**The Assessment and Treatment of Sexual Offenders with Intellectual Disability:**

**New Directions**

by

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April 2018

## Abstract

This thesis explores sexual offenders with intellectual disability (ID), the current position on assessment and treatment, and future directions. Chapter one distinguishes between the mainstream sexual offender population and the sub-population of ID sexual offenders. Chapter two reviews the literature on the treatment of ID sexual offenders. The majority of studies evaluated cognitive behavioural therapy (CBT) group programmes. The review highlighted a paucity of research exploring mindfulness and biofeedback in treating ID sexual offenders. Chapter three examines the Questionnaire on Attitudes Consistent with Sexual Offences (QACSO; Lindsay, Whitefield, Carson, Broxholme, & Steptoe, 2004), a widely used measure with ID sexual offenders. The review highlights the benefits of using the QACSO with those with ID due to the adaptations embedded in the development of the measure. Chapter four explores the impact of biofeedback in improving emotion regulation in ID sexual offenders. The study did not demonstrate any significant improvement following treatment in self-assessed emotion regulation, observed acts of aggression, or observed acts of sexually inappropriate behaviour. However, there were some non-significant improvements noted in self-assessed emotion regulation, and the feasibility of this intervention is discussed further. Chapter five provides a thesis conclusion along with recommendations for future research and clinical practice.

**Acknowledgements**

First, a thank you to all the patients who participated in the study, and to all my colleagues. A special thank you to Dr Philippa Thody, for all your help and support, for encouraging me to keep going even in those moments when I didn't think I would ever finish, and for teaching me so much throughout our time working together.

I would like to thank the supervisors who supported me throughout my doctorate. Particularly Professor Anthony Beech, who provided me with such invaluable guidance throughout, and Professor John Rose for stepping in to supervise me as I approached the final hurdle.

Above all, thank you to my friends and family. Thank you for your patience and support, and reminders that it will all be worth it in the end. Laura – I owe you the biggest thank you, I can honestly say that I could not have achieved this without your support and belief in me. You have been there for me every step of the way – providing me with endless cups of tea on those weekends when I was holed up writing assignments, the trips to the train station at obscenely early hours, and just generally being awesome.

Finally, thank you to the best course mates I could have asked for. You have kept me sane with your support and copious amounts of food. We did it!

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# Chapter One

## Introduction

This chapter provides an overview of the aims of the thesis. The thesis is focused on the current position with regards to the assessment and treatment of ID sexual offenders. This chapter critically reviews literature on ID sexual offenders and considers how this offender population differs from the general sexual offender population; providing a rationale for the necessity of this thesis as separate from the literature pertaining to mainstream sexual offenders. Attention will be given to the current treatment programmes utilised with ID sexual offenders and the psychometric measures used to evaluate the treatment. Finally, the role of emotion regulation in sexual offending is considered, and future treatment directions are outlined and explored.

### Sexual Offending

#### *Mainstream Offender Population*

#### *Definition and Prevalence*

Sexual offending is defined legally, and can differ across countries and cultures. Within the United Kingdom sexual offending is defined by the Sexual Offences Act (2003), and includes both contact and non-contact offences. Sexual offending has a significant impact on those who are victim to it. There were approximately 645,000 adult victims (aged between 16 and 59) of sexual offences in the United Kingdom in a one year period (ending March 2016) (Office for National Statistics, 2016). Due to the age restrictions of this survey, and the potential reticence of a victim to disclose an offence, the true figure is likely to be even higher. There has been an increase of 12% in the number of sexual offences the Police recorded in the past year (Office for National Statistics, 2016). This will result in more sexual offenders coming to the attention of the Criminal Justice System (CJS), and even greater

emphasis will need to be placed on relevant services being able to have a clear theoretical understanding, conduct a thorough assessment of risk and criminogenic need, and provide effective treatment for this offender population.

*Theories*

There have been significant developments in the theories of sexual offending, with a move towards an integrated framework. Different levels of theory exist; level one multifactorial theories consider a number of factors influencing sexual offending. These theories include Finkelhor's Precondition Model (Finkelhor, 1984), Marshall and Barbaree's Integrated Theory (Marshall & Barbaree, 1990), Hall and Hirschman's Quadripartite Model (Hall & Hirschman, 1992), and Ward and Siegert's Pathways Model (Ward & Siegert, 2002). Level two single-factor theories consider the role of specific deficits or deviancies in the commission of a sexual offence. Level three theories, such as the Self-Regulation Model (Ward, Hudson, & Keenan, 1998) are offence process models and consider the factors which directly contribute to a sexual offence in the moment (Ward, Polaschek, & Beech, 2006). The most recent development is the Integrated Theory of Sexual Offending (ITSO; Ward & Beech, 2006). This theory aims to provide an explanation of the different factors which may precipitate and perpetuate sexual offending, for example neurodevelopmental and/or environmental factors.

*Assessment*

Accurate assessment of criminogenic needs is essential in guiding formulation and treatment aims. Thornton (2002) proposed a framework to guide the assessment process of sexual offenders. From this, four domains were proposed which capture themes of dynamic risk thought to influence sexual offending. These include deviant sexual interests, distorted attitudes/cognitions, deficits of socioeffective functioning, and deficits of self-management. Whilst the psychometric assessments used to assess this offender population develop and

evolve, this framework continues to guide current practice in the assessment and treatment of sexual offenders. Thornton (2013) expands and redefines the framework without altering the domains, and incorporates the findings from a meta-analysis of psychological risk factors for sexual offenders, which highlight the empirically supported and promising risk factors (Mann, Hanson, & Thornton, 2010). Risk factors which are supported empirically have been identified (Mann et al., 2010). These risk factors include sexual preoccupation, sexual preference for children, sexual violence, multiple paraphilias, offence supportive attitudes, emotional congruence with children, difficulties in adult emotionally intimate relationships, lifestyle impulsivity, problem solving difficulties, problems abiding with rules and supervision, hostility, and an anti-social peer influence. Risk factors thought to also be relevant include holding hostile beliefs about women, Machiavellianism[1], and poor or dysfunctional coping. This includes an inability to manage difficult emotional states, with offenders responding to such emotions by using sexual activity as a coping strategy (Cortoni & Marshall, 2001), or a more general externalisation of behaviour.

*Treatment*

There have been significant developments in the treatment of sexual offenders. The most commonly adopted treatment model is CBT, however other approaches are also utilised, including behavioural, therapeutic community, and multi-systemic treatment (Losel & Schmucker, 2005; Schmucker & Losel, 2015). Particular emphasis should be given to deviant sexual interests, sexual pre-occupation, problems of self-regulation, and general anti-sociality in the treatment of sexual offenders, given the predictive role they have been identified to play in recidivism (Hanson & Morton-Bourgon, 2005).

[1] Individual views others as easy to manipulate, and believe it acceptable to take advantage of, and manipulate others (Mann et al., 2010; Paulhus & Williams, 2002)

Offenders who have completed treatment demonstrate reductions in sexual recidivism as measured by lapse behaviour (Losel & Schmucker, 2005), general re-offending rates (Kim, Benekos, & Merlo, 2015; Losel & Schmucker, 2005; Schmucker & Losel, 2015), and sexual re-offending rates (Kim et al., 2015; Losel & Schmucker, 2005; Schmucker & Losel, 2015). This suggests treatment is effective in preventing re-offending (Kim et al., 2015; Losel & Schmucker, 2005; Schmucker & Losel, 2015). A meta-analysis found a 37% reduction in sexual recidivism when comparing treated offenders with control groups (Losel & Schmucker, 2005). A subsequent meta-analysis by Schmucker and Losel (2015) found a 26.3% reduction in recidivism for treated offenders compared with untreated sexual offenders. Treatment programmes adhering to the Risk-Need-Responsivity (RNR) principle (Bonta & Andrews, 2007) demonstrated greater reductions in sexual recidivism when compared with those programmes which did not (Hanson, Bourgon, Helmus, & Hodgson, 2009). This suggests a need to adhere to the RNR principles in developing and delivering treatment programmes with sexual offenders. A recent evaluation of Her Majesty's Prison (HMP) service sex offender treatment programme (SOTP) indicated that those attending treatment recidivated at a greater rate than those not engaged in treatment (Mews, Di Bella, & Purver, 2017). However, this finding continues to be subject to scrutiny, including failures to match participants on sexual deviancy, and the reliance on accurate file data (Walton, 2018).

## Sexual Offenders with Intellectual Disability

### *Prevalence*

The current literature tends to focus on 'mainstream' sexual offenders; adult males of average intellectual functioning, with relatively less attention being given to other sub-offender populations (Craig & Hutchinson, 2005). The exact prevalence of those with ID amongst the sexual offender population is unclear (Lindsay, 2002). It has previously been suggested offending was significantly greater in those with ID, although concerns were raised about the

validity of the studies identifying these findings (Davis et al., 2016; Murphy & Clare, 1998). It has been preliminarily found that the prevalence of sexual offending is higher when compared with other criminal offences committed by those with ID, and with other offenders (Barron, Hassiotis, & Banes, 2004; Hayes, Shackell, Mottram, & Lancaster, 2007). Increased prevalence may be in part owing to the characteristics of ID offenders which make them more likely to fall under suspicion of an offence, be arrested, and receive a conviction (Singh et al., 2011). Conversely, other studies have suggested limited evidence of offending being significantly greater proportionally in an ID population when compared with the general population (Langevin & Curnoe, 2008; Simpson & Hogg, 2001a).

There have been some methodological difficulties identified with regards to the prevalence studies; unclear definitions of ID, reliance on remand or prison populations, the exclusion of hospital populations in studies, and the underreporting of sexual offending behaviour by either the victims or caregivers due to the disability of the offender (Craig & Hutchinson, 2005; Green, Gray, & Willner, 2002; Holland, Clare, & Mukhopadhyay, 2002; Jones, 2007; Murphy, undated; Simpson & Hogg, 2001a). Individuals with ID are often diverted out of the CJS as is recommended (Bradley, 2009), and therefore may not be accounted for within prevalence figures (Hayes, 2007; Hayes et al., 2007; Holland et al., 2002; Jones, 2007; Jones & Talbot, 2010). Alternatively individuals may be present within a mainstream prison population with undiagnosed ID (Herrington, 2009).

There is uncertainty about the exact prevalence of sexual offenders with ID, however ID sexual offenders present unique challenges to forensic practitioners and services tasked with their assessment, treatment, and detention. Simpson and Hogg (2001b) suggest less attention be given to prevalence rates, simply having an awareness of this offending sub-population is sufficient. Instead greater attention should be given to establishing processes for the consistent identification of those with ID who enter the CJS, clear paths to appropriate

services either within the prison or healthcare systems, and the development and provision of effective treatment specific to this offender population (Barron, Hassiotis, & Banes, 2002; Bradley, 2009; Hayes, 2007; Simpson & Hogg, 2001b). This is particularly important given the potential for ID offenders to be excluded from aspects of prison routine, including access to appropriate treatment (Talbot & Riley, 2007).

*Defining Intellectual Disability*

When addressing the assessment and treatment needs of ID sexual offenders, it is important to have a clear and shared definition of the criteria for the diagnosis of intellectual disability. Intellectual disability is diagnosed when three core criteria are present; significant impairment of intellectual functioning, impairment of adaptive/social functioning, with onset age before adulthood (British Psychological Society (BPS), 2015; Royal College of Psychiatrists, 2001). A significant impairment of intellectual functioning is the reduction in the ability to understand novel or complicated information, or to acquire new skills (Department of Health (DoH), 2001). A significant impairment of adaptive and/or social functioning is the diminished ability to cope autonomously (DoH, 2001).

Intellectual disability is diagnosed by assessing intellectual functioning and adaptive functioning. Intellectual functioning can be assessed using the Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV; Wechsler, 2010). Those with an Intelligence Quotient (IQ) below 70 are considered to have intellectual functioning associated with intellectual disability (BPS, 2015).

There are no "gold standard" assessments when assessing adaptive functioning in adults, however two assessment tools are preferable over others; the Vineland Adaptive Behaviour Scales – Second Edition (VABS-II, Sparrow, Cicchetti, & Balla, 2005) and the Adaptive Behaviour Assessment System, Second Edition (ABAS-II; Harrison & Oakland, 2003)

(Blasingame, 2016; BPS, 2015). Both utilise scales, and scores below 70 would be associated with levels of functioning expected in those with ID (BPS, 2015).

*Assessment*

Assessment of dynamic risk factors and criminogenic need are essential to the formulation process, and the development of a treatment plan. This assessment is primarily conducted using validated psychometric assessments. Despite the importance of accurate assessment, there is a paucity of psychometric assessments developed for the ID offender population (Williams, Wakeling, & Webster, 2007). The options for assessments are limited to using existing psychometric assessments, using modified or adapted assessments, or developing new assessments (Keeling, Beech, & Rose, 2007a). More often practitioners are reliant on using assessments developed for the mainstream offender population, either as designed or modified, due to the lack of assessment measures designed specifically for those with ID (Keeling et al., 2007a; Lindsay, 2002). Modified assessments are beneficial when compared with unmodified assessments, however there are still limitations to using psychometric measures in this way. There are difficulties with using assessments which not normed with the specific population being assessed, such as sexual offenders with ID (Wilcox, 2004). This limits the understanding forensic practitioners and researchers can derive from the assessment, and how any deficit may be influencing offending behaviour (Wilcox, 2004). Additionally, even when modified a number of these measures remain inaccessible for those with ID (Clare, 1993).

The Abel and Becker Cognition Scale (ABCS) (Abel, Becker, & Cunningham-Rathner, 1984) is designed to assess cognitive distortions in child molesters. This measure has been modified for ID offenders, and subsequently normed with this population (M-ABCS; Kolton, Boer, & Boer, 2001). However, concerns have been raised about the inability of this measure to distinguish between offenders and non-offenders (Keeling et al. 2007a).

The Socio-Sexual Knowledge and Attitudes Test has also been modified to be more accessible for ID sexual offenders (SSKAAT-R; Griffiths & Lunsky, 2003). There are other measures which have been modified, including the Victim Empathy Scale (VES; Beckett & Fisher, 1994b; Keeling et al., 2007a), the Miller Social Intimacy Scale (MSIS; Miller & Lefcourt, 1982; Keeling et al., 2007a), the Rosenberg Self-Esteem Inventory (RSE; Rosenberg, Schooler, & Schoenbach, 1989; Keeling et al., 2007a), the Social Comparison Scale (SCS; Allan & Gilbert, 1995; Keeling et al., 2007a), and the Self-Control Rating Scale (SCRS; Kendall & Wilcox, 1979; Keeling et al., 2007a). Whilst these modified assessment tools clearly have utility in the assessment of this population, ideally psychometric assessments should be designed specifically for the population they are seeking to assess (Keeling et al., 2007a). Additionally, not all measures are shown to be relevant to the reduction of risk (i.e. victim empathy; Hanson & Morton-Bourgon, 2005).

The Questionnaire on Attitudes Consistent with Sexual Offending (QACSO) is one of the few psychometric assessment designed specifically for use with ID sexual offenders (Broxholme & Lindsay, 2003; Lindsay et al., 2006a; Lindsay, Whitefield, & Carson, 2007b; Lindsay et al., 2004). This measure is discussed further in Chapter Three.

The Assessment of Sexual Knowledge (ASK; Galea, Butler, Iacono, & Leighton, 2004) and the Sexual Attitudes and Knowledge Scale (SAK; Heighway & Webster, 2007) are both measures developed specifically to assess sexual knowledge with this population.

*Treatment*

It is not possible to infer that treatment would work in the same way for ID sexual offenders as for those in the mainstream offender population (Lambrick & Glaser, 2004; McKenzie, Chisolm, & Miller, 1997). The RNR principles suggests that interventions should be matched to an offenders level of risk (risk), their criminogenic needs (need), and should be delivered

in a way which increases the ability of an offender to benefit from the intervention (responsivity) (Andrews, Bonta, & Hoge, 1990; Bonta & Andrews, 2007). The cognitive and social difficulties experienced by those with ID would be considered responsivity issues, and create difficulties in applying treatment developed for mainstream sexual offenders (McKenzie et al., 1997).

Treatment approaches used with ID sexual offenders have included behavioural management, education, problem solving, psychotherapy, cognitive therapy, social skills training, therapeutic community, and cognitive behavioural approaches (Courtney & Rose, 2004; Lambrick & Glaser, 2004; Lindsay, 2002; Lindsay & Taylor, 2005). Evidence suggests cognitive-behavioural interventions can be effective in the treatment of ID sexual offenders (Barron et al., 2002; Barron et al., 2004), and sexual offenders in the general offending population (Losel & Schmucker, 2005; Schmucker & Losel, 2015). Overall, there are similarities in the interventions effective with sexual offenders both with and without ID, however there is a need to adapt any interventions offered to those with ID, and place more emphasis on motivation (Clare, 1993; Wilcox, 2004). Those with ID also benefit from a more active style of treatment than their mainstream counterparts (Williams & Mann, 2010).

At the turn of the century there was a paucity of studies evaluating the treatment available for ID sexual offenders, particularly when compared with the research base for sexual offenders in the general offender population (Lambrick, 2003; O'Connor & Rose, 1998). Courtney and Rose (2004) conducted a systematic literature review regarding the treatment of ID sexual offenders. The review identified 31 studies between 1990 and 2002. This included case studies, larger outcome studies, studies of group interventions, and retrospective studies. The flaws of the identified studies were highlighted, along with the need to expand the evidence base (Courtney & Rose, 2004). This review did not solely focus on psychological intervention, rather some studies focused on drug therapy as the primary intervention or as

part of an intervention package. A number of the earlier studies in this review were case studies. Courtney and Rose (2004) highlight the role of case studies in establishing evidence in a discipline's origins, and from this point a more rigorous evidence base can develop. This statement suggests this field of research has only begun to receive attention and to develop in the past thirty years.

Concerns have been raised about the treatment studies being published at this time, with these being too rudimentary to provide an accurate overview of the effectiveness of any intervention (Barron et al., 2002; O'Connor & Rose, 1998). Issues with the available studies at that time were highlighted, including small samples and a lack of empirical validation (Craig & Hutchinson, 2005). There is also a dearth of randomised controlled trials (RCT) evaluating treatment (Lindsay & Taylor, 2005; Murphy, undated). The difficulties in the available studies prompted Craig and Hutchinson (2005) to urge researchers to consider the appropriateness of simply adapting mainstream interventions for ID sexual offenders, given that it is unclear which elements of treatment reduce recidivism in this offender population. They highlight the promising developments specific to this offender population, namely the Sex Offender Treatment Services Collaborative – Intellectual Disability group (SOTSEC-ID).

**Future Treatment Directions**

Dysfunctional coping has been identified as a potential psychological risk factor (Mann et al., 2010). This includes using sex to cope with emotional states or stress, or responding in a disorganised and impulsive way when experiencing negative emotions. Difficulty coping with emotional states, namely negative emotions, is referred to as emotion dysregulation. Emotion dysregulation develops when patterns of responding to emotions occur which results in a chronic inability to modulate emotional responses (Cole, Michel, & O'Donnell, 1994; Koole, 2009).

Mindfulness and biofeedback are thought to play a role in improving emotion regulation, and be potentially beneficial as an intervention for sexual offenders (Gillespie, Mitchell, Fisher, & Beech, 2012). Research has begun to explore the utility of mindfulness with sexual offenders (Byrne, Bogue, Egan, & Loneran, 2014), adolescent sexual offenders, (Jennings, Apsche, Blossom, & Bayles, 2013), and ID sexual offenders (Singh et al., 2011). The impact of biofeedback on sexual offenders is yet to be explored. This is interesting given the recommendations to explore emotion focused interventions with this population (Day, 2009; Gannon & Ward, 2017; Gillespie et al., 2012), and the emerging evidence base for biofeedback with a variety of psychiatric disorders (Schoenberg & David, 2014). This suggests biofeedback warrants further examination with this population.

**Aims**

This thesis aims to evaluate the progress and current position in the assessment of criminogenic need and treatment of ID sexual offenders. Chapter one provides a summary of the distinctions between the mainstream sexual offender population and the sub-population of sexual offenders with ID, and includes a definition of intellectual disability. The chapter outlines the prevalence of each population, and theories of sexual offending. It also considers the assessment and treatment of sexual offenders, and how this differs for those with ID. Chapter two is a systematic review of the literature relating to the recent trends in the treatment of ID sexual offenders. Chapter three contains a critique of a psychometric assessment developed for ID sexual offenders. This psychometric assessment is commonly used to evaluate treatment studies, is one of the few assessments developed specifically for adults with ID, and represents the progress being made in this area of the literature. Chapter four will then consider future treatment directions, and will focus on evaluating the role of biofeedback in improving emotion regulation for this offender population. Chapter five provides a conclusion to the thesis, summarising the findings from each of the chapters, and

integrating these findings into overall implications for practice, and recommendations for future research.

# Chapter Two

## Treatment for males with intellectual disability who sexually offend: A systematic review


### Abstract

*Aim:* This systematic review examines the treatment for males with ID who sexually offend.

*Method:* A preliminary scoping search assessed the need for the current review. Four electronic databases were searched using pre-defined search criteria. Studies were reviewed using an inclusion/exclusion criteria. Selected studies were appraised using a quality assessment.

*Results:* Fifteen studies met the inclusion criteria and were included in the review. A narrative synthesis of the data highlighted that CBT group programmes had some benefits for sexual offenders with ID. The studies exploring CBT found reductions in cognitive distortions[2] and reconviction rates, and improvements in victim empathy and sexual knowledge. One study highlighted improvements in sexual knowledge, victim empathy, and reductions in sexual risk following a CBT programme with a dialectical behaviour therapy (DBT) component. Mindfulness was associated with reduced self-reported deviant sexual arousal. Relapse-prevention plans were shown to have greater generalisation in younger offenders and those with fewer paraphilias.

*Conclusions:* This review revealed some successes of treatment programmes used with ID sexual offenders. However, there are methodological flaws within the majority of the studies including small sample sizes, lack of control or treatment comparison groups, short periods of


[2] Beliefs and distorted patterns of thinking which support sexual offending behaviour (Broxholme & Lindsay, 2003)

follow up, and issues surrounding validity and reliability of psychometric assessments. This limits the confidence which can be held about the efficacy of these treatments.

## Introduction

Sexual offenders, and the treatment of this population, has attracted increasing attention over recent years. Sexual offending within mainstream offending populations has been examined in systematic literature reviews and meta-analyses (Dennis et al., 2012; Losel & Schmucker, 2005; Robertson, 2010; Schmucker & Losel, 2015). Psychological treatment for sexual offenders has some utility in reducing recidivism and has been shown to have a positive impact at post-treatment evaluation and at short term follow ups. A recent longer term examination of treatment in Her Majesty's Prison (HMP) Services found treated sex offenders recidivated at a greater rate than an untreated comparison group (Mews et al., 2017). Despite the conflicting findings, overall it is the case that treatment programmes for mainstream sexual offenders have been well reviewed and evaluated. In contrast there are far fewer reviews of treatment programmes for ID sexual offenders.

