuse: A Journal of Research and Treatment*, 16(4), 299-314.
- Polaschek, D. L. L., & Ward, T. (2002). The implicit theories of potential rapists: What our questionnaires tell us. *Aggression and Violent Behavior*, 7, 385-406.
- Porter, J. F., & Critelli, J. W. (1994). Self-talk and sexual arousal in sexual aggression. *Journal of Social and Clinical Psychology*, 13, 233-239.
- Premack, D., & Woodruff, G. (1978) Does the chimpanzee have a 'theory of mind'? *Behavioral and Brain Sciences*, 4, 515-526.
- Quinsey, V. L. (1977). The assessment and treatment of child molesters: A review. *Canadian Psychological Review*, 18, 204-220.
- Quinsey, V. L., Ketsetzis, M., Earls, C., & Karamanoukian, A. (1996). Viewing time as a measure of sexual interest. *Ethology and Sociobiology* 17(5), 341-354.
- Radford, L., Corral, S., Bradley, C., Fisher, H., Bassett, C., Howat, N., & Collishaw, S. (2011). *Child abuse and neglect in the UK today*. London: NSPCC.
- Rahman, R. (2011). Facing good and evil: Early brain signatures of affective biographical knowledge in face recognition. *Emotion*, Epub available ahead of print.



- Rahman, Q., & Hull, M.S. (2005). An empirical test of the kin selection hypothesis of male homosexuality. *Archives of Sexual Behavior*, 34, 461-467.
- Rahman, Q., Wilson, G. D., & Abrahams, S. (2004). Sex, sexual orientation, and identification of positive and negative facial affect. *Brain and Cognition*, 54, 179-185.
- Ratcliff, R. (1979). Group reaction time distributions and an analysis of distribution statistics. *Psychological Bulletin*, 86, 446-461.
- Ratcliff, R. (1993). Methods of dealing with reaction time outliers. *Psychological Bulletin*, 114, 510-532.
- Rosenzweig, S. (1942). The photoscope as an objective device for evaluating sexual interest. *Psychosomatic Medicine*, 4, 150-158.
- Roskos-Ewoldsen, D. R., Klinger, M.R. & Roskos-Ewoldsen, B. (2007). Media priming. In *Mass media effects research: Advances through meta-analysis*. Edited by Raymond W. Preiss, Barbara Mae Gayle, Nancy Burrell, Mike Allen, and Jennings Bryant, 53-80. Mahwah, NJ: Erlbaum.
- Rudman, L. A., Greenwald, A. G., & McGhee, D. E. (2001). Implicit self-concept and evaluative implicit gender stereotypes: Self and ingroup share desirable traits. *Personality and Social Psychology Bulletin*, 27, 1164-1178.
- Ryan, G. (2002). Victims who go on to victimize others: No simple explanations. *Child Abuse & Neglect*, 26, 891-892.
- Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379-399.
- Schafer, H. H., & Colgan, A. H. (1977). The effect of pornography on penile tumescence as a function of reinforcement and novelty. *Behaviour Therapy*, 8, 938-946.
- Schwarz, N., & Strack, F. (1981). Manipulating salience: Causal assessment in natural settings. *Personality and Social Psychology Bulletin*, 6, 554 - 558.
- Segal, Z.V., & Stermac, L.E. (1990). The role of cognition in sexual assault. In W.L. Marshall, D.R. Laws & H.E. Barbaree (Eds.), *Handbook of sexual assault: Issues, theory and treatment of offenders*. New York: Plenum Press.

