# THE ROLE OF INHIBITORY CONTROL IN DEFINING TYPOLOGIES OF INTERNET SEX OFFENDERS

by

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A thesis submitted to

The University of Birmingham

for the degree of

DOCTORATE IN FORENSIC PSYCHOLOGY PRACTICE

Centre for Forensic and Criminological Psychology

School of Psychology

The University of Birmingham

October 2014

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## ABSTRACT

Developing a greater understanding of the characteristics of Internet sex offenders is an important area of research for reducing recidivism and working towards prevention strategies for the future. Exploring characteristics allows for more robust risk assessment and management, particularly in relation to the type of offence committed and propensity for future offences. This is particularly significant in the case of sexual offending against children using the Internet, where a pertinent question is whether individuals with online-only offences are at risk of "crossing-over" to offline contact offences. Some characteristics of these individuals have begun to be explored; however one area that is lacking comprehensive examination is inhibitory control. It has been noted that such impulsivity deficits are present in offline sexual offenders (e.g., Smith & Waterman, 2004) and therefore such work should be extended to include Internet sex offenders and to explore how such regulatory processes affect the likelihood of an individual committing both online and offline offences, and whether this evidences distinct Internet sex offender typologies.

This thesis aims to answer such questions by examining the characteristics of Internet sex offenders and, specifically, the role played by inhibitory control in defining distinct typologies. The first chapter provides an introduction to the prevalence of sexual crime, some of the existing theoretical underpinnings of this behaviour, and evidence for criminogenic characteristics. The second chapter then provides a systematic review of these characteristics within the literature and identifies gaps in our knowledge. The third chapter explores how impulsiveness is measured through actuarial tools and a critique is provided on the Barratt Impulsiveness Scale – Version 11 (Patton, Stanford & Barratt,

1995). This scale is then utilised within an empirical research study in the fourth chapter, which aims to understand the role of impulsiveness in Internet sex offenders as well as exploring deviant cognitions and the differentiation between online-only and cross-over Internet sex offenders. The fifth chapter provides a comprehensive discussion of the content of this thesis, including implications for research and clinical practice.

This thesis appears to highlight a link between impulsiveness and sexual offending against children commissioned online. However, this significant characteristic does not appear to differentiate Internet sex offenders based upon their modus operandi, which has important implications for assessing, managing and treating future risk in online-only offenders.

**Acknowledgements**

I would like to thank everyone who has supported me and been a part of this doctoral thesis. In particular I would like to thank my academic supervisor, Professor Anthony Beech, for his guidance throughout my time at Birmingham, as well as the rest of the staff in the department for their on-going support and wisdom.

I am also extremely thankful to the staff and members of the Lucy Faithfull Foundation who made it possible for me to complete the research chapter of this thesis. I would also like to thank Eleanor Gould for her valuable research contributions.

Finally, I would like to give special thanks to my friends and family who have always encouraged and supported me, and without whom I could not have completed this thesis.

## Table of contents


| | Page No. |
|---|---|
| **Abstract** | **i-ii** |
| **Acknowledgements** | **iii** |
| **Table of contents** | **iv - vii** |
| **List of tables** | **viii** |
| **List of figures** | **viii** |
| **List of appendices** | **ix** |
| **Chapter 1 – Introduction** | |
| Prevalence of sexual crime | 1 - 2 |
| Aetiological theories of sexual offending | 2 - 4 |
| Characteristics of individuals who sexually offend | 4 - 6 |
| Impulsivity | 7 - 9 |
| Aims and objectives | 9 - 10 |
| **Chapter 2 - Examining the characteristics of online-only and cross-over Internet sex offenders: A systematic literature review** | |
| Abstract | 12 - 13 |
| Introduction | 14 - 18 |
| **Method** | **18 - 24** |
| Sources | 18 - 19 |
| Search strategy | 19 - 20 |
| Study selection | 20 - 22 |

Quality assessment 23

Data extraction 23 - 24

**Results** **24 - 47**

Descriptive data synthesis 33 - 34

Sexual behaviours 34 - 35

Substance use 35 - 36

Paraphilias 36

Cognitive and emotional factors 36 - 37

**Discussion** **48 - 54**

Results 48 - 51

Limitations 51 - 53

Implications 53 - 54

Conclusion 54

**Chapter 3 - Critique of a psychometric assessment: Exploring the psychometric properties of the Barratt Impulsiveness Scale – Version 11**

Introduction 56 - 58

**Overview of the BIS-11** **58 – 60**

Attentional impulsiveness 59 - 60

Motor impulsiveness 60

Nonplanning 60

Psychometric characteristics 60 - 62

**Reliability** **62 - 64**

Internal consistency 62 - 63

Test-retest reliability 63 - 64

Replication with a different sample 64

**Validity** **64 - 69**

Face validity 64 - 65

Differential validity 65

Construct validity 65 - 66

Content validity 66

Concurrent validity 67 - 68

Predictive validity 68 - 69

Conclusion 69 - 70

**Chapter 4 - Examining inhibitory control in Internet sex offenders**

Abstract 72 - 73

Introduction 74 - 77

**Method** **77 - 85**

Ethics 77 - 78

Treatment of data 78

Analysis 1: Trait impulsiveness and Internet sex offender typologies 79 - 81

Analysis 2: Trait and state impulsiveness in Internet sex offenders 81 - 83

Analysis 3: Emotional interference in Internet sex offenders 83 - 84

Analysis 4: Sexual compulsivity in Internet sex offenders 84 - 85

**Results** **85 - 93**

Trait impulsiveness and Internet sex offender typologies 86 - 87

Trait and state impulsiveness in Internet sex offenders 87 - 90

Emotional interference in Internet sex offenders 90 - 92

Sexual compulsivity in Internet sex offenders 92 - 93

**Discussion** **93 - 102**

Trait impulsiveness and Internet sex offender typologies 94 - 95

Trait and state impulsiveness in Internet sex offenders 95 - 97

Emotional interference in Internet sex offenders 97 - 100

Sexual compulsivity in Internet sex offenders 100 - 101

Limitations 101 - 102

Conclusion 102 - 104

**Chapter 5 – Discussion and Conclusion**

**Discussion** **106 - 114**

Implications 108 - 111

Limitations 111 - 112

Future directions 112 - 114

Conclusion 114 - 115

**References** **116 - 129**

**Appendices** **130 - 164**

## List of tables


| | Page No. |
|---|---|
| Table 2.1 - Quality of included studies | 21 - 24 |
| Table 2.2 - Tabulation of included study data | 29 - 33 |
| Table 2.3 - Synthesised data highlighting comparative characteristics | 34 - 38 |
| Table 4.1 – Descriptive statistics for the BIS-11 across three group types | 65 |
| Table 4.2 – Univariate test results for the three BIS-11 domains | 66 |
| Table 4.3 – Mean reaction times for congruent and incongruent trials on the Stroop colour-naming task | 67 |
| Table 4.4 - Mean scores and standard deviations for the Internet sex offender and control groups on a psychometric measure of general impulsiveness | |
| Table 4.5 – Mean reaction times for themed stimuli on the emotional Stroop task | 68 |
| Table 4.6 – Univariate results for the online-only Internet sex offenders and control subjects on the emotional Stroop task | 68 |
| Table 4.7 – Bias scores for themed stimuli on the emotional Stroop task | 69 |
| Table 4.8 – Mean scores and standard deviations for the Internet sex offenders and control groups on the psychometric measures of general impulsiveness and sexual compulsivity | 70 |


## List of figures


| | Page No. |
|---|---|
| Figure 1 - Flow diagram of the study selection process | 16 |

**List of appendices**


| | Page No. |
|---|---|
| Appendix 1 – Syntax for search strategy | x - xxi |
| Appendix 2 – Inclusion and exclusion criteria for the systematic literature review PICO | xxii |
| Appendix 3 – Quality assessment forms | xxiii - xxiv |
| Appendix 4 – Data extraction form | xxv - xxvi |
| Appendix 5 – Items from the Barratt Impulsiveness Scale – Version 11 (BIS-11; Patton, Stanford & Barratt, 1995) | xxvii - xxviii |
| Appendix 6 – Research study information sheet for control participants | xxix - xxxii |
| Appendix 7 – Research study information sheet for offender participants | xxxiii - xxxvi |
| Appendix 8 – Research study consent form | xxxvii |
| Appendix 9 – Items from the Impulsivity, Risk-Taking, and Sensation Seeking Scale (IRTSSS; Schafer, Blanchard & Fals-Stewart, 1994) | xxxviii |
| Appendix 10 – Research study demographics form | xxxix |
| Appendix 11 – Word list for the emotional Stroop task devised by Smith and Waterman (2004) | xl |
| Appendix 12 – Internet-themed word list for the emotional Stroop task | xli |
| Appendix 13 – Items from the Sexual Compulsivity Scale (SCS; Kalichman & Rompa, 1995, 2001) | xlii |
| Appendix 14 – Items from the Sexual Symptom Assessment Scale (S-SAS; Raymond, Lloyd, Miner & Kims, 2007) | xliii - xliv |

# Chapter 1: INTRODUCTION

Understanding offending behaviour may be argued as one of the most important areas of modern research, due to the significant costs to both society and the individuals involved. In particular, sexual offending is viewed as one of the most psychologically damaging criminal behaviours therefore great effort has been put into trying to understand such behaviour in order to improve preventative management and treatment strategies.

## Prevalence of sexual crime

Sexual offending encompasses a range of criminal behaviour conducted by individuals which involve a sexual component. Much research has been done to explore how and why such offences may be committed, with the primary purpose of reducing the risk of further offending. In particular, there has been a significant focus on sexual offending against children due to the high prevalence of such activities and the vulnerable nature of the victims involved. It is thought that between 2012 and 2013, there were over 18,900 incidents of sexual offending against children, including indecent assault, sexual assault and rape (Office for National Statistics, 2013).

More recently, there have also been increased reports of sexual offences against children facilitated through the use of the Internet (Child Exploitation and Online Protection Centre, 2012); whereby online networks link computers across the world for the transmission of information and communication. The abuse of children through the Internet comprises many forms outlined in the Sexual Offences Act 2003, including the production and distribution of indecent images, the grooming of children for offline sexual activity, and the trading of children for sexual abuse by others. A report by the Child Exploitation and Online Protection

Centre (CEOP; CEOP 2014) estimated that in 2012 there were around 50,000 individuals involved in the possession and distribution of indecent images of children, indicating a significant problem on a globally widespread scale. This proliferate offending behaviour leads researchers to try and understand the motivation behind such acts, in order to develop and instruct appropriate risk assessment and intervention aimed at both recidivism reduction and prevention. Indeed, CEOP have advised that one of their key recommendations is to identify the characteristics of Internet sex offenders and to understand the link between such factors and the propensity for both online and offline offending (CEOP, 2012).

Understanding the characteristics of Internet sex offenders has been attempted in a variety of ways through the research domain, including theoretical propositions and behavioural testing based on such theories. It will be useful to initially examine some of the main theories of sexual offending before exploring facets of these which have been researched in more depth.

**Aetiological theories of sexual offending**

Cognitive and psychodynamic theoretical approaches for understanding sexual offenders have tended to focus upon their motivation above all else. For example, some models have drawn upon the emotional congruence that sex offenders experience with children and distortions used to "make it ok", as well as physiological and psychological arousal to children, and deficits in self-regulation (Finkelhor & Araji, 1986; Ward & Siegert, 2002). Sub-conscious explanations have also included a merge between the fantasies of childhood and sexuality, as well as trauma-related emotions driving the individual to seek out deviant sexual stimulation for self-soothing dominance (Wood, 2013). Whilst these models are useful in their application to some cases of sexual offending, they appear to lack a comprehensive

approach which may be explanatory for all incidents; therefore multifactorial models have attempted to rectify this issue.

One model which utilises the concept of multiple interacting systems is the Pathways Model (Ward & Siegert, 2002). This theory proposes that sexual offenders are motivated to offend through the activation of four distinct pathways; intimacy deficits, distorted sexual scripts, emotional dysregulation and cognitive distortions. Ward and Siegert have argued that all four pathways may be activated to different degrees which results in different modes of offending behaviour. This account is useful as it appears to account for difficulties that may be evidenced within applied research; however it continues to lack depth of explanation for other causal factors that influence these pathway mechanisms, such as neuropsychological factors. This is particularly important when distinguishing individuals who may have developed in the same environment and had similar difficult life experiences; however are differentiated by their pro or antisocial behaviours. An alternative multifactorial approach which attempts to explain some of these issues in more depth is the Integrated Theory of Sexual Offending (ITSO; Ward & Beech, 2006).

The ITSO aims to explain sexual offending by examining biological, social and psychological constructs, with overlapping mechanisms that provide a more complete aetiological account. It was developed in order to be an independent theoretical approach; however several models of sexual offending, including the Pathways Model (Ward & Siegert, 2002), may be easily mapped onto this framework. This multifactorial approach is therefore able to combine not just theoretical ideas but evidence from research looking into both psychosocial and neuropsychological perspectives. This is particularly useful given the extension of research in this area; for example from a neuropsychological point of view,

Kafka (1997) observed that serotonin deficits may be implicated within paedophilic arousal, whilst other researchers have identified significant disinhibition within the prefrontal cortex for offline sex offenders (e.g., Price & Hanson, 2007). These findings may therefore be placed into the model as aspects of 'biological functioning' as well as 'interlocking neuropsychological functions'. Psychosocial evidence may also be combined with these findings, through the 'ecological niche' factors to produce an interactive process which explains clinical symptomology.

The usefulness of theoretical models may be more completely understood when they are applied to a clinical sample. In terms of specific Internet sexual offending, Wood's (2011) psychodynamic approach appears to explain this as a way for individuals to replace vulnerability with control, as an expression of deviancy and as a defence against challenging intimacies. Whilst these conclusions appear to make sense for a theoretical perspective, psychodynamic approaches are difficult to evidence through structured assessment and therefore the efficacy of this approach is limited. Concerning multifactorial models which may be more robustly measured, such as the Pathways Model and ITSO, Internet sex offenders have also been applied (Middleton, Elliott, Mandeville-Norden & Beech, 2006; Elliott & Beech, 2009). It was observed that they represent a diverse group with particular deficits for intimacy skills and emotional regulation. Of note, it was highlighted that dysfunctional self-control mechanisms lead to the presence of problematic mood states and impulsive behaviours that drive offending behaviour. This was suggested as an area requiring further investigation through the exploration of Internet offender characteristics, specifically those relating to impulsiveness.

**Characteristics of individuals who sexually offend**

In order to expand on motivational theories, research has begun to explore the characteristics of sexually offending individuals in order to improve our understanding of this behaviour. Research for characteristics of offline sex offenders has provided a picture of criminogenic needs (Ward & Stewart, 2003a), which may be usefully targeted within interventions. This includes, but is not limited to, pro-criminal attitudes, intimacy difficulties, deviant sexual interests and sexual preoccupations (Hanson, Bourgon, Helmus & Hodgson, 2009). In addition to considering motivation, research has also explored modus operandi, that is, the way in which individuals sexually offend; for example through intra or extra familial offending (e.g., Fischer & McDonald, 1998), offending facilitated through use of the Internet (e.g., Webb, Craissati & Keen, 2007) or specific choice of victim, such as a particular gender or age (e.g., Kalichman, 1991; Worling, 1995). This has been seen as important in order to distinguish different typologies of sex offenders, with theorised implications for risk based on contextual features.

Due to the unique methodology used and the dangerous nature of the Internet as an accessible, affordable and anonymous tool for offending behaviour (Cooper, 1998), Internet sex offenders are becoming more widely studied within sex offender research. These individuals have engendered questions regarding the purpose of the Internet; as a method by which sexual offending is carried out, or as a specific part of the offending behaviour or ritual. It has been noted that there appears to be some disparity in the way that these individuals behave; either solely committing (non-contact) offences online - hereafter referred to as online-only - or committing both online (non-contact) offences and offline (contact) offences - hereafter referred to as cross-over. In order to better understand the exclusivity of these differing modus operandi, it has been considered helpful to understand the psychological characteristics of these individuals, often in comparison to offline sex

offenders, to identify similarities or differences. By doing so, it may be possible to further evidence the theoretical underpinnings of Internet sexual offending and to clarify more robust typologies if they are present. Identifying characteristics of this population may also augment our knowledge regarding the Internet as a significant criminogenic feature, or as merely a tool to facilitate offending that may have occurred irrespective of means.

The current research base for understanding characteristics of Internet sex offenders appears to have focused primarily on demographic factors and characteristics relating to the practical process of offending (Quayle & Taylor, 2001; Quayle & Taylor, 2002a; Mitchell, Finkelhor & Wolak, 2005; Eke, Seto & Williams, 2011). Whilst these are useful areas of study, they are less related to criminogenic need than more psychologically-related features, such as attitudes, emotional regulation and interpersonal relationships; therefore studies which have extended their research into this area may be more relevant for risk-reduction applications (e.g., Quayle, Vaughan & Taylor, 2006; Webb, Craissati & Keen, 2007; Elliott, Beech, Mandeville-Norden & Hayes, 2009; Elliott, Beech & Mandeville-Norden, 2013). In addition, the focus on psychological variables also allows for greater cohesion with aetiological theories; for instance exploring the emotional dysregulation and deviant sexual ideation processes outlined in the Pathways and ITSO models (Ward & Siegert, 2002; Ward & Beech, 2006).

Studies which have aimed to understand the distinction between online-only and cross-over Internet sex offenders initially appear to have contrasting conclusions, with some evidencing distinct cohorts (e.g., Webb, Craissati & Keen, 2007; McCarthy, 2010), whilst others find overall levels of homogeneity (e.g., Seto & Eke, 2005; Wolak et al., 2005). It is unclear as to

the extent of these disputing conclusions and therefore a systematic review has been included within this thesis in order to provide some clarity on this position.

**Impulsivity**

As has been observed in the literature on theoretical models and characteristics of sexual offenders, impulsivity is an important consideration when attempting to understand their behaviour. Indeed, the emotional regulation account of sexual offending has been furthered into a specific theory founded in self-control mechanisms (Ward, Hudson & Keenan, 1998). This theory suggests that deficits in such mechanisms fall into two pathways based on the inability to inhibit deviant sexual thoughts and actions, as well as the attempted suppression of deviant fantasies which leads to inappropriate action. Ward, Hudson and Keenan also describe a third pathway by which self-control is intact; however the actions are in themselves deviant due to inappropriate beliefs or attitudes regarding sexual activity.

This model is designed to be dynamic, as the authors recognise that impulsiveness may alter with the goals trying to be achieved. For example, an individual may attempt to suppress their desires which leads to impulsive actions that meet their criminogenic needs; this may then lead to the action being viewed positively which may enforce – or reinforce – minimisation and pro-offending attitudes. This model is useful as it acknowledges the individualisation in goal-directed behaviour whilst also accounting for external factors that may influence response inhibition; this approach appears to be supported by research which distinguishes between state and trait impulsiveness (e.g., Wingrove & Bond, 1997; Guerrieri et al., 2007). This self-regulation theory also integrates well with the ITSO model (Ward & Beech, 2006),

which highlights difficulties in impulse control as a deficit in the "action selection and control system", that is similar to the first pathway described by Ward, Hudson and Keenan. In addition, the ITSO model proposes that maladaptive beliefs and attitudes incite problematic actions, and arise through the "perception and memory system", which holds similarities with the third pathway in the self-control model.

It appears as though some studies have also begun to provide evidence for impulsivity deficits in sex offender populations; for example Smith and Waterman (2004) observed that sex offenders had greater difficulty in inhibiting their automatic reading response during an emotional Stroop task when presented with sexually-themed stimuli. Whilst this experiment indicated problems in response inhibition, it was notable that there was specific interference from sexual words only, indicating deviant stimuli which interfere with information-processing capabilities. This research would support the notion of both poor action and selection control functions as well as maladaptive goals; as proposed in the ITSO and self-regulation models (Ward, Hudson & Keenan, 1998; Ward & Beech, 2006). The ITSO model has a greater focus on neurological functioning in combination with psychological mechanisms, in order to account for the role of the brain in the development and maintenance of deviant behaviours. Some research has explored the physiological side of sexual offending and some evidence of impulsiveness deficits have been noted. For example, one study utilising penile plethysmography observed that sex offenders and control subjects could not be differentiated based on deviant stimuli; however there were differences observed in the ability to control reactions to these stimuli, with control subjects producing significantly superior results (Howes, 1998).

When considering interventions for sex offenders, with a view to reducing reoffending, the risk-need-responsivity principle must be upheld as the gold standard for research and clinical

practice (Andrews & Bonta, 2006), with additions from strengths-based approaches which have proved useful in practice (Ward & Stewart, 2003b; Andrews, Bonta & Wormith, 2011). In terms of criminogenic need, self-control has been described for general offending rather than sexual offending specifically; however it is likely that in practice there is some overlap, particularly when research studies evidencing impulsivity deficits are taken into account (e.g., Smith & Waterman, 2004; Price & Hanson, 2007). It is also important that the nature of these deficits is considered, as described in the self-control model and literature on state and trait impulsivity, as this should allow for more responsive treatment approaches. This is particularly important when attempting to understand and work with a relatively new type of offending behaviour, such as sexual offending facilitated through the Internet.

Whilst some characteristics of Internet sex offenders have been explored, the role of self-control is still largely unknown, despite several recommendations for this area to be better understood. This has been specifically emphasised in relation to online-only Internet sex offenders potentially crossing over to offline contact offences, particularly when other differentiators are not present (Quayle & Taylor, 2002; Babchishin, Hanson & Hermann, 2011; Elliott & Beech, 2013). Research that has begun exploring inhibitory control mechanisms in Internet sex offenders has found results which are indeed indicative of deficits (e.g., Middleton, Elliott, Mandeville-Norden & Beech, 2006), further evidencing the need for more thorough exploration.

**Aims and objectives**

The current knowledge base regarding Internet sexual offending appears inconclusive in terms of typologies and characteristics. There also continues to be a lack of understanding for the disparity of risk between such typologies and the propensity for offences to be committed

outside of the online environment. Whilst such issues remain unknown, difficulties in accurate risk assessment are perpetuated and interventions are unable to be responsive to this risk, leading to reduced confidence in their efficacy as well as a lack of clarity for resource distribution. The purpose of this thesis is to attempt to fill some of our knowledge gaps by improving current understanding regarding the role of inhibitory control in Internet sexual offending, and the relevance of this for offender typologies. In addition it hopes to unite empirical research in this area with theoretical understandings of sexual offending, specifically applied to the Internet. This work should enable a greater understanding of the risk implications for Internet sex offenders and perhaps provide some guidance for assessment, management and treatment of such. This is particularly important, given that the integration of research and clinical work is considered best practice for protecting the public by managing recidivism, with tangible results from psychologically-informed treatment programmes beginning to be evidenced (e.g., Middleton, Mandeville-Norden & Hayes, 2009), as well as being an ethical responsibility for clinicians (American Psychological Association, 2010).

The following chapter is a systematic literature review which will provide an overview of the current research understandings into Internet sex offender characteristics. This review should enable the most robust empirical studies to be examined so that overall conclusions, upon which this thesis is based, may be drawn with confidence.

# Chapter 2

# EXAMINING THE CHARACTERISTICS OF ONLINE-ONLY AND CROSS-OVER INTERNET SEX OFFENDERS: A SYSTEMATIC LITERATURE REVIEW

**Abstract**

The Internet has been a useful tool for facilitating positive change and growth within society; however it has also provided a foundation for some individuals to express and reinforce deviant sexual ideals, with child sexual abuse as a prevalent outcome. Current research proposes that child sexual abuse is facilitated online through the production, distribution and collection of indecent images as well as through public "chat rooms" and social networking sites as means of victim selection and "grooming" for contact sexual offences. One of the key questions regarding the individuals who perpetrate and perpetuate such abuse is whether they are distinct types of offenders based upon their particular modus operandi. In particular this relates to whether individuals who commit offences related to indecent images of children are a distinct category of offender compared to those who commit contact sexual offences facilitated by the Internet.