### *Current trends in treating ID sexual offenders*

Treatments are increasingly being adapted and developed for use with ID sexual offenders (Lindsay, 2009a; Lindsay, Michie, & Lambrick, 2010; McKenzie et al., 1997; McKenzie, Chisolm, & Murray, 2000; McNair, Woodward, & Mount, 2010; Verhoeven, 2010; Williams & Mann, 2010). Two main treatment approaches have been adopted with ID offenders; pharmacological and psychological (Lambrick & Glaser, 2004; Lindsay, 2002). Psychological treatments have varied in their approaches from psycho-education, to behavioural management, and cognitive-behavioural interventions (Courtney & Rose, 2004; Lambrick & Glaser, 2004; Lindsay, 2002; Lindsay & Taylor, 2005).

Recent reviews indicate that there have been innovations in sexual offender treatment for ID offenders (Lindsay, 2011). A number of studies demonstrate improvements in ID sexual offenders engaged in treatment. Benefits include reductions in offending, improvements in victim empathy, and reductions in cognitive distortions. However, there are difficulties in conducting RCT's in ID populations due to difficulties in gaining ethical approval for studies involving no-treatment conditions (Lindsay, 2002), and the small sample sizes available (Singh et al., 2011).

This review examines the effectiveness of treatments for ID sexual offenders. This is pertinent given the distinction between treating ID sexual offenders and the mainstream sexual offender population. This evaluation will review the efficacy of interventions for this population, and provide guidance to clinicians and researchers regarding current trends, and future research.

**Existing systematic literature review assessments**

A preliminary search was conducted in November 2014 for existing systematic literature reviews and meta-analysis relating to the treatment of sexual offenders with ID. These searches were conducted within the Cochrane Database of Systematic Reviews, University of York Centre for Reviews and Dissemination, Campbell Collection, and Google Scholar. This search identified two existing systematic literature reviews: Ashman and Duggan, 2008; Courtney and Rose, 2004. Since the completion of the preliminary search several systematic literature reviews of ID sexual offenders have been identified, however none report on all of the same papers (Cohen & Harvey, 2016; Jones & Chaplin, 2017; Marotta, 2017).

A review of RCT's evaluating treatment of sexual offending within an ID population concluded none were present (Ashman & Duggan, 2008). Courtney and Rose (2004)

evaluated the effectiveness of treatment for male ID sexual offenders. This review adopted a less rigorous approach, encompassing a wider variety of study types within their review.

The current review will evaluate the literature published since the review by Courtney and Rose (2004). A scoping search established studies have been published since the previous review.

The inclusion/exclusion criteria for identifying relevant studies resulted from scoping searches and the review of existing systematic literature reviews. Study types of varying quality were included due to the lack of RCT's, and the small sample sizes available in this population which restrict research possibilities (Singh et al., 2011).

**Aims/Objectives**

- To evaluate the literature since the review conducted by Courtney and Rose (2004).
- To evaluate the treatment of ID sexual offenders.

**Method**

**Sources of literature**

A search was conducted of electronic bibliographic databases to identify studies which evaluated the treatment of ID sexual offenders.

This included:-

- PsycINFO (2002 to August week 3 2017, completed on the 29th of August 2017)
- MEDLINE (2002 to August week 3 2017, completed on the 29th of August 2017)
- EMBASE (2002 to August week 3 2017, completed on the 29th of August 2017)
- Web of Science (2002 to August week 3 2017, completed on the 29th of August 2017)

The review by Courtney and Rose (2004) reported papers up to 2002, therefore the search was conducted from 2002.

## Search Strategy

A scoping search was conducted in November 2014. Search terms were identified, including alternative diagnostic terms used internationally, ie. “mental retardation” and “intellectual disability” (North America) and “learning disability” (United Kingdom). Four main themes were identified as being integral in the search; effectiveness, treatment, sex offender and intellectual disability. From these a number of search terms were identified. The aforementioned electronic databases were searched using the search terms shown in Figure 1.

| **Effectiveness** | **Treatment** | **Sex Offender** | **Intellectual Disability** |
|---|---|---|---|
| Effect* | Treat* | Paedo* | Learning disab* |
| Efficacy | Session* | Pedo* | Mental* retard* |
| Outcome* | CBT | Rape* | Development* disab* |
| Course | Behaviour* | Rapist* | Intellectual* disab* |
| Evaluation | Pharmaco* | Sex* Offen* | Development* deficit* |
| Recovery | Benperidol | Sex* Crim* | Special needs |
| Relapse | Mindful* | Sex* Abus* | Retard* |
| Impact | Good Lives* | Paraphilia* | Mental* deficien* |
| Consequence* | SOTP | Fetish* | Intellectual* development* disorder* |
| Reoffen* | ASOTP | Exhibition* | Learn* disorder* |
| Reconvict* | Becoming New Me | Molest* | Intellectual* handicap* |
| Recidiv* | Rehabilit* | Sexually abusive behaviours | Mental* handicap* |
| Rehabilit* | Therapy | Sexually harmful behaviours | Developmental* handicap* |
| Crim* | Cognitive* | Sexual* assault* | Learning* deficit* |
| Readmission* | Group* near treat* | Incest | Intellectual* deficit* |
| Release* | Group* near therap* | Sexual* harass* | Cogniti* deficit* |
| Discharge | Group* near program* | Devianc* | Social* function* deficit* |
| Remission | Individual* near treat* | Deviation* | |
| follow up | Individual* near therap* | Perversion* | |
| | Individual* near program* | Voyeurism | |
| | Sex* Offend* Treat* Program* | Devian* sex* arous* | |
| | Therapeutic* | | |

*Figure 1.* Search Themes and Terms

## Study Selection

### Inclusion criteria

To select the relevant studies the PICO (Population, Intervention, Comparison, Outcome) inclusion and exclusion criteria were developed and applied when reviewing papers identified from the electronic bibliographic database searches (inclusion criteria form – Appendix 1).

*Population*

Participants met the following criteria:

- Diagnosed ID
- Aged 18 and above
- Male

*Intervention*

Studies focused on the treatment of sexual offending.

*Comparator*

Studies either with or without a control or comparison group were considered, as were studies using pre- and post-outcome measures.

*Outcome*

Studies producing quantitative data relevant to sexual offending treatment needs.

### Study design

Due to the dearth of RCT's in this area it was decided to include any study with a comparator group, or pre-/post- measures.

### Exclusion criteria

Studies not written in English were excluded due to an inability to translate into English, due to time constraints and a lack of resources. Abstracts from dissertations and conferences were

excluded as they provided insufficient information to evaluate the quality of the research. Studies already featured in the systematic literature review conducted by Courtney and Rose (2004) were excluded. Figure 2 outlines the summary of the process of selecting studies.

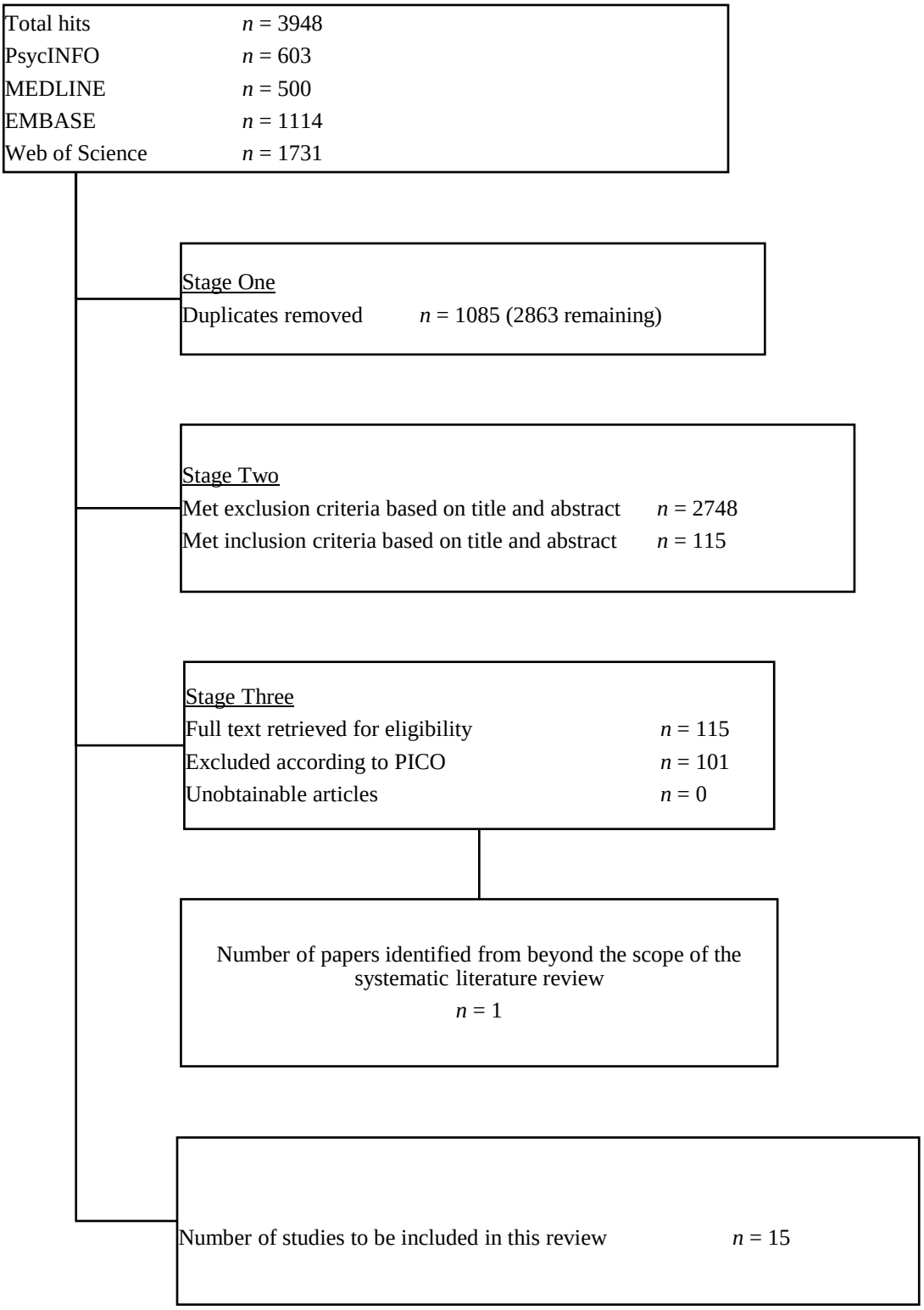


*Figure 2.* Summary of Study Selection and Exclusion

## Quality assessment

After applying the PICO criteria, and removing duplicates, 3934 studies were excluded. One additional study was identified from a systematic literature review conducted since the initial search in 2014 (Cohen & Harvey, 2016). Quality assessments were conducted on the identified studies ($n$ = 15). A quality assessment was adapted for the topic of the current review from existing quality assessments for non-RCT quantitative studies (Critical Appraisal Skills Programme, 2013; Law et al., 1998; Long, Godfrey, Randall, Brettle, & Grant, 2002). The quality assessment evaluated the strength of the methodological quality of the research paper, and established the risk of bias. The quality assessment explored the characteristics of the sample, ethical issues, outcomes, interventions, and the implications of the result. Consideration was given to potential biases including; sample bias, measurement bias, intervention bias, and attrition bias.

A scoring system was employed to assess methodological quality and risk of bias within each paper. Items were scored 0, 1, 2, or "don't know" where insufficient information was available, in these instances attempts were made to acquire additional information. Scores attained were converted into a category relating to strength of methodological quality and risk of bias; strong methodological quality and low risk of bias (38 to 54 points; 70%-100%), intermediate methodological quality and moderate risk of bias (21-37 points; 38%-69%) or weak methodological quality and high risk of bias (0 to 20 points; 0%-37%) (quality assessment form – Appendix 2). Studies were not excluded from the review based on the quality assessment due to the paucity of research evaluating treatment of ID sexual offenders.

## Data extraction

A structured form was developed to extract relevant data from the selected studies (data extraction form – Appendix 3). The following data was extracted:

- Sample size and characteristics for each condition
- Comparability of participants or groups
- Study design
- Intervention
- Outcome measures and the validity of these with ID participants
- Attrition and statistical analysis
- Findings
- Significance and implications of the research findings
- Strengths and limitations of the study

## Results

### *Overview of Studies*

The 15 studies included in this review focused on the evaluation of treatment, or treatment components, for ID sexual offenders. These studies evaluated treatment using a variety of different measures, with varying validity and reliability with an ID population.

### *Methodological and study characteristics*

Studies originated predominantly from the United Kingdom (ten studies), with other studies originating from North America (two studies), Australia (two studies) and New Zealand (one study).

The earliest study in this review was in 2006 and the most recent in 2014. The majority of the studies employed the same study design; a before-after design, examining one treatment group before and after treatment (n=9). Two of the studies examined a treatment group before and after treatment, but also compared the progress of two different offender groups. In one study "special needs" sexual offenders were compared with mainstream sexual offenders (Keeling, Rose, & Beech, 2007b), the other compared ID offenders against women, and ID

offenders against children (Lindsay, Michie, Steptoe, Moore, & Haut, 2011). One study evaluated an empathy treatment component by comparing a treatment group and a group not receiving the treatment component (Michie & Lindsay, 2012). The final three studies employed a multiple case study design, evaluating treatment of three ID sexual offenders in two studies (Sakdalan & Collier, 2012; Singh et al., 2011), and the third evaluating the extent to which ten participants complied with their relapse-prevention plan (Rea, Dixon, & Zettle, 2014).

*Participants*

The age of participants for this review was 18 years and above. The ages of participants was reported in all of the studies; either as specific ages or as group averages. Across the studies the youngest participant was aged 18 years and the eldest aged 68 years.

In all but three of studies the participants either had diagnosed ID or were referred from ID community services. Within the study conducted by Williams et al. (2007) participants were those who had been excluded from the Core SOTP within HMP Services due to having an IQ below 80. Within the studies conducted by Keeling, Rose and Beech (2006; 2007b) not all of the participants had a diagnosed ID. However, all had low average functioning through to a mild ID, and had been excluded from the mainstream sexual offender programmes due to their level of functioning. Keeling et al. (2006) postulated that whilst there would be some difficulties in applying the outcomes to an ID population, the results were largely applicable and therefore these studies were included in this review. Sample sizes in the included studies were small; the smallest sample size being three (Sakdalan & Collier, 2012; Singh et al., 2011) and the largest being 211 (Williams et al., 2007) (average sample size = 29.26).

*Study focus/ aims and comparison groups where present*

The majority of the studies evaluated CBT group programmes for sexual offenders with ID or "special needs". The exceptions were, an evaluation of the effectiveness of mindfulness in reducing deviant sexual arousal (Singh et al., 2011), an evaluation of the generalisation of relapse-prevention behaviours (Rea et al., 2014), and the evaluation of an empathy treatment component (Michie & Lindsay, 2012).

The length of full treatment programmes varied; from weekly treatment for two hours over seven months (Craig, Stringer, & Moss, 2006; Sakdalan & Collier, 2012), to weekly treatment for two hours over a 36 month period (Lindsay et al., 2011). However, it should be noted that Keeling et al. (2006) delivered a greater number of treatment hours over a shorter period than Lindsay et al. (2011) delivered within the 36 month period. The majority of full treatment programmes were delivered between seven months and one year. The empathy component was the shortest period of intervention, at six sessions over eight weeks, each lasting two hours (Michie & Lindsay, 2012).

Of the studies, 11 evaluated ID sexual offenders before and after treatment, with some studies including a follow up period. On occasion this follow up period focused on psychometric assessment, however more frequently focused on sexual recidivism or "sexually inappropriate behaviours". The duration of follow up varied between studies. The focus of one study was the evaluation of a previous treatment programme and therefore had the longest follow-up period with an average of 44 months from the completion of treatment (Heaton & Murphy, 2013).

Of the studies, three included a comparison group; however only in one instance could this be viewed as a control group (Michie & Lindsay, 2012). One of the studies evaluated special needs sexual offenders against mainstream sexual offenders, the groups were receiving either

the standard treatment programme (mainstream offenders) or the adapted treatment programme (special needs offenders) (Keeling et al., 2007b). The final study with a comparative group compared the progress of ID offenders against adult females, and ID offenders against children. Both groups received the same treatment programme (Lindsay et al., 2011). One study compared the reoffending rates of the treatment completers and the non-treatment completers, however this was not a formal comparative group (Newton, Bishop, Ettey, & McBrien, 2011).

*Outcome measures*

Whilst the studies appeared to employ similar treatment modalities and have similar aims, a wide variety of outcome measures were employed. Similar themes of the outcome measures used emerged. Intellectual and social functioning were commonly assessed by the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III; Wechsler, 1997), or Wechsler Adult Intelligence Scale-Revised (WAIS-R; Wechsler, 1981) and the Vineland Adaptive Behaviour Scale (VABS).

Risk was not commonly assessed within the studies. The Rapid Risk Assessment for Sex Offence Recidivism (RRASOR; Hanson, 1997) and Sexual Violence Risk-20 (SVR-20; Boer, Hart, Kropp, & Webster, 1997) were utilised, both of which are considered suitable for use with ID offenders (Craig, Stringer & Sanders, 2012; Boer, Tough, & Haaven, 2007). The STATIC-99 (Hanson & Thornton, 2000), Risk Matrix 2000 (RM2000; Thornton et al., 2003), and STABLE and ACUTE risk measures (Hanson & Harris, 2000b) have also been used (Newton et al., 2011; Williams et al., 2007), although their validity with ID offenders is questioned, and none have been standardised with ID populations (Langdon & Murphy, 2010). The RM2000 was little better than chance at predicting sexual reconviction among ID offenders (Blacker, Beech, Wilcox, & Boer, 2011). The STATIC-99 was however found to

significantly predict inappropriate sexual incidents in individuals with ID (Langdon & Murphy, 2010).

Psychometric assessments were selected which reflected the treatment needs being addressed. Cognitive distortions were assessed using the Multiphasic Sex Inventory (MSI) (Nichols & Molinder, 1984), the QACSO, and the M-ABCS. The QACSO is a tool specifically developed for use with individuals with ID, and is internally consistent and reliable (Broxholme & Lindsay, 2003). The M-ABCS is a scale modified for use with ID sexual offenders, and is internally consistent (Keeling et al., 2006; Kolton, 1996; Kolton et al., 2001).

Attitudinal change was assessed using the Sex Offences Self-Appraisal Scale (SOSAS; Bray & Forshaw, 1996), which has been considered appropriate for use with individuals with ID. This tool is internally consistent (Williams et al., 2007). The Sex Offenders Opinion Test (SOOT; Bray, 1997) was used to assess attitudes about victims. The SOOT has good internal consistency, and is sensitive to treatment effects (Williams et al., 2007).

Sexual knowledge was assessed using the SAK, a tool specifically designed for use with individuals with ID (Langdon, Maxted, Murphy, & SOTSEC-ID, 2007). The MSI was used to assess changes in sexual knowledge, as was the SSKAAT-R. The SSKAAT-R was adapted specifically for use with individuals with ID and found to be reliable (Griffiths & Lunsky, 2003). The ASK was also used, this was distinguished from other tools in that it was completed by health professionals (Galea et al., 2004; Sakdalan & Collier, 2012).

Changes in victim empathy were most commonly assessed using the VES adapted for use with ID offenders (Beckett & Fisher, 1994a; Langdon et al., 2007). The MSI was also used to assess changes in victim empathy, as was the Adapted Victim Empathy Consequences Task (Williams et al., 2007). Empathic concern was assessed using the Interpersonal Reactivity

Index (IRI; Davis, 1983), a measure found to be internally consistent (Michie & Lindsay, 2012). Whilst the MSI was used by Craig et al. (2006) to assess a number of domains, concerns have been raised about its validity for use with ID offenders (Keeling et al., 2007a).

Intimacy deficits were assessed using the UCLA Loneliness Scale – Revised (UCLA-R; Russell, Peplau, & Cutrona, 1980), the Adapted Emotional Loneliness Scale, or the MSIS. The MSIS was used by Keeling et al. (2006) without adaptations for ID offenders, however Keeling et al. (2007b) utilised an adapted version for ID offenders. The UCLA-R assesses experience of loneliness; Keeling et al. (2007b) found good internal consistency with ID offenders.

The Adapted Relapse Prevention Interview was also used. This measure assesses an individual's ability to identify risk factors and coping strategies. It has been found to have good internal consistency, and demonstrated sensitivity to treatment effects (Williams et al., 2007).

Other outcomes were also utilised, including assessments focused on improvements in social functioning and general coping ability. The Coping Response Inventory (CRI; Moos, 1993) was used to assess coping abilities and strategies in one study (Craig et al., 2006), however no evidence of validity or reliability with ID offenders could be identified. The Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994) was used to assess relationships. Whilst this was an adapted measure for ID offenders there is varied utility reported (Keeling, Rose, & Beech, 2007c). A measure of self-esteem was used in one study; the Adapted Self-Esteem Questionnaire (Williams et al., 2007). The Self-Control Rating Scale (SCRS) was used to assess an individual's ability to control their behaviour. This was a tool developed for use with children, however was felt to be appropriate for use with ID adults if modified (Keeling et al., 2007a).

Singh et al. (2011) relied solely on participants' self report of deviant sexual arousal. Rea et al. (2014) relied upon compliance scores related to relapse-prevention plans. These scores were generated by the individual supporting the participant when they were accessing the community.

There are difficulties in relying on self-report measures, particularly in an offender population. These difficulties with self-reported measures are exacerbated within an ID population given the established difficulties with reading ability and general suggestibility (Clare & Gudjonsson, 1993). Furthermore, there is a tendency for ID individuals to acquiesce, creating difficulties in ensuring the validity of self-report measures (Finlay & Lyons, 2002). Two of the studies attempted to ensure the validity of responding by using the Paulhus Deception Scales (PDS; Paulhus, 1998) to assess for socially desirable responding (Keeling et al., 2006; Keeling et al., 2007b). Of the studies, ten attempted to overcome the difficulties by complementing the self-report measures with the monitoring of reoffending (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2007b; Lindsay et al. 2011; Newton et al., 2011; Rose, Rose, Hawkins, & Anderson, 2012), or sexually abusive behaviours (Heaton & Murphy, 2013; Murphy, Powell, Guzman, & Hays, 2007; Murphy et al., 2010; Sakdalan & Collier, 2012). Michie and Lindsay (2012), Singh et al. (2011), and Williams et al. (2007) only utilised self-report measures to assess outcomes. Conversely, Rea et al. (2014) relied only on reports from the individuals supporting the participants.