- Seidman, B.T., Marshall, W.L., Hudson, S.M., & Robertson, P.J. (1994). An examination of intimacy and loneliness in sex offenders. *Journal of Interpersonal Violence*, 9(4), 518-534.
- Seto, M. C., & Lalumiere, M. L. (2000). Psychopathy and sexual aggression. In C. Gacono (Ed.), *The clinical and forensic assessment of psychopathy* (pp. 333-350). Mahwah, NJ: Lawrence Erlbaum.
- Seto, M. C., & Lalumière, M. L. (2010). What is so special about male adolescent sexual offending? A review and test of explanations using meta-analysis. *Psychological Bulletin*, 136, 526-575.
- Seto, M. C., Marie, A., & Barbaree, H. E. (2001). The role of pornography in the etiology of sexual aggression. *Aggression & Violent Behavior*, 6, 35-53.
- Sewell, K.W., & Salekin, R.T. (1997). Understanding and detecting dissimulation in sex offenders. In R. Rogers (Ed.), *Clinical assessment of malingering and deception* (2nd ed., pp. 328-350). New York: Guilford.
- Shamay-Tsoory, S.G., & Aharon-Peretz, J. (2007). Dissociable prefrontal networks for cognitive and affective theory of mind: A lesion study. *Neuropsychologia*, 45 (13), 3054 – 3067.
- Shapiro, P., & Penrod, S.D. (1986). A Meta-analysis of the Facial Identification Literature. *Psychological Bulletin*, 100, 139-156.
- Simons, D., Wurtele, S. K., & Heil, P. (2002). Childhood victimization and lack of empathy as predictors of sexual offending against women and children. *Journal of Interpersonal Violence*, 17(12), 1291-1307.
- Singer, B. (1984). Conceptualizing sexual arousal and attraction. *Journal of Sex Research*, 20(3), 230-240.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.
- Smith, G., & Fischer, L. (1999). Assessment of juvenile sexual offender: Reliability and Validity of the Abel Assessment for Interest in Paraphillias. *Sexual Abuse: A Journal of Research and Treatment*, 11, 207-216.
- Smith, P. & Waterman, M.G. (2003) Cognitive bias for aggression words in forensic and non-forensic samples. *Cognition and Emotion*, 17(5), 681-701.
- Smith, P. & Waterman, M.G. (2004) Processing Bias for Sexual Material: the Emotional Stroop and Sexual Offenders. *Sexual Abuse: A Journal of Research and Treatment*, 16(2), 163-171.

- Smith, P., & Waterman, M.G. (2005) Sex differences in processing aggression words using the Emotional Stroop task. *Aggressive Behavior*, 31, 271-282.
- Snowden, R. J. & Gray, N. S. (2010) Implicit Social Cognition in Forensic Settings. In: B.Gawronski & B.K. Payne (Eds). '*Handbook of Implicit Social Cognition: Measurement, Theory, and Applications*'. New York: Guilford. pp522 – 534.
- Snowden, R. J., Wichter, J., & Gray, N. S. (2008). Implicit and explicit measurements of sexual preference in gay and heterosexual men: A comparison of priming techniques and the implicit association task. *Archives of Sexual Behavior*, 37, 558-565.
- Spence, J.T., Helmreich, R., & Stapp, J. (1973). A short version of the attitudes towards women scale (AWS). *Bulletin of the Psychonomic Society*, 2, 219-220.
- Spiering, M., & Everaerd, W. (2007). The sexual unconscious. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 166–184). Bloomington, IN US: Indiana University Press.
- Steffens, M. C., Yundina, E., & Panning, M. (2008). Automatic associations with “erotic” in child sexual offenders: Identifying those in danger of reoffence. *Sexual Offender Treatment*, 3(2), 1-9.
- Sterelny, K. (2004). Externalism, epistemic artefacts and the extended mind. In R. Schantz (Ed.), *The externalist challenge: New studies on cognition and intentionality* (pp. 239–254). Berlin & New York: de Gruyter.
- Stermac, L.E., & Segal, Z.V. (1989). Adult sexual contact with children: An examination of cognitive factors. *Behaviour Therapy*, 20, 573-585.
- Stiller, J. & Dunbar, R.I.M. (2007). “Perspective taking and memory capacity predict social network size” *Social Networks* 29, 93-104.
- Stormark, K. M., & Torkildsen, Ø. (2004). Selective processing of linguistic and pictorial food stimuli in females with anorexia and bulimia nervosa. *Eating Behaviors*, 5(1), 27-33.
- Strassberg, D. S., & Lowe, K. (1995). Volunteer bias in sexuality research. *Archives of Sexual Behavior*, 24(4), 369-382.
- Stroop, J.R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, 28, 643-662.
- Swaffer, T., Hollin, C., Beech, A., Beckett, R., & Fisher, D. (2000). An Exploration of Child Sexual Abusers' Sexual Fantasies Before and After