Previous criminological reviews and meta-analyses have been conducted on the distinction between sex offenders who commit sexual offences either online or offline; however no review to date has focused on the sub-category distinction of Internet offenders. The current review intends to consider the evidence for heterogeneous and/or homogeneous characteristics of Internet sex offenders, either online-only or cross-over, and attempts to provide an overview of the research conclusions.

A protocol was devised for the current review with explicit research questions and objectives outlined. An initial scoping search identified a need for the review and a presence of available literature. Key terms were devised in the protocol and were used to search three large bibliographic databases, from which 3768 papers were found to be relevant to the review. A PICO with inclusion and exclusion criteria was applied to these papers and fifteen studies

remained, of which six were unobtainable. Quality assessment was conducted on the remaining nine papers and two were excluded, leaving seven papers from which to extract appropriate data to answer the research questions.

Heterogeneous factors were identified in all seven studies, with some conflict over group ownership of characteristics. Sexual behaviours, substance use, paraphilic diagnoses and emotional factors were highlighted as commonly identified characteristics in the research. Homogeneous factors were noted in six of the studies, which may be a significant finding in this research field, as homogeneity of Internet sex offenders is more often apparent in qualitative rather than quantitative data.

Sexual behaviours presented as the biggest discriminator for online-only and cross-over Internet sex offenders. The research disagreed on paraphilic diagnoses; however quality of research methodology indicated greater empirical grounding for findings that contact offenders are significantly more paraphilic. Homogeneous factors were also found, however identification of these was by absence of statistical difference and therefore their validity may be contested.

The differences in characteristics appear to propose distinct sub-categories of Internet sex offenders; however the homogeneous data is needed to be further examined before the research is fully conclusive. Inclusion of qualitative and quantitative data will aid in providing more comprehensive results in future.

## Introduction

The growth of the Internet has produced opportunities for increased economical productivity and communication between people on a global scale. However, there have also been opportunities for misuse of this facility through cyber-criminal activities, such as the direct and indirect sexual abuse of children. Such sexual offences include the production and distribution of indecent images of children, sexual exploitation and trafficking, and "grooming" behaviours in order to commit a contact sexual offence or incite engagement in sexual activity (Sexual Offences Act 2003). Research into Internet-initiated sexual offences has noted an increase in awareness of such acts; however actual prevalence rates are difficult to accurately measure (Taylor & Quayle, 2003; Elliott & Beech, 2009). Such offending may have potentially increased due to sophisticated technology lowering the rate of detection (Krone, 2005) or increased communicative networks, such as peer-to-peer sharing, facilitating widespread distribution of offence-related material (Steel, 2009).

Individuals who use the Internet to facilitate child sexual abuse have been studied fairly extensively, particularly over the last decade, with one of the largest areas of research focusing upon individuals producing, collecting or distributing child pornography. A wide variety of pornography is readily available (D'Orlando, 2011) and highly demanded (Freeman-Longo & Blanchard, 1998) on the Internet and the amount of available material has grown exponentially; potentially due to the anonymity, accessibility and affordability that the Internet medium provides (Cooper, 1998; Putnam, 2000). Along with this increase in quantity has also been observed an increase in the explicit content of the material (Beech, Elliott, Birgden & Findlater, 2008), with sadistic, bestial and paedophilic imagery becoming more commonplace. It has been proposed that individuals who view such material may be experiencing the effect of desensitisation, leading them to require more extreme content for

sexual gratification (Sullivan & Sheehan, 2002). It has been observed that severe and explicit pornography, in particular indecent images of children, is primarily accessed through peer-to-peer network sharing (Cameron, 2008) as this promotes anonymity for the users, free access to wider collections of images and inclusion within a specialised online community. Online paedophilic communities may serve a reinforcing function for individuals with deviant interests as they often minimise the abusive aspects of child pornography (Durkin, 1997) and provide status for members (Quayle, Lööf & Palmer, 2008). As a result of such widespread availability and the increase in networking and perceived justification for viewing such material, there is a need to consider the impact that viewing indecent images of children may have upon the prevalence of child sexual abuse.

Indecent images of children inherently require the abuse of children for production of material and this is augmented by the demand for more images with more explicit content. Increased production may also benefit some individuals financially through distribution at a commercial level, however this has found to be minimal in comparison to free sharing (Cameron, 2008). It has been suggested that individuals viewing indecent images of children may have a deviant sexual interest in minors which precedes their exposure to such material on the Internet (Sheehan & Sullivan, 2010). This finding would suggest that paedophilic interests may not be contained to merely online offences and at least deems such individuals susceptible for offline sexual offences against children; relating to inferences that sex offenders may be placed on a continuum for offending behaviour (Robertiello & Terry, 2007). This contradicts other research perspectives that Internet sexual offenders display distinct typologies (McLaughlin, 1998); suggesting that it is unlikely for indecent image possessors to include contact offences in their repertoire. However, it may also be the case that specialist typologies as well as versatile "combination" offenders are apparent within the

scope of the Internet sex offender population (Soothill, Francis, Sanderson & Ackerley, 2000; Alexy, Burgess & Baker, 2005).

Quantitative studies identifying motivations behind Internet sexual offending appear to indicate a disparity between those who use the Internet for "fantasy-driven" means, in order to experience sexual gratification from online encounters, and those who use the Internet for "contact-driven" means, in order to locate victims and physically elicit sexual abuse (Briggs, Simon & Simonsen, 2011). These typologies have been evidenced based upon conviction data and, as such, qualitative research appears to present conflicting findings. Some researchers have highlighted the implicit desire for contact in online sexual offenders (Calder, 2004), others suggest a graduation from online to offline offending (Sullivan & Beech, 2003) and others indicate pornography as functional for the perpetration of contact offences (Goldstein, 1999).

The conflict of interpretations within the research of Internet sex offenders suggests that collaboration of findings and reviews of quality and consistency in methodology is required. By systematically comparing studies, including their sample, method and outcomes, it may be possibly to understand why a disparity in findings is evident. Babchishin, Hanson and Hermann (2011) conducted a meta-analysis of research into the characteristics of online and offline sex offenders and found similar rates of negative childhood experiences. However they also noted differences in demographics and psychological variables, for example that online offenders are more likely to be young Caucasians with greater sexual deviancy and higher victim empathy. The studies included in this meta-analysis met a specific set of criteria and were subjected to interrater reliability testing to ensure quality in study selection. This method of analysing research allows for conclusions to be drawn based upon the best

possible evidence in a scientific, measurable manner. Babchishin, Hanson and Hermann highlighted that they had included studies of online offenders without distinct categorisation of online-only and cross-over sexual offences and that this would be a useful classification to include in future work.

The supposition that sub-classifications may be made for Internet sex offenders was drawn from research by Seto, Hanson and Babchishin (2011), who identified in a meta-analysis that approximately one in eight Internet sex offenders have a history of contact sexual offending. It was on this empirical basis that a systematic review of the characteristics of online-only and cross-over Internet sex offenders was deemed necessary. A scoping search was carried out across systematic review databases to identify whether this comparison of literature had previously been conducted. If a previous review existed, then it would only be prudent to carry out another review in order to update the included research. The databases searched were The Cochrane Library, the Database of Abstracts of Reviews of Effect and The Campbell Collaboration Library of Systematic Reviews. Babchishin, Hanson and Hermann's (2011) meta-analysis was the only review apparent for the topic of Internet sex offender characteristics and there were none employing the specific research questions of the current appraisal. A scoping search of bibliographic databases identified a plethora of research regarding Internet sex offenders and a sufficient amount of identifying characteristics, which enabled this review to be conducted.

The current review aims to answer the following research questions:

- Are there characteristic similarities between online-only and cross-over Internet sex offenders?

- Are there distinct differences in the characteristics of online-only and cross-over Internet sex offenders?
- Does the available research present a general homogeneous or heterogeneous view of Internet sex offenders?
- Is there sufficient evidence upon which to base the conclusions of Internet sex offender typologies?
- What is the quality of the available evidence?
- Is there consistency in methodology for establishing similarities and differences in characteristics of Internet sex offenders?

The objectives of the current review for answering the research questions are:

- To identify heterogeneous characteristics for online-only and cross-over Internet sex offenders.
- To identify homogeneous characteristics for online-only and cross-over Internet sex offenders.

The objectives by which the aims are intended to be met are carried out through a systematic process of reviewing the literature, in order to scientifically compare and analyse the best quality data for answering specific research questions. Explicitly this includes identifying relevant research through strategic searching of bibliographic databases; applying inclusion and exclusion criteria; assessing the quality of included research; extracting the relevant data; synthesising the data for conclusive outcomes and analysing bias which affects those outcomes.

## Method

**Sources**

Three electronic bibliographic databases were chosen for this review: PsycINFO (1967 to February Week 3 2014), EMBASE & EMBASE Classic (1974 to 2014 Week 07), and Web of Science (1970 to Week 07 February 2014), in order to cover literature from psychology, social science and biomedical disciplines. These databases provide over 50 million source references from which to search and therefore date and language restrictions were deemed necessary to refine the search strategy; only papers written in the English language were included in the scoping search and publishing dates were restricted to 1980 onwards. This date was selected as the Internet only became available for commercial use during the 1980s and thus Internet sexual offending is unlikely to have been a reported issue prior to this date. Several authors were contacted for literature and material was obtained from Dr Ann Wolbert Burgess of Boston College's Connell School of Nursing, Dr Daniel Wilcox of Wilcox Psychological Associates, Dr Liam Marshall of Rockwood Psychological Services and Dr Sébastien Prat of St Joseph's Healthcare and McMaster University.

**Search Strategy**

Initial key terms were devised from a brief overview of the existing literature on this subject, identified in the scoping search. Mesh headings were used in order to identify synonymous or related terms and truncations were employed to encompass all potential spelling and grammatical usage. Once a sufficient number of terms had been identified for the search concepts, they were applied to each bibliographic database (see Appendix 1 for the search syntax). The final selection of key terms was:

fantas* OR contact* OR porn* OR groom* OR molest* OR abus* OR "indecent image*" OR picture* OR image* OR cyber* OR rape OR exploit* OR erotic* OR chat room* OR chat log* OR illegal* OR sex* OR coerc* OR offen?e* OR paraphil*

AND

child* OR kid* OR minor* OR victim*

AND

Internet OR web* OR online OR Internet-based OR "social network*" OR "world wide web"

AND

sex* OR offend* OR p?edophil* OR criminal* OR predator* OR "p?edophile ring" OR "p?edophile network" OR devian* OR trade* OR shar* OR travel* OR aggress*

AND

character* OR heterogene* OR homogene* OR factor OR distinguish* OR trait OR feature OR attribut*

**Study Selection**

The studies selected for quality assessment were refined according to specified inclusion and exclusion criteria which were identified in a protocol prior to commencement of the review.

A PICO was then formulated to outline the refined inclusion and exclusion criteria for the systematic process (see Appendix 2). The population for this review were adult males who had been arrested for a sexual offence against a child committed through use of the Internet; this could either be a cross-over contact offence (including attempted contact), for example grooming a child; or online-only non-contact offence, for example possession of indecent images of children. Female or adolescent offenders were excluded, as well as adult males without charges for an online sexual offence or with charges for a non-sexual Internet crime. Studies were excluded if they only concerned one type of Internet sex offender as this review was specifically focusing on the comparison between both online-only and cross-over online offenders.

The variable for this search was offender characteristics, with at least one differing characteristic between online-only and cross-over Internet sex offenders required for study inclusion. There was no comparator identified for inclusion as the Internet sex offenders being compared were both part of the same population and would not be observed in comparison to other groups or individuals. The outcome of included studies would be online-only and cross-over sexual offences committed through use of the Internet. The studies included for review would only be presented in the English language due to time constraints for finding all language papers and acquiring translations.

In order to ensure best quality results and adequate comparisons for characteristic differences, it was determined that only quantitative research would be included in the review and therefore study designs of a qualitative nature, such as narrative reviews, were excluded. As has been previously mentioned, the timespan for publications was limited to 1980 until 2014 in order to produce a relevant but representative sample of papers to review.

The full texts of studies which adhered to the inclusion and exclusion criteria were identified and the majority of studies were accessible for quality assessment. Figure 1 is a flow diagram explicitly demonstrating the search strategy used in this review.

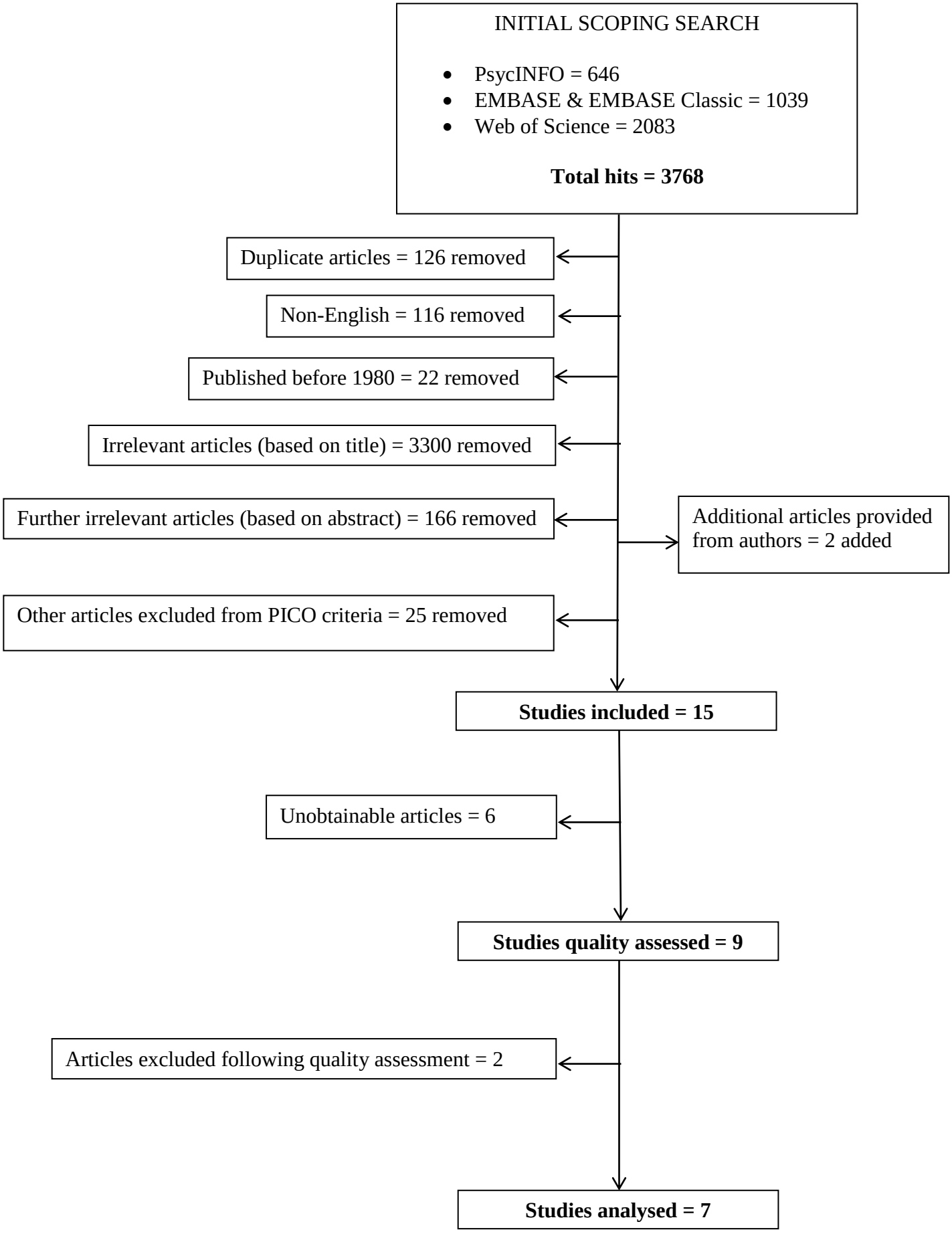


Figure 1: Flow diagram of the study selection process

## Quality Assessment

There were nine studies included for quality assessment as six articles were unobtainable from either electronic sources, the British Library or from authors. Quality assessment criteria were formed from critical appraisal tools for case control and case series research designs. The original checklists were accessed from the Critical Appraisal Skills Program authored by the NHS Public Health Resource Unit, and then modified for applicability to the current review. Modification was required as this review was not based on a medical framework, such as examining the effect of an intervention, and therefore some quality assessment items were not applicable. The quality checklists were used to identify selection bias, measurement bias, classification bias and the reliability and validity of results in order to ensure that only the best quality studies were included in the final analysis (see Appendix 3). Studies were scored on the quality assessment items by the presence or absence of each feature or whether it was unclear in the paper; studies were scored with 1 point for the presence of a quality item, 0 for the absence of a quality item or -1 for an unclear classification. Unclear responses were subtracted from the score as they suggest flaws in the clarity of methodology or write-up of the study. Total scores were translated into a percentage and those studies with a score below 70% for quality were excluded from the final analysis. This cut-off score was arbitrary; however, similar to other research (e.g. Bizzini, Childs, Piva & Delitto, 2003), 70% was used in order to establish a fair representation of quality within the review. This score aimed to avoid being overly critical due to the small selection of papers available, as well as avoiding being overly inclusive of substandard studies.

## Data Extraction

Following the quality assessment there were seven studies eligible for data extraction as two articles were excluded for falling below the 70% quality score limit. The data extraction

process uses a standardised form in order to select and extract the same data from each included study. In this way the process remains systematic and avoids biasing towards one paper or another, so that validity and reliability of the review itself is upheld. The data extraction form used in this review was an amalgamation of several example forms in order to produce a structure which was suitable for the included studies, in a similar manner as was done for the quality assessment checklist (see Appendix 4). The data extraction form considered the following:

- Where the study took place and in what year
- The publication type
- The aims of this review in comparison to the aims and objective of the study being analysed
- The research design and inclusion or exclusion criteria for their methodology
- Whether the study was informed by research or linked to empirical evidence
- The sample size and number of comparison subjects
- Methodology for data collection and selection
- The analysis used and specific statistical techniques to produce findings
- Reported results and those relevant to the present review
- The reliability and validity of measures used and the findings produced from the study

## Results

Nine studies were subjected to quality assessment and two were removed following this process. Niveau's (2010) paper was excluded due to small sample size of cross-over Internet sex offenders and an unclear distinction between these and online-only Internet sex offenders throughout the analysis, negatively affecting reliability of findings. Seto, Wood, Babchishin

and Flynn's (2013) study was also excluded as a result of potentially small sample size for cases and controls as well as lack of clarity regarding the method reliability. Seven articles were then included in the data extraction process; Endrass, Urbaniok, Hammermeister, Benz, Elbert, Laubacher and Rossegger (2009); Krueger, Kaplan and First (2009); McCarthy (2010); Neutze, Seto, Schaefer, Mundt and Beier (2010); Briggs, Simon and Simonsen (2011); Elliott, Beech and Mandeville-Norden (2013); and Long, Alison and McManus (2013). The quality characteristics of these studies are presented in Table 2.1.

Following data extraction of the seven remaining articles, it was evident that the majority of the research proposes Internet sex offenders to be a heterogeneous group with differentiating characteristics, defining those who utilise the Internet for fantasy-driven purposes and those who use the Internet for contact-driven purposes. Briggs, Simon and Simonsen (2011) identified the most differences between the two groups of offenders, in particular demographics such as marital status, age and education, and behavioural characteristics such as incentives used, length of online relationship and sexual behaviours displayed. In terms of sexual behaviours, these authors noted that online-only Internet sex offenders displayed more sexual behaviours online, including more incidents of "cybersex", which are sexual activities mediated by computer technology (Hernández, 2011); for example sexually explicit chat or masturbation whilst viewed over web camera. Although heterogeneity is supported by Krueger, Kaplan and First (2009), this specific finding for online-only offenders is unsupported as they noted a greater prevalence of hypersexual disorder characterised by cybersexual dependence in contact Internet sex offenders. Furthermore, McCarthy (2010) found that contact offenders were more likely to engage in a combination of sexual activities. McCarthy's research received the highest score for quality when assessed in this review, whereas Briggs, Simon and Simonsen's research received the lowest score. McCarthy

demonstrated greater avoidance of selection, measurement and classification bias suggesting that her outcomes may hold greater weight for reliability.

Briggs, Simon and Simonsen (2011) noted that contact offenders were more likely to be younger and unemployed, and less likely to have been married or received formal education whereas McCarthy (2010) found that demographic variables were similar for age, education and marital status. Long, Alison & McManus (2013) also found that age did not differ significantly across groups, although they found differences in living arrangements, as contact Internet sex offenders were more likely to be living with a partner and their children. The research by Briggs and colleagues also identified a range of homogeneous characteristics between their samples, such as compulsive pornography use and promiscuous offline sexual behaviours. The similarities noted may reflect homogeneous characteristics reflective of sex offenders in general whereas the overall large number of differences suggests support for distinct typologies of within a sample of Internet sex offenders. Endrass et al. (2009) identified that contact Internet sex offenders were more likely to recidivate with a contact sexual offence, which would support the conclusion from Briggs, Simon and Simonsen (2011) that the samples of offenders are distinct.

McCarthy (2010) presented findings that contact Internet sex offenders may engage in a combination of sexual activities such as possessing large collections of indecent images of children, using "grooming" behaviours online and contacting others with similar deviant interests. These outcomes may relate to the demographics specified by Briggs, Simon and Simonsen (2011), as it is likely that unemployed individuals may have more leisure time in which to collect a greater number of indecent images or spend longer developing an online relationship in order to meet potential victims. However, it should be considered that online-only offenders were shown to have longer online relationships by Briggs, Simon and

Simonsen in their study and findings from Long, Alison and McManus (2013) indicate that online-only Internet sex offenders were also more likely to have larger numbers of indecent images in their possession. This may either suggest that increased leisure time is not required for the grooming process and thus the demographic variables are not correlated or that online-only offenders are potentially grooming victims over a longer period of time and may have been convicted of an indecent image offence before a contact offence could be carried out. This hypothesis would therefore expect similar characteristics across the two groups.

Despite having identified some differences in hypersexual disorder diagnoses, Krueger, Kaplan and First (2009) found similarities in the occurrence of post-traumatic stress disorder, paedophilia and paraphilias, major depressive disorder and alcohol use disorder. These variables may be indicative of similar lifestyles, personality types and trauma experiences between online-only and cross-over Internet sex offenders. Neutze and colleagues (2010) found evidence which supports these findings regarding psychological functioning as they evidenced similar high levels of emotional deficits across both groups. Whilst Elliott, Beech and Mandeville-Norden (2013) reported differences for self-control mechanisms, such as impulsiveness and assertiveness, indicating a differentiating role in behaviour, they also found similarities in the beliefs and attitudes held by both offender groups. McCarthy (2010) observed that both groups frequently shared a history of child abuse which is likely linked to some of the psychological difficulties reported in these other studies.

Neutze et al. (2010) suggest that Internet sex offenders are characterised by more shared than differing characteristics. Their findings do not support differential typologies for online-only and cross-over Internet sex offenders, possibly implying that all Internet sex offenders may on a continuum of risk for perpetuating further offences, either online or offline. Neutze and

colleagues indicate that differences were mainly observed when comparing online to offline sex offenders. The fact that online offenders differ as a whole group from offline offenders may suggest that use of the Internet serves a particular function for individuals who are younger, have less offence-supportive cognitions and are more likely to be employed.

All papers discussed here were rated high for quality overall; however the studies by Neutze et al. (2010) and Krueger, Kaplan and First (2009) presented with issues for reliability based on inadequate validity of measures and poor disaggregation of participants in the analyses. These quality deficits may impact the reliability of findings in comparison to the other research studies without such concerns.