*Quality of included studies*

All of the studies were quality assessed, and achieved varying degrees of quality. The quality ranged from 41% to 69% (mean = 55%) (quality assessment results – Appendix 4). All of the studies achieved an intermediate methodological quality, indicating a moderate risk of bias. There were difficulties in assessing the majority of studies on several of the items on the quality assessment due to poor reporting within the research papers. All except one of the

studies had small sample sizes. Confounding variables were rarely identified, and where they were this tended to relate to participants attending other treatments which were not described. Concerns were raised about the validity and reliability of some of the outcome measures with an ID offender population.

Table 1 shows the characteristics and key findings from the fifteen studies included in the review. Table 2 outlines the strengths and limitation of the included studies.

**Table 1.** Characteristics and findings for included studies

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Craig et al. (2006) United Kingdom<br><br>Quality Score = 63% | Six male sex offenders (at least one sexual offence).<br>Mean age = 24.8 (*SD*=7.46 years, range 18-39 years)<br>IQ range = <60-80<br>Participants recruited from local National Health Service (NHS) ID service.<br>Five living in private residential accommodation, one living with grandparents. | Before-After Design<br>Weekly group CBT for two hours, over seven months.<br>**Content Overview**<br>Cycle of offending; thoughts of sexual fantasy and masturbation; sex education and the law; cognitive distortions; victim empathy; relapse prevention skills.<br>**Delivery style**<br>Frequent repetition of information. Pictures. Flexible sessions to be responsive. Language simplified. Role-plays. In-group responsibilities for participants.<br>**Assessment for Suitability**<br>WAIS-III; VABS | **Psychometric Assessments**<br>MSI; CRI; Psychiatric Assessment for Adults with a Developmental Disability (mini-PAS-ADD); VABS<br>**Measurement times**<br>Pre-treatment.<br>12 months post-treatment.<br>**Findings**<br>Significant improvements in socialization, and play and leisure time domains of the VABS. Non-significant improvements on a lie scale in the MSI and in sexual knowledge.<br>**Reoffending**<br>During 12 month follow up none of the participants were charged or reconvicted for a sexual offence. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Craig et al. (2012) United Kingdom<br><br>Quality Score = 54% | 14 male sexual offenders.<br>13 convicted of sexual contact with a child, one of attempted rape of adult female.<br>Mean age = 35 (range 19-61 years).<br>Mean FSIQ = 73 (range 67-79).<br>Participants serving probation orders or prison licences. Three continued after their licence period ended.<br>11 living independently in the community. Three in probation approved hostels. | Before-After Design<br>Weekly group CBT for two hours, over 14 months. Treatment delivered over two groups.<br>**Content Overview**<br>Sex education and the law; cognitive distortions; victim empathy; relapse prevention skills; cycle of offending; thoughts of sexual fantasy and masturbation.<br>**Delivery Style**<br>Manualised treatment. Use of pictures, drawings, interactive exercises, videos, quizzes, group discussions, role plays and games. Repetition of information. In-group responsibilities for participants.<br>**Assessment for Suitability**<br>WAIS-III; VABS; Autism assessment: the diagnostic criteria; British picture vocabulary scale (BPVS) | **Psychometric Assessments**<br>SAK; QACSO; VESA; SOSAS<br>**Risk Assessment**<br>RRASOR<br>**Outcomes administration times**<br>Pre-treatment.<br>Six participants followed up for 12 months, remainder followed up for six months.<br>**Findings**<br>Significant improvements in victim empathy, and on all seven QACSO subscales.<br>Non-significant improvements in cognitions about sexual offending using the SOSAS.<br>**Reoffending**<br>None of the participants were charged or reconvicted for a sexual offence during the follow-up. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Heaton and Murphy (2013) United Kingdom<br><br>Quality Score = 65% | 34 male offenders. History of sexual offending and sexually abusive behaviours.<br>Mean age at follow-up = 44 (*SD*=12, range 22-68 years)<br>Formal ID diagnoses in 91% of participants. All using ID services.<br>15% of participants living in secure services, remainder in the community. | Before-After Design<br>Details of intervention - Murphy et al. (2010)<br>**Assessment for Suitability**<br>WAIS-III | **Psychometric Assessments**<br>SAK; QACSO; SOSAS; VESA<br>**Outcomes administration times**<br>Pre- and post-treatment, six-month follow-up, and current "longer term" follow-up. Insufficient data at six month follow-up – time point removed from the analyses.<br>Mean length of follow up since end of respective treatment group = 44 months (*SD*=28.8, range 15-106 months).<br>**Findings**<br>Significant improvements in sexual attitudes and knowledge, and attitudes consistent with sexual offending. Significant improvements in victim empathy. Gains maintained at longer term follow up.<br>**Reoffending**<br>32% engaged in sexually abusive behaviour between treatment completion and analysis (*n*=11). Seven were interviewed by Police. Two (6%) attended court and received conviction. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Keeling et al. (2006) Australia<br><br>Quality Score = 50% | 18 participants convicted for at least one sexual offence received treatment. 11 were subject to analysis. Seven participants discharged before completing treatment - not possible to collect follow-up data. All excluded from further analysis.<br>Mean age = 35.22 (*SD*=7.26, range 25-46 years)<br>Average IQ = 71.8 (*SD*=6.80)<br>Three low average functioning; seven borderline intellectual functioning; eight mild intellectually disabled range | Before-After Design. Correctional setting. Developed for ID sexual offenders based on existing CBT programme. Facilitated four days per week, for two and a half hours (30 minute break), over 12 months. Participants completed homework tasks on a further day per week.<br>**Content Overview**<br>*Offence-Specific Content* - Sex and sexual abuse education; disclosure; victim empathy; cognitive distortions; life time patterns; offence cycle; relapse prevention.<br>*Offence-Related Content* - Communication, problem solving; decision making; victim awareness; emotions; sexual self-regulation; attitudes and beliefs; relationships; goal setting.<br>**Delivery Style**<br>Content simplified. Drama therapy techniques. Symbols. "Old Me/New Me". Reduced written tasks/materials. Therapeutic community (TC) alongside was essential. | **Psychometric Assessments**<br>UCLA-R; Criminal Sentiments Scale (CSS); MSIS; M-ABCS; Victim Empathy Distortion Scale (QVES); QACSO; SCRS; PDS<br>**Risk Assessments**<br>Static-99<br>**Outcomes administration times**<br>Pre- and post-treatment.<br>**Findings**<br>Significant improvements in cognitive distortions, victim empathy, self-control, and attitudes consistent with sexual offending. All improvements had large effect sizes.<br>Number of participants showing reliable change ranged from two to seven.<br>Non-significant reduction in socially desirable responding following treatment completion. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Keeling et al. (2007b) New South Wales, Australia<br><br>Quality Score = 59% | 22 participants - 11 with special needs, 11 mainstream. Offenders matched on risk, victim gender, offence type and participant age.<br>**Special Needs Sample**<br>Mean age=37.82 (*SD*=6.85, range 25-46 years).<br>Average FSIQ = 71.0 (*SD*=6.0, range 63-83).<br>*Intellectual functioning*<br>Borderline (*n*=6); mild (*n*=4); low-average (*n*=1).<br>**Mainstream Sample**<br>Mean age=45.73 (*SD*=13.73, range 23-67 years).<br>Intellectual functioning unknown. | Before-After Design. Comparison of two offender populations. SOTP in a therapeutic unit in an Australian correctional centre. Treatment for special needs sexual offenders adapted from mainstream sexual offender treatment.<br>Sessions lasting two and a half hours (30 minute break), delivered four times per week, over 12 months.<br>**Content Overview (Keeling & Rose, 2006)**<br>Sex education and sexual abuse education; disclosure; victim empathy; cognitive distortions; life time patterns; offence cycle; relapse prevention.<br>**Delivery Style (Keeling & Rose, 2006)**<br>Use of symbols; "Old me/New me"; "old me" masks; warm-up exercises; reduced reliance on written materials; modelling; drama therapy. | **Psychometric Assessments**<br>Adapted versions of the assessments used with the special needs offenders. Original versions with mainstream offenders. QVES; RSQ; Social Intimacy Scale (SIS) UCLA-R; PDS<br>**Outcomes administration times**<br>Pre- and post- treatment. Reoffending for special needs offenders examined on average 16 months following release.<br>**Findings**<br>Special needs offenders showed significantly greater socially desirable responding than mainstream offenders post-treatment. No significant effect of treatment found for either group when socially desirable responding was a covariate.<br>*Special needs sexual offenders* – When socially desirable responding removed, improvements found in victim empathy and deteriorations in forming relationships with others. No recorded sexual recidivism. One committed a non-sexual offence, and one a parole breach.<br>*Mainstream offenders* - When socially desirable responding was removed improvements found in victim empathy and relationships with others. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Lindsay et al. (2011) United Kingdom<br><br>Quality Score = 57% | 30 participants (15 per condition). All had a history of sexual offending, against adult women or children.<br>**Offenders against Adult Women**<br>Mean age = 32.7<br>Average FSIQ = 65.4<br>**Offenders against Children**<br>Mean age = 36.4<br>Average FSIQ = 63.2<br>**Living conditions**<br>All living in the community with open access. | Cohort, Before-After Design<br>Group facilitated once per week for 2 hours, over a 36 month period.<br>**Content Overview (Lindsay, 2009b)**<br>Treatment delivered in two separate locations.<br>Modules include:-<br>Disclosure; pathways into offending; cognitive distortions; childhood abuse; victim awareness; interpersonal style; pornography; relapse prevention.<br>**Delivery Style**<br>Groups of 6-10 participants with a variety of offences. | **Psychometric Assessments**<br>QACSO<br>**Other Outcomes**<br>Incidents of inappropriate behaviour, including reoffending.<br>**Outcomes administration times**<br>Pre- and post-intervention, and at six monthly intervals throughout treatment. At least two year follow-up following treatment completion.<br>**Findings**<br>**Within-group differences**<br>Both groups showed significant improvement on the "rape and attitudes to women" and "offences against children" scales from pre- to post-treatment.<br>**Reoffending**<br>Total reoffending rate of 23.3%. Three of the offenders against women re-offended, whilst four of the offenders against children reoffended. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Michie and Lindsay (2012) United Kingdom<br><br>Quality Score = 46% | 20 participants (10 per condition), all had a history of sexual offending.<br>**Treatment condition**<br>Mean age = 36.4 (range 22-57 years)<br>Average FSIQ = 65.8<br>**Control condition**<br>Mean age = 34.2 (range 19-58 years)<br>Average FSIQ = 66.2 | Cohort, Before-After Design<br>All participants received a CBT programme for sexual offenders. Treatment group received an empathy component - control group did not. Empathy component delivered in six sessions over eight weeks for two hours.<br>**Content Overview**<br>Confidentiality; responsibility for offence; cognitive distortions (denial and minimisation); harm to the victim; circumstances leading to offending.<br>*Treatment Condition* - As above and additional empathy enhancing component, including group rules; description of sexual offence; identifying offence types; impact of offending on victim. | **Psychometric Assessments**<br>IRI<br>**Outcomes administration times**<br>Administered in first session, last session and at three, six, and nine-month follow up.<br>**Findings**<br>Significant improvements in empathy found for the treatment group between pre-, post- and three-month follow up. Significant improvements in empathy scores from pre-treatment to six-month follow up, and pre-treatment to nine-month follow up.<br>**Between-group differences**<br>No significant difference between the groups at pre-treatment. Empathy scores at post-treatment and three-month follow up were significantly higher for the treatment group than the control group. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Murphy et al. (2007) United Kingdom<br><br>Quality Score = 61% | Eight males - history of sexual offending or sexually abusive behaviour.<br>Mean age = 38.8 (*SD* 14.6)<br>All had a diagnosed ID.<br>Average FSIQ = 67 (*SD* 9, range 52-83).<br>Recruited from local ID services in two South London Boroughs, referred by the services.<br>Participants living in secure hospitals, residential homes, placements, with family, or alone. | Before-After Design<br>Weekly group for two hours, over one year.<br>**Content Overview**<br>"Men's Group" for treatment of sexually abusive behaviour.<br>Content included: body part names; social rules regarding potentially sexual behaviour; relationships; sex and the law; coping with feelings and stress; understanding their own illegal sexual behaviour; experiences of being a victim; understanding their victims; understanding causes of sexual behaviour; offence cycles; consent; relapse prevention.<br>Programme delivered to two groups. Session topics for both groups were "extremely similar".<br>**Assessment for Suitability**<br>WAIS-III; VABS; BPVS | **Psychometric Assessments**<br>Sexual Attitudes and Knowledge Scale (SAKS); QACSO; SOSAS; VESA<br>**Outcomes administration times**<br>Pre- and post-treatment. Sexually abusive behaviour monitored for group duration, and six months following treatment completion.<br>**Findings**<br>Significant improvements in sexual attitudes and knowledge, and victim empathy. Non-significant improvements in attitudes consistent with sexual offending.<br>**Reoffending and Sexually Abusive Behaviour**<br>*During treatment* - No further non-sexual offences were committed by any group participants. One participant engaged in sexually abusive behaviour during the groups in the form of non-contact behaviours.<br>*At 6 month follow-up* - No further sexual offences were committed by any group participants. Three men committed sexually abusive behaviour. All were on the autism spectrum. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Murphy et al. (2010) United Kingdom<br><br>Quality Score = 69% | 46 participants - history of sexual offending or sexually abusive behaviour (13 groups over 9 sites).<br>91% of group participants were receiving no other treatment for their sexual behaviour at the start of the group.<br>Mean age = 35.3 years (*SD*=12.0)<br>Average FSIQ = 68 (*SD*=7.6, range 52-83).<br>Participants recruited from community ID teams, secure services, or a probation service. | Before-After Design<br>CBT for sexual offenders, or those who engaged in sexually abusive behaviour. Groups facilitated for two hours once per week, over one year. All facilitators had undertaken SOTSEC-ID training.<br>**Content Overview and Delivery Style**<br>Described in SOTSEC-ID treatment manual. Content included: social and therapeutic framework of group; sexual education; cognitions; victim empathy; sexual offending model – offence cycles; relapse prevention.<br>**Assessment for Suitability**<br>WAIS-III; VABS; BPVS-II; Mini-PAS-ADD; Diagnostic Criteria Checklist for Autism | **Psychometric Assessments**<br>SAKS; QACSO; VESA; SOSAS<br>**Other Outcomes**<br>Sexually abusive behaviour or convictions for sexual offences.<br>**Outcomes administration times**<br>Pre- and post-treatment. Followed up at six months post-treatment.<br>**Findings**<br>Significant improvements in sexual attitudes and knowledge, and attitudes consistent with sexual offending from pre-treatment to follow up. Significant improvements in victim empathy, and cognitions related to sexual offending, however these results were non-significant at follow up.<br>**Reoffending and Sexually Abusive Behaviour**<br>*During treatment year* - No participants committed non-sexual offences. Three engaged in sexually abusive behaviours; all non-contact behaviours.<br>*During six-month follow-up* - No participants committed non-sexual offences. Four engaged in sexually abusive behaviours; some non-contact behaviours and others contact behaviours. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Newton et al. (2011) United Kingdom<br><br>Quality Score = 44% | 13 participants. Refused to engage (*n*=2). Failed to complete (*n*=4). Participants recruited from regional community ID team.<br>**Treatment completers**<br>Mean age=32 years 5 months (range 22-47 years). Average IQ=61.6 (range 56-70).<br>Number of known sexual incidents=5.0 (range 1-11).<br>Number of sexual offence convictions=1.2 (range 0-3).<br>*Participant's residence*<br>Supported living residential homes, a psychiatric unit, and independent community living. | Before-After Design<br>**Content Overview**<br>CBT intervention with drama/experiential techniques. Good lives philosophy.<br>**Duration**<br>Year one – Group intervention four hours once a week (160 hours group work)<br>Year two – Group intervention two hours twice a week, with every fourth session as an individual session (120 hours group work, 20 hours individual treatment).<br>**Assessment for Suitability**<br>Eligibility criteria of the local community ID team (IQ under 70; deficits in social functioning; onset before age of 18)<br>**Pre-intervention assessments**<br>BPVS; P-Scan; STATIC-99; STABLE and ACUTE | **Psychometric Assessments**<br>STABLE and ACUTE; QACSO; VES<br>**Other Outcomes**<br>Changes in care plans; levels of supervision; behavioural change; re-offending<br>**Outcomes administration times**<br>Pre-, mid-, and post-treatment. One year follow up.<br>**Findings**<br>No significant change in cognitive distortions. No statistical analysis of victim empathy or risk. No consistent trends observed. Positive changes to care plans, and reductions in levels of support and supervision (*n*=5). Most demonstrated positive behavioural changes.<br>**Re-offending**<br>No treatment completers committed a sexual offence or harmful sexual behaviour during group or follow-up (1-2 years). Of the non-completers, three engaged in either an alleged sexual or violent offence. Of the refusers, one was re-arrested for an alleged sexual offence three years after having refused to engage. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Rea et al. (2014) North America<br><br>Quality Score = 52% | Ten participants recruited from specialist residential units treating ID sexual offenders.<br>All convicted of at least one sexual offence of child molestation. Six participants also had at least one additional offence.<br>Mean age = 23.8 (range 18-28 years)<br>Average FSIQ = 63.1 (range 40–78) | Multiple case study design to evaluate the extent of compliance with relapse-prevention plans. The development of each relapse prevention plan (RPP) is not outlined within this study. | Compliance with RPPs coded by a companion supporting the community access. Companion was treatment staff (TS), non-treatment staff (NTS), or another adult not familiar to the patient (CA). Four probe sessions conducted; one with TS, then either with NTS or CA (and then the other), and the final session again with TS. Pre-assessment baseline was established in the preceding six months. Compliance assessed in relation to 18 behaviours.<br>**Findings**<br>*Main Effect of Companion* - 100% compliance with RPPs when accompanied by TS. 55% compliance with NTS. 44% compliance with CA. Compliance significantly better with TS than NTS or CA.<br>*Generalisation* - Most behaviours proximal to re-offending showed high generalisation. High generalisers were significantly younger. Low generalisers had a more diverse sexual offending history. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Rose et al. (2012) United Kingdom<br><br>Quality Score = 48% | 12 participants with a history of sexual offending.<br>Mean age = 39.5 (range 20-65 years).<br>Average FSIQ = 58 (range 49-70).<br>Referrals from local clinicians.<br>Participants living in parental home or residential care/supported living. | Before-After Design<br>Treatment adapted from existing CBT programme. Weekly group for two hours, over 40 weeks.<br>**Content Overview**<br>Sex education and relationships; emotion recognition; life stories; motivation to offend; offence analysis; offence cycle; anger management; cognitive distortions; victim empathy; relapse prevention.<br>**Delivery Style**<br>Adapted materials developed and used. Use of role plays and modelling.<br>**Assessment for Suitability**<br>WAIS-III | **Psychometric Assessments**<br>QACSO; Nowicki-Strickland Locus of Control Scale (NS); SSKAAT-R<br>**Outcomes administration times**<br>Pre-and post-treatment, and six-month follow-up.<br>18 month follow-up for further offending.<br>**Findings**<br>Significant improvements in attitudes consistent with sexual offending, and sexual knowledge. More external locus of control noted following treatment.<br>Number of participants showing reliable change on each assessment varied.<br>**Reoffending**<br>One participant committed a sexual offence. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Sakdalan and Collier (2012) New Zealand<br><br>Quality Score = 54% | Three participants with a history of sexual offending and sexually abusive behaviours.<br><u>Client 1</u><br>Mid-30's male, mild to moderate ID.<br><u>Client 2</u><br>Mid-20's male, mild ID.<br><u>Client 3</u><br>Mid-30's male, placed in ID community secure facility.<br>Recruited from a secure ID hospital and a secure ID residential setting.<br>Conducted in a secure setting. | Multiple case study design, Before-After Design<br>**Content Overview**<br>SAFE-ID programme, based on SOTSEC-ID programme (Murphy et al., 2010).<br>Content included: sexual education; relationships; cognitions; sexual offending model; empathy; relapse prevention; adapted DBT coping skills – focus on emotion regulation, frustration tolerance and interpersonal effectiveness.<br>Participants received individual psychotherapy to reinforce learning.<br>**Duration**<br>Group delivered weekly for two hours, over a seven month period.<br>Individual sessions delivered weekly for one hour. | **Psychometric Assessments**<br>ASK; SOSAS; QACSO; Victim Empathy Scale (VES)<br>**Other Outcomes**<br>Sexually abusive behaviours, physical and verbal aggression from incident logs.<br>**Risk Assessments**<br>SVR-20<br>**Outcomes administration times**<br>SVR-20 administered pre-, post- and at one-year follow-up.<br>**Findings**<br>Decrease in SVR-20 scores post-treatment and at follow-up. All showed improvements in sexual knowledge and victim empathy. Reductions in cognitive distortions, and attitudes consistent with sexual offending (*n*=2). Improved insight, and reduction in sexually inappropriate behaviours (*n*=2). Gains maintained at follow up. Decrease in masturbation, sexual excitability, and improved emotion regulation (*n*=1). One client had an incident during treatment where he took photographs of teenage females in public. He continued to demonstrate cognitive distortions. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Singh et al. (2011) North America<br><br>Quality Score = 41% | Three participants with a history of sexual offending, and a mild ID.<br><u>Client 1</u><br>34 year old male.<br><u>Client 2</u><br>23 year old male.<br><u>Client 3</u><br>25 year old male.<br>All resided in a forensic mental health facility for ID clients. | Multiple case study design, Before-After Design<br>**Content Overview**<br>Mindfulness training. Participants taught two skills referred to as "meditation on the soles of the feet" and "mindful observation of thoughts".<br>**Duration**<br>Training delivered in sessions lasting between 30 minutes and one hour, four times per week. Duration of intervention varied per participant (35-40 weeks).<br>Participants also seen individually by the therapist during the study.<br>**Facilitators**<br>Facilitated by two therapists. Primary therapist had ample experience in mindfulness. | **Assessments**<br>Self-report data relating to level of sexual arousal, on a four point rating scale.<br>**Outcomes administration times**<br>Pre-treatment baseline established.<br>Arousal levels assessed at four stages throughout the treatment. Assessment points different for each participant.<br>**Findings**<br>Reduction in reported sexual arousal for all three participants.<br>Self-reported use of mindfulness procedures in daily life.<br>Participants reported feelings of empowerment. |

| Study | Participants | Study Design and Intervention | Measures and Outcomes |
|---|---|---|---|
| Williams et al. (2007) United Kingdom<br><br>Quality Score = 56% | 211 participants detained across eight HMP Services. All participants excluded from the CORE SOTP due to their IQ.<br>Mean age (206) = 40.3 (*SD*=12.1)<br>Average FSIQ (211) = 71.9 (*SD*=5.8)<br>**Most serious sexual offence**<br>• Rape 39.8%<br>• Indecent assault 35.5%<br>• Buggery 7.8% | Before-After Design<br>**Content Overview**<br>Adapted SOTP - manualised group treatment programme.<br>Content areas: old me; sex education; modifying offence justifying thinking; offence accounts; victim awareness; risk awareness; developing relapse prevention skills.<br>**Course Duration**<br>Intervention delivered across 89 treatment sessions with additional diary sessions. Average of approximately 200 hours of treatment.<br>**Assessment for Suitability**<br>WAIS-R; Psychopathy Checklist; RM2000 | **Psychometric Assessments**<br>SOSAS; SOOT; Adapted Victim Empathy Consequences Tasks; Adapted Relapse Prevention Interview; Adapted Self-Esteem Questionnaire; Adapted Emotional Loneliness Scale<br>**Outcome administration times**<br>Pre- and six weeks post-treatment.<br>**Findings**<br>Significant improvements in sexual knowledge, attitudes, relapse prevention awareness, and self-esteem. No significant change in emotional loneliness. |