- Treatment. *Sexual Abuse: A Journal of Research and Treatment*, 12(1), 61-68.
- Symons, D. (1979). *The evolution of human sexuality*. New York: Oxford University Press.
- Tan, L. & Grace, R. (2008). Social desirability in sex offenders: A review. *Sexual Abuse: A Journal of Research and Treatment*, 20, 61-87.
- Tangney, J. (1991). Moral affect: The good, the bad, and the ugly. *Journal of Personality and Social Psychology*, 61, 598-607.
- Tanner, J. (1973). Growing up. *Scientific American*, 229(3), 34-43.
- Taylor, J. & Kinderman P. (2002) An analogue study of attributional complexity, theory of mind deficits and paranoia. *British Journal of Psychology*, 93, 137-140.
- Terry, K., & Tallon, J. (2004). *Child sexual abuse: A review of the literature*. The Nature and Scope of the Problem of Sexual Abuse of Minors by Priests and Deacons, 1950-2002 Washington, D.C.: United States Conference of Catholic Bishops.
- Ulrich, R., & Miller, J. (1994). Effects of truncation of reaction time analysis. *Journal of Experimental Psychology: General*, 123, 34-80.
- Valentine, T. (1991). A unified account of the effects of distinctiveness, inversion and race in face recognition. *Quarterly Journal of Experimental Psychology*, 43A, 161-204.
- Varker, T., & Devilly, G. J. (2007). Types of empathy and adolescent sex offenders. *Journal of Sexual Abuse*, 13, 139-149.
- Varney, N. R., & Menefee, L. (1993). Psychosocial and executive deficits following closed head injury: Implications for orbital frontal cortex. *Journal of Head Trauma Rehabilitations*, 8, 32-44.
- Vega V, & Malamuth NM. (2007). Predicting sexual aggression: The role of pornography in the context of general and specific risk factors. *Aggressive Behaviour* 33, 104-107.
- Vollm, B.A., Taylor, A.N.W., Richardson, P., Corcoran, R., Stirling, J., McKie, S., Deakin, J.F.W. & Elliott, R. (2006). Neuronal correlates of theory of mind and empathy: A functional magnetic resonance imaging study in a nonverbal task. *Neuroimage*, 29, 90-98.
- Walters, D. (1990). *The Criminal Lifestyle*, NY: Sage



- Ward, T. (2000). Sexual offenders' cognitive distortions as implicit theories. *Aggression and Violent Behavior, 5*, 491-507.
- Ward, T. (2002). Good lives and the rehabilitation of offenders: promises and problems. *Aggression and Violent Behavior, 7*, 513-528.
- Ward, T., & Beech, A. R. (2006). An integrated theory of sexual offending. *Aggression and Violent Behavior, 11*, 44-63.
- Ward, T. & Casey, A. (2010). Extending the mind into the world: A new theory of cognitive distortions in sex offenders. *Aggression and Violent Behaviour, 15*(1), 49-58.
- Ward, T., Gannon, T.A. & Keown, K. (2006) Beliefs, values, and action: The judgment model of cognitive distortions. *Aggression and Violent Behavior, 11* (4), 323-340.
- Ward, T., Hudson, S. M., & Marshall, W. L. (1996). Attachment style in sex offenders: A preliminary study. *Journal of Sex Research, 33*, 17-26.
- Ward, T., Hudson, S.M., & Marshall, W.L. (1995). Cognitive distortions and affective deficits in sex offenders: A cognitive deconstructionist interpretation. *Sexual Abuse: Journal of Research and Treatment, 7*(1), 67-83.
- Ward, T. & Keenan, T. (1999). Child molesters' implicit theories. *Journal of Interpersonal Violence, 14*, 821-838.
- Ward, T., Keenan, T., & Hudson, S. (2000). Understanding cognitive, affective, and intimacy deficits in sexual offenders A developmental perspective. *Aggression and Violent Behavior, 5* (1), 41-62.
- Ward, T., Polaschek, D., & Beech, A. R. (2005). *Theories of sexual offending*. Chichester: John Wiley & Sons Ltd.
- Ward, T., & Siegert, R. J. (2002). Toward and comprehensive theory of child sexual abuse: A theory knitting perspective. *Psychology, Crime, and Law, 9*, 319-351.
- Watson, P.J., & Morris, R. J. (1990). Irrational beliefs and the problem of narcissism. *Personality and Individual Differences, 11*, 1137-1140.
- Webster, S.D., & Beech, A. (2000). The nature of sexual offenders' affective empathy: A grounded theory analysis. *Sexual Abuse: A Journal of Research and Treatment, 12*, 249-261.
- Wechsler D. (1997). *Wechsler Adult Intelligence Scale-Third Edition*. San Antonio: The Psychological Corporation.