Table 2.1: Quality of included studies

| Author | Study Design | Sample | Avoids selection bias | Avoids measurement or classification bias | Findings | Reliability of findings | Quality assessment score |
|---|---|---|---|---|---|---|---|
| **Endrass, Urbaniok, Hammermeister, Benz, Elbert, Laubacher, & Rossegger (2009)** | Case series | Cross-over ISOs = 2<br>Online-only ISOs = 224 | 67% Yes<br>33% Unclear | 67% Yes<br>33% No | Cross-over ISOs:<br>-50% (n=1) recidivated with a contact sexual offence<br>Online-only ISOs:<br>-0.4% (n=1) recidivated with a contact sexual offence | 100% Yes | 81% |
| **Krueger, Kaplan & First (2009)** | **Case control** | **Cross-over ISOs = 22**<br>Online-only **ISOs = 38** | **89% Yes**<br>**11% No** | **67% Yes**<br>**33% No** | **C**ross-over **ISOs:**<br>**-were more likely to have a diagnosis of hypersexual disorder characterised by cybersexual dependence (p<0.5) but only 30% had the diagnosis.**<br><br>Online-only **ISO**s:<br>**-were more likely to have a diagnosis of hypersexual disorder characterised by pornography dependence (p<0.5) but only 21% of these subjects had the diagnosis**<br>**-were more likely to have a diagnosis of a substance use disorder associated with their criminal behaviour (p=0.5)** | **75% Yes**<br>**25% Unclear** | **81%** |

Table 2.1: Quality of included studies

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **McCarthy (2010)** | Case control | Cross-over ISOs = 51<br>Online-only ISOs = 56 | 89% Yes<br>11% No | 100% Yes | Cross-over ISOs were more likely to:<br>-have history of illicit drug use<br>-have history of more than one conviction for a sexual crime<br>-have diagnosis of paedophilia<br>-use the Internet to locate potential sexual abuse victims and engage in grooming behaviour<br>-contact others with similar deviant interests<br>-have larger child pornography collections<br>-engage in a combination of activities and to save child pornography to an external medium | 100% Yes | 94% |
| **Neutze, Seto, Schaefer, Mundt & Beier (2010)** | Case control | Cross-over ISOs = 50<br>Online-only ISOs = 64 | 89% Yes<br>11% No | 100% Yes | Cross-over ISOs:<br>-had recent child sexual abuse offences<br><br>Online-only ISOs:<br>-displayed different characteristics to offline sexual abuse offenders. | 50% Yes<br>25% Unclear<br>25% No | 81% |
| **Briggs, Simon & Simonsen (2011)** | Case control | Cross-over ISOs = 30<br>Online-only ISOs = 21 | 67% Yes<br>22% Unclear<br>11% No | 67% Yes<br>33% No | Cross-over ISOs:<br>-16.7% masturbated during chat versus 76.2% of non-contact ISOs<br>-16.7% encouraged their victim to masturbate during sex versus 61.9%<br>-6.7% engaged victim in cybersex versus 81%<br>-13.3% attempted to teach victims sexual behaviours versus 66.7% | 100% Yes | 75% |

Table 2.1: Quality of included studies

-13.3% offered to pay for sex versus 0%
-93.3% scheduled face-to-face meetings versus 14.3%
-80% attempted to meet victim versus 14.3%
-13.3% of subjects had a contact sexual offence versus 0%
-6.7% displayed exhibitionism on web camera versus 66.7%
-scheduled a specific meeting time/place
-were younger
-most had never been married
-had less formal education and were more likely to be unemployed
-engaged in few sexual behaviours (except grooming)

Online-only ISOs:
-13.3% sent victim online pornography versus 0% of cross-over ISOs
-had offender-victim relationships of average duration 32.9 days versus less than 24 hours for cross-over ISOs
- engaged in mutual masturbation, cybersex and/or exhibitionism with climax during cybersex or phone sex
-were more often diagnosed with a paraphilia and narcissistic personality disorder
-masturbated an average of 5.48 times per

Table 2.1: Quality of included studies

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | week versus 4.10 for cross-over ISOs<br><br>Both groups had compulsive pornography use, solicited adults online regularly, engaged in one-night stands, group sex and sex with prostitutes | | |
| **Elliott, Beech & Mandeville-Norden (2013)** | Case control | Cross-over ISOs = 143<br>Online-only ISOs = 459 | 89% Yes<br>11% No | 67% Yes<br>33% No | Cross-over ISOs:<br>- greater frequency of victim empathy distortions<br>- lower scores for overassertiveness<br>- higher levels of empathic concern<br>- higher levels of personal distress<br>- increased perspective taking<br>- generally more self-management deficits | 100% Yes | 81% |
| **Long, Alison & McManus (2013)** | Case control | Cross-over ISOs = 60<br>Online-only ISOs = 60 | 89% Yes<br>11% No | 67% Yes<br>33% No | Cross-over ISOs (compared to online-only ISOs):<br>- more likely to live with a partner and partner's children<br>- more likely to have access to children<br>- more likely to have previous nonsexual convictions | 100% Yes | 88% |

N.B. ISOs = Internet sex offenders

**Descriptive Data Synthesis**

Through data extraction it was possible to identify the heterogeneous and homogenous characteristics identified in each study with regards to online-only and cross-over Internet sex offenders (see Table 2.2). Endrass et al. (2009) identified two heterogeneous factors only; Krueger, Kaplan and First (2009) identified three heterogeneous factors and four homogeneous factors; McCarthy (2010) identified seven heterogeneous factors and six homogeneous factors; Neutze et al. (2010) identified two heterogeneous factors and three homogeneous factors; Briggs, Simon and Simonsen (2011) identified fifteen heterogeneous factors and five homogeneous factors; Elliott, Beech & Mandeville-Norden (2013) identified six heterogeneous factors and three homogeneous factors; and Long, Alison and McManus (2013) identified fourteen heterogeneous factors and five homogeneous factors.

Further synthesis has been carried out on this data to identify comparative characteristic features across the research (see Table 2.3). All seven studies identified at least one differing characteristics for the sexual behaviours employed by online-only and cross-over Internet sex offenders. Krueger, Kaplan and First (2009) found differentiating factors for substance use, as did McCarthy (2010). Briggs, Simon and Simonsen (2011) identified differences across diagnostic factors for paedophilia which was also found by McCarthy, and in addition to this Krueger, Kaplan and First noted differences for other paraphilic diagnoses. Finally, Kruger, Kaplan and First, McCarthy, Neutze et al. (2010) and Elliott et al. (2013) identified similarities for factors relating to cognitive and emotional deficits; McCarthy, Briggs et al., Elliott et al., and Long et al. (2013) also found differences within these domains.

The results of the data synthesis indicate that differences were mainly found for Internet sex offender characteristics. However, some similarities were also evident and it appeared that

the degree to which differentiation was present may vary greatly due to confounding factors, such as research methodology. Endrass et al. (2009) and Briggs, Simon and Simonsen (2011) used only descriptive statistics and frequencies in their analyses and so outcomes from those studies are based upon clinical, rather than statistical, significance. Krueger, Kaplan and First (2009) used descriptive statistics but tested for significance with either Fisher's Exact test or Chi Square; Neutze et al. (2010) also conducted statistical testing with Chi Square analysis. Long et al. (2013) used ANOVA and Mann-Whitney U tests whilst McCarthy conducted comparative analyses of the demographic and behavioural variables. Elliott et al. (2013) were the only authors to conduct discriminant functions analysis and multivariate general linear model analyses. This disparity in analytical approaches makes it difficult for conclusions to be effectively drawn and therefore the results of these studies should be considered with caution.

**Sexual behaviours**

Briggs, Simon and Simonsen (2011) proposed that cross-over Internet sex offenders display fewer sexual behaviours than online-only Internet sex offenders, who engage in a greater amount of cybersexual activity. However, this finding is opposed by Krueger, Kaplan and First (2009) who indicate that cybersex dependency is characteristic of contact offenders ($p < .05$) and by McCarthy (2010) who notes that a combination of sexual activities is more often seen in the contact demographic (explicitly described in Table 2.3; $p < .05$). Neutze et al. (2010) also revealed statistical significance for recent sexual offences in contact offenders ($p < .01$) and Endrass, et al. (2009) found that they were more likely to recidivate with a contact sexual offence. Long, Alison & McManus (2013) noted that cross-over offenders were more likely to have a history of convictions in comparison to online-only offenders, although these were more often deemed as non-sexual convictions. The findings suggestive

of prevalent sexual activity in cross-over offenders appears most valid due to statistically significant outcomes from more robust analysis, compared to descriptive statistical outcomes.

McCarthy (2010) found that cross-over Internet sex offenders were more likely than online-only Internet sex offenders to use "grooming" behaviours with children in order to engage them in sexual activity. The study by Long, Alison and McManus (2013) found evidence that may support these findings, as they observed contact Internet sex offenders to have greater access to victims through their living arrangements with a partner and their children ($p<.01$). They also found cross-over Internet sex offenders to be more likely to engage in offline grooming activities; however both groups appeared to show similar levels of online grooming. Briggs, Simon and Simonsen (2011) disagree with such conclusions however, as they found that online-only Internet sex offenders were more likely to engage in online grooming of children; this included encouraging or teaching sexual behaviours to victims online and having online relationships with children which lasted longer than two days.

Long and colleagues (2013) explored the content of indecent images possessed by both cross-over and online-only Internet sex offenders. They found that online-only Internet sex offenders were more likely to have larger collections of indecent movies and still images, with a greater age range of victims. These details were not explored by the other research studies; however they correlate with Briggs et al.'s (2011) findings of increased behaviours in the online domain by online-only Internet sex offenders.

**Substance use**

Krueger, Kaplan and First (2009) proposed a significant difference in substance use disorder ($p= .05$), which is supported by McCarthy (2010; $p< .01$); however the findings are opposed

directionally for the two groups, with Krueger et al. indicating greater diagnostic rates for online-only offenders whilst McCarthy suggests this for cross-over offenders. Both sets of research are North American in origin and based upon file data; however McCarthy's research paper attained the greatest perceived level of reliability and validity during quality assessment, including a larger sample of participants, thus suggesting those outcomes have a stronger evidence base.

**Paraphilias**

Briggs, Simon and Simonsen (2011) suggested from their findings that online-only Internet sex offenders were more likely to have a paraphilic diagnosis; however Krueger, Kaplan and First (2009) state there is no difference in prevalence across the two offender groups ($p = .66$) and McCarthy (2010) proposes that cross-over Internet sex offenders are more likely to have a paedophilic diagnosis ($p < .001$). Briggs, Simon and Simonsen did not explicitly state how diagnoses were made and so combined with non-statistical data does not provide an empirical foundation for validity of results. The difference in results across papers may reflect the use of different versions of a diagnostic manual for defining paraphilic criteria, or there may be an effect of sample size as McCarthy had over a third more participants included in her analyses.

**Cognitive and emotional factors**

In terms of trauma experiences, McCarthy found that there was fairly equal prevalence across online-only and cross-over Internet sex offenders for child abuse histories. This was supported by Krueger, Kaplan and First (2009) who found that there was no difference in the processing of trauma, with similar rates of Post-Traumatic Stress Disorder identified across groups. Neutze et al. (2010) also found similar high levels of psychological problems and

emotional deficits across both Internet sex offender groups, including difficulties in coping, sexual preoccupation, victim empathy, neuroticism, depression and loneliness. Elliott et al. (2013) also found similar levels of offence-supportive beliefs, beliefs relating to fictional characters and attitudes regarding cross-over Internet sex offenders as more dangerous than online-only Internet sex offenders. However, the research by Elliott and colleagues did identify some psychological areas of difference between the groups, including online-only offenders demonstrating fewer distortions regarding empathy for victims but less general empathy ($p<.001$), more assertion with less personal distress, and decreased perspective-taking ($p<.05$).

Table 2.2: Tabulation of included study data

| Author | Study Design | Sample | Heterogeneous characteristics | | Homogeneous characteristics |
|---|---|---|---|---|---|
| | | | **Characteristics of cross-over ISOs** | **Characteristics of online-only ISOs** | |
| **Endrass, Urbaniok, Hammermeister, Benz, Elbert, Laubacher, & Rossegger (2009)** | Case series | Cross-over ISO = 2<br>Online-only ISO = 224 | More likely to recidivate with a contact sexual offence | Rare recidivism for a contact sexual offence | |
| **Krueger, Kaplan & First (2009)** | Case control | Cross-over ISO = 22<br>Online-only ISO = 38 | More likely to have a diagnosis of hypersexual disorder characterised by cybersexual dependence | More likely to have a diagnosis of hypersexual disorder characterised by pornography dependence<br><br>More likely to have a diagnosis of a substance use disorder | Around half of each ISO type had a major depressive disorder<br><br>Similar occurrence of alcohol use disorder<br><br>Similar occurrence of post-traumatic stress disorder<br><br>Similar diagnoses for paedophilia and other paraphilias |

Table 2.2: Tabulation of included study data

| | | | | | |
|---|---|---|---|---|---|
| **McCarthy (2010)** | **Case control** | Cross-over **ISO = 51** Online-only **ISO = 56** | **More likely to have a history of illicit drug use**<br><br>**More likely to have a history of more than one sexual offence conviction**<br><br>**More likely to have a diagnosis of paedophilia**<br><br>**More likely to use grooming behaviour**<br><br>**More likely to contact others with similar deviant interests**<br><br>**More likely to have larger child pornography collections**<br><br>**More often engage in a combination of sexual activities** | | **Similar adult pornography collection sizes**<br><br>**Similar demographics for race/ethnicity**<br><br>**Similar demographics for marital status**<br><br>**Similar demographics for education attainment**<br><br>**Similar demographics for history of child abuse**<br><br>**Similar duration spent viewing child pornography** |
| **Neutze, Seto, Schaefer, Mundt & Beier (2010)** | Case control | Cross-over ISO = 50 Online-only ISO = 64 | More likely to have recent child sexual abuse offences | More likely to have different characteristics to offline sexual abuse offenders | No difference in relation to dynamic risk factors.<br><br>Similar levels of offence-supportive cognitions. |

Table 2.2: Tabulation of included study data

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Similar levels of sexual self-regulation problems.<br><br>Similar rates of emotional deficits.<br><br>Similar lifetime offence history |
| **Briggs, Simon & Simonsen (2011)** | Case control | Cross-over ISO = 30<br>Online-only ISO = 21 | Exclusive financial incentive offered to victim<br><br>Increased attempt to meet victim<br><br>Exclusive presence of contact sexual offence<br><br>More likely to be younger than non-contact ISOs<br><br>Only engaged in a few sexual behaviours<br><br>Less likely to have been married<br><br>Less likely to have formal education<br><br>More likely to be unemployed | More sexual behaviours<br><br>Increased encouragement or teaching of sexual behaviours for online victims<br><br>Increased cybersex<br><br>Increased exhibitionism on web camera<br><br>Exclusively sent online pornography to victim<br><br>More likely to have an online relationship over 2 days in length<br><br>More likely to have a diagnosis of a paraphilia or narcissistic personality disorder | Compulsive pornography use<br><br>Regular solicitation of adults online<br><br>Engagement in one-night stands<br><br>Group sex<br><br>Sex with prostitutes |

Table 2.2: Tabulation of included study data

| | | | | | |
|---|---|---|---|---|---|
| **Elliott, Beech & Mandeville-Norden (2013)** | Case control | Cross-over<br>ISOs = 143<br>Online-only<br>ISOs = 459 | Greater frequency of victim empathy distortions<br><br>Lower scores for over assertiveness<br><br>Higher levels of empathic concern<br><br>Higher levels of personal distress<br><br>Increased perspective taking | Generally better self-management skills | Similar level of offence-supportive beliefs (less than offline contact SOs)<br><br>Ability to relate to fictional characters (greater than offline contact SOs)<br><br>View other sex offenders as more dangerous, harmful and deviant than themselves |
| **Long, Alison & McManus (2013)** | Case control | Cross-over<br>ISOs = 60<br>Online-only<br>ISOs = 60 | More likely to live with a partner and partner's children<br><br>More likely to have access to children | Possessed significantly more indecent images of children (IIOC; still images and movies)<br><br>Possessed more still IIOC at level 1 and 2 | Similar age across groups (mean age = 42 years)<br><br>Both groups more likely to live alone than with a partner |

Table 2.2: Tabulation of included study data

| | | | |
|---|---|---|---|
| | More likely to have previous nonsexual convictions | | Similar amount of still and movie IIOC at level 5 |
| | Possessed more still IIOC at level 3 and 4 | Possessed more movie IIOC at levels 1, 2, 3 and 4 | Similar gender (mainly female) and age (average of 10 years) of victims in IIOC |
| | More likely to give 'no comment' explanations in police interview | Possessed IIOC with a significantly greater age range of victims | Similar rates of online grooming techniques used |
| | More likely to produce IIOC | Downloaded IIOC over a longer period of time, with more movies gathered. | |
| | More likely to use grooming behaviour, particularly offline grooming | More likely to pay for access to IIOC | |
| | | More likely to admit attraction to IIOC in police interview | |

N.B. ISOs = Internet sex offenders; SOs = sex offenders

Table 2.3: Synthesised data highlighting comparative characteristics

| Author | Sexual behaviours | | Substance use | | Paedophilia or other paraphilias | | Cognitive and emotional factors | |
|---|---|---|---|---|---|---|---|---|
| | **Cross-over ISOs** | **Online-only ISOs** | **Cross-over ISOs** | **Online-only ISOs** | **Cross-over ISOs** | **Online-only ISOs** | **Cross-over ISOs** | **Online-only ISOs** |
| **Endrass, Urbaniok, Hammermeister, Benz, Elbert, Laubacher & Rossegger (2009)** | More likely to recidivate with a contact sexual offence | Less likely to recidivate with a contact sexual offence | | | | | | |
| **Krueger, Kaplan & First (2009)** | More likely to have a diagnosis of hypersexual disorder characterised by cybersexual dependence | More likely to have a diagnosis of hypersexual disorder characterised by pornography dependence | Similar alcohol use to online-only ISOs | Similar alcohol use to cross-over ISOs<br><br>More likely to have a substance use disorder diagnosis | Similar diagnosis rates to online-only ISOs | Similar diagnosis rates to cross-over ISOs | Similar occurrence of PTSD to online-only ISOs | Similar occurrence of PTSD to cross-over ISOs |

Table 2.3: Synthesised data highlighting comparative characteristics

| | | | | | |
|---|---|---|---|---|---|
| **McCarthy (2010)** | More likely to have a history of more than one sexual offence conviction<br><br>More likely to use grooming behaviour<br><br>More likely to contact others with similar deviant interests<br><br>More often engage in a combination of sexual activities | More likely to have a history of illicit drug use | More likely to have a paedophilia diagnosis | Similar history of child abuse to online-only ISOs | Similar history of child abuse to cross-over ISOs |

Table 2.3: Synthesised data highlighting comparative characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Neutze, Seto, Schaefer, Mundt & Beier (2010)** | More likely to have recent child sexual abuse offences | More likely to have different characteristics to offline sexual abuse offenders | | Similar high levels of psychological problems to online-only ISOs<br><br>Similar rates of emotional deficits to online-only ISOs | Similar high levels of psychological problems to cross-over ISOs<br><br>Similar rates of emotional deficits to cross-over ISOs |
| **Briggs, Simon & Simonsen (2011)** | Only engaged in a few sexual behaviours | Engaged in more sexual behaviours<br><br>More occurrence of cybersex<br><br>More exhibitionism on web camera | More likely to be diagnosed with a paraphilia | | More likely to have an online relationship over 2 days in length<br><br>Increased encouragement or teaching of sexual behaviours to online victims |

Table 2.3: Synthesised data highlighting comparative characteristics

| | | |
|---|---|---|
| **Elliott, Beech & Mandeville-Norden (2013)** | Similar level of offence-supportive beliefs to online-only ISOs | Similar level of offence-supportive beliefs to cross-over ISOs |
| | Similar ability to relate to fictional characters as online-only ISOs | Similar ability to relate to fictional characters as cross-over ISOs |
| | Similar view of other sex offenders as more dangerous, harmful and deviant as online-only ISOs | Similar view of other sex offenders as more dangerous, harmful and deviant as cross-over ISOs |
| | Greater frequency of victim empathy | Generally better self-management skills |

Table 2.3: Synthesised data highlighting comparative characteristics

| | | | |
|---|---|---|---|
| | | | distortions<br><br>Lower scores for over assertiveness<br><br>Higher levels of empathic concern<br><br>Higher levels of personal distress<br><br>Increased perspective taking |
| **Long, Alison & McManus (2013)** | More likely to have access to children<br><br>More likely to have previous nonsexual convictions | | More likely to live with a partner and partner's children |

N.B. ISOs = ISO

## Discussion

This review has been carried out in order to improve understanding of similarities or differences between online-only and cross-over Internet sex offenders. Much research has been carried out regarding Internet sexual offending and there have been meta-analyses appraising characteristic disparities between online and offline sex offenders; however there had not been a systematic review conducted for online-only and cross-over Internet sex offenders. One of the most common research questions present in the literature is whether Internet sex offenders arrested only for indecent image offences may be at risk of committing contact sexual offences. In order to better answer this question it is pertinent for the current evidence base of Internet offender typologies to be examined. If Internet sex offenders are found to be a heterogeneous group with differing characteristics then it is unlikely that online-only Internet offenders pose a high risk for contact offending. However, if they are found to be a homogeneous group with a lack of distinguishing features then there may be a propensity for online-only Internet offenders to commit contact sexual offences or indeed have already done so but with better strategies for evading detection.

### Results

Following a systematic structure, 3768 initial research papers were condensed to seven studies on the basis of inclusion and exclusion criteria, access to articles and quality assessment. The data was extracted from these papers and compared with reference to the research questions outlined in the method. It was found that there were four types of characteristics which could be compared across studies, with sexual behaviours being prominent in six of the papers, substance use apparent in two papers, diagnosis of paraphilias mentioned in three papers and psychological deficits outlined in four papers.

Once the data was synthesised, conflict was obviously noted amongst the research. Briggs, Simon and Simonsen (2011) suggested that cross-over Internet sex offenders displayed fewer sexual behaviours and that online-only Internet sex offenders were more likely to have a paraphilic diagnosis, whereas research by Krueger, Kaplan and First (2009) and McCarthy (2010) indicated that the cross-over offenders had a range of cybersexual behaviours and were more likely to have a paedophilic diagnosis. Additionally, Endrass et al. (2009) observed that the cross-over offenders were more likely to recidivate with a contact sexual offence, which would support McCarthy's supposition of paraphilias within this group as these are strong predictors of sexual recidivism (Hanson & Bussière, 1998). Neutze et al. (2010) found more recent contact sexual offences for the cross-over offenders, which may also propose strong evidence for paraphilic tendencies or increased sexual behaviours.

An additional conflict arose regarding substance misuse, as Krueger et al.'s (2009) research found that substance use disorder was more prominent for online-only offenders whereas McCarthy's (2010) paper suggested that substance misuse history was more often observed for cross-over offenders. There was greater consensus for cognitive and emotional factors, with papers by McCarthy, Krueger and colleagues, Neutze and colleagues, and Elliott and colleagues (2013) all finding similar rates of psychological difficulties, particularly trauma, for both Internet sex offender groups. Elliott et al. did however observe some differences for empathy, personal distress and perspective-taking, suggesting some variation in psychological functioning across groups.

In terms of homogenous characteristics, six papers identified similarities for the offender groups, however these factors differed amongst themselves and were therefore not directly comparable across studies. Briggs, Simon and Simonsen (2011)'s paper identified similarities

for compulsive pornography use and promiscuous sexual behaviour; Krueger, Kaplan and First (2009) identified similar rates for major depressive disorder, post-traumatic stress disorder, paraphilias and alcohol use disorder. McCarthy (2010) and Long et al. (2013) identified similarities across demographic variables which contests heterogeneous findings from Briggs' paper. Neutze et al. (2010) found similarities in dynamic risk factors and psychological deficits, which was supported by findings on offence-supportive beliefs from Elliott et al.'s (2013) study. Endrass et al. (2009) did not identify any homogeneous characteristics between cross-over and online-only Internet sex offenders; however this may be due to a bias in sampling. They had a large population of 226 male Internet sex offenders but only 0.8% (n=2) of these were individuals who met the criteria for cross-over Internet sex offenders. This discrepancy in sample size may explain why homogeneity could not be identified and why only few differentiating factors were found. Further, the aim of Endrass et al.'s study was to identify characteristics for a general sample of Internet sex offenders and a specific distinction between those with contact offending histories was only made in the analysis of recidivism; therefore it was difficult to review the other characteristics identified and much fewer were noted compared to the other reviewed studies.