**Table 2.** Strengths and limitations of studies

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Craig et al. (2006) | *Sample*<br>Variety of offence types.<br>Co-morbid diagnoses which may be reflective of clinical practice.<br>*Assessments*<br>One measure included a validity scale (measure of social desirability and a lie scale).<br>Mini-PAS-ADD and VABS validated for use with ID population.<br>*Outcomes*<br>Improvements in some measures following treatment.<br>Clinical improvements in implicit treatment goals, including listening skills and social responsibility.<br>No reoffending in the one year follow-up.<br>*Treatment*<br>Treatment programme described as structured but flexible, therefore responsive. | *Sample*<br>Small sample size.<br>Lack of control/comparison group.<br>All participants had committed at least one sexual offence, may not be representative of those not apprehended.<br>Not all had diagnosed ID.<br>May reflect lower risk offenders who benefit more from treatment.<br>*Assessments*<br>CRI and MSI not standardised with ID population.<br>*Outcomes and follow-up*<br>Short follow-up period of recidivism.<br>Potential sexually inappropriate behaviours occurred rather than re-offending.<br>24-hour supervision and restrictions could have prevented re-offending.<br>*Treatment*<br>Unclear if results are due to intervention itself, group structure, or 24-hour supervision all participants were subject to.<br>Short intervention length (seven months).<br>Flexible nature of treatment programme limits generalisability.<br>Previous treatments not consistently reported. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Craig et al. (2012) | *Sample*<br>Varied offending histories.<br>Some voluntarily chose to continue attending.<br>Participants with co-morbid disorders not excluded.<br>*Assessments*<br>All measures valid with ID population.<br>Visual Likert scale; increased accessibility.<br>SOSAS includes social desirability domain.<br>Measures have good internal consistency.<br>Risk measures largely valid with ID population.<br>*Outcomes and follow-up*<br>Improvements in measures related to perspective taking, victim empathy, cognitive distortions and pro-sexual assault attitudes.<br>All participants had unsupervised access to the community providing opportunity to offend.<br>Data analysed anonymously, reduced risk of researcher bias.<br>*Treatment*<br>Manualised treatment delivered by same facilitators. | *Sample*<br>Sample may not represent clients referred to ID services. Not all participants had a diagnosed ID and some had IQ's above those typical of ID services.<br>Small sample size.<br>Lack of control or comparative group.<br>Participants varied in level of risk.<br>*Assessments*<br>Reliance on self-report measures.<br>*Outcomes and follow-up*<br>Short follow-up period of recidivism (six to twelve months).<br>Lack of reoffending may not indicate improvement. Sexually inappropriate behaviour or sexual offending behaviour may not be detected or reported.<br>No significant differences on SAK or SOSAS.<br>*Treatment*<br>Unclear if results are due to intervention itself, group structure or probationary supervision all participants were subject to.<br>Treatment was delivered in two groups, consistency across these not explicitly assessed. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Heaton and Murphy (2013) | *Sample*<br>Larger sample size than is usually the case for ID studies.<br>Sample regarded as characteristically similar to ID sex offender population.<br>All participants had used ID services.<br>Did not exclude participants with co-morbid disorders, enhances clinical applicability.<br>*Assessments*<br>All measures considered valid with ID population.<br>SAK, SOSAS and VES-A internally consistent.<br>*Outcomes and follow-up*<br>Changes in sexual knowledge, attitudes, and victim empathy. Gains maintained at follow up.<br>Longer follow up period than previous studies.<br>Not only reoffending was examined, also included sexually abusive behaviour. | *Sample*<br>Small sample size.<br>Lack of control/comparative group.<br>Not all participants had ID diagnosis.<br>*Assessments*<br>Concerns about utility of SOSAS with ID clients. SOSAS had lower internal consistency, and double negatives which were hard to understand.<br>*Outcomes and follow-up*<br>Not all potential participants could be included due to time restraints.<br>Some participants able to access the community without escort, therefore opportunity to commit a sexual offence/inappropriate behaviour undetected.<br>No improvement on SOSAS.<br>One third engaged in sexually abusive behaviour during treatment or follow-up.<br>SAKS continued to improve from post-treatment to follow-up - authors were unclear for the reasons for this.<br>*Treatment*<br>Participants received different ‘dosages’ of treatment.<br>Treatment delivered over seven different sites; treatment fidelity not assessed.<br>Some participants received treatment following the end of the group, no further details provided. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Keeling et al. (2006) | *Sample*<br>Includes crossover offenders.<br>*Assessments*<br>Risk measure considered valid with ID population.<br>M-ABCS, QVES, and QACSO all valid with ID offenders.<br>Included social desirability scale.<br>*Outcomes and follow-up*<br>Significant post-treatment change on measures relating to offending attitudes, victim empathy, and self-control, with large effect sizes.<br>Clinical observations of improved communication and socialisation with others.<br>Improved participation with community activities.<br>Some showed reliable change on a number of measures. | *Sample*<br>Small sample size.<br>Lack of control or comparative group.<br>Not all participants had formal ID diagnosis, limits generalisability.<br>*Assessments*<br>Some measures have limited evidence of validity and reliability with ID clients (UCLA-R, CSS, MSIS, SCRS, and PDS).<br>*Outcomes and follow-up*<br>Lack of follow-up data.<br>Did not include drop-outs in analysis.<br>Many measures did not show significant difference pre- to post-treatment.<br>Many participants did not show reliable change on a number of measures.<br>Some participants could not achieve reliable change due to floor effects and were not subject to analysis.<br>No recidivism/reoffending follow-up.<br>No follow-up of sexually inappropriate behaviours.<br>*Treatment*<br>TC could have had benefits, confounding variable.<br>Treatment outcomes may be restricted to prison setting. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Keeling et al. (2007b) | *Sample*<br>Participants matched between groups on risk, victim gender, offender type, and age of participant.<br>Although not an ID population it is felt the results are partially applicable.<br>Participant's high or medium risk.<br>*Assessments*<br>Most measures reliable and valid with ID offenders.<br>Included a measure of social desirability.<br>*Outcomes and follow-up*<br>Presence of follow-up period.<br>Some changes in measures relating to victim empathy and relationships.<br>No participants reconvicted at follow-up since their release.<br>*Treatment*<br>Treatment for the two groups based on the same aims and content.<br>Appropriate adaptations made to ID group delivery. | *Sample*<br>Small sample size.<br>Intellectual functioning of mainstream offenders not assessed, difference from special needs offenders not established.<br>Special needs offenders may not be representative of ID sexual offenders.<br>Lack of control group.<br>*Assessments*<br>Difficulties in applying psychometric tests to ID population (UCLA-R, RSQ and PDS).<br>Reliance on self-report measures.<br>*Outcomes and follow-up*<br>Short follow-up period.<br>No follow-up data available for the mainstream offender group.<br>Higher levels of social desirability following intervention for ID offender group when compared with mainstream group.<br>No significant effect of treatment over time for ID group.<br>Reliance on reoffending figures, may underestimate true recidivism rate.<br>*Treatment*<br>Different treatments administered, therefore not directly comparable. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Lindsay et al. (2011) | *Sample*<br>Comparison between two types of ID offenders.<br>*Assessments*<br>QACSO valid and reliable with ID offenders.<br>QACSO discriminated between adult and child offenders on relevant scales.<br>*Outcomes and follow-up*<br>Longer follow-up period (at least two years).<br>Considered reoffending and inappropriate behaviour.<br>Participants had unsupported community access - opportunity to offend.<br>Improvements following treatment of attitudes supporting sexual offending.<br>Attitudes in offenders against children reduced to level comparable to non-sexual offenders at 24 months.<br>*Treatment*<br>Long treatment length; research showed greatest change between 18 and 36 months for offenders against women. | *Sample*<br>Small sample size.<br>Lack of control group.<br>Cross-over offenders not included.<br>Lack of reference to previous or concurrent treatment.<br>Offenders against adults had more often committed contact offences when compared with offenders against children, indicating potentially different levels of risk for each group.<br>Potential participants had committed undiscovered crossover offences.<br>*Assessments*<br>Did not include a measure of social desirability.<br>*Outcomes and follow-up*<br>Several participants had reoffended or engaged in a sexually inappropriate behaviour at follow-up (23.3%).<br>Participants may have committed a sexually inappropriate behaviour or a sexual offence which went undetected/unreported.<br>*Treatment*<br>Programmes delivered in two separate locations and described as being based on a programme. Potential variance between the two evaluated treatment groups. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Michie and Lindsay (2012) | *Sample*<br>Presence of a comparable control group.<br>Wide age range.<br>Participants all had a diagnosed ID.<br>*Assessments*<br>Assessment items read to participants, responded using a pictorial scale; consideration given to responsivity issues.<br>Comprehension of items assessed during administration.<br>Assessment completed for a follow-up period.<br>*Outcomes and follow-up*<br>Treatment component resulted in improved empathy, which was not observed in the control group.<br>Gains maintained at follow-up.<br>*Treatment*<br>Treatment component could be integrated into other programmes. | *Sample*<br>Small sample size.<br>Not matched on offence types.<br>*Assessments*<br>Concerns regarding the validity of the IRI with ID population. Lack of test-retest reliability.<br>No measure of social desirability.<br>Responding could be impacted upon by presence of an interviewer.<br>Test-retest reliability not assessed.<br>*Outcomes and follow-up*<br>Measure not repeated at same time intervals for each group.<br>Reliance on self-report measures.<br>No data pertaining to reoffending/recidivism or sexually inappropriate behaviour.<br>*Treatment*<br>Only evaluated one treatment component.<br>Treatment component was an additional module to a full treatment programme, extending the length of treatment compared to the control group. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Murphy et al. (2007) | *Sample*<br>Sample included men who had committed sexually abusive behaviour, not just sexual offences.<br>*Assessments*<br>All measures considered valid and reliable for use with ID offenders.<br>*Outcomes and follow-up*<br>Conducted a follow-up.<br>SAKS and VESA showed significant improvements.<br>Included sexually abusive behaviour as well as sexual offending in follow-up.<br>Identified autism spectrum disorders (ASD) as a potential risk factor for recidivism.<br>*Treatment*<br>Treatment adapted for ID. | *Sample*<br>Small sample size.<br>No control or comparative group.<br>Some participants completed both group 1 and group 2 (excluded from analysis).<br>Not all participants had a diagnosed ID.<br>*Assessments*<br>Did not include measure of social desirability.<br>*Outcomes and follow-up*<br>Drop-outs not accounted for in analysis.<br>Short follow-up duration.<br>No significant change on QACSO or SOSAS.<br>Some participants committed sexually abusive behaviour either during or following group.<br>*Treatment*<br>Concerns duration of treatment was insufficient.<br>Multi-site design - treatment fidelity not assessed, topics described as being "extremely similar". |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Murphy et al. (2010) | *Sample*<br>Included participants who had committed sexually abusive behaviour as well as sexual offences.<br>Participants resided in a wide array of settings.<br>Majority of participants not legally mandated to attend.<br>*Assessments*<br>All measures considered valid and reliable for use with ID offenders.<br>*Outcomes and follow-up*<br>Participants made improvements on measures related to sexual offending, and some gains maintained at follow-up.<br>Follow-up period, including sexually abusive behaviour as well as sexual offending.<br>*Treatment*<br>Multi-site design of manualised treatment for which facilitators had received training.<br>Majority of participants completed the full treatment programme. | *Sample*<br>Insufficient data collected for proposed wait-list control group.<br>Small sample size.<br>Not all participants were receiving only this treatment.<br>Not all participants reached criteria for an ID diagnosis, however all had been referred from ID services.<br>*Assessments*<br>Did not include measure of social desirability.<br>Concerns about validity of SOSAS.<br>*Outcomes and follow-up*<br>Short follow-up duration.<br>Improvements only maintained at six-month follow-up on the SAKS and QACSO.<br>Several men engaged in sexually abusive behaviour or had reoffended during the treatment group and follow-up period.<br>Incomplete datasets.<br>*Treatment*<br>Concerns duration of treatment was insufficient.<br>Multi-site design - treatment fidelity could not be ensured. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Newton et al. (2011) | *Sample*<br>All participants had diagnosed ID.<br>Provided characteristics of refusers/non-completers.<br>*Assessments*<br>Consideration given to risk pre- treatment.<br>Measures repeated at one year follow-up.<br>Measures valid and reliable for use with ID offenders.<br>*Outcomes and follow-up*<br>Considered both sexual offending/harmful behaviour<br>Reviewed treatment completers, non-completers, and refusers throughout follow-up period.<br>No treatment completers re-offended or committed sexually harmful behaviour at follow up. Some treatment refusers/non-completers had, showing effect of treatment.<br>*Treatment*<br>Highlights importance of complementing group programmes with staff risk awareness. Acknowledges limitations of group programmes alone for this offender population. | *Sample*<br>Participants all recruited from the community.<br>Small sample size.<br>Participants previously received treatment for sexual offending (*n*=2).<br>Lack of control or clearly identified comparative group.<br>Drop-outs not included in analysis.<br>Missing data.<br>*Assessments*<br>Risk measures not validated for ID clients. Authors not trained in the measures.<br>QACSO suffered from floor effects.<br>Did not include a measure of social desirability.<br>*Outcomes and follow-up*<br>Some participants managed in the community may have offended undetected.<br>Some supported 24 hours a day; may not have had opportunity to offend.<br>Reliance on qualitative analysis. More susceptible to researcher bias.<br>No significant changes in psychometric measures statistically analysed.<br>Variable follow-up period.<br>*Treatment*<br>Treatment impacted by support settings and staff.<br>Participants received different intensities of intervention. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Rea at al. (2014) | *Assessments*<br>Attempts made to standardise measurement by training supporting staff in coding compliance with RPPs.<br>Long baseline period of compliance established.<br>No reliance on self-report measures.<br>*Outcomes and follow-up*<br>Included assessment condition for return to baseline.<br>Included behaviours proximal to reoffending.<br>*Treatment*<br>Novel study examining the generalisation of RPPs.<br>Attempts made to avoid order effects of supporting staff.<br>Utility for both community and in-patient services supporting ID patients in implementing RPPs.<br>Highlighted importance of staff training. | *Sample*<br>Limited age range of participants (eldest participant was 28 years).<br>Small sample size.<br>Not all had a diagnosed ID.<br>*Assessments*<br>No standardised measures used.<br>Reliance on supporting staff to provide accurate assessment of compliance.<br>*Outcomes and follow-up*<br>Levels of generalisation generated by authors.<br>Reoffending and sexually abusive behaviour not assessed or evaluated.<br>*Treatment*<br>Intervention received by participant not outlined, generally referred to as a relapse-prevention. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Rose et al. (2012) | *Sample*<br>Voluntary attendance.<br>All participants had diagnosed ID.<br>Varied in age.<br>Varied in offending history.<br>*Assessments*<br>Some measures valid and reliable with ID offenders (QACSO, SSKAAT-R).<br>Adaptations to administration – items read to participants.<br>*Outcomes and follow-up*<br>Improvements noted on psychometric assessments related to sexual offending.<br>Included a follow-up period.<br>*Treatment*<br>Programme adapted for ID population. Speech and Language Therapist reviewed group material.<br>Included role play and modelling. | *Sample*<br>Small sample size.<br>Lack of control or comparative group.<br>Drop-outs from treatment not included in analysis.<br>Missing data.<br>*Assessments*<br>NS not normed with ID offenders.<br>*Outcomes and follow-up*<br>Short follow-up period.<br>Only one participant showed reliable change on NS.<br>One participant committed a sexual offence.<br>*Treatment*<br>Short duration of treatment.<br>Additional support offered by therapists is not clearly explained.<br>Treatment not replicable.<br>Participants could "opt in" for components of the group.<br>Some participants supported by staff from their services, others were not.<br>Impact of this on generalisation not assessed. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Sakdalan and Collier (2012) | *Sample*<br>Case study design allows rich detail of sample.<br>*Assessments*<br>Measures considered valid and reliable for ID offenders.<br>Risk assessment completed by clinician not involved in delivering treatment.<br>Risk assessment completed at one-year follow-up.<br>*Outcomes and follow-up*<br>Psychometric and clinician reported improvements.<br>Gains maintained at follow-up.<br>Information pertaining to sexually abusive behaviours and sexual offending was collected.<br>*Treatment*<br>Investigated novel treatment approach with ID sexual offenders (adapted DBT). | *Sample*<br>Small sample size.<br>Lack of control or comparative group.<br>Not all participants had confirmed ID diagnosis.<br>Limited age range.<br>One participant previously received treatment.<br>*Assessments*<br>ASK not re-administered.<br>Did not include measure of social desirability.<br>*Outcomes and follow-up*<br>Lack of statistical analysis.<br>Increase in sexually abusive behaviour during group attendance period.<br>*Treatment*<br>Short duration of group programme.<br>Potential inconsistencies with facilitators.<br>Adapted manualised treatment programme, limits generalisability.<br>Participants also received weekly individual psychotherapy, hard to distinguish impact of each treatment.<br>Impact of staff support on generalisation was not assessed. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Singh et al. (2011) | *Sample*<br>All participants had diagnosed ID.<br>*Outcomes and follow-up*<br>Baseline of sexual arousal established.<br>*Treatment*<br>Novel treatment for managing sexual arousal with ID sexual offenders.<br>Treatment showed a reduction in self-reported sexual arousal.<br>Participants reported utility.<br>Participants reported increased hopefulness. | *Sample*<br>Small sample size.<br>No control/comparative group.<br>Focuses on offenders against children.<br>*Assessments*<br>Reliance on self-report measures with no measure of social-desirability.<br>*Outcomes and follow-up*<br>Lack of statistical analysis.<br>No consideration to reoffending or sexually inappropriate behaviour.<br>*Treatment*<br>Mindfulness intervention administered following, or alongside, a group programme focused on sexual behaviour and sexual offending.<br>Participants also received individual sessions from a therapist.<br>Participants had all previously engaged in mindfulness exercises; may need this prior experience of mindfulness.<br>Participants had some difficulties in understanding the directions, and the skill being practiced appeared to have been interpreted as a cognitive self-control strategy rather than mindfulness.<br>Participants were unsure how to apply skills in real life situations.<br>Treatment fidelity not assessed. |

| Authors, Year | Strengths | Limitations |
|---|---|---|
| Williams et al. (2007) | *Sample*<br>Large sample size.<br>Participants varied in level of risk.<br>Multi-site design.<br>*Assessments*<br>Adapted measures for ID offenders.<br>Measures have reasonable psychometric properties and are good indicators of treatment change.<br>Measures administered in an interview format increasing accessibility of measures for ID population.<br>*Outcomes and follow-up*<br>Large effect sizes of treatment found for most measures.<br>*Treatment*<br>Manualised standardised treatment.<br>Consideration given to responsivity issues relating to ID offenders. | *Sample*<br>No reference to drop-out and missing data.<br>Lack of control or comparative group.<br>Not all participants had diagnosed ID.<br>*Assessments*<br>Some psychometric measures specific to the Prison Service.<br>Some measures not sensitive to treatment change.<br>Reliance on self-report measures, and lack of social desirability measure.<br>Risk measure not validated for use with ID.<br>*Outcomes and follow-up*<br>No details of re-offending/recidivism.<br>Individuals who carried out the outcome measures were aware participants had received treatment.<br>Outliers were removed from analysis, these individuals could contribute further understanding to our knowledge base.<br>*Treatment*<br>Not a research study; designed to evaluate psychometric measures.<br>Facilitator effect not evaluated.<br>No reference to treatment length. |

## Narrative data synthesis and key findings

Whilst the majority of treatment tended to evaluate CBT programmes for ID offenders, this was not the case for all of the studies. Due to the variability in the studies within this review narrative data synthesis was conducted.

*Treatment Programme*

Four main types of interventions were examined in the treatment of ID sexual offenders. CBT was the primary treatment model used, however components of DBT were also used in one study (Sakdalan & Collier, 2012). One study focused on the generalisation of relapse-prevention plans (Rea et al., 2014), whilst another investigated mindfulness (Singh et al., 2011).

### *CBT*

Most studies examined CBT group interventions (Craig et al., 2006; Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Keeling et al., 2007b; Lindsay et al., 2011; Michie & Lindsay, 2012; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose et al., 2012; Williams et al., 2007). These groups lasted between two, and two and a half hours, and were delivered once a week. There were three exceptions, one delivered the programme twice a week (Newton et al., 2011), and others delivered the group four days per week (Keeling et al., 2006; Keeling et al., 2007b). The treatment programmes lasted between seven months (Craig et al., 2006; Sakdalan & Collier, 2012) and thirty-six months (Lindsay et al., 2011). The total amount of treatment hours was greatest in the treatment delivered four times per week for two and half hours, over twelve months (Keeling et al., 2006; Keeling et al., 2007b).

The majority of the studies examining CBT were examining full treatment programmes, with one exception (Michie & Lindsay, 2012). The empathy component examined by Michie and

Lindsay (2012) was delivered in six sessions over eight weeks, each of which lasted two hours.

*Content Overview*

Topics covered included; the offence cycle (Finkelhor, 1984), sexual education, relationships and the law, cognitive distortions, victim empathy, and relapse prevention skills (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2006; Keeling et al., 2007b; Lindsay et al., 2011; Murphy et al., 2007; Murphy et al., 2010; Rose et al., 2012; Williams et al., 2007). Other topics were also addressed within the group setting including improving social skills and problem solving skills (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2006; Keeling et al., 2007b; Lindsay et al., 2011).