- Wellman, H. (1990). *The child's theory of mind*. Cambridge, Mass.: MIT Press.
- Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, 72, 655–684.
- Wheeler, J.G., George, W.H., & Dahl, B.J. (2002). Sexually aggressive college males: Empathy as a moderator in the "Confluence Model" of sexual aggression. *Personality and Individual Differences*, 33(5), 759-776.
- Whelan, R. (2008). Effective analysis of reaction time data. *The Psychological Record*, 58 (3), 475-482.
- Wicker, B., Keysers, C., Plailly, J., Royet, J. P., Gallese, V., & Rizzolatti, G. (2003). Both of us disgusted in my insula: The common neural basis of seeing and feeling disgust. *Neuron*, 40(3), 655-664.
- Wiens, S., & Ohman, A. (2002). Animal Behavior Processes. *Journal of Experimental Psychology*, 27-31.
- Wiers, R. W., Beckers, L., Houben, K., & Hofmann, W. (2009). A short fuse after alcohol: implicit power associations predict aggressiveness after alcohol consumption in young heavy drinkers with limited executive control. *Pharmacology, Biochemistry and Behavior*, 93, 300–305.
- Wilcox, R.R. (1998). How many discoveries have been lost by ignoring modern statistical methods? *American Psychologist*, 53, 300–314.
- Williams. J. M. G., Mathews, A., & MacLeod, C. (1996). The Emotional Stroop Task and Psychopathology. *Psychological Bulletin*, 120 (1), 3-24.
- Wilson, R. A. and A. Clark (2009). How to Situate Cognition: Letting Nature Take Its Course. In Robbins, P. & Aydede, M, (Eds). *The Cambridge Handbook of Situated Cognition*. (pp. 55-77). Cambridge, Cambridge University Press..
- Worling, J. R. (2006). Assessing sexual arousal with adolescent males who have offended sexually: Self-report and unobtrusively measured viewing time. *Sexual Abuse: A Journal of Research and Treatment* 18(4), 383-400.
- Wright, L. W., & Adams, H. E. (1994). Assessment of sexual preference using a choice reaction time task. *Journal of Psychopathology and Behavioral Assessment*, 16, 221-231.
- Wright, L. W., & Adams, H. E. (1999). The effects of stimuli that vary in erotic content on cognitive processes. *The Journal of Sex Research*, 36, 145-151.

- Yochelson, S., & Samenow, S. E. *The Criminal Personality, Volume I: A Profile for Change*. New York: Jason Aronson, 1976.
- Zamansky, H. S. (1956). A technique for measuring homosexual tendencies. *Journal of Interpersonal Violence*, 16, 73-85.
- Zillman, D., & Bryant, J. (1984). Effects of massive exposure to pornography. In N. M. Malamuth & E. Donnerstein. (Eds.), *Pornography and sexual aggression*. New York: Academic Press.

## **Appendix A: Publications and presentations arising from the present work**

### Journal Article

Bourke, A. & Gormley, M. (in press). Comparing a pictorial Stroop task to a viewing time measure of sexual interest. *Sexual Abuse: A Journal of Research and Treatment*.

### Conference Presentations

Bourke, A. & Gormley, M. (2011). The Relationship Between Theory of Mind and Empathy. *Association for the Treatment of Abusers Annual Conference*, Toronto, November, 7<sup>th</sup>- 11<sup>th</sup>.