The results indicate the presence of both similarities and differences for online-only and cross-over Internet sex offenders. From the seven papers included in this review it is apparent that there are more differing characteristics described across groups than similarities. It is possible this is due to the current review methodology as studies were only included based on the presence of at least one differing characteristic, and homogeneous characteristics were neither explicitly included nor excluded. Furthermore, from the search strategy there were no papers evident in the literature which reviewed homogeneous characteristics from a statistical perspective and therefore characteristic similarities were assumed from the absence of

statistical difference. This was identified through linguistic features describing characteristics as "…not statistically significant…" or "…no difference was found…" This may have presented a bias of results as authors may not have explicitly stated their non-significant results, which would then present as a lack of homogeneous data.

In order to make the results of this review comparable and measurable, characteristics present in the majority of studies were synthesised. These variables expressed significant differences, particularly regarding sexual behaviour and paraphilic diagnoses. From existing literature on sexual offending recidivism and paraphilia, it appears that the studies with greater quality, such as McCarthy (2010) and Krueger, Kaplan and First (2009), conformed to the general consensus of findings. The quality of all seven included studies was generally high and only two papers from the original study selection had been excluded from the quality assessment, suggesting that research on this topic is generally well constructed and valid. The meta-analysis conducted by Babchishin, Hanson and Hermann (2011) compared 27 papers which is a much greater number, however the criteria for population in the current review excluded offline sex offenders, which limited the scope of research considerably. These exclusion criteria had been applied in order to only include papers which would answer the research questions relating to Internet sex offender typologies.

**Limitations**

Although the studies met the inclusion and exclusion criteria for this review, only the papers by McCarthy (2010) and Long, Alison and McManus (2013) were directly comparing online-only and cross-over Internet sex offenders as the main aim of their research. The other five included studies made a comparison but as part of larger explorations of online and offline sexual offending, which often resulted in small sample sizes and difficulty identifying

characteristics specific only to the Internet groups. This disparity in methodology suggests that comparisons should be taken with caution and that a further review should be carried out when more relevant research is available. Alternatively, inclusion and exclusion criteria should be expanded in order to compare the characteristics of cross-over Internet sex offenders, online-only Internet sex offenders and also offline sex offenders; as a greater amount of research might be available for review.

Although the key terms used for the search strategy appear comprehensive, it may be pertinent to explore further subject headings from other bibliographic databases. Furthermore it may be useful to search additional databases to increase the scope of potential papers included in the review. This would ensure that the majority of research had been considered and avoid dismissing any important papers that may only be available to specific databases. The current review excluded qualitative data, published theses and dissertations, editorials, commentaries and "grey literature", such as unpublished articles. These restrictions may have excluded relevant papers which would account for only seven papers being included in the final analysis. The restrictions were placed upon the search due to keeping the search strategy concise, managing time constraints and placing a preference on comparing quantitative data only. However, research on characteristic variables often presents as qualitative data so some relevant material may have been missed through this approach. The authors of papers included from the initial search were contacted for full texts and other relevant research, and six authors responded. Four additional articles were provided with relevant abstracts; however they did not adhere to the inclusion criteria and so were excluded from the review.

The inclusion and exclusion criteria for this review were revised by a lecturer of Psychology at the University of Birmingham prior to the search strategy being carried out and these were

deemed to be suitable; however the restrictions may need to be reviewed again in future in order to increase the scope of papers being included. This should be done with caution so that the specific research questions are still able to be answered. Interrater reliability was not utilised in the current review due to time constraints; however this would have been preferable in order to improve validity of the systematic process.

**Implications**

The findings from this review predominantly indicate that Internet sex offenders are predominantly a diverse group; with significant differences noted for online-only and cross-over Internet sex offenders. These findings would correlate with the majority of other existing literature on the topic which also suggests distinct typologies of Internet sex offenders (Seto & Eke, 2005; Webb et al., 2007). However, whilst the majority of findings indicated differences across the offender group, there was additional evidence proposing a lack of differentiation and thus some characteristic similarities. The similarities noted would suggest that online-only and cross-over Internet sex offenders are not two distinct typologies of Internet sex offenders but rather a homogeneous group that may represent an escalation in offending or a greater ability for some individuals to avoid detection or minimise disclosure (Bourke & Hernandez, 2009).

The hypothesis for heterogeneity suggest that online-only Internet sex offenders present as a low risk for contact sexual offending, as they are essentially a distinct group of individuals whose offending is contained to an online facility. If this hypothesis were to be rejected then the risk assessment of online-only Internet sex offenders must be reviewed as they may pose a greater than perceived risk for contact offending. Additionally, a lack of evidence for contact offending may be an indication of better detection avoidance which is also implicated

within accurate risk assessment. As this review excluded qualitative research, which more often presents evidence for a homogeneous view of Internet sex offenders, this is an unrepresented data cohort which may affect overall conclusions.

## Conclusion

The current review aimed to appraise the available research for typologies of online-only and cross-over Internet sex offenders. It was found that heterogeneity is prevalent, with particular regard to disparate sexual behaviours. However, some similarities were also identified, particularly regarding emotional and cognitive factors. Assessing the quality of the included papers enabled scientific judgement of the most reliable outcomes, which was useful for contesting evidence. As heterogeneity was proportionately more evident within this review, future extension of this work might also consider inclusion of qualitative data, which more often evidences an overlap of typologies; this balance of evidence should enable a more conclusive result to be drawn.

Identifying the presence or absence of specific typologies for Internet sex offenders is required for the appropriate treatment and management of such offenders. If online-only Internet sex offenders are a distinct group, unlikely to commit a contact offence, then treatment needs would be tailored towards appropriate online behaviour and skills for managing impulsiveness. However, if there is no such distinction, then treatment may be more appropriately constructed as a preventative measure for potential future offline offending.

As this thesis intends to further understand this differentiation of Internet sex offenders through examining self-control skills, the next chapter provides a critical evaluation of a psychometric tool which may be used to assess the trait of impulsiveness.

# Chapter 3

# CRITIQUE OF A PSYCHOMETRIC ASSESSMENT: EXPLORING THE PSYCHOMETRIC PROPERTIES OF THE BARRATT IMPULSIVENESS SCALE – VERSION 11

## Introduction

Impulsivity is a facet of executive processing which has been inherently linked to many aspects of human functioning; it may be defined as a predisposition for reacting without forethought or consideration for the costs of such actions (Moeller, Barratt, Dougherty, Schmitz & Swann, 2001). As the human species has evolved, we have developed the capacity to self-regulate our emotional and behavioural reactions to stimuli through an impulse control system based within the prefrontal cortex (Knight, Grabowecky & Scabini, 1995). This process of self-control appears to serve an adaptive function for improved social functioning as well as consideration of longer-term benefits (Baumeister, Vohs & Tice, 2007), with the ultimate end of refined self-protection (e.g., Tice, Bratslavsky & Baumeister, 2001). The control of instinctive impulses was an innate aspect within the origins of psychological analysis, with Sigmund Freud concerned over the defences of the 'ego' and the developed ability to delay gratification (Freud, 1959). Indeed, many researchers have explored the presence of impulsiveness within normative populations, particularly concerning sensation-seeking, liveliness and risk-taking (Eysenck & Eysenck, 1977). Following normative explorations, reasonable assumptions have thenceforth been made about the links between impulsiveness and populations where such behaviour has become more extreme and lacking consideration of consequences, for example in psychiatric patients and offender groups (e.g., Brower & Price, 2001; Evenden, 1999).

The measurement of impulsiveness has been tested through a variety of means, including psychometric assessment and attentional paradigms. Some behavioural techniques that have been used include the Stroop colour-naming task (Stroop, 1935) which measures response inhibition for word stimuli, and the Stop Signal paradigm (Lappin & Eriksen, 1966) which measures action suppression. Whilst these tools provide an objective means of testing

behavioural inhibition, they do not further the field knowledge into the concept of impulsiveness itself or how it relates to personality functioning, due to a greater focus on situational impulsiveness (Dougherty, Mathias & Marsh, 2003). In order to explore this, self-report questionnaires were utilised to obtain first-hand accounts of how individuals functioned in everyday life. Such psychometric measures were considered beneficial as they allowed for factor analyses which could identify correlates of impulsivity as well as sub-traits within the construct of impulsivity itself. These tools were also able to be used in conjunction with attentional paradigms in order to compare impulsiveness as a function of behaviour and personality.

The Barratt Impulsiveness Scale (BIS) was developed by Ernest Barratt in 1959, as part of an experiment exploring the effects of anxiety and impulsiveness on psychomotor learning. The most widely used edition of the BIS in current clinical practice is the eleventh version (BIS-11; Appendix 5) developed by Patton, Stanford and Barratt (1995). It is a measure which has been utilised in a variety of settings and with a diverse range of clients, including the exploration of characteristics and risk factors within sex offending populations (Carvalho & Nobre, 2013) and, more specifically, those with Internet-based sexual offences (Elliott, Beech & Mandeville-Norden, 2013). Impulsivity has been an area of great research interest when considering offending behaviour, due to the implications for treatment and risk management, and its applicability to models of sexual offending regarding poor action selection and control (Ward, Hudson & Keenan, 1998; Ward & Siegert, 2002; Ward & Beech, 2006). It is now a widely accepted feature of treatment and care pathways for mainstream, intellectually disabled and mentally disordered forensic clients, and the BIS-11 has become one of the standard tools for measuring both cognitive and behavioural aspects of impulsivity compared to other measures which may have a more narrow focus, such as impulsiveness as a

personality trait (Eysenck, Pearson, Easting & Allsopp, 1985). Therefore this review intends to examine the BIS-11 (Patton, Stanford & Barratt, 1995) in order to explore its' psychometric properties, evidence-base, relevance within forensic settings and appropriateness for researching characteristics of forensic clients.

## Overview of the BIS-11

The Barratt Impulsiveness Scale – 11 (BIS-11; Patton, Stanford & Barratt, 1995) is a paper-based assessment tool, which consists of 30 self-report items. The BIS-11 is the eleventh version of the Barratt Impulsiveness Scale (IS; Barratt, 1959), which was devised within a context of cognitive psychology, exploring the effects of anxiety and impulsiveness on motor task completion. Barratt's intention appeared to be the development of a measure which was independent from other tools exploring attention-interference, in particular anxiety which he considered to be a major interfering factor that had been appropriately assessed through psychometrics such as the Taylor Manifest Anxiety Scale (Taylor, 1953). It is important to define exactly what is being measured with the Barratt scale as arguably impulsivity may be seen in a variety of ways; for example as a lack of appropriate motor control (Rubia et al., 2001) or as a sensation-seeking personality construct (Zuckerman, 1996). Indeed, some research has presented evidence that counters previously held ideas of impulsivity as intrinsically linked to just a single construct (e.g., Magid, MacLean & Colder, 2007; White et al., 1994) and instead has proposed that there are several factors to be considered (e.g., Dalley, Everitt & Robbins, 2011; Patton, Stanford & Barratt, 1995). This was a view that Barratt himself supported and after testing the original BIS he proposed that the measure required refinement, in particular for its construct validity, due to the tool having been developed through paraphrasing existing items from previous measures and including some new unvalidated items (Barratt, 1959). Therefore, different versions were developed, with

impulsivity held as separate constructs linked to cognitive and behavioural planning and control.

The refinement process of the Barratt scales included numerous factor analyses to define the constructs which make up impulsiveness, particularly as Barratt himself recommended further development following analysis of the original tool (Barratt, 1959). The second version was disseminated into five specific domains: lack of persistence, social optimism, lack of motor inhibition, aggression-autonomy, and action oriented (BIS-2; Barratt, 1965). Further factor analysis of the BIS questionnaire and its items later reduced these five domains to four: speed of cognitive response, lack of impulse control, adventure seeking-extroversion, and risk taking (BIS-5; Barratt, 1965). By the tenth version, these domains had yet again been reduced to three sub-traits: motor impulsiveness, cognitive impulsiveness and nonplanning which were found to be similar to sub-traits within research on other impulsiveness psychometrics (Barratt, 1987; Gerbing, Ahadi & Patton, 1987).

In the case of the BIS-11, the 30 items were divided into three separate subscales; attentional impulsiveness, motor impulsiveness and nonplanning. This differs from the BIS-10 due to 'attentional impulsiveness' replacing 'cognitive impulsiveness' as a result of principal components analysis identifying both attentional and cognitive first-order factors within this sub-trait (Patton, Stanford & Barratt, 1995).

**Attentional Impulsiveness**

The attentional subscale is comprised of eight items on the BIS-11 which further divide into two sub-subscales of first order factors: 'attention' and 'cognitive instability'. The attentional subscale is designed to measure deficits in awareness and concentration as a component of

impulsiveness. The attention items focus on restlessness and concentration, for example “I “squirm” at plays or lectures”, whilst the items within cognitive instability are more focused on uncontained cognitions, for example “I have “racing” thoughts”.

### Motor Impulsiveness

There are eleven items within the motor subscale which may be categorised into two groupings of first order factors; ‘motor’ and ‘perseverance’. The items within the motor subscale are primarily concerned with actions lacking forethought, such as “I buy things on impulse”, whereas the perseverance items concern long-term instability, such as “I change residences”.

### Nonplanning

The nonplanning subscale comprises eleven items across two groupings of first order factors; ‘self-control’ and ‘cognitive complexity’. The nonplanning items within the self-control factor focus on planning of behaviour, for example “I say things without thinking”, whilst those in the cognitive complexity factor are more concerned with mental effort, for example “I get easily bored when solving thought problems”.

## Psychometric Characteristics

The BIS-11 consists of 30 statements to which answers are selected along a 4-point opinion scale of 1 “Rarely/Never”, 2 “Occasionally”, 3 “Often” and 4 “Almost Always/Always”. These answers form a set of ordinal data as they represent non-dichotomous rankings, the intervals of which may be assumed as unequal. The answer data for the BIS-11 may therefore be analysed through the mode as the measure of central tendency, rather than the mean, as the

ordinal data is derived from opinion; therefore making the mode more appropriate (Jamieson, 2004).

This measure relies on self-report data from participants, which may arguably contribute to method variance; that is, variance resulting from the measurement method such as format for responding, rather than the construct being examined (Fiske, 1982). Self-report measures, such as the BIS-11, may generate method variance through biased responding, whereby participants may mask psychological difficulties in order to present in a socially desirable manner (Crowne & Marlowe, 1964), or they attempt to gain empathy or assistance through over-disclosure of symptoms (Wetzler & Marlowe, 1990). Additionally, participants may respond in a consciously consistent manner (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) in order to present as credible.

In the case of the BIS-11, response bias may manifest as individuals answering with "Rarely/Never" to the majority of items which would implicate a high level of self-control and conservative nature, or conversely with "Almost Always/Always" to the majority of items in order to present themselves as highly impulsive. This is confounding within research as it undermines the construct validity of a measure, that is, that the tool is actually measuring the concept it intends to measure. Indeed, Barratt himself indicated that self-report measures alone may be inadequate for measuring a single idea, such as impulsivity (Barratt & Patton, 1983), and therefore other research methods should be implemented to uphold construct validity.

However, self-report measures do benefit from accessing a primary data source, where direct behavioural observation is not possible (Thornberry & Krohn, 2000), as well as providing a

clear data-gathering technique for researchers and facilitating sum and mode analyses for simple interpretation of scores (Jamieson, 2004). It could also be argued that if a measure is constructed with adequate validity then it should safeguard against any attempts at response bias by the participant, for example by repeating items in order to assess consistency of responding.

Despite his criticisms of self-report data, Barratt continued to develop and use such methodologies in his exploration of the impulsivity construct, indicating that he supported these techniques but required them to be more robust. Indeed he revised his original impulsiveness scale eleven times until he developed the BIS-11 which is the version currently being examined.

## Reliability

The reliability of a psychometric test may be assessed across several domains: internal consistency, test-retest reliability and replication with a different sample.

### Internal Consistency

Internal consistency may be assessed through statistical testing which analyses how well the test items load onto the chosen construct and how they correlate with one another. For the BIS-11, this concerns how well each individual item reflects impulsiveness as a construct and how far the items agree with one another. The relationship between items is an important consideration for reliability as there may be many items which measure the same overall construct but do not fit together when broken down into smaller concepts. This is particularly pertinent when a construct, such as impulsiveness, may be multifaceted and relies on the inter-relatedness of item clusters to measure specific sub-traits.

Patton, Stanford and Barratt (1995) assessed the BIS-11 on its internal consistency with four participant groups and achieved alpha coefficients ranging between .79 and .83 which is considered to be within 'good' limits (George & Mallery, 2003). A review of the BIS-11 (Stanford et al., 2009) also explored internal reliability by administering the measure to a large sample of individuals within a normative population (n=1577, mean age=21.6 years), and they found an overall alpha coefficient of .83. However, when the analysis was done on individual subscales and on the first-order factors within the subscales, the coefficients reduced dramatically, with only two of the first-order factors producing coefficients above the desired .7 level (Nunnally & Bernstein, 1994). What this likely suggests is that the 30 items across the measure are well correlated for impulsiveness; however the individual factors may not be as cohesive within the subscales - this was particularly evident within the 'motor impulsiveness' subscale which produced a total coefficient of .59. This suggests that researchers and clinicians using this tool should consider both the total BIS score and the individual subscale scores in order to appropriately measure impulsiveness.

**Test-retest reliability**

A psychometric tool may be assessed on its reliability through replication with the same sample; known as test-retest reliability. The standard error rate between the scores is measured and if this is too great then the assessment may be deemed as unreliable. The previous version of the BIS (BIS-10) was assessed for test-retest reliability and found to have a Pearson's correlation coefficient of .59 (Luengo, Carrillo-De-La-Peña & Otero, 1991) which suggests that the error rate was undesirably high. The BIS-11 was assessed through test-retest after one-month of being initially administered (Patton, Stanford & Barratt, 1995) and it yielded a Pearson's correlation coefficient of .83 which suggests an improvement on

reliability from the tenth version. It should be noted however, that the retest was administered to only 153 participants, compared to the original 1577; therefore the sample sizes being compared were highly unequal and as such the likelihood of committing a type I error, due to violated homogeneity assumptions, may be increased and so the conclusions drawn should be considered tentatively.

### Replication with a different sample

The BIS-11 has been replicated in its use with samples from several different international populations. Such replication allows for test-retest of the assessment whilst safeguarding against similar results due to population characteristics rather than the pure validity of the tool. A study researching the BIS-11 with an Italian population of undergraduates (Fossati, Di Ceglie, Acquarini & Barratt, 2001) yielded an internal consistency coefficient of .79 and a test-retest coefficient of .89. Another study with Japanese participants (Someya et al., 2001) found a good measure of internal consistency, at .8, but a lower test-retest coefficient of .71 compared to the Italian study. Research examining the BIS-11 with Chinese adolescents (Yao et al., 2007) provided an even more distinct sample of participants, yet this study also found internal consistency at .8 and test-retest reliability at .7; indicating that the BIS-11 is consistent across a variety of diverse populations and thus provides a reliable measure of impulsiveness.

## Validity

The validation of psychometrics is concerned with assessing either the extent to which the measure encompasses a specific construct within its structure (face, differential, construct and content validity), or the precision with which an assessment predicts a construct in line with similar assessment tools (concurrent and predictive validity).

**Face Validity**

If a measure appears as though it is measuring the hypothesised concept, then it is deemed to have face validity. The BIS-11 demonstrates good face validity as the items on the measure seem to be making statements relating to impulsive thoughts and actions; additionally, the original Barratt scale (IS) was developed on face validity alone (Webster & Jackson, 1997) and many of the items are similar in content to the BIS-11 version. However, this does not appear to have been formally tested with participants and/or non-professional individuals which are the recommended rater groups (Nevo, 1985) and therefore conclusions have not be empirically drawn regarding the face validity of the BIS-11.

**Differential validity**

A measure may be validated through its ability to differentiate samples from one another by comparing validity coefficients, for example by comparing clinical and normative participant groups (Patton, Stanford & Barratt, 1995; Stanford, Greve, Boudreanx, Mathias & Brumbelow, 1996). This is an area in which the BIS-11 has been found to have strength as it has evidenced the ability to discriminate trait impulsiveness between subjects with substance misuse disorders, including those who misuse alcohol (Ketzenberger & Forrest, 2000) and cocaine (Moeller et al., 2002), from controls. The BIS-11 has also been applied, measured and validated with a variety of different participant groups; however such studies have previously been mentioned within the discussion of its reliability through replication.

**Construct Validity**

Construct validity reflects how well the assessment evaluates the concept it intended to explore by measuring how far that concept explains the test variance (Cronbach & Meehl,

1955). Barratt (1994) conducted factor analysis on the BIS-11 which identified three main factors; 'ideo-motor', 'careful planning' and 'coping stability'. However, due to this being a factor analysis, not all of the variance within the data would be accounted for; only the identifiable factors. The following year, a principal components analysis was conducted in order to attribute all of the variance to a factor structure (Patton, Stanford & Barratt, 1995). This principal components analysis identified six first-order factors; 'attention', 'motor impulsiveness', 'self-control', 'cognitive complexity', 'perseverance' and 'cognitive instability' and three second-order factors: 'attentional', 'motor' and 'nonplanning', all of which were significantly intercorrelated ($p < .0001$).

When compared with other measures of impulsivity in a principal components analysis (Miller, Joseph & Tudway, 2004), all three second-order BIS-11 factors were found to load onto one component, labelled 'nonplanning and dysfunctional impulsive behaviour' and only very weakly loaded onto the other two components of 'venturesomeness' and 'reward responsiveness and drive'. This research indicates that the BIS-11 is primarily concerned with the general concept of impulsiveness, rather than specific personality traits or motivational drive, which was the intention proposed by Barratt in his initial (1959) research and which is supported by face validity.

**Content validity**

Content validation is concerned with the extent to which a psychometric measure encompasses all aspects of the construct under investigation. This is established by testing whether the assessment items are a good representative sample of that construct (Cronbach & Meehl, 1955). It appears as though the BIS-11 has not been assessed for content validity; however the testing of construct validity indicates that the concept of impulsiveness is

accountable for the variance within BIS-11 test scores, which could indicate that the items are representative of the construct.

**Concurrent Validity**

When the correlation between similar assessments is found by measuring the tools at the same time then this is referred to as 'concurrent validity' (Mislevy & Rupp, 2010). Whilst the BIS-11 has not necessarily been found to correlate with behavioural measures of impulsivity (e.g., Barratt & Patton, 1983), the BIS-11 was examined by Stanford and colleagues (2009) and found to have strong positive relationships with similar self-report psychometrics, such as the Zuckerman Sensation-Seeking Scale (SSS-Z; Zuckerman, Kolin, Price & Zoob, 1964) and the Eysenck Impulsiveness Scale ($I_{7;}$ Eysenck & Eysenck, 1978). This might indicate that the BIS-11 measures impulsiveness as a similar construct of personality, but with a multi-faceted structure.

Additional support for this validation came from a study exploring boredom proneness and aggression (Dahlen, Martin, Ragan & Kuhlman, 2004) which concluded that total scores on the Barratt scale were related to the Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986) with a correlation coefficient of .5, as well the Aggression Questionnaire (AQ; Buss & Perry, 1992) with a coefficient of .26. There was also a positive relationship (r = .29) found between the BIS-11 and the Anger Expression-Out (AX-O) scale of the State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999) and negative relationships found with the Anger Control scales of the STAXI-2 (r = - .2 and - .3). The significance of these relationships indicates that the BIS-11 has high convergence with other tools and measures concepts relevant to its intended construct. Although the correlation coefficients themselves

appear small, the sample sizes within these analyses ranged from 40 to 100 participants and therefore significance was found, implicating concurrent validity for the BIS-11.