*Treatment Delivery*

Treatment was adapted to improve its suitability for ID clients. This included repetition of concepts to improve learning and retention, increased use of pictures and symbols, use of role plays, simplified language, interactive exercises, games, and group discussions (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2006; Keeling et al., 2007b; Newton et al., 2011; Williams et al., 2007). One programme consulted a Speech and Language Therapist regarding the adaptation of materials and session delivery (Rose et al., 2012). One group included drama and experiential techniques (Newton et al., 2011).

*Assessment of Outcomes*

Outcomes were assessed using a variety of measures. Assessment of outcomes was primarily through psychometric assessment or reoffending rates. The three main treatment needs were assessed using psychometric assessments; cognitive distortions and attitudes associated with sexual offending, sexual knowledge, and victim empathy.

*Cognitive distortions and attitudes associated with sexual offending*: Cognitive distortions were often examined using the QACSO (Broxholme & Lindsay, 2003). Several of the studies noted significant improvements on the QACSO (Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Lindsay et al, 2011; Murphy et al., 2010; Rose et al., 2012). However, two studies found no significant change following treatment (Murphy et al., 2007; Newton et al., 2011). The M-ABCS was also used, and significant improvements were noted on this assessment (Keeling et al., 2006). Murphy et al. (2010) found significant improvements on the SOSAS after treatment completion, however these gains were not maintained at follow up. Williams et al. (2007) also found significant improvements on the SOSAS following treatment, however did not reassess at follow up. Improvements were noted on the SOOT (Williams et al., 2007). The SSKAAT-R was used to examine sexual knowledge and attitudes by Rose et al. (2012), who noted significant improvements following treatment.

*Sexual knowledge*: Sexual knowledge was often examined using the SAK (Heighway & Webster, 2007), significant improvements were noted (Heaton & Murphy, 2013; Murphy et al., 2007, 2010). Craig et al. (2012) found no significant change following treatment using the SAK. Craig et al. (2006) found improvements on the sexual knowledge scale of the MSI. Improvements in sexual knowledge were also found by Rose et al. (2012) on the SSKAAT-R.

*Victim empathy*: Victim empathy was commonly examined using the VES (Beckett & Fisher, 1994b; Langdon et al., 2007). Several of the studies noted significant improvements with regards to victim empathy (Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Keeling et al., 2007b; Murphy et al., 2007). Murphy et al. (2010) found significant improvements on the VES after treatment completion, however these gains were not maintained at follow up. Newton et al. (2011) did not statistically analyse the outcome of the VES, however a narrative interpretation showed no conclusive trends. Williams et al. (2007) found significant improvements on the Adapted Victim Empathy Consequences Task.

Following treatment Michie and Lindsay (2012) examined an empathy component using the IRI. A significant difference was found between the treatment and control group at follow up which had not been present prior to treatment.

*Other assessments*: The SCRS was used to investigate self-control, with significant improvements noted (Keeling et al., 2006). The Adapted Relapse Prevention Interview was used to assess the ability to identify risk factors and coping strategies, and significant improvements were observed (Williams et al., 2007). The Adapted Self-Esteem Questionnaire demonstrated significant improvements post-treatment (Williams et al., 2007), whilst the Adapted Emotional Loneliness Scale did not (Williams et al., 2007).The NS was used to assess locus of control, Rose et al. (2012) noted a more external locus of control following treatment.

*Socially desirable responding*: Social desirability has been assessed using the PDS. Keeling et al. (2006) noted a significant reduction in socially desirable responding following treatment. However, following treatment special needs offenders continued to show significantly greater socially desirable responding than mainstream offenders (Keeling et al, 2007b). Keeling et al. (2007b) found that using socially desirable responding as a covariate resulted in no significant effects of treatment being identified, suggesting some caution should be applied when interpreting outcomes.

*Reoffending and sexually abusive behaviour*: Several of the studies followed up participants in the period following treatment completion. The length of follow-up varied, from six to 106 months. The majority of studies followed up for between six and 12 months. Several of the studies found none of the participants were charged or reconvicted of a sexual offence in the follow up period (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2007b; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011). Some studies reported participants having

reoffended; Lindsay et al. (2011) noted a reoffending rate of 23.3% which they observed to be comparable with rates reported for ID sexual offenders by Lindsay, Steele, Smith, Quinn, and Allan (2006b). Rose et al. (2012) reported one participant committed a sexual offence which resulted in a move to a secure setting. Heaton and Murphy (2013) was a follow-up study on Murphy et al. (2010) and had the longest follow up period (mean = 44 months, range 15-106 months), this revealed a 6% reconviction rate for sexual offences. The majority of the studies which examined reconviction/reoffending rates did not provide a comparison to rates among a non-treated comparison group. Despite Keeling et al. (2007b) comparing the progress of offenders with special needs and mainstream offenders, there was no follow-up data available for the mainstream offender group, and therefore a comparison of reoffending rates for these two groups was not conducted. Only Newton et al. (2011) made specific reference to reoffending for those who had refused treatment initially and those who dropped out of treatment, and compared these rates with those who completed the treatment.

Concerns have been raised regarding the validity of reconviction rates (Craig et al., 2006). It may be that reconviction rates alone are an insufficient measure of recidivistic sexual offending. It is possible sexual offences go underreported, particularly in an ID population. There is a reticence to report ID offenders to the authorities (Singh et al., 2011). Even when individuals are reported those with ID are often diverted from the CJS (Bradley, 2009), and it is sometimes not considered to be in the public interest to prosecute these individuals (Holland et al., 2002). To overcome these potential difficulties some studies included sexually abusive behaviours in addition to reoffending rates. Heaton and Murphy (2013) examined sexually abusive behaviours, as did Murphy et al. (2007, 2010). Murphy et al. (2007) found three of the eight participants' committed sexually abusive behaviour in the six month follow up, they noted all were on the autism spectrum. Murphy et al. (2010) found four participants had engaged in sexually abusive behaviours in the follow up period. Heaton

and Murphy (2013) found 32% of the participants had engaged in sexually abusive behaviour between completing the group and the time of analysis.

### *CBT and DBT*

Sakdalan and Collier (2012) utilised the treatment model outlined by Murphy et al. (2010), however also incorporated elements of DBT. This programme was delivered in two hour sessions, once per week, over a seven month period. In addition to the group programme participants were also invited to attend a weekly individual session for one hour, which aimed to reinforce learning from the group sessions. The group sessions were facilitated by one male and one female facilitator each week, however these were not always the same facilitators. The treatment was delivered within a secure setting, with participants being recruited from secure hospitals and residential settings.

The treatment included a sexual education and relationships component, addressed cognitive distortions, included a sexual offending model, and addressed victim empathy from a CBT perspective. The group also included a DBT component focused on developing emotion regulation skills, frustration tolerance and interpersonal effectiveness, using the DBT concept "Wise Mind-Risky Mind". It was concluded there had been a reduction in risk as assessed by the SVR-20. Clinicians noted improvements in sexual knowledge and victim empathy, and reductions in cognitive distortions in two of the clients.

### *Mindfulness*

Singh et al. (2011) evaluated the effectiveness of mindfulness in reducing deviant sexual arousal. This programme was delivered in sessions lasting between thirty minutes and one hour, four times per week. The intervention was delivered over a 35 to 40 week period. Participants also received individual support from their therapist during the study. The

facilitators both had ample experience in mindfulness. Treatment was delivered in a forensic mental health setting for clients with ID.

Singh et al. (2011) evaluated the treatment by supporting patients to report their own levels of sexual arousal. A reduction was reported for all three participants. This study explored a novel treatment modality with ID sexual offenders and showed promise for mindfulness interventions. Although the study did not assess social desirability, limiting the confidence in the findings.

### *Relapse Prevention*

Rea et al. (2014) evaluated the ability of clients to comply with, and generalise, relapse-prevention plans according to the familiarity of their companion. The nature of the intervention in which the relapse-prevention plans were developed is unclear from the current study. Participants accessed the community with a member of staff familiar with their treatment, a member of staff not familiar with their treatment but known to them, and a community adult unfamiliar with their treatment or them.

Rea at al. (2014) found that being accompanied by treatment staff resulted in significantly greater compliance with relapse-prevention plans. Behaviours proximal to re-offending had the highest levels of generalisation. Younger participants showed greater generalisation, and those who demonstrated less generalisation had a more diverse sexual offending history.

## Discussion

This systematic review examined treatment for ID sexual offenders. There have been some promising developments in the treatment of ID sexual offenders, however there continues to be difficulties in treating this population, and in evaluating treatment.

The majority of the studies evaluated CBT treatment programmes, or CBT treatment components. This tended to be adapted versions of programmes used with mainstream

offenders. The studies showed some improvements in relation to treatment needs such as victim empathy, cognitive distortions and attitudes, and sexual knowledge. Studies showed low levels of reconviction in the follow up period.

One study evaluated CBT treatment with a DBT component (Sakdalan & Collier, 2012). This found reductions in sexual risk, and improvements in sexual knowledge and victim empathy. As the treatment added a DBT component, and an additional hour per week of individual therapy and support, it is not possible to establish the impact of either of these additions to the CBT. The lack of comparative or control group complicates the evaluation of the additional treatment elements. The study examined a small sample size ($n$=3) and did not statistically analyse changes, therefore it is not possible to indicate if the gains reported were significant.

One study evaluated mindfulness (Singh et al., 2011). Reductions in deviant sexual arousal were reported, however the study examined a small sample size and relied upon the participants self-report to evaluate the treatment.

One study evaluated the generalisation of, and compliance with, relapse-prevention plans (Rea at al., 2014). Whilst the current study did not outline the treatment which had resulted in the development of the relapse-prevention plans, the paper provided valuable insight into the generalisation of skills with this offender population.

All of the studies demonstrated intermediate quality. Of the studies, fourteen contained small sample sizes (range = 3–46) which limits the power of the results. Singh et al. (2011) comment on the restricted research possibilities within the ID population due to the small sample sizes available. One study examined a larger sample size ($n$=211) (Williams et al., 2007), however there were several methodological difficulties with this study. All except one of the studies (Michie & Lindsay, 2012) lacked a control group, this is problematic as it cannot be concluded the changes would not have occurred naturally over time without the

intervention. Further to this, almost all studies lacked a comparative group. In some instances even where a comparative group was present, this either examined the progress of two offender populations (ID offenders against women and ID offenders against children) on the same treatment (Lindsay et al., 2011), or evaluated two dissimilar populations (special needs and mainstream offenders) on different treatments (Keeling et al., 2007b). There are difficulties in having control groups in ID populations due to difficulties in obtaining ethical approval for studies which include a no-treatment condition (Lindsay, 2002). Murphy et al. (2010) intended to include a wait-list control group, however a failure to prioritise data collection from this sample led to an inadequate data set being collected for this group. The difficulties in allocating participants to a wait-list control group was also complicated due to the apprehension of services to postpone treatment for those who had engaged in sexually abusive behaviour. Due to a lack of comparison groups it is not possible to state changes in the outcome measures are as a result of the treatment, and are not a regression to the mean.

Issues pertaining to quality arose in part due to the infrequency with which confounding variables were identified and addressed. Concurrent treatment was not routinely identified, and where it was identified the nature of it was not described. Furthermore, a lack of attention was given to the treating environment. Many of the participants were supported by care staff 24 hours a day, or were part of a Therapeutic Community (TC). Consideration to the environment is particularly pertinent in an ID population, given the greater needs this group presents with regards to knowledge acquisition and generalisation. It is also difficult to disentangle the impact of the group setting and structure, from the impact of the group content. Group setting is known to impact on change (Beech & Fordham, 1997).

Concerns arose regarding evaluation of the interventions. There are concerns about the validity and reliability of the psychometric assessments for use with ID sexual offenders and the over-reliance on self-report measures is problematic due to the tendency of ID clients to

acquiesce (Finlay & Lyons, 2002), and the more general concerns about sexual offenders having a tendency to 'fake good'. This review highlighted the inaccessibility of psychometric measures to ID offenders, and the lack of consideration to socially desirable responding in research. When consideration was given to reoffending, recidivism, or sexually harmful behaviour this was also problematic due to the short follow-up periods often observed. Additionally, there are difficulties in demonstrating treatment effectiveness from reconviction rates alone, as not all those who commit offending behaviour will have come into contact with the CJS (Bradley, 2009; Craig et al., 2006; Singh et al., 2011). Whilst some studies attempted to overcome this by reporting on the presence of sexually abusive behaviours (Heaton & Murphy, 2013; Murphy et al., 2007, 2010) the follow up periods were short and there was no guarantee sexually harmful behaviour came to the attention of the research teams.

The relationship between psychometric assessments and future recidivism should be considered. Measures routinely employed focus on areas which may not have a strong correlation with recidivism. The measures employed tended to focus on sexual knowledge, cognitive distortions and attitudes associated with sexual offending, and victim empathy. Victim empathy has been shown to have little if any relationship with recidivism (Hanson & Morton-Bourgon, 2005), and limited difference were found between sex offenders and non-offenders with ID with regards to empathy (Ralfs & Beail, 2012). Whilst there is evidence to suggest ID sexual offenders actually have a greater degree of sexual knowledge than their non-offending counterparts (Michie, Lindsay, Martin, & Grieve, 2006; Talbot & Langdon, 2006). Therefore any progress on measures related to these areas would not be reflective of reduced recidivism.

Further methodological issues arose with regards to the level of functioning of the participants. The majority of studies did not evaluate participants who all had a diagnosed ID.

This limits the generalisability of outcomes, as samples included those with ID and low average intellectual functioning. Furthermore, a number of the studies relied on IQ assessments to indicate the presence of ID. An individual cannot be diagnosed with ID on the basis of IQ alone, and therefore it is unclear if these participants were ID offenders, or individuals with impaired intellectual functioning.

Consideration was rarely given to the characteristics of treatment refusers or non-completers, and those who failed to complete treatment were rarely included in the analysis. Several studies suffered from missing data for those who had completed the intervention. This creates bias in the data presented within the studies.

Methodological issues were present regarding the treatment programmes themselves. Most of the treatment programmes were not manualised or standardised, creating difficulties in replicating the intervention or research. Treatment fidelity was rarely commented on, or evaluated. Lindsay et al. (2011) found the greatest changes in treatment outcomes occurred between 18 and 36 months, and felt this reflected the ideal treatment length for this population. All of the other studies delivered treatment for a shorter duration than this, often for 12 months or less. This may have impacted upon the effectiveness of the interventions being evaluated. It was not possible to corroborate the claim made by Lindsay et al. (2011) regarding ideal treatment length. This has implications for clinical and forensic settings tasked with treating this offender population.

*Limitations of the review*

There are several limitations to this review. The author was the only assessor in the quality assessment and therefore there is a lack of inter-rater reliability. The review relied upon narrative synthesis of the data due to the variety of intervention types being examined. There is a potential for publication bias to have occurred as no authors were contacted for grey

literature. This is particularly problematic when considering that it is often only positive findings which are published. There was a limited number of relevant papers available pertaining to the subject, therefore it was necessary to include papers of any quality. This increased the risk of bias within each study, and for the systematic literature review as a whole. One of the difficulties which was present throughout the available research was the small sample sizes used, with two of the studies examining only three participants. Furthermore, some of the studies were not designed as research studies, and no RCT's were identified relevant to the topic. The studies included all tended to adopt different research designs, increasing the difficulty in synthesising the findings. Additionally, whilst the majority of studies focused on CBT a number of different treatments were examined, and even those adopting similar models delivered differing treatment programmes. The studies all had differing research aims, again increasing the difficulties in synthesising the findings. This systematic literature review was further limited due to missing information from the identified studies.

*Implications for practice*

The studies outlined within the review show some promise for the treatment of ID sexual offenders, and can guide professionals working with this population. Clinicians need to remain aware of the limitations of the studies reviewed. The studies predominantly examined group programmes, and clinicians should consider the potential role of the group structure on treatment outcomes. Treatment proven successful in group programmes may not be transferrable to an individual treatment setting. In practice it is not always feasible, or possible, to deliver group programmes due to insufficient numbers being available attend a group, or offenders being at different stages of treatment. In these instances a group based programme may be considered inappropriate. Consideration should be given to the role of the

setting in which the client resides, one study commented on the essential role of the Therapeutic Community (TC) (Keeling et al., 2006).

Further consideration should be given to the recruitment of participants. A number of the studies reported the progress of participants engaged in a community setting on a voluntary basis (Craig et al., 2006; Craig et al., 2012; Lindsay et al., 2011; Newton et al., 2011; Rose et al., 2012). This would have implications with regards to implementing the treatment in secure settings, where participants may be less motived to engage than the participants within this review, or may engage due to the implications of non-compliance for release.

The skills and experience of the facilitators need to be taken into consideration. Some of the studies had facilitators who had received SOTSEC-ID training (Heaton & Murphy, 2013; Murphy et al., 2007, 2010; Sakdalan & Collier, 2012), whilst other studies did not comment on the experience of their facilitators. Despite the lack of comment it is anticipated facilitators would be skilled experienced therapists with this client group, and this would have implications for implementing treatment programmes. Sandhu and Rose (2012) examined the role of the therapists in sexual offender treatment and identified therapist characteristics such as gender of the therapist, the empathy and attitudes of the therapist, and a supportive approach all had an impact on treatment outcomes. This would need to be taken into consideration when implementing the treatment outlined within the studies.

*Future directions*

This review indicated some success of adapted offender treatment programmes for ID sexual offenders, however the studies had a number of methodological flaws. Future research should seek to overcome these methodological flaws to improve the quality of future research, and allow clinicians to have more confidence in the conclusions of the studies. Future research should evaluate larger sample sizes. In addition longer periods of post-treatment follow up

would ideally be employed, and these would include not only reconviction rates but also sexually abusive/inappropriate behaviour. Future research should include a control group, or a comparison group which compares different treatment types for ID offenders. Future research should consider evaluating the effectiveness of the Good Lives Model as it has been highlighted as being potentially beneficial (Aust, 2010), however has not been evaluated. Future research should also expand on the novel interventions examined in this review including DBT (Sakdalan & Collier, 2012), and mindfulness (Singh et al., 2011).

Future research may also wish to examine the impact of treatment duration on outcomes, Lindsay et al. (2011) suggested the greatest changes were observed between 18 and 36 months, however the majority of studies within this review only delivered treatment over a period of seven to twelve months. Consideration should be given to the number of treatment hours versus length of treatment; Keeling et al. (2006) delivered the greater number of treatment hours, whilst Lindsay et al. (2011) delivered treatment over a longer period of time. Lindsay et al. (2011) comment the greatest treatment change was observed after 18 months, Keeling et al. (2006) did not make these same observations. It may be length of treatment, rather than intensity, is crucial in allowing ID sexual offenders to benefit from treatment due to difficulties in processing information, and further exploration regarding this would be beneficial. Treatment length may be related to the risk principle of RNR (Andrews & Bonta, 1990), in that higher risk offenders require longer/more intense treatment programmes. However, with regards to ID sexual offenders it may also be that treatment length is a responsivity issue. Offenders with ID may need time between sessions to process the information provided, before being able to take on more information.

This review also suggested the psychometric assessments used to evaluate treatment were not always valid and reliable with an ID population. Future research may wish to improve upon this.

## Conclusions

Sexual offending continues to be present within an ID population, and the effective treatment of this population continues to require attention. Whilst these studies demonstrated some promise each study contained several methodological flaws, making it difficult to confidently assert the effectiveness of treatment being examined. CBT group programmes remain a popular choice in the treatment of sexual offenders, and have been applied - with adaptations – successfully to an ID population. More recent studies within the review have begun to explore different treatment approaches including DBT and mindfulness, and whilst these showed promise they would require further examination regarding their effectiveness in treating ID sexual offenders. Since the review by Courtney and Rose (2004) there have been several studies which have expanded our understanding within this area, however there continues to be similar methodological difficulties with the published studies. Future research should be guided towards improving the methodological flaws acknowledged within this review.

# Chapter Three

## Critique of the Questionnaire on Attitudes Consistent with Sexual Offending

### Introduction

Sexual offending has attracted increasing attention over the past two decades, including theoretical understanding, the assessment of risk and treatment needs, and the effectiveness of interventions. A number of theories have been developed with regards to sexual offending. One subset of theories pertains to the cognitive distortions held by sexual offenders, and considers the ways in which attitudes, beliefs, and cognitions are linked to sexual offending (Marshall, 2004; Ward et al., 2006). Cognitive distortions are defined as a set of beliefs which support or condone illegal sexual contact, such as attitudes condoning sexual contact with children, or attitudes supportive of rape (Ward et al., 2006). Cognitive distortions form an essential link in the chain of offending, and create the conditions for a sexual assault to take place by effectively giving an offender 'permission' to commit an offence (Lindsay et al., 2004). Cognitive distortions allow an offender to rationalise and justify actions following an offence (Beech, Bartels, & Dixon, 2013). Cognitive distortions are consistently linked with sexual recidivism (Helmus, Hanson, Babchishin, & Mann, 2012). Treatment programmes for sexual offenders often focus on addressing cognitive distortions due to the importance of these as a dynamic risk factor (Helmus et al., 2012; Ward et al., 2006).

Accurate assessment of treatment needs and risk factors is an essential part of treatment, and can only be achieved using valid and reliable measures (Keeling et al., 2006). Limited attention has been given to an assessment process specific to ID sexual offenders, despite the acknowledged distinctions to be made between mainstream sexual offenders and this population (Keeling et al., 2007a).

Cognitive distortions are most often assessed through the use of questionnaires (Beech et al., 2013). Progress has been made in the development of assessment tools specifically for ID offenders, with specific reference being made to the significance of the Questionnaire on Attitudes Consistent with Sexual Offending (QACSO) (Keeling et al., 2007a), an assessment of cognitive distortions specifically designed for ID sexual offenders (Craig & Lindsay, 2010; Langdon & Murphy, 2010). Offenders with ID have the ability to respond to questionnaires when the measures are suitably adapted, or are developed specifically for this population (Keeling et al, 2007a).

A systematic literature review identified 15 studies of treatment of ID sexual offenders published between 2002 and August 2017 (Gray, this volume). There were similarities in the measures used within these studies, The most commonly used was the QACSO, being utilised in nine of the 15 studies examined (Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Lindsay et al., 2011; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose et al., 2012; Sakdalan & Collier, 2012). The literature review highlighted treatment commonly focused on three areas; sexual knowledge, victim empathy, and cognitive distortions and attitudes. Victim empathy has a poor relationship with recidivism (Hanson & Morton-Bourgon, 2005), and it has been suggested ID sexual offenders actually have a greater sexual knowledge than non-offenders with ID (Michie et al., 2006; Talbot & Langdon, 2006). Therefore, the accurate assessment of cognitive distortions becomes even more important in evaluating the effectiveness of treatment administered in research studies.