Bourke, A. & Gormley, M. (2011). Development and Factor Analysis of an Implicit Theories Questionnaire. *National Organisation for the Treatment of Abusers Annual Conference*, Brighton, September 28<sup>th</sup>-30<sup>th</sup>

Gormley, M & Bourke, A. (2010). The use of an implicit association task to investigate gender sex cognitive association and analytical issues. *National Organisation for the Treatment of Abusers Annual Conference*, Belfast, December 22<sup>nd</sup>-24<sup>th</sup>.

Bourke, A. & Gormley, M. (2010). The relationship between pornography use, implicit theories and propensity to sexually aggress. *National Organisation for the Treatment of Abusers Annual Conference*, Belfast, December 22<sup>nd</sup>-24<sup>th</sup>.



Bourke, A. & Gormley, M. (2010). The Viewing Time measure of sexual interest: Implications of differing methodology and analysis on correct classification.

*British Psychological Society, Division of Forensic Psychology Annual Conference*, Kent, June 22<sup>nd</sup>-25<sup>th</sup>.

Bourke, A. & Gormley, M. (2009). A comparison of attentional measurements of sexual interest and methods of data analysis. *Association for the Treatment of Abusers Annual Conference*, Texas, September 30<sup>th</sup>- October 3<sup>rd</sup>.

**Appendix B: Acronyms used throughout the thesis**

| <u>Acronym</u> | <u>Full Title</u>                 |
|----------------|-----------------------------------|
| IT             | Implicit Theory                   |
| IAT            | Implicit Association Task         |
| ToM            | Theory of Mind                    |
| EF             | Executive Function                |
| RME            | Reading the Mind in the Eyes Task |
| IMT            | Imposing Memory Task              |
| ERA            | Emotion Recognition Accuracy      |

Appendix C: Exemplars used for the Gender-Good IAT

| Category |        |          |         |
|----------|--------|----------|---------|
| Man      | Woman  | Good     | Bad     |
| Husband  | Wife   | Honest   | Cruel   |
| Gent     | Lady   | Decent   | Hurtful |
| Mister   | Madam  | Kind     | Wicked  |
| Bloke    | Girl   | Pleasant | Nasty   |
| Male     | Female | Nice     | Hurtful |

## **Appendix D: An example of a story and the accompanying questions of the Imposing Memory Task (Cognitive Theory of Mind)**

### **WHERE'S THE POST OFFICE?**

Sam wanted to find a Post Office so he could buy a Tax Disc for his car. He was already late buying one, as his Tax Disc had run out the week before. Because traffic wardens regularly patrolled the street where he lived, he was worried about being caught with his car untaxed. As Sam was new to the area, he asked his colleague Henry if he could tell him where to get one. Henry told him that he thought there was a Post Office in Elm Street. When Sam got to Elm Street, he found it was closed. A notice on the door said that the Post Office had moved to new premises in Bold Street. So Sam went to Bold Street. But by the time he got there, the Post Office had already closed. Sam wondered if Henry, who was the office prankster, had deliberately sent him on a wild goose chase. When he got back to the office, he asked another colleague, Pete, whether he thought it likely that Henry had deliberately misled him. Pete thought that, since Sam had been anxious about the Tax Disc, it was unlikely that Henry would have deliberately tried to get him into trouble.



**Story 1: Where's the Post Office**

**Please answer TRUE (✓) or FALSE (X) to each of the questions that follow each story.**

Sam left Bold Street, then went to the office and spoke to Pete

Pete, the man who worked at the same place as Henry, and who knew that Henry was the office prankster, was Sam's cousin

Henry thought that Sam knew he was a prankster

Henry knew Sam believed he knew where the Post Office was

Sam thought that Henry knew the Post Office was in Bold Street and hence that Henry must have intended to mislead Sam

Sam believed that Pete thought the Post Office was in Elm Street and hence that Pete must not have intended to mislead Sam

Sam wanted to buy a stamp

Pete wanted Sam to know that Henry believed that the Post Office was on Elm Street and hence did not intend to mislead him

The Post Office was closed and Sam's insurance had run out

Pete wanted Sam to know that he believed that Henry had intended not to mislead him