Several studies have made comparisons with the BIS-11 and the Buss-Durkee Hostility Inventory (BDHI; Buss & Durkee, 1957), which is a self-report reaction questionnaire, to explore concurrent validity. One piece of research found that the BIS-11 correlated significantly with the majority of the BDHI subscales ($p < .05$; Stanford, Greve & Dickens, 1995), whilst a second study found correlations at a higher level of significance ($p < .001$) on the subscales of irritability, indirect and verbal hostility, and assault, with the greatest correlation observed for the irritability subscale ($r = .51$; Seroczynski, Bergeman & Coccaro, 1999).

**Predictive Validity**

If an assessment tool is successful in determining future performance from previous test results then it is deemed to have predictive validity (Messick, 1990). The BIS-11 has been used to predict certain impulsive, sensation-seeking and risk behaviours in individuals and in several cases has demonstrated predictive validity. For example, in one study by Stanford and colleagues (1996), it was found that aggression and substance misuse could be predicted by the BIS-11, and in a separate study by Hair and Hampson (2006), regression analyses found a predictive relationship between BIS-11 impulsivity scores and three measures of academic performance. In terms of its comparison with other measures of impulsivity, the BIS-11 has also been found to better predict delayed gratification in individuals through exploration of smoking cessation (Mitchell, 1999; Doran, Spring, McChargue, Pergadia & Richmond, 2004), which implicates high validity for calculating future behaviour.

The BIS-11 has also been noted as useful when applied to different client groups. For example, it was found to be predictive of incidents of aggression within a forensic mental health setting (Wang & Diamond, 1999), implicating its applicability to inpatient groups. However, other researchers have emphasised the need for caution when utilising the measure with specialist groups as the factor structure may differ due to issues of responsivity, such as greater emphasis on motor and nonplanning impulsivity compared to attentional impulsiveness (Haden & Shiva, 2008).

## Conclusion

The BIS-11 appears to be a well-established tool for measuring impulsiveness in a wide range of contexts, including substance misuse, undergraduate study and forensic mental health. It has been translated into a number of different languages and its internal structure examined and re-formed through eleven versions. The measure appears to be both reliable and consistent, measured through appropriate statistical means and on large participant cohorts in numerous studies. There appear to be few research studies evidencing different conclusions and both the supportive and contradictory research appear to demonstrate limitations as well as efficacies.

A major criticism of this measure could be argued that it does not correlate well with behavioural measures of impulsivity, as this might suggest that it is inherently flawed as not measuring the intended construct. However, when considering the vast literature on impulsivity, it becomes clear that psychometrics are more focused on the trait aspects of this construct, whilst behavioural measures consider state impulsiveness in response to presented stimuli. In this sense, these assessment methodologies are distinct and, as the BIS-11 is highly correlated with other self-report measures, it supports a strong case for validation.

By critiquing this tool, it has been possible to explore the usefulness of the measure when assessing the concept of impulsiveness, as well as understanding its psychometric properties that make it applicable for sound evidence-based practice. This is particularly important when drawing conclusions from the results that have practical implications for practice, for example recommending treatment needs for a specific client group based on the outcomes of an assessment with the BIS-11.

It may be useful for future research into this tool to consider examining the content validity of the measure further so that it can be more scientifically established whether the items included in the measure are representative of all aspects of the impulsiveness construct. Additionally, further research into the validity and reliability of using the BIS-11 with other specialised client groups may help develop understanding about how it can be generalised into other areas of research and practice, for example with personality disordered individuals or those with specific offending behaviours.

The next chapter utilises the BIS-11, in addition to several other actuarial and behavioural measures of impulsiveness, to explore the efficacy of self-control skills for a sample of Internet sex offenders and to consider the link between impulsiveness and online-only or cross-over offending.

# Chapter 4

# EXAMINING INHIBITORY CONTROL IN INTERNET SEX OFFENDERS

## Abstract

This study aimed to further understand the literature on sexual offending, as applied to individuals who commit such offences through the Internet. The focus of this research was to explore the presence of impulsivity deficits and interference within a sample of Internet sex offenders and to understand whether such difficulties may differ in severity according to the type of offence committed, that is, either online-only (non-contact) or cross-over (contact) sexual offences. For this investigation, 472 online-only Internet sex offenders, 143 cross-over Internet sex offenders and 32 control subjects were compared on a psychometric measure of impulsiveness; the Barratt Impulsiveness Scale – Version 11 (Patton, Stanford & Barratt, 1995).

This study also intended to expand our knowledge further regarding inhibitory control deficits in Internet sex offenders, by comparing 13 online-only Internet sex offenders and 32 control subjects on one further measure of impulsiveness; the Impulsivity, Risk-taking and Sensation-Seeking Scale (Schafer, Blanchard & Fals-Stewart, 1994) and a behavioural computer test; the Stroop colour-naming task (Stroop, 1935).

In order to explore the presence of deviant ideas which may interfere with behavioural control, as highlighted within the theoretical literature on sexual offending. The online-only Internet sex offenders and control subjects were therefore also compared on an emotional Stroop task.

The final element of this research study was to explore the influence of sexual compulsivity in Internet sexual offending; therefore participants were tested on two psychometric measures

of sexual compulsivity; the Sexual Compulsivity Scale (Kalichman & Rompa, 1995, 2001) and the Sexual Symptom Assessment Scale (Raymond, Lloyd, Miner & Kims, 2007).

It was found that Internet sex offenders as a homogeneous group display deficits in impulsivity, as well as specific deficits in the context of sexual compulsivity. No differentiating of typologies according to offence type and impulsiveness was observed. Interference difficulties were observed for Internet sex offenders on the emotional Stroop task regarding negative and sexual word themes. These results are discussed in the context of existing empirical research and theories regarding typologies of Internet sex offenders. Limitations of the study are discussed as well as recommendations for future directions in research.

## Introduction

Understanding the characteristics of individuals who engage in risky sexual behaviour against children is crucial in terms of appropriate interventions for prevention, treatment and risk management. As has been highlighted previously in Chapter 2, there have been myriad theoretical approaches developed for understanding sexual offending against children with research studies aimed at providing supporting or discounting evidence for such. A group of offenders becoming more prevalent within both crime statistics and the literature are individuals who utilise the Internet to engage in sexual offending; suggesting either an increase in such activity or an increase in awareness (Wolak, Finkelhor, Mitchell & Ybarra, 2010). It has been noted within existing studies on Internet sex offenders that impulse control mechanisms represent relevant characteristics lacking in empirical evidence (Babchishin, Hanson & Hermann, 2011; Elliott & Beech, 2009), which is particularly pertinent when taken with the divided view of academics and practitioners regarding the homogeneity of this cohort. Specifically, impulsiveness may provide explanatory reasoning for why some Internet sex offenders commit online-only offences whilst others cross-over to offline contact offences.

Inhibitory control mechanisms appear evident in most theoretical models of sexual offending, including those with multifactorial components (e.g., Hall & Hirschman, 1991; Ward & Beech; Ward & Siegert, 2002) and those specifically related to impulsiveness (Ward, Hudson & Keenan, 1998). It has been suggested that processes involving inhibiting desired behaviour may provide further explanations for the low reoffending rate amongst sexual offenders (e.g., Hanson & Bussière, 1998), provide further evidence for a steps-based theory of offending development (Finkelhor, 1984) and may explain differing modus operandi, for example online versus offline sexual contact with children. In addition to impulsiveness, interfering

deviant arousal has also been implicated in the theoretical underpinnings of sexual offending; for example Ward and Siegert (2002) suggested that sexual offenders may have deviant fantasies which become activated either solely or in conjunction with other psychological factors, including impulsiveness. When taken together, these factors implicate sexually compulsive behaviour, which in this context refers to paraphilic compulsions (e.g., Bradford, 2001). Some research has begun to explore sexual compulsiveness in sexual offending and found that sexual offenders may be more likely than their non-offending counterparts to have addictive sexual behaviours (Marshall & Marshall, 2006); however such pathology is yet to be understood with Internet sex offenders and, in particular, how this may relate to distinct offending methodologies.

Research has been carried out previously to understand the inhibitory control processes within offline sexual offenders and appears to provide support for deficits within this group. For example, Smith and Waterman (2004) utilised a Stroop task to measure response inhibition for colour-naming and they observed that sexual offenders did indeed appear to show some deficiencies for inhibiting their responses, as compared with a non-offending sample. An interesting additional facet of this research was the exploration into emotional interference by certain word stimuli, including sexual and aggressive word themes, through an emotional Stroop task. It was found that these themes did indeed interfere with the responses of sexual and violent offenders, distinguishing them from control subjects and non-violent offenders. In addition, response latencies to these emotive categories were able to distinguish between child molesters and rapists, implicating differing deviant stimuli across modus operandi. It may be concluded from these findings therefore, that such a measure may be able to explore deficiencies within other offender groups, such as Internet sex offenders who commit offences purely online compared with those who commit both online and offline

offences. It is possible that this may be done with the existing emotive word themes; however it may also be useful to also examine the effect of Internet-themed stimuli in order to explore the function of the Internet for this group, that is, whether it is a significant feature of the offending behaviour or whether it is a tool used to facilitate sexual offending that may have occurred in another context anyway (Quayle & Taylor, 2002b).

Other studies have included similar behavioural tasks to explore inhibitory deficits without the confounding effects of socially desirable responding, as may be observed in self-report data from questionnaires or interview. For example, Chen, Muggleton, Juan, Tzeng and Hung (2008) utilised a 'Stop Signal' paradigm with violent offenders in order to explore how well they may inhibit a key-press response either with or without time pressure. They found that the offender group were significantly slower when responding to the "Stop" signal; however this was noted only in the time-pressure condition, suggesting that impulsiveness may be related to frustration rather than executive dysfunction. This research therefore implicates emotional states within behavioural responding, such as that found with emotional Stroop tasks, and provides support for two aspects of sexual offending theory: deficits in impulse control and deviant scripts through emotional interference.

Whilst behavioural tasks are able to explore facets of state impulsiveness, which indicates inhibitory deficits to a given stimuli, they may lack the ability to explore trait impulsiveness which likely corresponds to an offender's chosen modus operandi over time, by examining control mechanisms across a range of situations. In order to measure trait impulsiveness, structured actuarial measures have been implicated (e.g., White et al., 1994). These are questionnaires with psychometric properties, such as evidenced validity and reliability, which may be used to measure a particular construct. By using these psychometric measures, it may

be possible to identify deficits within different domains of impulsiveness, which, as highlighted in Chapter 3, may be the most reliable application of this concept. It has been recommended that utilising psychometrics alongside behavioural measures provides a more valid overview of an individual's impulsiveness (Barratt & Patton, 1983) and therefore administering both types of assessment is recommended for such research.

The aim of the current research is to pull together some of the disparity within the literature related to Internet sex offenders, in particular concerning impulsiveness, the function of the Internet, and the links between Internet sex offenders' modus operandi and risk for future contact offending. It is proposed that these factors will be explored through 1) comparison of online-only Internet sex offenders, cross-over Internet sex offenders and a sample of non-offending control subjects on impulsiveness; 2) behavioural and psychometric testing of impulsiveness; 3) examination of emotive rumination through emotional interference; and 4) psychometric testing of sexual compulsivity. The hypotheses for this study are that online-only and cross-over Internet sex offenders will display differing levels of trait and state impulsiveness and that both Internet sex offender groups will perform significantly worse than the control group. It is also proposed that Internet sex offenders will display interference effects for sexual, aggressive and Internet-themed stimuli, and will demonstrate significantly greater sexual compulsiveness compared to control subjects.

## Method

### Ethics

This research project attained ethical approval from the University of Birmingham's ethical committee in January 2013. Approval was also granted from the National Offender

Management Service for the sharing of data from the study by Elliott, Beech and Mandeville-Norden (2013).

Consent was gathered from participants prior to testing. They were provided with an information sheet outlining the research project and a verbal briefing by the investigator. Participants were informed that the study is measuring information processing, rather than explicitly referencing inhibitory control, in order to inform without deception whilst safeguarding against desirable responding. They were required to sign a consent form following this information.

There were no consequences for participants withdrawing from the study and they were informed in the information sheet about the treatment of their data.

**Treatment of data**

In order to uphold confidentiality within this research project, measures were taken to ensure that all data was stored securely. The electronic data yielded from the Stroop and emotional Stroop tasks was saved according to individual participant identification numbers. These identification numbers were also used on the paper data; the psychometrics, consent form and demographics form, and matched up with the electronic data.

The paper data was filed securely at the University of Birmingham and the electronic data was stored on an encrypted storage device. The data will be kept until at least ten years following this research project, in accordance with the University of Birmingham's 'Code of Practice for Research'. Access to the data has only been made available to the primary

researcher and supervisors in this project, as well as an undergraduate student completing an ethically approved dissertation project.

**Analysis 1: Trait impulsiveness and Internet sex offender typologies**

**Participants**

Three participant groups were included in this analysis; a sample of control subjects who had not been arrested for sexual offences, a group of individuals who had been arrested for engaging in online-only sexual offences against children, and a group of individuals who had been arrested for engaging in online and offline sexual offences against children. The offender participant groups shall henceforth be referred to as 'online-only' Internet sex offenders and 'cross-over' Internet sex offenders respectively. Sexual offences in this study were included as those outlined in the Sexual Offences Act (2003) which had been facilitated through the Internet against child victims only.

All participants included in this analysis were male and at least 18 years of age. The groups were also matched as far as possible for age and ethnicity. It was a requirement that participants were fluent in English and functionally literate, that is, they must be able to read at the same ability or higher than an 11 year old. Individuals were excluded from participating in this study if they had ever received a diagnosis of a Learning Disability, criteria for which is outlined in the Diagnostic and Statistical Manual of Mental Disorders – Fourth edition (text revised; APA, 2000), or a brain injury. Online-only Internet sex offenders must also not have committed an offline contact sexual offence and control participants must not have engaged in any sexual offending activities. This information was gathered from self-report demographics provided by the participants.

The control sample consisted of 32 individuals (mean age = 26.2 years), including professionals and undergraduate students. The students were recruited through the University of Birmingham's Research Participation Scheme, where a summary of the research was provided as advertisement. The professionals were recruited through personal acquaintance with the researcher by means of a verbal research proposal and provision of an information sheet, including inclusion and exclusion criteria. The control sample was tested by the primary researcher and an undergraduate psychology student completing an academic dissertation project.

The online-only Internet sex offender sample was gathered through a support group run by the Lucy Faithfull Foundation (Registered Charity No. 1013025). The researcher was invited to propose this research project to the support group on two separate occasions with different participant cohorts. A verbal proposal was given and information sheets provided. Thirteen online-only Internet sex offenders (mean age = 44.7 years) agreed to take part in this research and each arranged a thirty minute testing timeslot prior to commencement of the support group.

The researcher was unable to physically access a sample of cross-over Internet sex offenders and therefore existing data was collected for comparison with the other groups. This data was gathered from a research study on Internet sex offender characteristics (Elliott, Beech & Mandeville-Norden, 2013) with agreement from the researchers and approval from the National Offender Management Service. Demographic information and psychometric results for the Barratt Impulsiveness Scale – Version 11 were the only data applicable from this study for direct comparison. Data was gathered for 143 cross-over Internet sex offenders from a prison population (mean age = 43.6 years).

459 additional sets of online-only Internet sex offender data (mean age = 42 years) were also gathered from the Elliott, Beech and Mandeville-Norden (2013) study for comparison on the Barratt Impulsiveness Scale, generating a total subgroup of 472 online-only Internet sex offenders (mean age = 42 years).

**Measures**

All three groups were tested on a psychometric measure of impulsiveness; the Barratt Impulsiveness Scale – Version 11 (BIS-11; Barratt & Slaughter, 1998; Patton et al., 1995; Appendix 5), which assesses long-term patterns of behaviour by asking the subject to answer questions about the ways they act and think. Some sample items from the BIS-11 are 'I act on impulse', 'I plan tasks carefully', and 'I act without thinking'.

**Procedure**

BIS-11 data was obtained for cross-over Internet sex offenders from researchers conducting a study into Internet sex offender characteristics. For details on how this data was obtained please see that publication (Elliott, Beech & Mandeville-Norden, 2013).

The testing conditions involved the control participants being tested in individual cubicles within the School of Psychology at the University of Birmingham, whilst the online-only Internet sex offenders were tested in the meeting room of the Lucy Faithfull Foundation support group from whence the subjects were recruited. These arrangements were made in order to create safe, quiet and confidential testing environments for both subjects and researchers. Participants were given an information sheet outlining the study (Appendix 6 &

7), a verbal briefing of the task and a consent form to sign if willing to participate (Appendix 8).

**Analysis 2: Trait and state impulsiveness in Internet sex offenders**

**Participants**

Only two of the previously described participant groups were included in this analysis; the sample of 32 control subjects gathered from the University of Birmingham and the sample of 13 online-only Internet sex offenders gathered from the Lucy Faithfull Foundation support group.

**Measures**

The control participants and online-only Internet sex offenders were tested with a computerised colour-naming Stroop task. This is a behavioural task which examines general response inhibition through the measurement of response latencies. This Stroop task was specifically designed by the researcher using an E-Prime computer programme.

These participants were also provided with a psychometric scale in order to measure their self-reported impulsiveness given a measure of risk-taking and sensation-seeking; the Impulsivity, Risk-Taking, and Sensation Seeking Scale (IRTSS; Schafer, Blanchard & Fals-Stewart, 1994; Appendix 9) which measures trait impulsivity through agreement with risky tendencies.

**Procedure**

The testing conditions for this analysis were the same as those outlined in Analysis 1. The participants were presented with the colour-naming Stroop and emotional Stroop task (see

Analysis 3) before being presented with the IRTSSS. The subjects were counterbalanced according to whether they received the shorter colour-naming Stroop block first or the longer emotional Stroop block. The colour Stroop block solely contained words which were colour names in order to measure general response inhibition through congruent and incongruent word names and font colour. The Stroop tasks were conducted prior to the psychometric in order to avoid behavioural responses being affected by the content of the questionnaire. The behavioural tasks lasted approximately fifteen minutes in total and participants were also provided with a demographics form to complete (Appendix 10).

Participants were positioned in front of a laptop in order to complete the colour-naming Stroop task. This consisted of word stimuli appearing sequentially on a black computer screen. The words were presented in different font colours and the participants were required to identify the font colour of the word and press the corresponding colour key on the keyboard (denoted with coloured stickers). Latencies between word presentation and response time were then measured to observe the interference of word semantics. Participants were given a practice block of 30 word trials before the recorded blocks. They were offered up to two practice blocks in order to become more familiar with the placement of the coloured keys on the keyboard; this aimed to reduce time taken between viewing the word stimuli and making a response. No more than two practice blocks were offered however; as the Stroop tasks have been evidenced as susceptible to practice effects (e.g., Feinstein, Brown & Ron, 1994).

**Analysis 3: Emotional interference in Internet sex offenders**

**Participants**

The two previously described participant groups were also included in this analysis; the sample of 32 control subjects gathered from the University of Birmingham and the sample of 13 online-only Internet sex offenders gathered from the Lucy Faithfull Foundation support group.

**Measures**

The control participants and online-only Internet sex offenders were tested with a computerised emotional Stroop task. This is a similar behavioural test to the colour-naming Stroop; however this task measures response inhibition specifically related to different emotional concepts as well as colour names. This emotional Stroop task was specifically designed by the researcher using an E-Prime computer programme.

**Procedure**

The testing conditions for this analysis were the same as those outlined in Analysis 1. The participants were positioned in front of a laptop in order to complete the emotional Stroop task. The procedure for this task was the same as the colour-naming Stroop task (see Analysis 2); however the emotional Stroop presented seven different word themes instead of solely colour words. These word themes were intended to measure the interference effect of specific emotive stimuli, including neutral, positive, colour, negative, sexual and aggressive words, devised by Smith and Waterman (2004; Appendix 11), and Internet words, devised by the researcher (Appendix 12).

**Analysis 4: Sexual compulsivity in Internet sex offenders**

**Participants**

The two previously described participant groups were included in this analysis; the sample of 32 control subjects gathered from the University of Birmingham and the sample of 13 online-only Internet sex offenders gathered from the Lucy Faithfull Foundation support group.

**Measures**

The participants were given two measures of sexual inhibitory control; the Sexual Compulsivity Scale (SCS; Kalichman & Rompa, 1995, 2001; Appendix 13) which measures sexually intrusive thoughts and preoccupations, and the Sexual Symptom Assessment Scale (S-SAS; Raymond, Lloyd, Miner & Kims, 2007; Appendix 14) which assesses intensity of current sexual urges and overt recognition of the severity of problematic sexual behaviour over the previous week. All psychometric scales included in this study have been evidenced as having high internal consistency, yielding Cronbach's alpha scores above .8 (Benotsch, Kalichman & Kelly, 1999; Patton, Stanford & Barratt, 1995; Raymond, Lloyd, Miner & Kim, 2007; Schafer, Blanchard & Fals-Stewart, 1994). This indicates that the items included on the scales were very good at accurately representing the constructs of impulsiveness and sexual compulsivity.

**Procedure**

The testing conditions for this analysis were the same as those outlined in Analysis 1. Participants were provided with the SCS and SSAS questionnaires to complete.

## Results

Outcome data for the behavioural Stroop tasks and psychometrics was collated for the online-only Internet sex offenders, cross-over Internet sex offenders and control subjects. Stroop data was measured in milliseconds (ms) and responses <300ms or >2000ms were excluded.

This was done in order to preserve the construct validity of the research by safeguarding against data which was not representative of interference effects, either through automatic motor reactions or overthought cognitive responses. As a result of these timing constraints, 3.2% of Internet sex offender data and 4.79% of control data was excluded. Only fully completed psychometric data was included in this study and any qualitative feedback from participants regarding the questionnaires was also recorded for analytical purposes. All data in this research study was analysed using the Statistical Package for Social Sciences - version 17.0.

**Trait impulsiveness and Internet sex offender typologies**

Three participant groups were compared on the BIS-11 domains; which included the participant data from Study 1. Descriptive statistics are shown for these groups in Table 4.1, indicating that the cross-over Internet sex offenders produced the highest scores for the 'attentional' and 'nonplanning' domains and the online-only Internet sex offenders had the highest scores for the 'motor' domain.

Table 4.1: Descriptive statistics for the BIS-11 across three group types.

| | Group mean scores | | |
|---|---|---|---|
| | Online-only ISOs (n = 472) | Cross-over ISOs (n = 143) | Controls (n = 32) |
| BIS-11 'Attentional' | 21.75 | 22.41 | 15.33 |
| | (3.85) | (3.73) | (3.4) |
| BIS-11 'Motor' | 20.17 | 19.76 | 19.88 |
| | (4.11) | (3.78) | (3.12) |
| BIS-11 'Nonplanning' | 22.91 | 23.1 | 21.27 |

| | | | |
|---|---|---|---|
| | (4.56) | (4.75) | (4.56) |

N.B. Standard deviations for scores are denoted in parentheses; ISOs = Internet sex offenders

Correlational analyses indicated that the domains of the BIS-11 were related and therefore a Multivariate Analysis of Variance (MANOVA) was deemed appropriate for analysing the difference in scores across group type. The MANOVA indicated that there was a significant main effect of group type, $F(6, 1286) = 19.5$, $p = .000$, partial $\eta 2 = .08$; with significant differences specifically observed on the 'attentional' domain of the BIS-11 ($F(2, 645) = 48.48$, $p = .000$, partial $\eta 2 = .13$; see Table 4.2). A Tukey Honest Significant Difference (HSD) post hoc test was conducted to identify specific group differences within the MANOVA. Tukey HSD was chosen as it has greater power than some other tests when comparing multiple groups, such as Scheffé, and the Tukey-Kramer method allows for unequal sample sizes. The Tukey test identified that the control sample had significantly lower scores on the 'attentional' subscale of the BIS-11 compared to online-only and cross-over Internet sex offenders. All other comparisons were non-significant.