Given the limited amount of research on this offender population, and the prominent use of this tool in the available research, it is important to carefully examine the properties of this psychometric assessment. When considering assessments used in research it is necessary to have reliable and valid tools, or confidence in the research findings is undermined (Lindsay, Hastings, Griffiths, & Hayes, 2007a; Keeling et al., 2006).

Courtney and Rose (2004) highlighted weaknesses of the QACSO due to the lack of established validity, reliability and normative data, and Gillespie (2001) highlight the complexity of the language used in this assessment.

**Questionnaire on Attitudes Consistent with Sexual Offending**

The final version of the QACSO is a 107-item questionnaire designed to assess cognitive distortions in ID adult males with a history of sexual offending (Lindsay et al., 2004). Although there is reference to the scale containing different numbers of items. An earlier iteration of the measure contained 92 items (Broxholme & Lindsay, 2003). A version utilised in some research is reported to contain 63 items (Heaton & Murphy, 2013; Murphy et al., 2007), or 60 items (Szlachcic, Fox, Conway, Lord, & Christie, 2015). The most recent published paper refers to the scale containing 108 items, however later indicates that all except one of the items were reliable and it appears this item was later removed (Lindsay et al., 2007b).

The questionnaire consists of eight scales. Cognitive distortions in seven different areas of sexual offending are assessed across distinct scales; rape and attitudes to women, voyeurism, exhibitionism, stalking and sexual harassment, dating abuse, homosexual assault, and offences against children. The eighth scale is a social desirability scale.

The questionnaire is administered during an individual interview, rather than being completed independently. There are a number of reasons for this method of administering the questionnaire, including the need to assess basic sexual knowledge, and the poor reading abilities often observed within an ID population. Before administering the questionnaire the interviewer is recommended to first establish a good rapport with the interviewee (Lindsay et al., 2004). The QACSO does not assess sexual knowledge, therefore it is necessary to conduct a basic assessment of sexual knowledge prior to administration. There is a

"preamble" before five of the eight scales, this is a series of questions designed to assess the respondent's sexual knowledge. This allows the interviewer to ascertain whether the respondent has sufficient sexual knowledge on which to provide responses to the scale items. These answers are not scored, and do not contribute to the final score, rather they guide the assessor as to whether the participant would be able to provide responses to the questions in the scale. Examples of the knowledge assessment questions include "What does it mean to rape a woman?", "What does it mean to flash?", and "What does it mean to masturbate?" (Lindsay et al., 2004). Each scale varies in length with regards to the number of items in each scale, and the number of knowledge assessment questions (Appendix 5).

The scales consist of questions to which participants provide an answer from two fixed choice responses, most often 'yes' or 'no' responses. There are seven exceptions to this, at the end of six of the subscales the interviewee estimates the duration of time it would take a victim to "get over" the particular offence, or the duration of time for which the victim would be upset.

The scale can accommodate for "don't know" responses, which may reduce the risk of acquiescing (Finlay & Lyons, 2002). Lindsay et al. (2004) highlight the potential difficulties and confusion "don't know" responses can cause, and suggest it not be used in research. However, for clinical purposes the inclusion of "don't know" responses can be assessed on an individual basis. Scoring systems are provided for both systems of responding.

The scoring columns distinguish between 'A' items, 'B' items, and 'C' items (Appendix 6). The categorisation of each item on a scale is contingent on its statistical properties, including internal consistency and item to scale correlation (Lindsay et al., 2004). 'A' items have the strongest statistical properties, with each A item having an alpha coefficient greater than 0.8, and item to scale correlation of greater than 0.35. 'B' items have reasonable statistical

properties, and whilst these items did not show high item to total scale correlations, they did discriminate significantly between sexual offenders, non-sexual offenders, and non-offenders with ID. 'C' items have poor statistical properties, and did not discriminate between sexual offenders, non-sexual offenders, and non-offenders. The means and standard deviations are provided for the 'A' items, and the 'B' items in separate tables. The 'C' items should only be used for clinical information (Lindsay et al., 2004).

An administration and scoring manual exists as an unpublished manuscript (Lindsay et al., 2004). The QACSO manual was developed based on reference groups (Lindsay et al., 2007b). This study examined four groups; 41 male ID sexual offenders, 34 male ID non-sexual offenders, 30 ID males who have not offended, and 31 males without ID and no known history of sexual offending. The baseline means and standard deviations available within the administration and scoring manual were derived from these respondents. The version of the QACSO examined in this study consisted of 108 items, however during this study one item was found to be unreliable and appears to have been subsequently removed (Lindsay et al., 2007b). It should be noted these are small sample sizes, and are not considered to be sufficient to provide a reliable norm sample or sample means.

**Purpose of creating the tool**

The role of cognitive distortions in sexual offending has been highlighted (Beech et al., 2013; Helmus et al., 2012; Lindsay et al., 2004; Marshall, 2004; Ward et al., 2006). Cognitive distortions are often measured using psychometric measures. There are a variety of measures used within the mainstream sexual offender population (Beech et al., 2013). Some of the measures consider the cognitive distortions specific to a subtype of sexual offender; offending against children (Beliefs about Children Scale; Children and Sex: Cognitive Distortions Scale; Sex with Children Scale; Bumby MOLEST Scale), rape (Bumby RAPE Scale; Rape Myth Acceptance), or offences against women (Attitudes towards Women Scale;

Hostility towards Women Scale) (Beckett, 1987; Bumby, 1996; Burt, 1980; Check, Malamuth, Elias, & Barton, 1985; Mann, Webster, Wakeling, & Marshall, 2007; Spence, Helmreich, & Stapp, 1973). Other measures consider cognitive distortions of the sexual offender, regardless of specificity of offence type. This includes the MSI ('cognitive distortions and immaturity', and 'justifications' scales) (Nichols & Molinder, 1984), and the ABCS (Abel et al., 1984).

The QACSO has been developed specifically to assess cognitive distortions and attitudes of ID sexual offenders due to the linguistic complexity of measures designed for mainstream offenders (Lindsay et al., 2004).

**Characteristics of the Psychometric Measure**

*Level of Measurement*

The QACSO uses dichotomous level data. Participants are provided with two fixed choices, from which they indicate one response. The socially unacceptable response is scored as 1, the socially acceptable response is scored as 0. The summation of the scores is then compiled, creating numerical data which can be subject to analysis.

*Interview Questionnaire*

The QACSO uses an interview questionnaire design. The questionnaire is read to the interviewee, who provides a response based on the two fixed choices available. Alternatively the participant may provide a "don't know" response if the interviewer provides this option. There are a number of advantages and disadvantages to using an interview with this population.

The presence of an interviewer may impact upon responding, due to the lack of anonymity for the interviewee, especially considering the sexual content of the items, and the personal nature of the questions. Although in clinical practice this would be less relevant. Lindsay et

al. (2004) acknowledge this within the manual, and recommend the interviewer first develop a good rapport with the client.

The need for the interviewer to maintain a supportive environment and a neutral stance is highlighted. This allows the client to express their views freely. Interviewers will likely be presented with attitudes conflicting with their own values. If their discomfort or disagreement is displayed this may be detected by the interviewee, and increase the likelihood of the interviewee self-censoring (Lindsay et al., 2004).

Consideration should be given to the possibility of socially desirable responding, particularly given the sensitive nature of the questionnaire content (Keeling et al., 2007a; van de Mortel, 2008). Lindsay et al. (2004) include a socially desirability scale in order to attempt to account for this potential source of bias. However, within a forensic population self-report questionnaires are valid more often than is assumed to be the case (Mathie & Wakeling, 2011).

Each item provides two fixed choice responses for the interviewee to choose from, the majority of which are yes/no responses. Individuals with ID experience difficulty with Likert items, and a decreased accuracy is observed when using Likert responding (Finlay & Lyons, 2001). However, the use of yes/no responses are also thought to be problematic in an ID population, due to the tendency of those with ID to acquiesce (Finlay & Lyons, 2002). The inclusion of a "don't know" option is thought to reduce this risk, as is the simplification of the wording of questions (Finlay & Lyons, 2002). Acquiescence is likely due to the complexity of the question, rather than a desire to deceive or please (Finlay & Lyons, 2002). Consideration should be given to the potential complexity of reverse worded items (van Sonderen, Sanderman, & Coyne, 2013), particularly for those with ID (Finlay & Lyons, 2001).

There are benefits to using an interview questionnaire for those with ID. Those with ID are more likely than the general population to experience difficulties in reading. The use of an interview questionnaire removes concerns about reading ability. There is no minimum level of ability for who can be administered the measure (Lindsay et al., 2007b). The preamble questions are designed to assess basic sexual knowledge, and can guide the interviewer on the interviewee's level of comprehension and understanding.

The interview questionnaire also allows the interviewer to be able to explain the questions containing many parts. Individuals with ID experience deficits of working memory. The opportunity to break a question into multiple parts will increase the chance of the interviewee being able to understand, and provide a response to the item in question.

The interview questionnaire provides the opportunity for further clinical assessment and discussion. This is preferable in a clinical setting, where the richness of data produced is preferential to a score on a measure alone.

The interview questionnaire includes items to assess knowledge and understanding before the scales are administered. This would not be possible if the scale were administered as a self-report measure.

## Psychometric Properties of the QACSO

### Reliability

Reliability considers how consistent a measure is. There are two primary types of reliability; internal reliability and test-retest reliability (Howitt & Cramer, 2005).

*Internal Reliability*

Internal reliability considers the extent to which items in a scale are measuring the same concept (Howitt & Cramer, 2005). There are a number of ways in which internal reliability can be assessed; split-half reliability, Cronbach's Alpha, Kuder-Richardson Formula 20

(KR20), and Guttman reliability (Cortina, 1993; Howitt & Cramer, 2005; Kline, 1993). Measures with greater internal reliability indicate a better measure (Howitt & Cramer, 2005). KR20 is only for use with dichotomous items, such as those used in the "yes/no" version of the measure (Cortina, 1993; Kline, 1993). However, the QACSO has two scoring systems one in which "don't know" responses are scored as well as "yes/no" responses, and another in which only the "yes/no" responses are scored (Lindsay et al., 2004).

The internal consistency of the scale, and each of the subscales, has been examined (Broxholme & Lindsay, 2003; Lindsay et al., 2004; Lindsay et al., 2007b; Szlachcic et al., 2015). Broxholme and Lindsay (2003) examined an earlier version of the QACSO (not including the stalking subscale) with 72 males, both with and without ID. This examined 92 items across six subscales using Cronbach α. Prior to the exclusion of items, the α for the subscales ranged from 0.62 to 0.85, with an overall α value of 0.93. 'C' items (clinical information gathering items) were then formed from 29 rejected items. Following the removal of the 'C' items the α values for the subscales ranged from 0.70 to 0.87, and an overall Cronbach's α value of 0.95.

The full scale of 108 items was examined with regards to internal consistency, with 136 males both with and without ID (Lindsay et al., 2004; Lindsay et al., 2007b). The α values were only reported for the final items included on the 'A' scale (*n*=59). The α value for the scale as a whole was not reported, however the α values for each of the subscales were reported (Appendix 7).

Cronbach's α values of 0.8 or greater are considered to be good (Howitt & Cramer, 2005). Five of the seven subscales breach this threshold, with the subscales of stalking and homosexual assault being considered acceptable (α values range = 0.68-0.86).

Szlachcic et al. (2015) examined 31 mentally disordered sexual offenders using the A-items of the QACSO (*n*=60). The α value for each subscale was examined during this study (Appendix 8). Cronbach's α values for this study found several scales to be considered acceptable; rape and attitudes towards women, voyeurism, offences against children, and stalking and sexual harassment. The α values for exhibitionism, and dating abuse, were considered to be questionable. The α values for the homosexual assault, and social desirability scales were considered unacceptable (Szlachcic et al., 2015) (α values range = 0.21-0.80). These findings contradict the findings by Lindsay et al. (2007b). It is possible that this was due to Szlachcic et al. (2015) using a version of the measure which contained a different number of items than the version used by Lindsay et al. (2007b). It is also possible that this difference resulted from the varied characteristics of the samples in each study; Lindsay et al. (2007b) interviewed adults both with and without ID, whilst Szlachcic et al. (2015) examined sexual offenders with a mental disorder, and specifically excluded those with ID.

*Test-Retest Reliability*

Test-retest reliability considers how stable a measure is over time (Howitt & Cramer, 2005). One group of subjects completes the measure twice at two separate times, without any intervention occurring in the interim. When assessing test-retest reliability of a measure it is important to ensure the time period is not too short, as this would result in memory of the test impacting the results at the second administration. It is also important to ensure subjects are in a similar state of physical and mental health, as changes to health could result in inconsistencies which may not have otherwise been present.

Broxholme and Lindsay (2003) examined the test-retest reliability of the measure using Spearman's rank correlation coefficient, likely due to the small sample size, however this is not considered to be appropriate for test development. The period between each

administration of the measure was approximately one month, during which none of the respondents received treatment. Although, it is likely this period was too short to accurately assess test-retest reliability. All of the correlations were acceptable, with the exception of the test-retest reliability for the group of non-sexual offenders without ID with regards to the rape and attitudes to women subscale (Appendix 9).

Lindsay et al. (2007b) examined the test-retest reliability of the measure. Test-retest reliability found all but one of the items was reliable with the ID test groups. Between the two administrations participants were more likely to provide the same response than they were to change their response (Lindsay et al., 2007b). The period between each administration of the measure was four weeks, during which none of the participants received treatment. This suggests far greater test-retest reliability than is suggested by the results from Broxholme and Lindsay (2003).

**Validity**

The validity of a measure refers to whether a test is measuring what it is designed to measure. A number of different aspects of validity should be taken into consideration; face validity, content validity, concurrent validity, predictive validity, and construct validity (Howitt & Cramer, 2005).

*Face Validity*

Face validity refers to whether the measure appears to be measuring what it is intended to measure. Face validity considers whether items within the measure make sense in the context of the concept being assessed (Howitt & Cramer, 2005).

Broxholme and Lindsay (2003) had rejected several items from the scale following initial analysis. However, it was suggested these items could be retained for use in clinical assessment as the items had face validity. Szlachcic et al. (2015) report the QACSO to have

high face validity, and used this to justify using the measure with offenders without ID. Examples of items include “Is it only women who wear tight clothes that can be raped?”, “Do women make too much fuss about sexual assault?”, and “If a girl makes out that she does not want to kiss is she playing a game?”. These items appear to be measuring attitudes which condone sexual offending. Additionally, items in the rape and attitudes to women subscale are similar to items which appear in other measures of rape myth acceptance, such as the Illinois Rape Myth Acceptance Scale (IRMA) (McMahon & Farmer, 2011). One example of similar items include an item in the QACSO “Do you think that women who go around without a bra on or in tight clothes want to have sex?”, and an item in the IRMA “When girls go to parties wearing slutty clothes, they are asking for trouble.” There are also similarities between items within the offences against children subscale, and those which appear in other scales such as the Beliefs about Children Scale (BACS) (Beckett, 1987). Similar items include an item in the QACSO “Do children lead men on sexually?”, and an item in the BACS “Children can lead adults on”.

*Content Validity*

Content validity considers if the measure captures all aspects of the concept being assessed (Howitt & Cramer, 2005). The QACSO should assess all aspects of attitudes and distorted cognitions related to sexual offending, and the particular nuances of sexual offending in those with ID.

Broxholme and Lindsay (2003) examined six of the seven subscales with regards to the extent to which the subscale total scores correlate with each other, and the total overall score. Using Spearman’s rank the correlations ranged from 0.41 to 0.91 (all significant correlations). The subscales were concluded to measure a similar construct, that of attitudes condoning sexual offending, although it may not make sense to interpret the scores of the measure as a whole given the distinct nature of each subscale.

Concerns were raised about the items within the homosexual assault subscale. Items within this subscale were considered to be assessing something other than, or in addition to, attitudes towards sexual assault on males (Lindsay et al., 2007b). Homophobic attitudes may be influencing the responding to this subscale (Lindsay et al., 2007b). Furthermore the QACSO does not take into consideration the sexuality of the interviewee (Langdon & Murphy, 2010). The nature of some items assumes the interviewee is heterosexual. This could impact on the validity of the subscale. For example, one item asks "If a man approached you for sex would you hit him or tell him you are not gay?". The fixed choice responses to this item do not account for the possibility the respondent may be homosexual.

The other six subscales (rape and attitudes to women, voyeurism, exhibitionism, offences against children, stalking, and dating abuse) all address attitudes towards the offence subtype identified within the subscale title. Lindsay et al. (2006) compared two groups of ID sexual offenders. Those who had offended against adults scored significantly higher on the subscale "rape and attitudes to women". Conversely those who had offended against children scored significantly higher on the subscale "offences against children", a finding replicated by Lindsay et al. (2011). This would suggest these two subscales are measuring attitudes related to the specific offence type, however does not consider offenders may have committed crossover offending.

*Concurrent Validity*

Concurrent validity is the extent to which one measure correlates with another measure designed to assess the same concept, preferably the comparator should be a more established measure (Howitt & Cramer, 2005). A number of the measures available to assess cognitive distortions in mainstream sexual offenders are not considered appropriate for use with ID offenders (Langdon & Murphy, 2010). Therefore, these measures would not serve as a suitable comparator to the QACSO.

One measure which may serve as a suitable comparator is the SOSAS. This tool has been used in research with ID offenders (Langdon & Murphy, 2010). It has not been possible to access research which compares these two measures directly. Few studies have used both the SOSAS and QACSO to assess cognitive distortions pre- and post-treatment. Two studies found that following treatment there were significant improvements in the QACSO scores, whilst this was not the case for the SOSAS scores (Craig et al., 2012; Murphy et al., 2007). One of these measures appears not to be assessing cognitive distortions as accurately, or in the same way, as the other. It is suggested the SOSAS may be less sensitive than the QACSO (Murphy et al., 2007), have lower internal consistency (Heaton & Murphy, 2013), and be more complex due to the use of double negatives (Heaton & Murphy, 2013). However, it should be considered that the researchers were attempting to find treatment change and this may influence their conclusion that the QACSO is a more valid measure.

*Predictive Validity*

Predictive validity is the ability to predict future behaviour using the measure (Howitt & Cramer, 2005). There are difficulties in using cognitive distortions to predict future sexual offending behaviour (Lindsay & Taylor, 2009). Keeling et al. (2007b) query whether assessment changes post-treatment reflect behaviour change. Changes in attitudes following treatment, and therefore improvements on the QACSO measure, may indicate suppression of attitudes, a developed understanding of the need for socially desirable responding, or deceit. Therefore, the QACSO alone should not function as a risk assessment tool (Lindsay & Taylor, 2009).

The pre-treatment QACSO scores for the assessed sample ($n$=22) did not predict future sexually abusive behaviour (Murphy et al., 2010), possibly for the reasons outlined above.

*Construct Validity*

Construct validity is concerned with whether the measure is assessing an actual construct, clearly explained and understood within a theoretical framework (Howitt & Cramer, 2005).

The construct of the QACSO aims to measure the cognitive distortions and attitudes of ID sexual offenders. There are several theories which examine the impact of cognitive distortions in sexual offenders, and on future offending (Helmus et al., 2012; Marshall, 2004; Ward et al., 2006). If the construct of cognitive distortions is valid it would be expected that some sexual offenders would experience cognitive distortions, whilst those who had not committed a sexual offence would not.

Lindsay et al. (2007b) compared the QACSO total scale score for three groups of ID males. The QACSO as a whole scale was able to discriminate between sexual offenders, non-sexual offenders, and non-offenders. The sexual offenders scored highest, indicating the greatest number of socially unacceptable responses given, suggesting the scale as a whole is assessing attitudes linked with sexual offending.

Langdon and Talbot (2006) compared the QACSO for male ID sexual offenders who had received psychological treatment related to their offending ($n$=12), male ID sexual offenders who had not received psychological treatment ($n$=11), and male ID non-offenders ($n$=18). Significant differences were found between the three groups on five of the subscales (rape and attitudes to women, exhibitionism, homosexual assault, offences against children, and stalking). The group of sexual offenders who had not received treatment scored significantly higher than the other two groups on the five identified subscales, and the QACSO total scale score. This would suggest the QACSO may be measuring attitudes consistent with sexual offending, due to the prevalence of these attitudes in untreated sexual offenders, although the small sample size makes it difficult to draw any firm conclusions.

**Normative Samples**

When standardising a measure it is essential norms for the relevant population(s) be established (Kline, 1993). Without normative samples it is not possible to interpret scores produced by the measure, and scores lack meaning without the context of a normative sample (Kline, 1993). When producing normative samples it is essential the sample size is sufficient to represent the population in question. A small sample can never be considered a true representation of a population (Kline, 1993). Whilst some populations will be smaller, and therefore require a smaller sample to be considered representative, it remains imperative a sufficient normative sample be produced in order to standardise a measure (Kline, 1993).

The standardised mean scores were developed by Lindsay et al. (2004; 2007b). The measure was assessed across four separate and distinct populations; ID sexual offenders, ID non-sexual offenders, ID non-offenders, and adult males with no known history of offending or ID (controls). The sample sizes for each sample are small, and could be considered to be too small to be representative (41, 34, 30, and 31 respectively). This is the case for all sample groups, but is particularly so for the control group given this sample should be representative of the general male population. The control sample was drawn from two amateur football teams, which may not be a representative population for the general adult male population.

There are further issues with the control group sample. The response rate was 70.5%, despite the participants having guaranteed anonymity. Those who received the measure and did not respond may have responded differently than responders, potentially increasing the mean for this population (Lindsay et al., 2007b).

Another potential restriction to the representativeness of the data is the nationality of the participants from which the standardised norms were established. The study was conducted in the United Kingdom, and there is no reference made to the nationality of the participants in

any of the sample groups (Lindsay et al., 2007b). Therefore, the generalisability of the standardised scores should be considered when utilising this measure in other countries, or with diverse populations.

When administering the QACSO the level of ID experienced by each client should be considered. Given ID sexual offenders will vary with regards to their level of ID, it is important to consider that each of these samples fell within the upper range of the mild ID range (IQ range 53-78; mean IQ=66.80, SD=7.21). The QACSO may not be valid for offenders with lower IQ's and therefore greater levels of disability, nor may it be possible to compare such scores to the standardised norms presented within the manual.

**Use in Assessment and Research**

Cognitive distortions play an important role in sexual offending (Beech et al., 2013; Helmus et al., 2012; Lindsay et al., 2004; Marshall, 2004; Ward et al., 2006). In turn the emphasis on cognitive distortions within treatment programmes as a dynamic risk factor has been identified (Ward et al., 2006).