Sam needed a Tax Disc from the office

The Post Office was closed because it had moved to Bold St

Henry wanted to play a trick

Sam asked Henry, and did not ask Pete or the traffic wardens, about where the Post Office was in order to buy a Tax Disk

Sam found the Post Office closed and couldn't buy a tax disk for Pete

Sam thought Henry knew he wanted a Tax Disk

Sam who worked with Pete and Henry did not know where to buy a Tax Disk because he was new to the area

Henry, the man that Sam spoke to about where to buy a Tax Disk after he realized he needed to buy one soon, was a colleague of Pete's

The Post Office in Elm St. had a notice on the door

Pete suspected that Henry was playing a prank on Sam

**Appendix E: Exemplars used for the Age-Sex and Gender-Sex IATs**

*Table A1: Exemplars Used for the Age-Sex IAT*

| Category    |          |            |           |
|-------------|----------|------------|-----------|
| Adult       | Child    | Sex        | Furniture |
| Grown-up    | Kid      | Horny      | Chair     |
| Responsible | School   | Orgasm     | Wardrobe  |
| Work        | Underage | Naked      | Table     |
| Strong      | Small    | Masturbate | Sofa      |
| Mature      | Toys     | Lust       | Stool     |

*Table A2: Exemplars Used for the Gender-Sex IAT*

| Category |        |          |         |
|----------|--------|----------|---------|
| Man      | Woman  | Good     | Bad     |
| Husband  | Wife   | Honest   | Cruel   |
| Gent     | Lady   | Decent   | Hurtful |
| Mister   | Madam  | Kind     | Wicked  |
| Bloke    | Girl   | Pleasant | Nasty   |
| Male     | Female | Nice     | Hurtful |

Appendix F: Pornography Use Scale

You will be asked some questions below regarding four different types of pornography use. Please answer the questions below each type as honestly as possible.

Type 1: Sexually explicit material depicting adult men and women consensually involved in pleasurable, non-violent, non-degrading sexual interactions.

Q.1: What age were you when you were first exposed to this type of pornography? \_\_\_\_

Q. 2: How frequently have you viewed this type of material?

|           |                    |                    |                     |                    |       |            |
|-----------|--------------------|--------------------|---------------------|--------------------|-------|------------|
| Most days | 3-5 times per week | 1-2 times per week | 1-2 times per month | 1-2 times per year | Never | Don't know |
|           |                    |                    |                     |                    |       |            |

Q. 3: Generally how many times per month would you have viewed this type of material? \_\_\_\_

Type 2: Sexually explicit material where one of the participants is objectified or portrayed as powerless, where no violence is involved and the activity appears consensual.

Q.1: What age were you when you were first exposed to this type of pornography?

Q. 2: How frequently have you viewed this type of material?

|           |                    |                    |                     |                    |       |            |
|-----------|--------------------|--------------------|---------------------|--------------------|-------|------------|
| Most days | 3-5 times per week | 1-2 times per week | 1-2 times per month | 1-2 times per year | Never | Don't know |
|           |                    |                    |                     |                    |       |            |



|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|

Q. 3: Generally how many times per month would you have viewed this type of material? \_\_\_\_\_

Type 3: Sexually explicit material where there is any type of physical force is used or threatened but the activity appears consensual (e.g., spanking).

Q.1: What age were you when you were first exposed to this type of pornography?

Q. 2: How frequently have you viewed this type of material?

|           |                    |                    |                     |                    |       |            |
|-----------|--------------------|--------------------|---------------------|--------------------|-------|------------|
| Most days | 3-5 times per week | 1-2 times per week | 1-2 times per month | 1-2 times per year | Never | Don't know |
|           |                    |                    |                     |                    |       |            |

Q. 3: Generally how many times per month would you have viewed this type of material?

\_\_\_\_\_

Type 4: Sexually explicit material that depicts non consensual activity where physical force may or may not be used

Q.1: What age were you when you were first exposed to this type of pornography?