Table 4.2: Univariate test results for the three BIS-11 domains.

| Domain | F | Sig. | $\eta_p^2$ |
|---|---|---|---|
| BIS-11 'Attentional' | 48.480 | .000* | .131 |
| BIS-11 'Motor' | .633 | .531 | .002 |
| BIS-11 'Nonplanning' | 2.182 | .114 | .007 |

*. Differences in scores are significant at the .05 level.

A power analysis was conducted, using the G*Power application – Version 3.1.7, for the effect size of three participant groups across three domains of the BIS-11. In order for a desired power level of .8 (Cohen, 1988), this power analysis prescribed a total sample size of at least 90 participants. This analysis included 647 participants and therefore exceeded this recommendation, providing the maximum power of 1.

**Trait and state impulsiveness in Internet sex offenders**

In order to further analyse the influence of state impulsiveness in sexual offending, the online-only Internet sex offenders and control subjects were tested on a colour-naming Stroop task. There appeared to be differences in the mean response times between participant groups on the colour-naming Stroop task. It was noted that the Internet sex offenders took longer to inhibit the colour name and respond to the font colour (M = 758.17, SD = 99.08) compared to controls (M = 651.58, SD = 116.37). When examining the accuracy of responses, Internet sex offenders yielded a 95% accuracy rate and control subjects yielded 96%. This suggests that the response latencies are likely to be valid representations of response inhibition. Both groups also demonstrated faster reaction times when presented with congruent word trials, that is, word names which matched the colour font in which they were presented (see Table 4.3).

Table 4.3: Mean reaction times for congruent and incongruent trials on the Stroop colour-naming task.

| Variable | Group mean reaction times | |
|---|---|---|
| | ISOs (n = 13) | Controls (n = 32) |
| N | 13 | 32 |
| Congruent colour words | 730.92 | 618.63 |
| Incongruent colour words | 774.24 | 659.22 |

N.B. Mean reaction times are denoted in milliseconds (ms); ISOs = Internet sex offenders; N = sample size.

In order to explore the significance of these results further, the groups were examined on their mean response times through a MANOVA and a significant difference was observed based on group type, $F (2, 42) = 5.73$, $p < .01$, partial $\eta 2 = .21$. The effect of group type on

reactions times for congruent and incongruent words was also explored using a MANOVA. Significant differences were noted for both congruent words ($F (1, 43) = 11.69$, $p < .01$, partial $\eta 2 = .21$) and incongruent words ($F (1, 43) = 8.48$, $p < .01$, partial $\eta 2 = .17$.

A matched-pairs t-test was performed for each group to determine whether there was a significant difference between congruent and incongruent words. The t-statistic was significant for the Internet sex offender group ($t (12) = -3.85$, $p < .01$) and the control group ($t (31) = -3.71$, $p < .01$), implicating the interference effect of incongruent names on font colour.

A power analysis was conducted in order to ascertain the adequate sample size required for the colour Stroop task. This analysis yielded a prescribed sample size of 50 participants for power at the .8 level. As the current study included 45 participants, this lacked some power; however there were enough participants ($n = 40$) at the .7 level.

The online-only Internet sex offenders and control subjects were also tested on the Impulsivity, Risk-Taking and Sensation Seeking Scale (IRTSSS; Schafer, Blanchard & Fals-Stewart, 1994); a psychometric measure intended to further explore impulsiveness. Descriptive statistics for the results of the IRTSSS are shown in Table 4.4. The control sample appeared to show higher mean scores on this measure.

Table 4.4: Mean scores and standard deviations for the Internet sex offender and control groups on a psychometric measure of general impulsiveness

| | | Group mean scores | |
|---|---|---|---|
| Construct | Measure/Domain | ISOs | Controls |

| | | (n = 13) | (n = 32) |
|---|---|---|---|
| Risk-taking and sensation-seeking | IRTSSS | 29.54 (8.82) | 30.53 (6.64) |

N.B. Standard deviations for scores are denoted in parentheses; ISOs = Internet sex offenders

The IRTSSS appeared to meet assumptions of normal distribution and therefore a t-test was conducted in order to explore group differences. The analysis yielded no significant difference for group type on this measure of risk-taking and sensation-seeking at the .05 alpha level; $t(43) = .413$, $p = .682$.

A power analysis was conducted for the IRTSSS measure. The effect size appeared to be very small ($d = .13$) and therefore a much greater sample size would be required for each group to achieve even moderate power ($n = 336$ at the .5 level).

**Emotional interference in Internet sex offenders**

The emotional Stroop task was also administered to online-only Internet sex offenders and control subjects to identify interference effects of emotive stimuli related to sexual offending. Similar results to the colour-naming Stroop were found; with the Internet sex offenders producing longer mean reaction times for all word themes (see Table 4.4).

Table 4.5: Mean reaction times for themed stimuli on the emotional Stroop task.

| | Group mean reaction times | |
|---|---|---|
| Emotional Stroop word theme | ISOs (n = 13) | Controls (n = 32) |
| Neutral | 727.29 (102.41) | 664.92 (120.71) |
| Sexual | 732.64 (92.88) | 663.56 (123.67) |
| Aggressive | 725.31 (95.90) | 657.76 (112.56) |
| Internet | 716.94 (109.69) | 644.84 (118.37) |

| | | |
|---|---|---|
| Colour | 755.04 (134.64) | 652.05 (116.30) |
| Positive | 722.85 (117.23) | 645.96 (112.79) |
| Negative | 731.52 (113.59) | 646.05 (103.59) |

N.B. Mean reaction times are shown in milliseconds (ms) and standard deviations are denoted in parentheses; ISOs = Internet sex offenders

Correlational analyses indicated that the emotional Stroop word themes were significantly related to one another and therefore a MANOVA was deemed most appropriate for comparing two independent samples with multiple related dependent variables. The MANOVA yielded a non-significant main effect of group type, $F(7, 36) = 1.34$, $p = .26$, partial $\eta 2 = .21$; however a significant difference for group type was noted on two of the word themes, with the Internet sex offender group demonstrating significantly longer response latencies for colour words ($F(1, 42) = 6.29$, $p < .05$, partial $\eta 2 = .13$) and negative words ($F(1, 42) = 5.64$, $p < .05$, partial $\eta 2 = .12$). The univariate tests for all word themes are shown in Table 4.5.

Table 4.6: Univariate results for the online-only Internet sex offenders and control subjects on the emotional Stroop task.

| Word theme | Group mean reaction times | | F | Sig. | $\eta_p^2$ |
|---|---|---|---|---|---|
| | ISOs (n = 13) | Controls (n = 32) | | | |
| Neutral | 727.29 (102.41) | 664.92 (120.71) | 2.515 | .120 | .056 |

| | | | | | |
|---|---|---|---|---|---|
| Sexual | 732.64 | 663.56 | 3.074 | .087 | 0.68 |
| | (92.88) | (123.67) | | | |
| Aggressive | 725.31 | 657.76 | 3.386 | .073 | .075 |
| | (95.90) | (112.56) | | | |
| Internet | 716.94 | 644.84 | 3.362 | .074 | .074 |
| | (109.69) | (118.37) | | | |
| Colour | 755.04 | 652.05 | 6.285 | .016* | .130 |
| | (134.64) | (116.30) | | | |
| Positive | 722.85 | 645.96 | 3.972 | .053 | .086 |
| | (117.23) | (112.79) | | | |
| Negative | 731.52 | 646.05 | 5.641 | .022* | .118 |
| | (113.59) | (103.59) | | | |

N.B. Mean reaction times are shown in milliseconds (ms) and standard deviations are denoted in parentheses; ISOs = Internet sex offenders

*. The F statistic is significant at the .05 level.

In order to explore the level of cognitive competition elicited by different word themes, bias scores were calculated using the neutral theme as the baseline; with positive bias scores indicative of an interference effect (see Table 4.6). It appears as though the control subjects did not experience interference as a result of word theme; however the Internet sex offenders produced slower responses when presented with words from the sexual, colour and negative categories.

Table 4.7: Bias scores for themed stimuli on the emotional Stroop task.

| Emotional Stroop word theme | Group bias scores | |
|---|---|---|
| | ISOs (n = 13) | Controls (n = 32) |
| Sexual | 5.35* | -1.36 |
| Aggressive | -1.98 | -7.16 |
| Internet | -10.35 | -20.08 |
| Colour | 27.75* | -12.87 |

| | | |
|---|---|---|
| Positive | -4.44 | -18.92 |
| Negative | 4.23* | -18.87 |

N.B. ISOs = Internet sex offenders

* = Positive bias scores indicative of an interference effect

The effect size between groups for the emotional Stroop task, as measured by partial eta squared, was calculated through a multivariate ANOVA on SPSS. A power analysis subsequently conducted from this effect size indicated a required total sample size of 76 participants for 80% power. As only 45 participants were able to be acquired for this analysis of emotional Stroop word themes, the estimated power level was reduced to the .5 level.

**Sexual compulsivity in Internet sex offenders**

Descriptive statistics for the psychometric measures of risk-taking and sensation-seeking; the SCS and SSAS, are shown in Table 4.7. The Internet sex offender group appeared to show higher mean scores on both of these measures.

Table 4.8: Mean scores and standard deviations for the Internet sex offender and control groups on the psychometric measures of sexual compulsivity.

| | | Group mean scores | |
|---|---|---|---|
| Construct | Measure/Domain | ISOs (n = 13) | Controls (n = 32) |

| | | | |
|---|---|---|---|
| Sexual compulsivity | SCS | 2.13* | 1.13 |
| | | ( .65) | ( .12) |
| | SSAS | 16.46* | 1.38 |
| | | (10.11) | (2.92) |

N.B. Standard deviations for scores are denoted in parentheses; ISOs = Internet sex offenders
* = These mean scores were significant on a Mann-Whitney U test at the .01 level

A Levene's test for homogeneity of distribution indicated that the measures of sexual compulsivity, the SCS and SSAS, violated assumptions of normal distribution ($p < .000$); therefore the non-parametric equivalent of an ANOVA for two independent samples, a Mann-Whitney U test, was conducted. The results indicated a significant difference between the control group and Internet sex offender group based on mean ranks for the SCS ($U = 12$, $-4.99$, $p < .000$) and the SSAS ($U = 29$, $-4.93$, $p < .000$).

A power analysis was conducted for the psychometric measures across both participant groups, which indicated that the sample size was adequate for the measures of sexual compulsivity at the .7 level.

## Discussion

This research study aimed to explore whether Internet sex offenders showed deficits in inhibitory control, which has been previously evidenced in individuals who engage in offline sexual offending (Smith & Waterman, 2004). In addition, this research hoped to explore the heterogeneity of Internet sex offenders, by comparing impulsiveness across offence type; either sexual offences committed online-only, or both online and offline (cross-over). This study found that Internet sex offenders do appear to struggle with inhibiting their responses and show a greater level of attentional impulsiveness than a sample of non-sex offending control subjects. In addition it was observed that Internet sex offenders experience emotional interference related to negative and sexually themed content, and endorse a significantly

greater level of sexual compulsion than control participants. However, there were no findings observed for differences in motor control, spontaneity or risk-taking behaviour between Internet sex offenders and controls, and there was no difference noted for impulsiveness across offender typologies.

**Trait impulsiveness and Internet sex offender typologies**

Internet sex offenders were differentiated according to offences for which they had been charged and/or convicted, namely those which involved sexual offending in an online-only capacity, such as distributing indecent images of children, and those which also included offline sexual offending, such as arranging to meet a child offline for sexual activity, producing indecent images of children for distribution, or committing an offline sexual offence. It was held that as some of these individuals had "crossed over" from online to offline offending, they may have a lower threshold for engaging in risky behaviour and therefore may be more impulsive than individuals who had only committed offences within the domains of the Internet. In order to explore this concept, the two groups of Internet sex offenders (online-only and cross-over) were compared against one another, as well as a sample of control subjects, on a psychometric measure of trait impulsiveness; the Barratt Impulsiveness Scale – Version 11 (BIS-11).

It was found that both groups produced significantly poorer results for attentional impulsiveness compared to the non-sex offending subjects; however there was no difference in motor control or behavioural planning. These findings indicate that, as a group, Internet sex offenders lack focus and concentration and have difficulties with intrusive and racing thoughts; however they do not have difficulties in maintaining a consistent lifestyle, engaging in mental challenges or careful planning of tasks. It is likely that these findings reflect

intrusive thoughts regarding deviant sexual stimuli, which has been implicated in the progression from fantasy to action in sexual offending (Ward & Hudson, 1998; Sullivan, 2002).

There were no differences found across the three BIS-11 domains for the Internet sex offender typologies, indicating a homogeneous group for impulsiveness. These observed results suggest that, whilst impulsivity may be a deficit for those involved in sexual offending using the Internet, this may not be implicated in differentiating the type of offence they commit. This finding is particularly pertinent when considering risk, as is indicates that impulsiveness is not a significant factor in the cross over from online-only to offline offending. Of course it must be considered that there are other differentiating and protective factors which may be present to avoid contact offending such as access to children, previous convictions, paedophilic interests, age and victim empathy distortions (see Chapter 2). It would be useful for future research to consider the interaction of psychosocial and trait factors as, although impulsiveness may not define whether an offline act will be committed, it is clearly a feature of sexual offending in general and therefore may affect the imminence of an offline offence when taken in the context of greater sexual compulsions and the opportunity to offend, for example within the family home.

**Trait and state impulsiveness in Internet sex offenders**

In addition to exploring trait impulsiveness in Internet sex offenders, this research also intended to examine state impulsiveness to further understand how well they may be able to control their impulsiveness when responding to active external stimuli. A colour-naming Stroop task was used as an objective measure of behavioural inhibition, as this has been recognised as a useful measure that has been utilised with a wide range of participants across

many research studies exploring attention and interference (MacLeod, 1991). In addition, it was felt that this measure is one that is applied within clinical settings more frequently than other behavioural tasks, as the Stroop task may also be administered using cards as well as through a computer programme.

Findings from this study indicated that Internet sex offenders as a group were worse than non-sexual offenders at inhibiting their responses to word reading. This suggests that they are less adept at placing behavioural controls on their initial responses and may therefore be deemed as more impulsive than the control sample. This outcome supports previous findings that sexual offenders perform worse on the Stroop task (Smith & Waterman, 2004) and supports other research implicating poor inhibitory control within this group (Middleton, Elliott, Mandeville-Norden & Beech, 2006). It may useful for future research to take this further by exploring state impulsiveness across both typologies of Internet sex offenders, that is, online-only versus cross-over, as it was not possible for this comparison to be made within the current study. This may further our understanding as to whether these proposed groups react to external stimuli in similar or different ways; in conjunction with findings from the BIS-11, it may be possible to understand whether this group are similar on both trait and state impulsiveness or whether it is the state presentation of external stimuli – such as the opportunity for contact sexual offending - which distinguishes them.

As part of this study, trait impulsiveness was examined through self-report on the Impulsivity, Risk-Taking and Sensation-Seeking Scale (IRTSSS) and no differences were observed across offending and non-offending groups. This may not be a particularly contentious finding, as previous research has indicated that online-only Internet sex offenders tend to display limited sexual behaviours, low levels of personal distress and are more likely

to be employed (see Chapter 2). Nevertheless, one might expect that individuals who are committing illegal sexual acts on the Internet are more likely to be risk-takers than individuals who do not engage in such behaviour. It may therefore be the case that risk-taking behaviours are more likely to occur within the context of external stimuli, rather than as part of personality functioning per se. In order to explore this, it may be pertinent to use behavioural paradigms where observation of risk-taking is more representative of state behaviour. Exploring risk-taking by incorporating a consequence into behavioural tasks may also add to our understanding of impulsivity as previously measured by the Stroop task. In particular this would be interesting to explore with different Internet sex offender groups to understand whether greater repercussions affect behavioural control more positively for online-only Internet sex offenders than cross-over Internet sex offenders.

**Emotional interference in Internet sex offenders**

Previous research has held that individuals who engage in risky sexual behaviour may experience intrusive deviant thoughts and fantasies (Smith & Waterman, 2004). There has been some evidence that this may contribute to the facilitation of sexual offending; however it has been suggested that this area of understanding requires further exploration, particularly within the context of inhibitory control (Bartels & Gannon, 2011). In order to explore the presence of such deviant stimuli, online-only Internet sex offenders were compared against non-sex offenders for interference effects with an emotional Stroop task. It was observed that when responding to words categorised by sexual, negative or colour themes, the Internet sex offenders took significantly longer to inhibit their word responding and respond to the colour font. The colour theme interference was expected as this was a replication of the colour-naming task also conducted with this group. Colour words had been included in the emotional Stroop trial in order to provide validity for the emotional Stroop task in terms of

measuring interference effects, as well as further establishing some test-retest reliability for the colour-naming Stroop task.

The interference afforded by sexually themed words had been hypothesised due to the nature of the Internet sex offenders' behaviour and supports previously observed results for offline sexual offenders (Smith & Waterman, 2004). This response bias towards sexual words might indicate that Internet sex offenders hold strong, and potentially frequently reinforced, thoughts and fantasies regarding sexual themes, which is likely to make sense given cognitive and behavioural models for sexual offending (e.g., Finkelhor, 1984; Hall & Hirschman, 1992), as well as previous research which highlights greater sexual deviancy in Internet sex offender populations (Babchishin, Hanson & Hermann, 2011). These findings indicate similarities with offline sexual offenders, and therefore consideration must be paid to the specific Internet-based context of Internet sex offenders' chosen offending method. Internet-themed words were included as part of this explorative study; however no significant interference effects were found, which may suggest that the Internet is a functional resource for conducting offending behaviour perhaps due to the anonymity and accessibility that it affords (Cooper, 1998). Of course, there may be confounding factors which impacted upon the results, as one might expect individuals to use a range of methods for sexual offending rather than just the Internet if it is purely a matter of convenience. For example, the Internet-themed wordlist was newly derived for the purposes of this study and likely requires refinement in terms of identifying counterbalanced word lengths and frequency from an English lexicon in order to accurately measure response latencies with reading times.

The interference of negatively themed words was an interesting finding observed in this study. It has been previously held that sexual offenders are more likely to have suffered physical and/or sexual abuse than non-sexual offenders and that Internet sex offenders may

avoid emotional closeness which contributes to their chosen non-contact method for sexual offending (Babchishin, Hanson & Hermann, 2011). Such difficult and isolative life experiences might therefore engender these individuals to sensitivity towards negative themes which would cause inhibitory interference for such stimuli.

Additionally, the internal cognitions being exposed within this cohort (sexual and negative concepts) appear to connect thematically with external stimuli chosen by them (sexually abusive images of children on the Internet) which is thought to generate greater sexual arousal than either component alone (Ward & Casey, 2010). It may therefore be suggested that negative life experiences generate deviant cognitions which are then drivers for finding deviant external stimuli in order to produce a greater level of sexual arousal. It may be supposed that once this process has been exhausted by online-only imagery, progression would be made towards offline stimuli such as physical contact with children. This link between deviant cognitions and negative affect has been strongly upheld previously (Bartels & Gannon, 2011; Marshall & Marshall, 2000); however the bi-directional nature of this relationship is as yet unclear. There has been some thought regarding the previously stated hypothesis, that deviant thoughts are in response to negative affect and function as a coping mechanism; however it must also be considered that ruminating over such deviant sexual imagery may also generate negative emotions.

There is a link to be observed here between the interference effects of emotive stimuli and the results observed on the BIS-11 measure. It was found that Internet sex offenders as a group tend to experience attentional interference, which translates to intrusive thoughts, and therefore it makes sense that such intrusive thoughts are likely to be sexual and/or negative in nature. It appears that these intrusive themes are recognised within Internet sex offenders

themselves who will report such trait difficulties (on the BIS-11), but it also seems that these themes cause an observable interference for state impulsiveness as well, as measured by the emotional Stroop task. By considering the literature regarding sexual offending, it seems that intrusive deviant ideas fit within a fantasy-driven model of offending, or one which considers motivational psychology (e.g., Sullivan, 2002; Ward & Beech, 2006).

In terms of treatment, identifying the link between cognitions and external factors may allow clinicians to more effectively individualise treatment approaches towards the areas of relevant need, which is then likely to increase responsivity and reduce risk; deemed as the gold-standard approach for treating offenders (Andrews & Bonta, 2006). It may also allow clinicians to explore affective functioning more closely and to target areas of emotional need which may reduce the desire for deviant external stimuli.

**Sexual compulsivity in Internet sex offenders**

As previous research studies have highlighted the role of sexual disorders within excessive pornography use (Stein, Black, Shapira & Spitzer, 2001) as well as specifically for Internet sexual offenders (Krueger, Kaplan & First, 2009; Briggs, Simon & Simonsen, 2011) it was felt that this factor should be considered within the current study. It was important to consider additional factors beyond impulsiveness alone to account for deficits in behavioural control, particularly when the focus is so specifically targeted at sexual behaviours.

This study utilised two self-report psychometric measures to assess for sexual compulsiveness within the online-only Internet sex offenders and the control sample; the Sexual Compulsivity Scale (SCS) and the Sexual Symptom Assessment Scale (SSAS). It was observed from the analysis that there was a substantially significant difference between the

participant groups, with Internet sex offenders endorsing much higher scores on both scales. It appears that Internet sex offenders felt sexual thoughts and behaviours were interfering more with their daily functioning, that they had greater sexual preoccupations and were less able to control their sexual urges. These findings appear to correlate with results of the BIS-11 impulsiveness measure as well as the emotional interference of sexual words on the emotional Stroop.

**Limitations**

Whilst this research study has attempted to be robust in its methodology, there are some limitations which may have affected the outcomes achieved. One of these is related to the sample size of comparisons made between online-only Internet sex offenders and non-sexual offenders on the IRTSSS. Whilst power was adequate for other measures within this study, the IRTSSS appeared to require a greater number of subjects in order to be powerful enough for accurate conclusions to be drawn. It is recommended that this assessment be replicated with a larger participant cohort in future in order to establish results based on a good level of power.

Four measures included in this research study were self-report assessments which have potential disadvantages compared to more objective measures. For example, it was unknown how accurate the participants were as historians of their own functioning, and data was reliant solely upon the honesty of these participants. False responses may occur when individuals attempt to mask difficulties in order to present a socially desirable profile, or conversely they may over-disclose difficulties in order to justify behaviour or seek help. It may be useful in future to include a measure of deception and/or a psychometric which includes a validity index, in order to safeguard against potentially false self-reports.

A further pitfall of psychometric measures it that they may not be addressing the issue under examination; however the tools included in this study were examined prior to use in order to establish their validity and reliability coefficients, and were found to be adequate assessments.

An additional consideration of the study results should be the context in which online-only Internet sex offenders were tested. This was a cohort gathered from a support group in the community where individuals were awaiting bail or sentencing and therefore their results may have reflected greater justification of behaviour through enhanced reporting of psychological difficulties. This may also account for low disclosure of risk-taking behaviour which they may perceive to affect their on-going Court proceedings. In the same vein, no distinction was found between online-only and cross-over Internet sex offenders; however this cohort had been arrested for online-only offences and therefore the likelihood of disclosing a contact offence was likely to be extremely low for fear of greater criminal justice repercussions. It is therefore difficult to conclude that this group are online-only except for their self-report as such. Previous studies have included the use of polygraph in order to ensure truthful responding (e.g., Abel et al., 1992; Bourke & Hernandez, 2009); however the disadvantages of this tool, such as contaminated responding and issues with content validity, (Saxe & Ben-Shakhar, 1999) should be considered against the benefits of augmented self-report accuracy.