The "A" items of the QACSO have been used frequently within the limited available research pertaining to the treatment of ID sexual offenders, and have shown improvements post-treatment to varying degrees (Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Lindsay, Marshall, Neilson, Quinn, & Smith, 1998; Lindsay et al., 2011; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose, Jenkins, O'Connor, Jones, & Felce, 2002; Rose et al., 2012; Sakdalan & Collier, 2012).

The QACSO is the measure most commonly used in the recent literature relating to changes in cognitive distortions following treatment for ID sexual offenders. It is thought to be a useful measure in the commission of research (Craig et al., 2012), although given the

concerns about validity, reliability, and the normative samples it is possible the measure may not be as useful as first considered.

Some difficulties are noted in using the QACSO in research. Floor effects have been noted, as have restrictions in predicting reliable change (Keeling et al., 2006; Newton et al., 2011). This effect would distort the examination of treatment progress.

**Use of the Tool in Forensic Settings**

The QACSO has clinical utility in its ability to identify cognitive distortions in ID sexual offenders. The measure creates a score which can be compared to the normative samples provided. Furthermore, clinical information specific to the offender and the nuances of their cognitive distortions, becomes apparent during the interview (Lindsay et al., 2004).

The QACSO has been proposed as a tool to assess those identified of being at risk of sexual offending, and to reassess individuals who have attended treatment to assess the risk of re-offending (Broxholme & Lindsay, 2003). However, the predictive ability of the QACSO has been called into question (Murphy et al., 2010), and it has been suggested the QACSO should not fulfil this function, instead should serve to complement an appropriate risk assessment measure (Lindsay & Taylor, 2009). Consideration should be given to using the responses from the QACSO to inform clinical formulation, rather than using total scores to compare to the normative samples.

**Conclusion**

The QACSO was developed to assess cognitive distortions of ID sexual offenders. Cognitive distortions are an important part of the offending process, and an important treatment focus (Ward et al., 2006). Cognitive distortions within the mainstream sexual offender population are most often assessed using questionnaires (Beech et al., 2013). Whilst there are various measures available, these are inappropriate for ID offenders owing to the complexity of the

language used, and the inaccessibility of these measures to ID offenders (Lindsay et al, 2004). The QACSO was developed specifically to assess the cognitive distortions and attitudes of ID sexual offenders (Lindsay et al., 2004).

The QACSO is a questionnaire administered through an individual interview. Whilst there are some difficulties caused, such as the increased likelihood of socially desirable responding or self-censoring, there are also benefits to this format. Individuals with ID more often experience difficulties in reading, which this format compensates for. Confusion about more complex questions can be identified and appropriately addressed by the interviewer. Furthermore, the QACSO takes into consideration potential knowledge deficits of the interviewee, and provides the opportunity to address these.

The responding format of fixed choice responses appears preferential to Likert items, given the difficulties experienced with these by ID respondees (Finlay & Lyons, 2001), however does increase the risk of acquiescing. The QACSO includes reverse worded items, despite the acknowledged challenge these pose for this population (Finlay & Lyons, 2001; van Sonderen et al., 2013). However, overall the QACSO is considered an accessible measure for an ID population.

Internal reliability of each subscale was good or acceptable (Lindsay et al., 2004; Lindsay et al., 2007b). However, further examination contradicted this finding (Szlachcic et al., 2015), suggesting a need for further examination regarding internal consistency. Consideration should be given to using the KR20 to examine the internal consistency, given the dichotomous scoring system employed by the measure in research (Cortina, 1993; Kline, 1993).

Test-retest reliability found the measure to be reliable (Broxholme & Lindsay, 2003; Lindsay et al., 2007b), and it is thought to have good face validity (Broxholme & Lindsay, 2003;

Szlachcic et al., 2015). The QACSO is considered to assess the construct of cognitive distortions, and attitudes supportive of sexual offending, and in this regard is considered valid (Langdon & Talbot, 2006; Lindsay et al., 2007b).

Some concerns have been raised regarding the content validity of the "homosexual assault" subscale. This subscale may not measure attitudes condoning homosexual assault, and may rather reflect homophobic attitudes (Lindsay et al., 2007b). Additional consideration should be given to the concurrent validity of the measure. Little work has been done to compare this measure directly with either tools for the mainstream sexual offender population, or other measures developed for the ID population (ie. SOSAS).

The QACSO is not thought to possess predictive validity (Murphy et al., 2010). However, the limited ability of the QACSO to predict future sexual offending is highlighted (Lindsay & Taylor, 2009). The measure should rather be considered in conjunction with an appropriate risk assessment tool.

The QACSO has a small research base, and whilst represented within the literature pertaining to treatment of ID sexual offenders, such studies are limited in number. The QACSO standardised norms are based on small sample sizes, which could be considered to be unrepresentative. The QACSO would benefit from a larger scale administration of the measure in order to establish more representative standardised norms.

This critique has highlighted the greater utility in this measure guiding clinical formulation, rather than for use in research. This is significant given the reliance on this measure to show success of treatment with this offender population. Although when conducting research with offenders with ID there are limited options available, and the QACSO is preferable to other measures not developed specifically for those with ID.

# Chapter Four

## Examining the feasibility and impact of biofeedback in improving emotion regulation in adult sexual offenders with intellectual disability


### Abstract

*Background:* Emotion regulation is a process consisting of several strategies with the ability to influence behaviour and responses to situations within our environments. Emotion dysregulation is a pattern of responding to emotional states with strategies which are ineffective, or a failure to implement strategies. Emotion dysregulation has been linked to sexual offending and reoffending across a number of different theories. Interventions focused on improving emotion regulation in sexual offenders have been recommended.

*Objectives:* The current study explored the impact of biofeedback in improving an emotion regulation strategy linked to arousal control/response modulation in a sample of eight sexual offenders with intellectual disability.

*Method:* The study delivered a heartrate variability (HRV) biofeedback intervention on eight occasions over a period of four weeks. Success of the intervention was assessed using average heart coherence. Emotion dysregulation was assessed before and after the intervention through self-report using the Modified Difficulties in Emotion Regulation Scale (DERS), and behavioural observations of aggressive acts and sexually inappropriate behaviours.

*Results:* There were no significant improvements observed for the sample, however there were some improvements at an individual level. One individual demonstrated reliable change on the Modified DERS, and another demonstrated a significant decline in sexually inappropriate behaviours.

*Conclusion:* This study demonstrated the feasibility of this novel treatment with this offender population, and outlines the future directions for research to further explore this intervention.

## Introduction

Adults with intellectual disability who commit sexual offences present a unique challenge for those tasked with providing treatment. Whilst not all who commit an offence will face prosecution, such individuals may still come to the attention of secure services due to their concerning sexual behaviour. Singh et al. (2011) highlight the difficulties there are in ascertaining the true prevalence of sexual offending within the ID population. They postulate this could be owing to the changing definitions of ID, the reticence of the relevant parties to report such individuals to the police, and the position of the CJS in prosecuting such individuals. In spite of the difficulties in determining the prevalence of such offending, there is still a need to provide appropriate and effective treatment to this offender population. Within existing treatment interventions for offender populations a lack of consideration has been given to emotions (Day, 2009). This is particularly surprising when considering the intrinsic role of emotion in the motivation of action (Day, 2009).

### *Emotion regulation*

Emotion regulation is an area attracting increasing attention, and is being explored in relation to a variety of psychological disorders (Koole, 2009). Difficulties with emotion regulation have been linked with disorders such as bipolar disorder, major depressive disorder, eating disorders, borderline personality disorder (BPD), and alcohol- and substance-related disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Linehan, 1993).

Emotion regulation is regarded as the "extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions" (Thompson, 1991, p 269), and can be both a conscious and unconscious process (Aldao et al., 2010). Emotion regulation is a

dynamic, fluid process, which allows an individual to be responsive to the context in which demands are occurring (Aldao et al., 2010; Cole et al., 1994). Responsivity to the environment, in this context, is the ability to respond with a wide range of emotional states which are socially appropriate, with the ability to remain flexible to the need to both exhibit and inhibit emotional reactions as necessary (Cole et al., 1994).

The theoretical view of the functions of emotions has developed significantly in recent years, from a position where it was felt individuals are controlled by their emotional states, to one where it is suggested that almost all aspects of emotional experience fall within the control of the individual (Koole, 2009). This control includes being able to direct attention in the face of emotional stimuli, the cognitions associated with emotional experience, and the physiological reactions to emotional states (Koole, 2009). This is primarily the case with explicit (effortful) strategies, however some emotion regulation strategies can be implicit (automatic) in nature (Gyurak, Gross, & Etkin, 2011), with parallels being drawn between these processes and defense mechanisms within psychodynamic theory (Rice & Hoffman, 2014).

Emotions are felt to contribute to the ability to interact and communicate effectively in our social worlds, to pay attention, to pursue and achieve goals, our cognitive processing, and personality (Cole et al., 1994; Koole, 2009; Thompson, 1991; Thompson, 1994). Emotion has been termed a "behaviour regulator" (Thompson, 1991, pg. 270), and is thought to underpin a variety of adaptive behaviours including empathy, retrieval of memories, attachment, the ability to understand both ourselves and others, and social competence (Cole et al., 1994; Thompson, 1991). The ability to regulate ones emotional state has been linked with differences in the quality of interpersonal relationships (Thompson, 1991). Overall, emotion regulation abilities have been linked with an individual's ability to interact with the world around them (Thompson, 1991). Emotion regulation can be seen as a functional ability, it serves a purpose in the achievement of psychological goals and outcomes (Koole, 2009).

Emotion regulation strategies can focus on the fulfilment of hedonistic needs, the achievement of goals, or the optimisation of functioning in relation to personality (Koole, 2009).

Gross (2014) outlines a process model for emotion regulation. This model includes five stages, each of which present a potential opportunity during which an emotion can be regulated. These stages include situation selection, situation modification, attentional deployment, cognitive change, and response modulation. Situation selection is when an individual opts to avoid or approach a situation likely to increase or decrease a particular emotion. Situation modification involves adjusting a situation one is experiencing in order to alter the emotional response to it. Attentional deployment is the deliberate attention or inattention given to a situation in order to alter emotional experience. Cognitive change is the appraisal or reappraisal of a situation to modify the emotional impact of the event. Response modulation is implemented after the generation of an emotion state has occurred, and seeks to alter the physiological and behavioural response to an emotion. An extended process model of emotion regulation expands on this and highlights stages during which emotion regulation or failures in regulation can occur (Gross, 2015). There are three stages; identification, selection, and implementation. Within each of these stages there are sub-stages of perception, valuation, and action. The identification stage is concerned with recognition of an emotion and the need to apply an emotion regulatory strategy. During the selection stage the appropriate emotion regulation strategy is identified, and during the implementation stage the strategy is applied to a given situation and translated into action (Gross, 2015).

Aldao et al. (2010) highlight six emotion regulation strategies which can be accessed and applied within various stages of the process model; three adaptive (1. Acceptance, 2. Problem solving, 3. Reappraisal), and three maladaptive (4. Avoidance, 5. Rumination, 6. Suppression). No one strategy works all the time or in all situations, rather it is important an

individual is able to identify and apply the right strategy in the right situation. If a strategy is applied in the wrong situation or in the wrong way the strategy would no longer be considered adaptive. Acceptance is the recognition and tolerance of emotional states without placing judgement on the experience or emotional state, and is considered to be an adaptive alternative to avoidance (Aldao et al., 2010). Problem solving is the attempt to resolve a demanding situation, or minimise the negative consequences of a particular situation (Aldao et al., 2010). Reappraisal is the attempts an individual makes to reduce their distress to a demanding situation by developing neutral or positive explanations (Aldao et al., 2010). Reappraisal has been found to decrease the experience of an emotion and associated behaviours for that emotional state (Gross, 2002). Avoidance is when an individual seeks to avoid the experiences associated with an emotional state. This can include the emotion itself, the physical sensations, the cognitions, or the urges associated with the emotional state. It is argued avoidance prevents the individual from taking the appropriate (adaptive) action for their emotional experience (Aldao et al., 2010). The second maladaptive strategy is rumination; the excessive thinking over ones problem, inhibiting the implementation of problem solving strategies (Aldao et al., 2010). Finally, suppression is the immediate attempt to suppress the outward expression of a particular emotion. It is argued this strategy will be ineffective in reducing the experience of the emotion longer term, although may successfully reduce the experience in the short-term (Aldao et al., 2010). Suppression has been found to reduce the outward expression of an emotion, however fails to decrease the experience of the emotion internally (Gross, 2002). Suppression has been linked with difficulties in interpersonal functioning, a deficit not observed with the adaptive strategy of reappraisal (Gross & John, 2003). Behavioural suppression can result in increased arousal rather than a reduction in emotion (Gross & Levenson, 1997).

Adults with ID use a number of similar strategies to the mainstream population when regulating emotional states. Strategies commonly used by those with ID include regulatory talk (self-talk and expressing emotions is beneficial), avoidance (avoidance can be good and avoidance is bad), and cognitive strategies (cognitive distraction and cognitive appraisal) (Littlewood, Dagnan, & Rodgers, in press).

The development of emotion regulation occurs during formative years as a result of both internal and external factors (Fox & Calkins, 2003; Thompson & Calkins, 1996). Internal factors include innate temperament and processes pertaining to cognition, such as attention and the ability to inhibit action (impulse control). External factors influencing the development of emotion regulation include the caregiving environment, the influence of cultural norms on emotional expression, and social relationships (Fox & Calkins, 2003).

Emotion dysregulation occurs when unhelpful emotional patterns develop which impact on an individual's functioning, and result from a chronic inability to inhibit or modulate emotional responses (Cole et al., 1994; Koole, 2009). Emotion dysregulation can present in a variety of ways including; affect which is incompatible with the context, the avoidance of emotional experience, and the uncontrolled vacillation between a lack of affect and an excess of an emotional state such as anger (Cole et al., 1994). The experience of emotion dysregulation is associated with a variety of psychopathologies and disruption to psychological functioning (Aldao et al., 2010; Linehan, 1993; Koole, 2009). Emotion dysregulation does not mean an individual is emotionally unregulated, rather an individual has the system for emotion regulation, but it is operating in a dysfunctional manner (Cole et al., 1994). Emotion dysregulation does not simply take the form of under- or over-regulation for an individual, instead an individual may over-regulate their emotional states in some instances, and under-regulate in others (Cole et al., 1994). Dysregulation can include failures to regulate emotions where it would be helpful or necessary to do so, and misregulation by

applying strategies which are harmful rather than adaptive (Gross, 2015). Dysregulation of emotions can occur at various stages when attempting to manage emotional experience and responding. An individual may experience problems with emotional awareness, and may fail to detect the emotion in the first instance, may misevaluate the strength of the emotion, or may fail to respond due to beliefs that emotions cannot be changed (Gross, 2015; Gross & Jazaieri, 2014). An individual may experience problems with regards to goal setting in the context of emotion regulation, and may fail to consider the long and short term consequences of a particular course of action (Gross & Jazieri, 2014). An individual may fail to select the appropriate strategy due to a lack of strategies available to them, an overreliance on one particular strategy, or may fail to implement the strategy due to lack of confidence in ability (Gross, 2015). Finally, an individual may fail to translate the selected strategy into appropriate action for the specific situation due to lack of skill, or misapplication of skills when implementing the strategy (Gross, 2015). An individual who is unable to emotionally regulate may struggle to function in a variety of domains including communicating affective states effectively, and effective problem solving (Cole et al., 1994).

Due to the impact of emotion regulation, and dysregulation, on psychosocial functioning a variety of therapies now include an emotion regulation treatment component (Aldao et al., 2010). Treatment components focus on learning to understand and recognise emotions as they arise, developing skills to allow the appropriate expression of emotional states, and developing an understanding of emotional states which are more problematic in nature (Cole et al., 1994). Interventions focus on developing adaptive strategies (reappraisal, problem solving, and acceptance), all of which can be used at various stages of the process model (situation selection, situation modification, attentional deployment, and cognitive change). Interventions focused on improving response modulation are those focused on controlling the physiological response to emotions. The role of controlled breathing in emotion regulation is

one such intervention focused on adaptively responding in the response modulation stage of the process model (Arch & Craske, 2006; Gross, 2014; Koole, 2009). Consideration has been given to the role of emotion regulation, and dysregulation, within the theories pertaining to sexual offending.

### *Theories of sexual offending*

A theoretical understanding of sexual offending is essential in understanding the factors contributing to sexual offending, and in the development of treatment programmes specific to the criminogenic needs and dynamic risk factors identified. The Risk-Needs-Responsivity principle highlights the necessity to deliver treatment which addresses criminogenic needs (Bonta & Andrews, 2007). Reductions in recidivism are associated with treatment programmes where dynamic risk factors have been fully understood and attended to (Ford & Beech, 2004). Ward and Beech (2006) highlight the importance of theories of sexual offending in guiding treatment interventions.

Sexual offenders who recidivate have been found to share some common characteristics; self-regulation difficulties, anti-sociality, sexual deviancy, unstable lifestyle, and deficits in relation to intimacy (Hanson & Morton-Bourgon, 2005). Thornton (2002) propose there a need to target within treatment the following areas; sexual interest, socio-affective functioning, distorted attitudes, and poor self-management. Dynamic risk factors are thought to include four main domains: deviant sexual interests, dysfunctional schemas, problems with attachment, and impulsivity or mood difficulties (Ward & Beech, 2006). Mann et al. (2010) identified a number of empirically supported and relevant risk factors, including poor or dysfunctional coping.

Within the literature on sexual offending three levels of theory are identified (Keeling, Rose, & Beech, 2009). Level I theories are multi-factorial (Ward et al., 2006). Level II theories

identify and explore individual factors specific to the causation of sexual offending (Keeling et al., 2009; Ward et al., 2006). Level III theories are models which outline cognitions, behaviours, motivations, and social influences on offending and recidivism (Keeling et al., 2009; Ward et al., 2006). All three levels of theory are pertinent to the effective treatment of sexual offenders (Ward et al., 2006). More recently the Integrated Theory of Sexual Offending (ITSO) has been proposed. This assimilates elements of theories at all three levels, in an attempt to provide a clear and cohesive overview to clarify the contributing and maintaining factors in sexual offending (Keeling et al., 2009; Ward & Beech, 2006). Keeling et al. (2009) found theories at each of the three levels have relevance in the understanding of sexual offending within an ID population, and the ITSO also had relevance with regards to ID sexual offenders.

## Level I theories

### Finkelhor's Precondition Model

Finkelhor's Precondition Model suggest four factors underlie child sexual abuse; emotional congruence with children, sexual arousal to children, limited ability to meet sexual or emotional needs using adaptive strategies, and disinhibition (Beech & Ward, 2004; Ward et al., 2006).

Disruptions to emotional development are thought to have contributed to these factors. Emotional congruence with children may develop as a result of disruptions to the development of emotions (Ward et al., 2006). The role of sexual activities as maladaptive coping has been postulated (Cortoni & Marshall, 2001; Ward et al., 2006). Ward et al. (2006) highlight the lack of exploration of this by Finkelhor. Some of the barriers to adaptive strategies may result from poor interpersonal skills (Ward et al., 2006). Emotion regulation is integral to the development of interpersonal skills, and therefore emotion dysregulation may underpin deficits in interpersonal skills (Cole et al., 1994; Thompson, 1991).

This model provides clear treatment goals, including the development of emotion regulation abilities (Beech & Ward, 2004).

### Hall and Hirschman's Quadripartite Model

Hall and Hirschman's Quadripartite Model focuses on explaining the sexual abuse of children. They suggest four factors contribute to the commission of a sexual offence; physiological sexual arousal, cognitions justifying sexual deviancy, emotion dysregulation, and problems with personality (Beech & Ward, 2004; Ward et al., 2006). These factors interact to create different subgroups of offenders. It is suggested there is a subgroup of offenders who are defined by their inability to manage emotional states. In these instances treatment focus should be on developing emotion regulation skills (Ward & Beech, 2006; Ward et al., 2006).

### Marshall and Barbaree's Integrated Theory

Marshall and Barbaree's Integrated Theory theorises sexual offending against children and adults, and sexual deviancy (Ward et al., 2006). They suggest an interaction of proximal and distal factors contribute to offending (Beech & Ward, 2004). The theory hypothesises the presence of an invalidating environment during development results in the development of insecure attachments, which in turn contributes to poor self-regulation skills and difficulties with emotion regulation (Beech & Ward, 2004; Ward et al., 2006). A lack of self-regulation skills contribute to the presence of strong negative emotional states, which intensify sexual desire and reinforce fantasies of a sexually deviant nature (Beech & Ward, 2004), particularly during adolescence when the offender experiences a surge in hormones (Ward et al., 2006). The increase in hormones and the associated sexual urges, in the absence of adaptive emotion regulation and self-regulation skills, contribute to the process of engaging in sexually deviant or harmful behaviours (Ward et al., 2006). The role of reinforcement is also highlighted, in

that sexual activity may serve to improve mood state, and regulate the emotional states of the offender (Beech & Ward, 2004).

Further to this, an absence of self-regulation skills and emotion regulation skills contribute to deficits in interpersonal effectiveness (Ward et al., 2006). This in turn restricts the offender from being able to develop healthy intimate relationships during their adolescent years, and may also contribute to the onset of sexual fantasies of a deviant nature (Ward et al., 2006).

### Ward and Siegert's Pathways Model

Ward and Siegert (2002) knitted together several theories pertaining to the sexual abuse of children. Ward and Siegert (2002) proposed four main factors relevant to sexual offending against children; emotion regulation deficits, deficits in intimacy and interpersonal skills, deviant sexual arousal, and distortions of cognition. Sexual offences against children are thought to occur through various interactions of these four factors, resulting in differentiated presentation between offenders (Ward & Siegert, 2002).

Emotion dysregulation may result in an individual being unable to cope adaptively in times of distress, using sexual offending as a way to modulate their anger towards a partner, losing control in the face of negative moods, or using sexual behaviours to modulate other emotional states (Ward & Siegert, 2002). It is hypothesised that within this pathway offenders are likely to exhibit healthy sexual behaviours and interests when not experiencing stress.

### Level II theories

Level II theories include deficits in victim empathy, deficits in intimacy, distortions in cognition, and sexual deviancy (Keeling et al., 2009).

**Deficits in empathy towards victims**

Empathy deficits were thought to be a vital feature of sexual offending, and as such required consideration within treatment programmes (Covell & Scalora, 2002). However, victim empathy has since been found to have a limited relationship with recidivism (Hanson & Morton-Bourgon, 2005).