Q. 2: How frequently have you viewed this type of material?

|           |                    |                    |                     |                    |       |            |
|-----------|--------------------|--------------------|---------------------|--------------------|-------|------------|
| Most days | 3-5 times per week | 1-2 times per week | 1-2 times per month | 1-2 times per year | Never | Don't know |
|           |                    |                    |                     |                    |       |            |

Q. 3: Generally how many times per month would you have viewed this type of material?

## Appendix G: Sentences used for Implicit Theory Sentence Recall

### Task

#### Women as Unknowable/Dangerous

*First Ambiguous Presentation:* John could not understand Mary

*Neutral Interpretation:* John could not understand what Mary was saying

*IT Congruent Interpretation:* John could not understand what Mary wanted

*First Ambiguous Presentation:* Frank thought his girlfriend seemed unstable

*Neutral Interpretation:* Frank thought his girlfriend was mentally unstable

*IT Congruent Interpretation:* Frank thought his girlfriend might fall over

*First Ambiguous Presentation:* Luke's girlfriend was mad

*Neutral Interpretation:* Luke's girlfriend was deranged

*IT Congruent Interpretation:* Luke's girlfriend was great fun

*First Ambiguous Presentation:* Jen came across as cunning

*Neutral Interpretation:* Jen came across as clever

*IT Congruent Interpretation:* Jen came across as sneaky

*First Ambiguous Presentation:* Brian's new girlfriend was dark

*Neutral Interpretation:* Brian's new girlfriend was devious

*IT Congruent Interpretation:* Brian's new girlfriend had dark skin Entitlement

*First Ambiguous Presentation:* Anne's husband had always been her boss

*Neutral Interpretation:* Anne's husband had always been in charge of her

*IT Congruent Interpretation:* Anne's husband had always been her superior at work

*First Ambiguous Presentation:* Susan knew that Ben's needs were more important than her own

*Neutral Interpretation:* Susan knew her son's needs always came first

*IT Congruent Interpretation:* Susan knew her husband's needs always came first

*First Ambiguous Presentation:* Pat refused to give the control over to his wife

*Neutral Interpretation:* Pat refused to give any authority to his wife

*IT Congruent Interpretation:* Pat refused to pass the remote control to his wife

#### Women as sex objects

*First Ambiguous Presentation:* When Sally went to the bar she was looking for a good time

*Neutral Interpretation:* When Sally went to the bar she was planning on having sex

*IT Congruent Interpretation:* When Sally went to the bar she was planning on enjoying the evening

*First Ambiguous Presentation:* People thought that Grace was filthy

*Neutral Interpretation:* People thought Grace was promiscuous

*IT Congruent Interpretation:* People thought Grace was unhygienic



*First Ambiguous Presentation:* Shiela was fit

*Neutral Interpretation:* Sheila was sexy

*IT Congruent Interpretation:* Sheila was sporty

*First Ambiguous Presentation:* Louise had a lot of action on her holiday

*Neutral Interpretation:* Louise had a lot of sex on her holiday

*IT Congruent Interpretation:* Louise had been very active on her holiday

*First Ambiguous Presentation:* Mary asked Joe for a ride

*Neutral Interpretation:* Mary asked Joe for a lift

*IT Congruent Interpretation:* Mary asked Joe for sex

## Appendix H: Implicit Theories Questionnaire

Please indicate on the line below each statement the degree to which you agree or disagree with the statement

1. If a woman does not resist strongly to sexual advances, she is probably willing to have sex

-3      -2      -1      0      1      2      3

Strongly disagree

Strongly agree

2. Although most women wouldn't admit it, they generally find being physically forced into sex a real 'turn-on'

-3            -2            -1            0            1            2            3

Strongly disagree

Strongly agree

3 . If a woman is willing to 'make out' with a guy, then it is no big deal if he forces her to go a little further and has sex

-3            -2            -1            0            1            2            3

Strongly disagree

Strongly agree

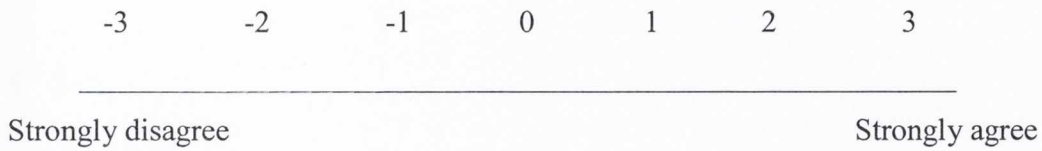
4. Most women are provocative and constantly want sex