## Conclusion

This research study intended to explore several components of Internet sexual offending in order to gain a greater understanding of the role of impulsiveness and Internet sex offender

typologies. Online-only and cross-over Internet sex offenders were compared on trait impulsiveness and found not to differ on this measure; however both groups disclosed significantly more deficits with attentional impulsivity than a sample of non-sexual offenders. Online-only Internet sex offenders were then examined for state impulsiveness and found to have significantly poorer inhibitory control than non-sexual offenders, with their performance further compounded through the interference of sexual and negatively themed stimuli. Online-only Internet sex offenders also self-reported greater sexual compulsiveness than non-sexual offenders; however they reported similar rates of risk-taking behaviour.

It seems reasonable to conclude that the group of online-only Internet sex offenders included in this study have experienced significant difficulties with sexual ruminations and negative cognitions that have interfered with their everyday responsibilities. It may then follow that these thoughts have translated into online risky behaviours as a management strategy; however the juxtaposition of viewing indecent material and holding deviant fantasies has consequently reinforced their cognitions and increased such offending behaviour. It may also be that difficulties with impulsiveness contributed to the likelihood of these individuals viewing indecent material initially and then reduced their ability to cease this behaviour once their deviant fantasies had been reinforced. This suggested hypothesis is a tentative explanation of the study outcomes and such conclusions should be mindful of other confounding variables which have been outlined within the limitations section of this discussion.

From the comparison included in this research it appears as though Internet sex offenders are a homogeneous group, which then implicates a continuum model for online offending behaviour and suggests an indistinguishable risky cohort. It is likely that individual factors,

such as opportunity and strength of fantasy, are more related to the imminence of a progression to contact offending than impulsiveness alone. Further exploration is required in terms of measuring risk-taking within a behavioural paradigm, as well as comparing online-only and cross-over Internet sex offenders on state impulsiveness, sexual compulsivity and emotional interference in order to further understand the presence or absence of Internet sex offender typologies.

The final chapter in this thesis will provide an overall discussion of the findings of this thesis and, in particular, how the outcomes of this research link to our established knowledge base. Some implications and limitations are also outlined along with some considerations for the future.

# Chapter 5

# DISCUSSION AND CONCLUSION

## Discussion

This thesis aimed to examine the role played by impulsiveness in distinguishing between online-only and cross-over Internet sex offenders. This was done by exploring the existing theories and research studies on Internet sex offenders, including defining characteristics; understanding how inhibitory control is measured through behavioural and actuarial tools; examining the validity of such measures; and then exploring the potential differences through a novel research study.

It was interesting to note that the current theoretical perspective on Internet sex offenders is somewhat divided; often with quantitative research (which makes use of conviction data) upholding a typology distinction between online-only and cross-over Internet sex offenders, and qualitative data conversely upholding a more continuum-based view. It was evident from several research papers in the field (e.g., Babchishin, Hanson & Hermann, 2011; Elliott, Beech & Mandeville-Norden, 2013) that one factor yet to be more fully considered in this debate over typologies was inhibitory control; as deficiencies in this area have been evidenced previously in offline sex offender populations (Barbaree, Marshall & Lanthier, 1979; Smith & Waterman, 2004; Price & Hanson, 2007). Therefore the current work intended to explore this facet in more detail, to understand whether deficiencies in impulsivity are present in an Internet sex offender population and whether this influences the propensity for some Internet sex offenders to cross over from online-only offending behaviour to offline contact offences.

When considering the characteristics of Internet sex offenders, a review was deemed necessary in order to condense and identify the main area of consensus within the research literature. A systematic approach was taken to ensure a comprehensive and reliable review

and the four main characteristics observed within the included literature were: sexual behaviours, substance use, cognitive and emotional factors, and paraphilias. The literature included in this review appeared to generate both similarities and differences for Internet sex offender groups; however overall there was a greater presence of differentiating factors, indicating that Internet sex offenders are a heterogeneous group with distinct typologies according to offence methodology.

It was evident from the systematic review that inhibitory control had not been a widely applied area of study to Internet sex offenders. Therefore it was considered an important direction to explore; however methodologies for examining this executive function had to be examined through previous use with similar populations, such as offline sex offenders or offenders in general. It appeared as though some behavioural methods had been employed which often assessed state-based impulsiveness, such as Stop Signal paradigms (e.g., Chen, Muggleton, Juan, Tzeng & Hung, 2008) and Stroop tasks (Stroop, 1935; Smith & Waterman, 2004); whereas other research made use of actuarial tools for assessing trait impulsiveness, such as the Barratt Impulsiveness Scale – Version 11 (BIS-11; Patton, Stanford & Barratt, 1995) and the Eysenck Impulsiveness Questionnaire ($I_{7;}$ Eysenck & Eysenck, 1978). Both types of assessment have been credited on their merits; although a combined approach using both methods has been recommended for a robust examination of impulsiveness (Barratt & Patton, 1983). Further investigation was given to the BIS-11 in order to critique the validity and reliability of the construct, as it has been a widely used tool in this area of study. It was evidenced as highly reliable and a valid tool for a range of client populations, including offenders and patients, therefore deeming it an appropriate measure to be used a part of an empirical research study.

Research was carried out to explore the presence or absence of impulsivity deficits within a group of Internet sex offenders; with comparisons made based upon modus operandi (online-only or cross-over offending). The behavioural and actuarial measures employed appeared to produce consistent findings of impulsiveness difficulties within the Internet sex offender group as a whole. Distinct typologies, however, were unable to be distinguished. Sexual compulsiveness was also characteristic of the Internet sex offender group and emotional interference was noted, indicative of intrusive cognitions regarding negative and sexual themes. These findings of psychological difficulty and executive function deficits as a general characteristic of Internet sex offenders appears to support previously held ideas regarding the profile of these individuals (Quayle, Vaughan & Taylor, 2005; Price & Hanson, 2007; Elliott & Beech, 2009).

**Implications**

The findings of this thesis indicate a mixed picture in terms of Internet sex offender typologies. The Barratt Impulsiveness Scale – Version 11 (BIS-11) which was used to compare Internet sex offender groups has been evidenced as a reliable and robust measure for trait impulsiveness and therefore the initial findings which do not distinguish between Internet sex offender groups should be considered with some merit. In addition, the specific findings related to deficits in attentional impulsiveness for all Internet sex offenders appeared to support findings of interference from negative and sexual cognitions on the emotional Stroop task. It is likely that the combined approach of utilising both behavioural and actuarial measures, as recommended for comprehensively measuring impulsiveness (Barratt & Patton, 1983), has given a more accurate and reliable picture of self-control characteristics within a sample of individuals who engage in risky sexual behaviour online.

Whilst a greater number of distinguishing features were found within the literature, there were also significant numbers of similarities across groups. These similarities have been replicated in the current research study on state and trait impulsiveness, which appear to be characteristic of sexual offenders in general. This appears to highlight that self-control is related more generally to overcoming inhibitors for sexual offending (Finkelhor, 1984), rather than being specifically related to the commission of online-only or cross-over Internet-based offences. It is possible, therefore, that such differences in modus operandi may be due to other differentiating characteristics which have been evidenced across Internet sex offender groups, such as paraphilias and substance use. Alternatively, differences in offending pattern may simply reflect the length of time spent engaging in offending behaviour and the point at which an individual was caught. This proposal is an interesting one as it could be supported by findings that an increase in offending duration over years corresponded with an increase in severity of material accessed (Long, Alison & McManus, 2013), suggesting somewhat of an escalation in risky behaviour.

Generally, qualitative research has shown greater evidence for a continuum, or spiral, theoretical understanding of Internet-facilitated offending (Sullivan, 2002; Sullivan & Beech, 2003), whilst quantitative approaches tend to support the theoretical notion of distinct typologies: those who commit offline as well as online offences, and those who do not. However, the current research used a quantitative approach but evidenced no such distinctions; therefore augmenting the continuum-based theory. This suggests that there may be other confounding elements within the methodology used which produced these interesting results. The online-only cohort gathered for participation within this research study were recruited through a self-referred community support group and therefore these individuals may be more reflective about their difficulties than individuals within custodial

settings. However it might also be argued that individuals within the community awaiting the conclusion of legal processes are unlikely to emphasise their difficulties or potential risk. It appeared during the testing process that the majority of these individuals seemed open and honest in their approach to the facilitator and were keen to emphasise difficulties, perhaps in an attempt to justify their actions and minimise their personal distress. This overall presentation seems consistent with the former proposition of a more reflective cohort; although future studies might consider the use of a personality assessment tool with disclosure and debasement constructs, such as the Millon Clinical Multiaxial Inventory – III (MCMI-III; Millon & Davis, 1997), in order to formally assess such extraneous variables.

In terms of clinical relevance, there appears to be an argument for providing a standardised approach to assessing, managing and treating Internet sex offenders, with the approach tailored to each individual. It seems as though, whilst there are some distinguishing characteristics across online-only and cross-over Internet sex offender groups, deficits in impulsivity are equally prevalent and do not seem to impact on probability for specifically commissioning an offline contact offence, although it is significant in terms of future sexual offending within any context. It would therefore be useful for clinicians to assess each Internet sex offender on both state and trait impulsiveness and to develop collaborative formulations to improve understanding on how this may link to offending behaviour. In terms of risk assessment, standardised risk assessment tools for sexual offending would be useful, such as the SVR-20 (Boer, Hart, Kropp & Webster, 1997), although it would also be recommended to include measures of beliefs and attitudes towards sexual offending, such as the Sex Offender Treatment Intervention and Progress Scale (SOTIPS; McGrath, Lasher & Cumming, 2012), in order to provide a more comprehensive assessment, particularly where sexual violence may be less explicit, such as in cases of online relationship grooming. In

addition to assessing risk and impulsiveness, it was also noted within this thesis that cognitive and emotional factors play a significant role within the Internet sex offender profile of psychological difficulties. Whilst some of these factors may be measured by an external attitude scale, it would also be useful to consider an introspective measure, such as the Rosenberg Self-Esteem Scale (Rosenberg, 1965) or a Beck Inventory for anxiety or depression, which may provide insight into internal difficulties that could be linked to sexually deviant fantasies and sexual offending (Marshall, 1997; Marshall, Marshall, Serran & O'Brien, 2009).

**Limitations**

There are some limitations to the outcomes of this thesis which should be considered in addition to the conclusions drawn. The Internet sex offenders included in the research study were defined according to the offence for which they had been arrested or convicted and therefore did not take into account previous unknown offences, which may have contaminated the differentiation of the groups. Whilst the online-only Internet sex offenders, who were directly involved in the testing of this research study, were asked for disclosure of any contact offending as part of the demographics form; the reliability of these individuals as historians is unknown and thus categorisation was done on uncorroborated self-report. Similarly, the actuarial measures used to test impulsiveness and sexual compulsivity also relied upon self-report data. Although the measures were chosen due to their high reliability and validity scoring, it is difficult to fully conclude the accuracy of responses given by participants and so the results should always be considered somewhat tentatively.

A further limitation within the exploration of Internet sex offender typologies in the research study was the comparison of online-only and cross-over groups only on one measure; the

Barratt Impulsiveness Scale – Version 11. It would be useful if both groups in future could be tested on the range of assessment tools, including behavioural tasks such as colour-naming and emotional Stroop tasks, in order to further corroborate the psychometric evidence. This would also be helpful in order to increase the sample size of participants included in these assessment processes, as the current study included only 13 online-only Internet sex offenders due to lack of access to potential participants, average recruitment success and time constraints in testing.

A limitation concerning the overall thesis is the focus on deficient characteristics within the commission of sexual offences against children online. Whilst this approach adds to our knowledge and reflects a need for exploration into knowledge gaps, as highlighted in the systematic review and previous literature; there is little consideration of protective factors which may be more pertinent, or indeed useful, in the real-world assessment and treatment of Internet sex offenders. What this thesis has highlighted, however, is additional support for the possibility of a continuum for Internet sexual offending, which therefore provides a theoretical argument for protective factors that are at play in the earlier stages of this continuum. It is integral that future research into this area is mindful of such considerations as positive psychological approaches to addressing offending are more well-known and more well-evidenced in their efficacy than ever before (e.g., Quayle, Vaughan & Taylor, 2005; Seligman, Steen, Park & Peterson, 2005).

**Future directions**

Additional research that may be carried forth in this area of study should consider the implications of the findings from this thesis. There is some tentative evidence that online-only and cross-over Internet sex offenders may not be distinguished from one another,

therefore representing Internet sex offenders as a homogeneous group with similar characteristics and potentially similar levels of risk for offline offending. Further evidence is required in order to corroborate or discount these findings and it is likely that the best outcomes will be achieved by combining both psychometric and behavioural tools, as well as including qualitative investigations alongside quantitative data. There is clearly a realm of psychological difficulty influencing the commission of online offences; however when considering the practical implications of these, future research might actually benefit from placing a greater emphasis on the positive and resilient traits that are protecting some individuals from progressing to more frequent or severe offending behaviours.

In terms of law enforcement, this thesis has highlighted a need for earlier involvement with online offenders in order to intervene prior to the escalation of offline contact offences. Whilst a progression of offending behaviour has not been specifically evidenced by this body of work, it is clear that the similarities and differences in Internet sex offender characteristics is so varied that typologies cannot be assumed with any great accuracy. This would suggest a reasonable argument for assumptions to be made about the propensity to further offend, which would be supported by theories of psychological difficulty that lead an individual to initiate any kind of sexual offence against a child. Continued collaborative working between researchers and law enforcement agencies will be crucial in terms of improving understanding, gathering further information through research with Internet sex offenders and improving prevention campaigns, such as those developed by the Child Exploitation and Online Protection Centre.

Regarding the assessment and treatment of Internet sex offenders, it appears as though an accurate, individualised assessment of difficulties will be the most informative approach to

take, as there are no clear definitions between individuals who commit offences solely online and those who cross-over to offline offending. It may be useful to use both qualitative and quantitative tools in order to build up a more complete picture of motivational drives, as well as identifying psychological difficulties which may predispose and precipitate an individual to sexually offend online, such as negative view of the self. It would also be recommended to utilise a risk assessment tool which incorporates protective factors, in order to help inform the most useful and efficient interventions. More tailored programmes and strengths-based approaches for intervention, may therefore provide a replacement for the criminogenic satiation afforded by sexual offending.

## Conclusion

This thesis aimed to provide a greater understanding of characteristics relevant to the commission of online sexual offences against children, with a specific focus on inhibitory control. It was evidenced from this work that deficits related to response inhibition, sexual compulsions and intrusive thoughts were significantly present within the sample of Internet sex offenders, reinforcing a previously described link between poor behavioural controls, psychological difficulties and criminal behaviour.

Outcomes of the systematic review indicated four key characteristics explored within Internet sex offender populations, including: sexual behaviours, substance use, paraphilias, and cognitive and emotional factors. It was observed that there was a greater distinction found between online-only and cross-over Internet sex offenders than similarity; however some limitations in methodology were also noted.

It appears as though the findings of this thesis may be extended in several ways through future work; including incorporating other psychological factors into the findings, such as personality difficulties and the effects of social desirability. Traits of resiliency or other external protective factors may also need to be considered for more effective assessment of risk within the community and improved intervention programmes. Psychometric measures may be appropriate for measuring these constructs, as the Barratt Impulsiveness Scale – Version 11 proved to be quite consistent in the validity and reliability of its findings; however it would be recommended for a variety of assessment tools and methodological approaches to be employed in order to generate more robust and reliable findings which are uncompounded by research artifacts.

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# APPENDICES

## APPENDIX 1

### Syntax for search strategy

PsycINFO (1967 to February Week 3 2014)

| # ▲ | Searches | Results | Search Type |
|---|---|---|---|
| 1 | fantas*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 14169 | Advanced |
| 2 | contact*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 50064 | Advanced |
| 3 | porn*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 2210 | Advanced |
| 4 | groom*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 3831 | Advanced |
| 5 | molest*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 1579 | Advanced |
| 6 | abus*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 130431 | Advanced |
| 7 | "indecent image*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 10 | Advanced |
| 8 | picture*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 46872 | Advanced |
| 9 | image*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 80658 | Advanced |
| 10 | cyber*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 4559 | Advanced |
| 11 | rape.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 7538 | Advanced |
| 12 | exploit*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 11612 | Advanced |
| 13 | erotic*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 4099 | Advanced |
| 14 | chat room*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 476 | Advanced |

| | | | | |
|---|---|---|---|---|
| ☐ | 15 | chat log*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 19 | Advanced |
| ☐ | 16 | illegal*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 5058 | Advanced |
| ☐ | 17 | sex*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 292998 | Advanced |
| ☐ | 18 | coerc*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 6588 | Advanced |
| ☐ | 19 | offen?e*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 31703 | Advanced |
| ☐ | 20 | paraphil*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 2573 | Advanced |
| ☐ | 21 | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 | 587098 | Advanced |
| ☐ | 22 | child*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 513502 | Advanced |
| ☐ | 23 | kid*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 9584 | Advanced |
| ☐ | 24 | minor*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 51541 | Advanced |
| ☐ | 25 | victim*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 44831 | Advanced |
| ☐ | 26 | 22 or 23 or 24 or 25 | 589082 | Advanced |
| ☐ | 27 | internet.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 31776 | Advanced |
| ☐ | 28 | web*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 29745 | Advanced |
| ☐ | 29 | online.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 31657 | Advanced |
| ☐ | 30 | internet-based.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 2884 | Advanced |
| ☐ | 31 | "social network*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 16912 | Advanced |

| | | | | |
|---|---|---|---|---|
| ☐ | 32 | "world wide web".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 1442 | Advanced |
| ☐ | 33 | 27 or 28 or 29 or 30 or 31 or 32 | 82089 | Advanced |
| ☐ | 34 | sex*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 292998 | Advanced |
| ☐ | 35 | offend*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 27833 | Advanced |
| ☐ | 36 | p?edophil*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 1769 | Advanced |
| ☐ | 37 | criminal*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 38312 | Advanced |
| ☐ | 38 | predator*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 7563 | Advanced |
| ☐ | 39 | "p?edophile ring".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 1 | Advanced |
| ☐ | 40 | "p?edophile network".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 0 | Advanced |
| ☐ | 41 | devian*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 13126 | Advanced |
| ☐ | 42 | trade*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 12677 | Advanced |
| ☐ | 43 | shar*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 94913 | Advanced |
| ☐ | 44 | travel*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 11329 | Advanced |
| ☐ | 45 | aggress*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 64143 | Advanced |
| ☐ | 46 | 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 | 498739 | Advanced |
| ☐ | 47 | character*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 380553 | Advanced |
| ☐ | 48 | heterogene*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 25095 | Advanced |
| ☐ | 49 | homogene*.mp. [mp=title, abstract, heading word, table of contents, key | 11830 | Advanced |

| | | | | |
|---|---|---|---|---|
| | | concepts, original title, tests & measures] | | |
| ☐ | 50 | factor.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 158905 | Advanced |
| ☐ | 51 | distinguish*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 51845 | Advanced |
| ☐ | 52 | trait.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 40740 | Advanced |
| ☐ | 53 | feature.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 28078 | Advanced |
| ☐ | 54 | attribut*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] | 91125 | Advanced |
| ☐ | 55 | 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 | 696476 | Advanced |
| ☐ | 56 | 21 and 26 and 33 and 46 and 55 | 646 | Advanced |
| ☐ | 57 | limit 56 to english language | 614 | Advanced |
| ☐ | **58** | **limit 57 to yr="1980 -Current"** | **611** | **Advanced** |

EMBASE & EMBASE Classic (1974 to 2014 Week 07)

| # ▲ | Searches | Results | Search Type |
|---|---|---|---|
| 1 | fantas*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 9003 | Advanced |
| 2 | contact*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 363935 | Advanced |
| 3 | porn*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 1040 | Advanced |
| 4 | groom*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 6523 | Advanced |
| 5 | molest*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 1646 | Advanced |
| 6 | abus*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 206754 | Advanced |
| 7 | "indecent image*".mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 4 | Advanced |
| 8 | picture*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 182033 | Advanced |
| 9 | image*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 561683 | Advanced |
| 10 | cyber*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 7287 | Advanced |
| 11 | rape.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, | 9936 | Advanced |

| | | | | |
|---|---|---|---|---|
| | | keyword] | | |
| ☐ | 12 | exploit*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 73885 | Advanced |
| ☐ | 13 | erotic*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 2640 | Advanced |
| ☐ | 14 | chat room*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 287 | Advanced |
| ☐ | 15 | chat log*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 0 | Advanced |
| ☐ | 16 | illegal*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 11470 | Advanced |
| ☐ | 17 | sex*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 992470 | Advanced |
| ☐ | 18 | coerc*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 4896 | Advanced |
| ☐ | 19 | offen?e*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 23052 | Advanced |
| ☐ | 20 | paraphil*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 814 | Advanced |
| ☐ | 21 | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 | 2304017 | Advanced |
| ☐ | 22 | child*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 2275054 | Advanced |
| ☐ | 23 | kid*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, | 1063845 | Advanced |

| | | | | |
|---|---|---|---|---|
| | | original title, device manufacturer, drug manufacturer, device trade name, keyword] | | |
| ☐ | 24 | minor*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 285779 | Advanced |
| ☐ | 25 | victim*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 50435 | Advanced |
| ☐ | 26 | 22 or 23 or 24 or 25 | 3531133 | Advanced |
| ☐ | 27 | internet.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 87340 | Advanced |
| ☐ | 28 | web*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 100290 | Advanced |
| ☐ | 29 | online.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 62406 | Advanced |
| ☐ | 30 | internet-based.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 5936 | Advanced |
| ☐ | 31 | "social network*".mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 11361 | Advanced |
| ☐ | 32 | "world wide web".mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 3357 | Advanced |
| ☐ | 33 | 27 or 28 or 29 or 30 or 31 or 32 | 214863 | Advanced |
| ☐ | 34 | sex*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 992470 | Advanced |
| ☐ | 35 | offend*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 22052 | Advanced |

| | | | | |
|---|---|---|---|---|
| ☐ | 36 | p?edophil*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 1297 | Advanced |
| ☐ | 37 | criminal*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 29617 | Advanced |
| ☐ | 38 | predator*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 16347 | Advanced |
| ☐ | 39 | "p?edophile ring".mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 0 | Advanced |
| ☐ | 40 | "p?edophile network".mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 0 | Advanced |
| ☐ | 41 | devian*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 9174 | Advanced |
| ☐ | 42 | trade*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 42771 | Advanced |
| ☐ | 43 | shar*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 351246 | Advanced |
| ☐ | 44 | travel*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 62024 | Advanced |
| ☐ | 45 | aggress*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 201581 | Advanced |
| ☐ | 46 | 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 | 1657952 | Advanced |
| ☐ | 47 | character*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 2520951 | Advanced |

| | | | | |
|---|---|---|---|---|
| ☐ | 48 | heterogene*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 253541 | Advanced |
| ☐ | 49 | homogene*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 126119 | Advanced |
| ☐ | 50 | factor.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 2601252 | Advanced |
| ☐ | 51 | distinguish*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 247582 | Advanced |
| ☐ | 52 | trait.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 86585 | Advanced |
| ☐ | 53 | feature.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 662659 | Advanced |
| ☐ | 54 | attribut*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 325093 | Advanced |
| ☐ | 55 | 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 | 5931154 | Advanced |
| ☐ | 56 | 21 and 26 and 33 and 46 and 55 | 1039 | Advanced |
| ☐ | 57 | limit 56 to english language | 955 | Advanced |
| ☐ | **58** | **limit 57 to yr="1980 -Current"** | **936** | **Advanced** |

Web of Science (1970 to Week 07 February 2014)

| Set | Results | Save History / Open Saved History |
|---|---|---|
| # 12 | **Approximately 2,083** | #10 AND #8 AND #6 AND #4 AND #2<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 11 | **Approximately 2,083** | #9 AND #7 AND #5 AND #3 AND #1<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 10 | **Approximately 17,447,454** | **TOPIC:** *(character*) OR* **TOPIC:** *(heterogene*) OR* **TOPIC:** *(homogene*) OR* **TOPIC:** *(factor) OR* **TOPIC:** *(distinguish*) OR* **TOPIC:***(trait) OR* **TOPIC:** *(feature) OR* **TOPIC:** *(attribut*)*<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 9 | **Approximately 18,459,798** | **TOPIC:** *(character*) OR* **TOPIC:** *(heterogene*) OR* **TOPIC:** *(homogene*) OR* **TOPIC:** *(factor) OR* **TOPIC:** *(distinguish*) OR* **TOPIC:***(trait) OR* **TOPIC:** *(feature) OR* **TOPIC:** *(attribut*)*<br>*Timespan=All years*<br>*Search language=English* |
| # 8 | **Approximately 3,490,533** | **TOPIC:** *(sex*) OR* **TOPIC:** *(offend*) OR* **TOPIC:** *(p?edophil*) OR* **TOPIC:** *(criminal*) OR* **TOPIC:** *(predator*) OR* **TOPIC:** *("p?edophile ring") OR* **TOPIC:** *("p?edophile network") OR* **TOPIC:** *(devian*) OR* **TOPIC:** *(trade*) OR* **TOPIC:** *(shar*) OR* **TOPIC:***( travel*) OR* **TOPIC:** *(aggress*)*<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 7 | **Approximately 3,799,873** | **TOPIC:** *(sex*) OR* **TOPIC:** *(offend*) OR* **TOPIC:** *(p?edophil*) OR* **TOPIC:** *(criminal*) OR* **TOPIC:** *(predator*) OR* **TOPIC:** *("p?edophile ring") OR* **TOPIC:** *("p?edophile network") OR* **TOPIC:** *(devian*) OR* **TOPIC:** *(trade*) OR* **TOPIC:** *(shar*) OR* **TOPIC:***( travel*) OR* **TOPIC:** *(aggress*)*<br>*Timespan=All years*<br>*Search language=English* |
| # 6 | **Approximately 684,631** | **TOPIC:** *(internet) OR* **TOPIC:** *(web*) OR* **TOPIC:** *(online) OR* **TOPIC:** *(internet-based) OR* **TOPIC:** *("social network*") OR* **TOPIC:***("world wide web")*<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 5 | **Approximately 696,978** | **TOPIC:** *(internet) OR* **TOPIC:** *(web*) OR* **TOPIC:** *(online) OR* **TOPIC:** *(internet-based) OR* **TOPIC:** *("social network*") OR* **TOPIC:***("world wide web")*<br>*Timespan=All years*<br>*Search language=English* |
| # 4 | **Approximately 4,739,812** | **TOPIC:** *(child*) OR* **TOPIC:** *(kid*) OR* **TOPIC:** *(minor*) OR* **TOPIC:** *(victim*)*<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 3 | **Approximately 5,575,291** | **TOPIC:** *(child*) OR* **TOPIC:** *(kid*) OR* **TOPIC:** *(minor*) OR* **TOPIC:** *(victim*)*<br>*Timespan=All years*<br>*Search language=English* |
| # 2 | **Approximately 4,872,517** | **TOPIC:** *(fantas*) OR* **TOPIC:** *(contact*) OR* **TOPIC:** *(porn*) OR* **TOPIC:** *(groom*) OR* **TOPIC:** *(molest*) OR* **TOPIC:** *(abus*) OR***TOPIC:** *("indecent image") OR* **TOPIC:** *(picture*) OR* **TOPIC:** *(image*) OR* **TOPIC:** *(cyber*) OR* **TOPIC:** *(rape) OR* **TOPIC:***(exploit*) OR* **TOPIC:** *(erotic*) OR* **TOPIC:** *(chat room*) OR* **TOPIC:** *(chat log*) OR* **TOPIC:** *(illegal*) OR* **TOPIC:** *(sex*) OR* **TOPIC:***(coerc*) OR* **TOPIC:** *(offen?* |

| | | |
|---|---|---|
| | | *e*) OR* **TOPIC:** *(paraphil*)*<br>*Timespan=1980-2014*<br>*Search language=English* |
| # 1 | **Approximately 5,232,921** | **TOPIC:** *(fantas*) OR* **TOPIC:** *(contact*) OR* **TOPIC:** *(porn*) OR* **TOPIC:** *(groom*) O R* **TOPIC:** *(molest*) OR* **TOPIC:** *(abus*) OR***TOPIC:** *("indecent image") OR* **TOPIC:** *(picture*) OR* **TOPIC:** *(image*) OR* **TOPIC:** *(cyber*) OR* **TOPIC:** *(rape) OR* **TOPIC:***(exploit*) OR* **TOPIC:** *(erotic*) OR* **TOPIC:** *(chat room*) OR* **TOPIC:** *(chat log*) OR* **TOPIC:** *(illegal*) OR* **TOPIC:** *(sex*) OR* **TOPIC:***(coerc*) OR* **TOPIC:** *(offen? e*) OR* **TOPIC:** *(paraphil*)*<br>*Timespan=All years*<br>*Search language=English* |

## APPENDIX 2

### Inclusion and exclusion criteria for the systematic literature review PICO

| | Inclusion | Exclusion |
|---|---|---|
| Population | - Males over 18 years<br>- Arrest for a contact sexual offence against a child committed through use of the internet<br>- Arrest for a non-contact sexual offence against a child committed through use of the internet | - Females<br>- Adolescents<br>- Males over 18 years without an online sexual offence against a child<br>- Arrest for a non-sexual internet offence |
| Exposure/Intervention | - At least one significantly different characteristic | - None |
| Comparator | - None | - None |
| Outcome | - Contact and non-contact sexual offending | - Non-sexual offending |
| Language | - English | - All non-English |
| Study Design | - Case-control<br>- Cross-sectional<br>- Case reports<br>- Case studies<br>- Case series | - Editorials<br>- Narrative reviews<br>- Commentaries or opinion papers<br>- Meta-analyses |

## APPENDIX 3

## Quality assessment forms

Case control studies

| Question | Yes | Unclear | No |
|---|---|---|---|
| **Selection Bias** | | | |
| Were the cases precisely defined? | | | |
| Were the cases representative? | | | |
| Was there a reliable system for case selection? | | | |
| Were the cases incident or prevalent? | | | |
| Was there something special about the cases? | | | |
| Was there a sufficient number of cases selected? | | | |
| Was there a power calculation? | | | |
| Were the controls representative of a defined population? | | | |
| Was there something special about the controls? | | | |
| Was there a sufficient number of controls selected? | | | |
| | | | |
| **Measurement or Classification Bias** | | | |
| Was the exposure clearly defined and accurately measured? | | | |
| Did the authors use subjective or objective measurements? | | | |
| Have the measures been validated? | | | |
| Were the measurements similar in cases and controls? | | | |
| Did the study incorporate blinding? | | | |
| | | | |
| **Results** | | | |
| Have confounding factors been considered in the design or analysis? | | | |
| Are the design and methodology sufficiently flawed to make the results unreliable? | | | |

| | | | |
|---|---|---|---|
| Can the results be applied to the local population? | | | |
| Do the results of this study fit with other available evidence? | | | |
| | | | |

Case series studies

| Question | Yes<br>1 | Unclear<br>-1 | No<br>0 |
|---|---|---|---|
| **Selection Bias** | | | |
| Were the cases precisely defined? | | | |
| Were the cases representative? | | | |
| Was there a reliable system for case selection? | | | |
| Was there something special about the cases? | | | |
| Was there a sufficient number of cases selected? | | | |
| Was there a power calculation? | | | |
| | | | |
| **Measurement or Classification Bias** | | | |
| Was the exposure clearly defined and accurately measured? | | | |
| Have the measures been validated? | | | |
| Were the measurements similar in cases and controls? | | | |
| | | | |
| **Results** | | | |
| Have confounding factors been considered in the design or analysis? | | | |
| Are the design and methodology sufficient to make the results reliable? | | | |
| Can the results be applied to the local population? | | | |
| Do the results of this study fit with other available evidence? | | | |

## APPENDIX 4

## Data extraction form

| | |
|---|---|
| **Date** | |
| **Details of publication:** | |
| Record number | |
| Author | |
| Title | |
| Year | |
| Type of publication | |
| Country of origin | |
| **Your purpose:** | |
| Aim of review | |
| **Study characteristics:** | |
| Aims/objectives of the study | |
| Study design | |
| Inclusion and exclusion criteria | |
| Recruitment procedures | |
| **Theory:** | |
| Informed by theory or linked to empirical research | |
| **Participants:** | |
| Number of subjects | |
| Gender of subjects | |
| Offence type(s) for subjects | |
| Number of comparISOn subjects | |
| Gender of comparISOn subjects | |
| Offence type(s) for comparISOn subjects | |
| **Methods:** | |

| | |
|---|---|
| Data collection methodology | |
| Data source | |
| Sample selection | |
| Definition of characteristics (exposure) | |
| **Findings:** | |
| Number of subjects included in analysis | |
| Number of comparISOn subjects included in analysis | |
| Attrition | |
| Method of analysis | |
| Statistical techniques used | |
| Key findings reported | |
| Key findings relevant to the review | |
| Follow-up | |
| **Reliability and validity** | |
| Reliability of findings | |
| Validity of measures and findings | |
| **Conclusion** | |
| Conclusion of findings relative to the review | |

## APPENDIX 5

### Items from the Barratt Impulsiveness Scale – Version 11

### (BIS-11; Patton, Stanford & Barratt, 1995)

1. I plan tasks carefully
2. I do things without thinking
3. I make-up my mind quickly
4. I am happy-go-lucky
5. I don't "pay attention"
6. I have "racing" thoughts
7. I plan trips well ahead of time
8. I am self controlled
9. I concentrate easily
10. I save regularly
11. I "squirm" at plays or lectures
12. I am a careful thinker
13. I plan for job security
14. I say things without thinking
15. I like to think about complex problems
16. I change jobs
17. I act "on impulse"
18. I get easily bored when solving thought problems
19. I act on the spur of the moment
20. I am a steady thinker

21. I change residences

22. I buy things on impulse

23. I can only think about one thing at a time

24. I change hobbies

25. I spend or charge more than I earn

26. I often have extraneous thoughts when thinking

27. I am more interested in the present than the future

28. I am restless at the theatre or lectures

29. I like puzzles

30. I am future oriented

## APPENDIX 6

### Research study information sheet for control participants

Doctoral Research Project: Information Processing

**Invitation**

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you want more information. Take time to decide whether or not you wish to take part.

**Purpose of the study**

This research study is looking into how people process information in different ways. In particular, the differences between control participants and individuals who engage in sexual offending through the Internet. The purpose of this research is to find out if certain thoughts and behaviour may increase risk of sexual offending through the Internet; this is important for prevention campaigns, risk management and treatment strategies for offenders.

**Your participation**

As part of this study you will be asked to practice and complete a simple computer task. You will then be asked to complete a demographics form and four self-report questionnaires. Your participation should take approximately thirty minutes.

**Eligibility**

To be eligible for this study as a control participant you:

MUST:

- Be male

- Be over the age of 18 years
- Be fluent in English
- Be able to read at least at secondary school level (age 11 years +)

MUST NOT:

- Have a learning disability (e.g. dyslexia; IQ below 69)
- Have a brain injury (e.g. brain damage from an operation or trauma)
- Have been arrested or convicted for a sexual offence

**Benefits**

You will be part of an academic research project which aims to increase our understanding of how people may process information in different ways. Information from this project may help to inform future research and treatment of individuals who commit sexual offences through the internet. You will be compensated for your time with credits, awarded through the Research Participation Scheme at the University of Birmingham. Credits will not be awarded for ineligibility, non-consent, non-compliance or non-attendance and only partially awarded for participant withdrawal.

**Risks**

Two of the questionnaires involve questions of a personal and sexual nature however this data will be kept completely confidential. The computer task also contains some sexual word stimuli. All risks will be minimised as far as possible and participation in this research is non-compulsory. If you find any of the material distressing, you may withdraw at any time with no negative consequences. Anonymous support and advice is available from the Stop it Now! Freephone Helpline (0808 1000 900), the Samaritans (0121 666 6644) and the University of Birmingham's Nightline (08000 274 750).

**Confidentiality**

After your part in the research, the information you provide will be entered into a computer database (accessible only by the researcher) and anonymised with an ID number. ID numbers will be used to connect paper and electronic data. No identifying information about you or your group members will be included in any publications using your data. All paper data will be stored in a locked cabinet in the School of Psychology at the University of Birmingham and all computer data will be stored securely on an encrypted storage device. This information will be kept for at least10 years following collection. The only circumstances under which a particular response would not be treated as confidential, would be if you were to say something that indicated that you or other people are at risk of harm. It is important for this study that you have not committed a sexual offence, either online or offline as it will deem you ineligible as a control participant for this study. If an unknown offence with an identifiable victim is disclosed to the researcher then it will be reported to the police.

**Results of the study**

The results of the research study will be analysed to see if ISOs process information differently compared to a control sample of participants. These results may then be presented at a conference or appear in a journal.

**Consent and Withdrawal**

You will be asked to provide your consent on the "Consent Form". This will include consent to participate and to provide data for use in a Doctoral research project. Your consent will be based upon the information provided about the study on this sheet. The research staff will be available to ask any questions you may have about the study before you provide consent. You have the right to withdraw participation or your data at any time during the research project. You are not required to provide a reason for

withdrawal; however credits will only be partially awarded. If you withdraw participation from the study, any data already gathered from your participation will be destroyed.

**Further information**

You may keep this information sheet and will be given a copy of the signed consent form should you choose to participate. For further information please contact the researchers at:

School of Psychology

The University of Birmingham

Edgbaston Birmingham

B15 2TT

Many thanks for your interest in this study,

Professor Anthony Beech (SupervISOr) a.r.beech@bham.ac.uk

Sophie Bettles (Postgraduate Researcher) svb759@bham.ac.uk

## APPENDIX 7

### Research study information sheet for offender participants

Doctoral Research Project: Information Processing

**Invitation**

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us (via phone or email) if there is anything that is not clear or if you want more information. Take time to decide whether or not you wish to take part.

**Purpose of the study**

This research study is looking into how people process information in different ways. In particular, the differences between control participants and individuals who engage in sexual offending through the Internet. The purpose of this research is to find out if certain thoughts and behaviour may increase risk of sexual offending through the Internet; this is important for prevention campaigns, risk management and treatment strategies for offenders.

**Your participation**

As part of this study you will be asked to complete a demographics form and four self-report questionnaires. You will then be asked to practice and complete a simple computer task. Your participation should take approximately twenty minutes.

**Eligibility**

To be eligible for this study you:

MUST:

- Be male
- Be over the age of 18 years
- Be fluent in English
- Be able to read at least at secondary school level (age 11 years +)
- Be involved in sexual offending behaviour committed using the internet

MUST NOT:

- Have a Learning Disability (e.g. Intelligence Quotient below 69)
- Have a brain injury (e.g. brain damage from an operation or trauma)

**Benefits**

You will be part of an academic research project which aims to increase our understanding of how people may process information in different ways. This includes looking at whether different people may use different brain areas to process the same information. Information from this project may help to inform future research and treatment of individuals who commit sexual offences through the internet.

**Risks**

There are minimal risks involved in this risk study. Two of the questionnaires involve questions of a personal and sexual nature however this data will be kept completely confidential. Any previous convictions will be held in the strictest confidence with only staff involved in the research project being able to access this data. All data will be kept confidential (see "Confidentiality" below). All risks will be minimised as far as possible and participation in this research is non-compulsory. If you find any of the material distressing, you may withdraw at any time with no negative consequences. Anonymous support and advice is available from the Stop it Now! Freephone Helpline (0808 1000 900) and the Samaritans (0121 666 6644).

**Confidentiality**

After your part in the research, the information you provide will be entered into a computer database (accessible only by the researcher) and anonymised with an ID number. ID numbers will be used to connect paper and electronic data. No identifying information about you or your group members will be included in any publications using your data. All paper data will be stored in a locked cabinet in the School of Psychology at the University of Birmingham and all computer data will be stored securely on an encrypted storage device. This information will be kept for at least10 years following collection. The only circumstances under which a particular response would not be treated as confidential, would be if you were to say something that indicated that you or other people are at risk of harm. If an unknown offence with an identifiable victim is disclosed to the researcher then it will be reported to the police.

**Results of the study**

The results of the research study will be analysed to see if ISOs process information differently compared to a control sample of participants. These results may then be presented at a conference or appear in a journal.

**Consent and Withdrawal**

You will be asked to provide your consent on the "Consent Form". This will include consent to participate and to provide data for use in an MSc and Doctoral research project. Your consent will be based upon the information provided about the study on this sheet. The research staff will be available to ask any questions you may have about the study before you provide consent. You have the right to withdraw participation or your data at any time during the research project . There will not be any negative

consequences for withdrawing. You are not required to provide a reason for withdrawal and any data already gathered from your participation will be destroyed.

**Further information**

You may keep this information sheet and will be given a copy of the signed consent form should you choose to participate. For further information please contact the primary researcher at:

School of Psychology

The University of Birmingham

Edgbaston Birmingham

B15 2TT

+44 1214147215

Many thanks for your interest in this study,

Professor Anthony Beech (SupervISOr) a.r.beech@bham.ac.uk

Sophie Bettles (Postgraduate Researcher) svb759@bham.ac.uk

## APPENDIX 8

### Research study consent form

Doctoral Research Project: Information Processing
Consent Form

☐ I have read and understood the information provided about the current research project.

☐ I understand the risks and benefits of the study.

☐ I understand that my data will be kept confidential.

☐ I understand that I am able to withdraw my data or consent to participate at any time during this research project and that I do not need to provide a reason . I understand there will not be any negative consequences for withdrawing from this study.

☐ I agree to participate in this research project.

Please feel free to ask the research staff questions at any time before, during and after participation in this study.

Thank you for your time and efforts.

Professor Anthony Beech
(SupervISOr)

Sophie Bettles
(Postgraduate Researcher)

Centre for Forensic and Criminological Psychology
School of Psychology
University of Birmingham
Edgbaston
B15 2TT

## APPENDIX 9

### Items from the Impulsivity, Risk-Taking, and Sensation Seeking Scale

### (IRTSSS; Schafer, Blanchard & Fals-Stewart, 1994)

1. I often act on the spur-of-the-moment without stopping to think
2. I get a real kick out of doing things that are a little dangerous
3. You might say I act impulsively
4. I like to test myself every now and then by doing something a little chancey
5. Many of my actions seem to be hasty
6. I'm always up for a new experience
7. I like the feeling of being giddy or woozy
8. I like to try new things just for excitement
9. I go for the thrills in life when I get a chance
10. I like to experience new and different sensations
11. In general, I enjoy the feeling of having an altered consciousness or state of mind

## APPENDIX 10

### Research study demographics form

Information Processing Study - Demographics Form

**Age:**

……

**Gender:** MALE/FEMALE

**Ethnicity:**

……

**Handedness** (please comment if ambidextrous): RIGHT/LEFT

……

**Have you ever been diagnosed with a learning disability, reading difficulty or movement dISOrder** (for example, IQ score less than 69, dyslexia, dyspraxia etc.)?

……

The following questions are for the purposes of comparing participants within the sample only. However, if you give details of an undisclosed offence with an identifiable victim then it will have to be reported to the police.

**Have you ever committed a contact sexual offence against a child?** YES/NO

……

**Have you ever used the Internet for the purposes of meeting a child offline to engage in sexual activity?** YES/NO

……

## APPENDIX 11

**Word list for the emotional Stroop task devised by Smith and Waterman (2004)**

| COLOUR | NEUTRAL | POSITIVE | NEGATIVE | AGGRESSIVE | SEXUAL |
|---|---|---|---|---|---|
| Purple | Door | Affection | Abused | Rage | Rape |
| Grey | Group | Funny | Fear | Anger | Lust |
| Flesh | Chair | Amused | Bitchy | Tear | Slap |
| Pink | Telephone | Euphoric | Aggressive | Assault | Victim |
| Orange | Dog | Beloved | Glum | Kick | Slut |
| Scarlet | Coat | Daring | Spiteful | Shout | Whore |
| Maroon | Sofa | Joy | Cruelty | Punch | Fuck |
| Crimson | Bag | Glad | Frightened | Hate | Bitch |
| White | Diary | Affectionate | Bad | Argue | Child |
| Black | Newspaper | Warm | Rage | Temper | Woman |
| Cyan | Eat | Fond | Agony | Fight | Force |
| Brown | Oven | Proud | Detest | Kill | Penetrate |
| Tin | Floor | Hope | Lose | Punish | Control |
| Bronze | Shopping | Tolerant | Arrogant | Annoyed | Schoolgirl |
| Mauve | Umbrella | Fond | Envy | Guilt | Power |
| Gold | Windy | Devotion | Abandoned | Scream | Dominance |
| Silver | Radio | Comfortable | Fury | Crush | Force |
| Jade | Painting | Grateful | Angry | Slash | Oral |
| Topaz | Milk | Calm | Greed | Smash | Abuse |
| Emerald | School | Peace | Hateful | Cut | Incest |
| Purple | Ball | Admire | Afraid | Wound | Molest |
| Grey | Pencil | Love | Crazy | Injure | Man |
| Flesh | Cigarette | Protective | Pain | Threaten | Grope |
| Pink | Football | Cheerful | Suspicious | Knife | Prostitute |
| Orange | Shoe | Lively | Misery | Wound | Anal |

## APPENDIX 12

### Internet-themed word list for the emotional Stroop task

INTERNET

WEB

ONLINE

NETWORK

CYBER

CHATROOM

USERNAME

BLOG

FORUM

BROWSER

HOMEPAGE

TOOLBAR

SEARCH

JPEG

MEGABITE

COMPUTER

DATA

EMAIL

NETWORK

GOOGLE

VIRTUAL

P2P

OFFLINE

DOWNLOAD

UPLOAD

## APPENDIX 13

## Items from the Sexual Compulsivity Scale

## (SCS; Kalichman & Rompa, 1995, 2001)

1. My sexual appetite has gotten in the way of my relationships
2. My sexual thoughts and behaviors are causing problems in my life
3. My desires to have sex have disrupted my daily life
4. I sometimes fail to meet my commitments and responsibilities because of my sexual behaviors
5. I sometimes get so horny I could lose control
6. I find myself thinking about sex while at work
7. I feel that sexual thoughts and feelings are stronger than I am
8. I have to struggle to control my sexual thoughts and behavior
9. I think about sex more than I would like to
10. It has been difficult for me to find sex partners who desire having sex as much as I want to

## APPENDIX 14

### Items from the Sexual Symptom Assessment Scale

### (S-SAS; Raymond, Lloyd, Miner, & Kims, 2007)

1. If you had urges to engage in problematic sexual behaviors, on average how strong were your urges?
2. How many times did you experience urges to engage in problematic sexual behaviors?
3. How many hours (add up hours) were you preoccupied with your urges to engage in problematic sexual behaviors?
4. How much were you able to control your urges?
5. How often did thoughts about engaging in problematic sexual behaviors come up?
6. Approximately how many hours (add up hours) did you spend thinking about engaging in problematic sexual behaviors?
7. How much were you able to control your thoughts of problematic sexual behaviors?
8. Approximately how much total time did you spend engaging in problematic sexual behaviors?
9. On average, how much anticipatory tension and/or excitement did you have *shortly before* you engaged in problematic sexual behaviors? If you did not actually engage in such behaviors, please estimate how much tension and/or excitement you believe you would have experienced if you had engaged in problematic sexual behaviors.

10. On average, how much excitement and pleasure did you feel when you engaged in sexual behaviors? If you did not actually engage in such behaviors, please estimate how much excitement and pleasure you would have experienced, if you had.
11. How much emotional distress (mental pain or anguish, shame, guilt, embarrassment) has your problematic sexual behaviour caused you?
12. How much personal trouble (relationship, financial, legal, job, medical or health) has your problematic sexual behaviour caused you?