-3      -2      -1      0      1      2      3

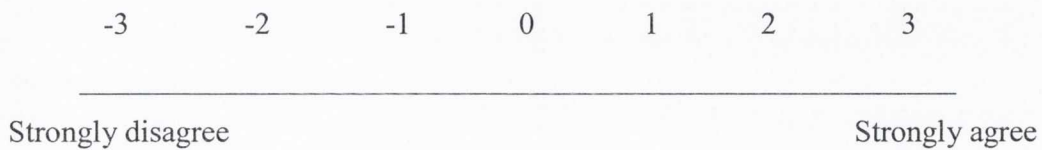
Strongly disagree

Strongly agree

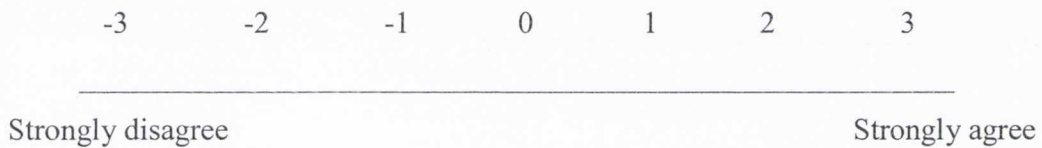
### 5. Women are the gatekeepers to men's sexual gratification



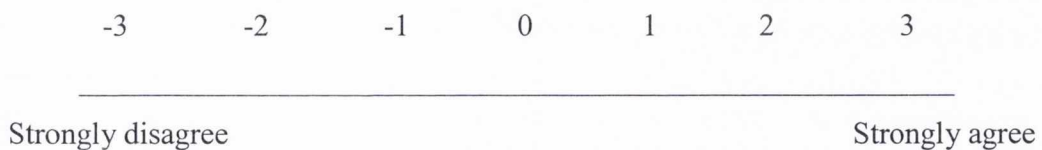
6. Men should be in charge of women because men are more psychologically mature and sexually sophisticated



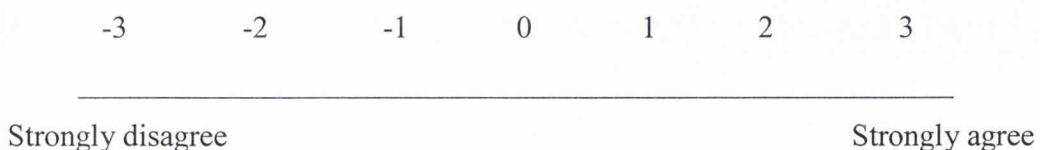
7. Women deliberately set out to deceive and manipulate men



8. A lot of women claim they were raped just because they want the attention



9. When women act like they are too good for men, most men probably think about raping the women to put them in their place



10. You cannot trust women not to start exerting their power over men

-3       -2       -1       0       1       2       3

---

Strongly disagree

Strongly agree

11. Part of a wife's duty is to satisfy her husband sexually whenever he wants it, whether or not she is in the mood

-3       -2       -1       0       1       2       3

---

Strongly disagree

Strongly agree

12. On a date, when a man spends a lot of money on a woman, the woman ought to at least give the man something in return sexually

-3       -2       -1       0       1       2       3

---

Strongly disagree

Strongly agree

13. Rape serves as a way to keep women in their place

-3       -2       -1       0       1       2       3

---

Strongly disagree

Strongly agree

14. If a woman does not physically fight back, you can't really say that it was rape

-3       -2       -1       0       1       2       3

---

Strongly disagree

Strongly agree

15. Women who go to bars a lot are mainly looking to have sex

-3       -2       -1       0       1       2       3



---

Strongly disagree Strongly agree

16. Rape accusations are often used as a way of getting back at men

-3 -2 -1 0 1 2 3

---

Strongly disagree Strongly agree

17. If a man has had sex with a woman before, then he should be able to have sex with her any time he wants

-3 -2 -1 0 1 2 3

---

Strongly disagree Strongly agree

18. Heterosexual encounters are quite often adversarial

-3 -2 -1 0 1 2 3

---

Strongly disagree Strongly agree