A four-stage process of empathy has been proposed; emotion recognition, perspective taking, replication of emotions, and the ability and motivation to interpret stimuli and act accordingly (Kennington & McGregor, 2017; Ward et al., 2006). There are several components considered to be essential in being able to achieve these stages, hence achieving empathy, amongst those is emotion regulation (Covell & Scalora, 2002; Kennington & McGregor, 2017). Deficits in theory of mind are also hypothesized to contribute to empathy deficits (Elsegood & Duff, 2010). Difficulties in inferring mental states in others can impact upon the ability to have or display empathy for others (Elsegood & Duff, 2010), as this would impede the perspective taking ability of that individual. Deficits in self- and emotion regulation contribute to deficits in theory of mind (Keenan & Ward, 2000; Ward, Keenan, & Hudson, 2000). There is also potential that in some instances offenders are unable to apply skills in inferring mental states of victims because of failures to control emotional states (Elsegood & Duff, 2010).

This suggests emotion dysregulation can impact upon deficits in theory of mind, which in turn contribute to empathy deficits, and can directly influence empathy deficits through failures in emotion recognition, failures in replicating the emotions of another, and failures to respond in a regulated and organised manner to relevant information.

## Level III theories

### Self-Regulation Model

The primary Level III theory regarded at this time is the Self-Regulation Model (SRM). Self-regulation deficits are purported to increase the risk of recidivism (Ward & Hudson, 1998; Ward et al., 1998). Self-regulation is a process by which an individual is able to engage in behaviours directed towards a goal through the control of internal and external processes (Keeling et al., 2009). Ward and Hudson (1998) propose the process of self-regulation is intrinsic to the offending process. They suggest four potential pathways in the relapse process which address the way an individual self-regulates and incorporates the offence-focused goal into their behaviour. These four pathways are; avoidant-passive, avoidant-active, approach-automatic and approach-explicit (Ward & Hudson, 1998). Lindsay (2009) highlights how influential this model has been in the assessment and treatment of sexual offenders, and postulates its potential utility in the assessment and treatment of ID sexual offenders.

Consideration has been given to the relevance of the SRM for adult ID sexual offenders. Keeling et al. (2009) discuss the relevance of each pathway for this population. The similarities between the avoidant-passive pathway and the characteristics of an ID sexual offender are outlined. A passive style of self-regulation indicates difficulties in social problem-solving, low self-esteem, poor coping style and greater difficulties with assertiveness (Ford, Rose, & Thrift, 2009; Keeling et al., 2009). Adults with an IQ below 70 and a conviction for a sexual offence were found to predominantly exhibit passive self-regulation when compared with offenders with an IQ greater than 70 (Ford et al., 2009).

Offenders using the avoidant-active pathway may also have difficulties in self-regulation. Whilst they will make attempts to implement coping strategies, they are more likely to implement ineffective strategies (Keeling et al., 2009). Similarities are drawn between the

characteristics associated with this pathway and ID sexual offenders, including difficulties in problem solving, and dysregulation (Keeling et al., 2009).

The SRM (Ward & Hudson, 1998; Ward et al., 1998) highlights the intrinsic role of self-regulation in the sexual offending process. Self-regulation is described as the process by which an individual is able to engage in goal-directed behaviours through the control of internal and external processes (Keeling et al., 2009). Thompson (1991) describes emotion regulation as being the process by which internal and external processes are directed to monitor, evaluate and modify emotional responses. The processes being described here appear to be underpinned by the same system. According to the SRM, different patterns of self-regulation influence the offending process in different ways. Emotion dysregulation can present in a number of different ways, and varies according to contextual demands. Self-regulatory dysfunction can present in a variety of ways. The individual may under-regulate their emotions, misregulate their emotions and employ maladaptive strategies, or regulate effectively but with maladaptive goals (Ward et al., 1998).

**Integrated Theory of Sexual Offending**

More recently there has been a movement towards "theory knitting". The process by which the most promising elements of different theories are unified in an effort to provide an encompassing theory. Ward and Beech (2006) developed the ITSO to provide an overarching theory of sexual offending. The ITSO discusses the role of biology, ecology and psychology in sexual offending (Ward & Beech, 2006). Keeling et al. (2009) discuss how each of these roles may be relevant to an ID sexual offender.

*Biology*

It is acknowledged those with ID are likely to have experienced difficulties in-utero and therefore this may be of particular relevance to this population, however this is yet to be ascertained (Keeling et al., 2009).

*Ecology*

The importance of distal factors (developmental experience) and proximal factors (personal circumstances) are discussed (Keeling et al., 2009). Negative experiences within development are particularly prevalent for those with ID (Keeling et al., 2009). Keeling et al. (2009) highlight the ways in which the proximal factors may be experienced by an adult with ID; difficulties engaging with society, being subject to stigmatization, and being socially isolated.

*Psychology*

Three systems are felt to be intrinsic to the process of offending; motivation/emotion, perception/memory, and action selection and control (Ward & Beech, 2006). Keeling et al. (2009) propose that for adult ID sexual offenders the impact of developmental difficulties increases the likelihood of deficits with regards to the motivation/emotion system. Difficulties in the area of action selection and control are influenced by motivation/emotion systems and perception/memory systems, and are associated with problems in self-regulation (Keeling et al., 2009). Disruptions to the action selection and control system are thought to underpin a plethora of self-regulation difficulties including deficits in impulse control, management of negative emotions, difficulties in problem solving, and managing changing demands and circumstances (Ward & Beech, 2006).

*ITSO and the role of emotion regulation*

The ITSO propose disruptions within the system develop into varying clinical presentations within this offender population (Ward & Beech, 2006). The role of emotion dysregulation is highlighted within this model. When emotion dysregulation is paired with a sexual desire this has the potential to result in a sexual offence (Keeling et al., 2009; Ward & Beech, 2006; Varker, Devilly, Ward & Beech, 2008). Disruptions to the emotion regulation system could directly result in a sexual offence by the individual using sexual activity as a way to regulate emotional states; sex as a coping strategy (Varker et al., 2008). The reinforcing effect of sexual offending is highlighted, particularly in the event negative mood states are reduced as a direct result of the offence (Ward & Beech, 2006).

Negative emotional states can lower the internal inhibitors an individual has, and allow for the commission of a sexual offence (Day, 2009). Child molesters utilise maladaptive emotion focused strategies, with it being proposed that poor coping, low self-esteem, and sexual offending, form a feedback loop (Marshall, Cripps, Anderson, & Cortoni, 1999).

An integrated theory of sexual reoffending - derived from the ITSO - proposed at least a portion of those who sexually reoffend experience difficulties regulating their emotions. Emotion dysregulation is a suggested risk factor associated with sexual recidivism (Thakker & Ward, 2012). Recidivists showed an increase in anger, distress, and negative emotions prior to reoffending (Hanson & Harris, 2000a; Howells, Day, & Wright, 2004).

***Emotion dysregulation and sexual offending***

There has been a theoretical proposition for the role of emotion dysregulation in sexual offending. Emotion dysregulation plays a complex role with regards to sexual offending, and underpins a number of factors present within a sexual offender population. This includes sexual offending as an emotional regulatory strategy, empathy deficits, deficits in

interpersonal skills, and deficits in theory of mind. Although the premise that an inability to cope with emotional states, and the idea of sex as a coping strategy, has not been consistently supported (Maniglio, 2011; McCoy & Fremouw, 2010). It has also been argued deviant fantasies have been used as a way in which individuals regulate emotions (Bartels & Beech, 2016). Whilst deviant sexual fantasies do not automatically equate to sexual offending, they have a role to play in the commission of sexual offending in some instances (Beech & Ward, 2004; Cortoni & Marshall, 2001; Marshall, Serran, & Cortoni, 2000; Ward et al., 2006).

The theoretical standpoint outlined extends to the literature pertaining to ID sexual offenders (Keeling et al., 2009). This is particularly the case owing to the deficits already observed within the wider ID population with regards to social skills and adaptive skills (Lindsay et al., 2007a).

Theoretically, improving emotion regulation strategies would reduce the reliance on sex as coping, improve quality of interpersonal relationships, and possibly improve the individuals' quality of life. Given the potential ways in which the systems of emotion regulation can fail, there are a number of different types of intervention which have the potential to improve emotion regulation. Some strategies are more cognitive in nature (reappraisal and problem solving), whilst others are more emotion focused (acceptance and response modulation strategies). Interventions focused on addressing emotion dysregulation in sexual offenders should consider addressing one or more of the stages in which failures to regulate can occur.

Cognition is no longer regarded as the primary construct influencing offending behaviour, rather it is considered to be affect which is now requiring additional consideration (Gannon & Ward, 2017). The importance of addressing affect and emotion in treatment is now considered to be crucial (Blagden, Lievesley, & Ware, 2017; Serran, 2017). It is necessary to address emotional needs in order to support the treatment of all dynamic risk factors. In

addition to being a potential dynamic risk factor for sexual offenders, emotion dysregulation can be considered a responsivity issue which impacts upon an offender's ability to gain from treatment (Blagden et al., 2017). Some sexual offenders fail to complete treatment or engage meaningfully due to an unwillingness or inability to cope with negative emotions (Serran & Marshall, 2006).

### *Treatment of sexual offenders with intellectual disability*

There is a dearth of previous research into treatment of ID sexual offenders. A systematic literature review identified 15 studies focused on the treatment of ID sexual offenders (Gray, this volume). The existing research is primarily focused on CBT programmes (Craig et al., 2006; Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; Keeling et al., 2007b; Lindsay et al., 2011; Michie & Lindsay, 2012; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose et al., 2012; Williams et al., 2007). Michie and Lindsay (2012) examined an empathy treatment component, whilst others incorporated developing victim empathy into a full treatment programme (Craig et al., 2006; Craig et al., 2012; Keeling et al., 2006; Keeling et al., 2007b; Lindsay et al., 2011; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose et al., 2012; Williams et al., 2007).

One study focused on treatment which combined CBT and DBT. The DBT component focused partially on developing emotion regulation skills using the DBT concept "Wise Mind-Risky-Mind"; resulting in a reduction in risk, and clinician observed improvements in victim empathy (Sakdalan & Collier, 2012).

Another study focused on the use of mindfulness in reducing deviant sexual arousal (Singh et al., 2011). Self-reports from the three participants suggested a reduction in levels of sexual arousal. This study explored a novel treatment modality with ID sexual offenders, and showed promise for the use of mindfulness based interventions with this population.

### *Biofeedback as an emotion regulation treatment*

Biofeedback is an intervention to teach individuals how to control automatic bodily reactions and functions (Gartha, 1976). Biofeedback is commonly achieved using computer based programmes which provide feedback on particular physiological processes through appropriate sensors, i.e. measuring heart rate through sensors attached to the fingers or the ear lobe. Biofeedback uses a variety of measurement methods; electroencephalographic (EEG) (brain activity), electromyographic (EMG) (electrical activity produced by skeletal muscles), heart rate variability (HRV), heart rate (HR), electrodermal (EDA) (skin conductance), and thermal (temperature) (Schoenberg & David, 2014). EEG, EDA, and HRV biofeedback are thought to demonstrate greater potential for development in the treatment of psychiatric disorders (Schoenberg & David, 2014).

HRV biofeedback assesses the variability in the time interval between heart beats using electrodes attached to the chest, or a sensor attached to the ear or finger. A computer programme is then able to interpret the heart rate variability and display this as a visual representation in the form of a graphical line. Participants are then able to learn to manipulate this and improve HRV (Thurber, Bodenhamer-Davis, Johnson, Chesky, & Chandler, 2010).

HRV is considered to be a measure of self-regulation (Reynard, Gevirtz, Berlow, Brown, & Boutelle, 2011). HRV interventions encourage recipients to develop slow paced breathing (Schoenberg & David, 2014). Gross (2015) outlined the various strategies by which emotion regulation can be achieved, highlighting focusing on the breath can help in achieving emotion regulation. Heart rate increases during inhalation and decreases during exhalation (Schoenberg & David, 2014). Teaching deep controlled breathing can increase heart rate regularity, and therefore improve HRV. Improving HRV has been associated with improvements in a number of other physical and psychological disorders (Gevirtz, 2013; Schoenberg & David, 2014). Improving HRV could result in improvements in behaviour

requiring self-regulation such as compliance with medication and attendance at therapeutic interventions (Reynard et al., 2011).

Gillespie et al. (2012) give consideration to the potential role of mindfulness and biofeedback in the treatment of emotion dysregulation in sexual offenders. Gillespie et al. (2012) propose the use of controlled breathing techniques, as are employed during biofeedback, encourage a state of mindfulness. This in turn results in improved emotion regulation. Gillespie et al. (2012) highlight the use of controlled breathing in addressing two treatment needs of sexual offenders; socio-affective functioning and self-management.

Increasing consideration is being given to the role of mindfulness, and in turn biofeedback, as an intervention for a variety of disorders. Biofeedback has been successful in reducing the symptoms of disorders such as attention deficit disorder, and did so more quickly and reliably than other therapies (Carmagnani & Carmagnani, 1999). Mindfulness has been increasingly used as an intervention for reducing violent and aggressive behaviours, particularly in an ID setting. Chilvers, Thomas and Stanbury (2011) examined the use of mindfulness in a medium secure female ID service. A reduction in physical interventions and seclusions was observed six months after the sessions had commenced. Singh, Wahler, Adkins and Myers (2003) used a mindfulness-based intervention with an adult male with ID and mental illness with a view to reducing aggression and violence. The results indicated he had been able to increase his self-control over his aggressive behaviours, and an absence of aggressive behaviour was noted up to one-year following completion of the intervention. Singh et al. (2011) also demonstrated the positive impact of a mindfulness based intervention on a sample of sexual offenders with ID. Ducharme et al. (2012) used a videogame, coupled with psychoeducation and CBT skills teaching, to teach emotion regulation skills and improve self-regulation. This intervention focused on one young female who was able to retain the skills taught between

sessions, and apply these to real-life situations. She demonstrated improvements in controlling her heart rate, and subsequently emotion regulation.

At present sexual offenders are underrepresented in the mindfulness literature (Shonin, Van Gordon, Slade, & Griffiths, 2013). Despite increasing consideration being given to the benefits of mindfulness, and in turn biofeedback, with this offender population (Bartels & Beech, 2016; Gillespie et al., 2012; Jennings et al., 2013; Serran, 2017; Singh et al., 2011). The need to integrate emotion regulation development into interventions for sexual offenders has been highlighted (Day, 2009; Gillespie et al., 2012; Zaremba & Keiley, 2011). Investigation of these interventions is considered to be a worthwhile endeavour (Day, 2009).

***Research aims and hypotheses***

The research aims to examine the impact of a biofeedback intervention on the development of emotion regulation in ID sexual offenders.

It is hypothesised engagement in the biofeedback intervention will result in improvements in emotion regulation. The biofeedback intervention will encourage the development of deep controlled breathing as a response modulation strategy in the emotion regulation process model.

## Method

### *Sample*

The study focuses on males aged between 18 and 65, with a history of sexual offending and a diagnosed ID.

All patients with a history of engaging in sexually offending behaviour were invited to participate, regardless of whether this has resulted in a criminal conviction. Not all those who commit an offence will face prosecution, however may still come to the attention of secure services due to their concerning sexual behaviour, particularly where the individual has ID (Courtney & Rose, 2004). Murphy et al. (2010) employed a similar methodology in the recruitment of participants; recruiting those who had engaged in sexually abusive behaviour, defined as sexual behaviour in which the other party did not consent and the behaviour would have been considered illegal.

Participants were recruited from a private healthcare low-secure unit for adults with ID and a history of offending or challenging behaviour.

The clinical records of all male patients within the identified site were reviewed. Participant's histories were reviewed initially for a diagnosis of ID. Within the service diagnosis of ID is identified through assessment of intellectual and adaptive functioning with onset before the age of 18 years. If no ID diagnosis was present due to incomplete assessment process the participant was screened out, and the individual's history was not reviewed any further. If an ID was identified as being present, the participant's history was reviewed further for the presence of a sexual offence or sexual behaviour which would be considered illegal according to English law, regardless of whether this resulted in a criminal conviction. If an ID diagnosis and a history of sexual offending behaviour were both identified as being

present the participant was then assessed with regards to capacity to consent to engage in the research.

The Responsible Clinician completed a Mental Capacity Assessment (Mental Capacity Act, 2005) in relation to each participant's ability to consent to the study. Participants were asked specific questions relating to the research and were assessed on their ability to understand, retain, and weigh up the information in order to make a decision about whether to take part or not. The ability to communicate this decision was also assessed. Those lacking capacity to consent were excluded from the study.

### *Procedures*

#### *Invitation and Consent*

All eligible participants were provided with a written information sheet in an easy-read format detailing the true purpose of the study (Appendix 10). The information sheet was read to participants in the presence of a member of the nursing team. Participants were then invited to sign the consent form if they agreed to take part. Any verbal comments demonstrating understanding and consent were recorded on the consent form (Appendix 10).

Participants who had consented to engage in the study were provided with an appointment letter which informed them of the day, date, and time of all eight scheduled biofeedback sessions. This letter was provided approximately two weeks prior to the first scheduled session. On the day of the scheduled session the researcher contacted the ward staff for each participant. Participants were then reminded of their scheduled session by ward staff. In the event participants did not attend a session the session was not rescheduled.

#### *Biofeedback intervention*

The biofeedback intervention was delivered on a one-to-one basis, supervised by the researcher. The intervention was delivered on eight occasions over four weeks. Sessions were

delivered twice a week in regular sessions. HRV biofeedback for psychiatric disorders is typically a short term intervention, with the number of sessions being delivered ranging from one to 28 (Ducharme et al., 2012; Schoenberg & David, 2014).

The biofeedback intervention was delivered using "The Wild Divine", a biofeedback computer based programme (Wilddivine.com, accessed on 27th April 2016). The Wild Divine monitors HRV via a sensor attached to the ear lobe. HRV refers to the amount of time between heartbeats and the variation of this. The biofeedback programme aims to improve HRV by reducing variability between heartbeats through controlled breathing (Wilddivine.com, accessed on 27th April 2016).

The biofeedback intervention was delivered in the same room on each occasion. The room was in a therapy building, and attempts were made to minimise distractions. When participants arrived at the session room the Wild Divine, Relaxing Rhythms software programme was already installed and open on the computer, and the IOM Sensor Hardware was connected to the computer.

The participant was seated in front of the computer, and asked to attach the sensor to their earlobe. The researcher then ensured the hardware was detecting their heart rate by viewing the indicator lights on the hardware.

Once the sensor was properly attached the researcher opened a guided training practice within the Relaxing Rhythms software programme. The breathing visual cue and audio cue were both turned on. The visual cue was a butterfly which opened and closed its wings at a regular pace. The audio cue was a small chime which sounded at regular set intervals. Both cues were set to a breathing pattern of eight seconds (breathe in to the count of four and out to the count of four). The screen also displayed the average heart coherence, heart rate as a number, and a visual representation of heart rate as a line.

Participants were oriented to a butterfly visual, and informed they should try to bring their breathing cycle in line with the moving wings on the butterfly, ie. breathing out as the wings open, and breathing in as the wings close. They were also informed of the small chime which sounds on the changing of the breath cycle, and they should try to bring their breathing in line with this sound.

Participants were encouraged to complete this breathing practice for 10 minutes. Once the breathing practice started the researcher placed themselves in the corner of the room, out of sight of the participant, however remained in the same room and monitored the wellbeing of the participant throughout.

After 10 minutes the researcher closed the Relaxing Rhythms programme, and instructed the participant to remove the sensor from their earlobe.

Participants were engaged in a short debrief following each session. This included asking the participants how they were feeling, how they found the practice, and discussing any reflections the participants had.

*Qualitative Feedback*

Participants were approached twelve weeks following the end of the biofeedback intervention and invited to provide more formal feedback (Appendix 13). They were initially approached by the researcher to provide their consent, however were interviewed by another member of the psychology department to reduce the risk of researcher bias and influence. Participants were asked to provide details on the best and worst things about the sessions, things they found helpful or difficult about the biofeedback sessions, if they would want to attend more sessions and the reasons for their response, if they would recommend biofeedback, and if there was anything they would change about the sessions.

*Study Design*

The study adopted a quasi-experimental research design; an A-B-A design (Robson, 2002). It was not possible to randomly allocate participants to a control condition due to the small number of potential participants available.

***Measures***

Clare (1993) outlines difficulties in the assessment of ID sexual offenders including; memory difficulties, acquiescence, suggestibility in responding, difficulties with reading, and difficulties in comprehension of complex language and abstract concepts. This was taken into consideration when completing psychometric assessment (of emotion regulation) with the participants.

Keeling et al. (2007a) discuss the options for assessing adult ID sexual offenders. In some instances it is necessary to use measures developed for a mainstream adult sexual offender population, although this creates concerns regarding the accuracy of the outcome of the measure. Where it is necessary to use such assessments it is advised the items be read verbally and visual cues used to support the process, such as a visual Likert scale (Hartley & MacLean, 2006; Keeling et al., 2007a). In other instances it is possible to use adapted versions of measures designed for mainstream sexual offenders.

*Average Heart Coherence*

Heart rate variability (HRV) is a measurement of the variation in time between heart beats. The sensor in the biofeedback programme used in this study measures HRV using a sensor placed on the ear. A regular breathing cycle - as is encouraged within this biofeedback programme - would expect to be associated with decreased variability between heartbeats, this is referred to as HRV coherence (Thurber et al., 2010).

Within Wild Divine (Relaxing Rhythms) the HRV coherence is reported. The average heart coherence is a calculation based on HRV (the difference in heart rate from one heartbeat to another), with scores of 0% indicating there is no coherence, and coherence of 100% being HRV of ten seconds. The more regular the breathing cycle is the less variability there will be in the time interval between heartbeats, and the higher the coherence score will be. Higher average heart coherence figures are considered to be preferable (Thurber et al., 2010; Wild Divine, 2014). The average heart coherence rate was recorded at the end of each session for each participant. It is expected that the average heart coherence rate would have increased from the first session to the last session as the participant completed progressive practices. This will allow for the assessment of the success of the biofeedback for each participant.

*Emotion regulation*

A number of psychometric assessments exist which assess emotion regulation; Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2007; Garnefski, Kraaij, & Spinhoven, 2001), Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), The Regulation of Emotions Questionnaire (REQ; Phillips & Power, 2007), and the DERS (Gratz & Roemer, 2004). Both the CERQ and the REQ focus more on the cognitive strategies and aspects of emotion regulation, and therefore would not assess physiological strategies of emotion regulation focused on response modulation or arousal control. The ERQ is comprised of two factors; cognitive reappraisal and expressive suppression. The DERS consists of six factors; non-acceptance of emotional responses, difficulties in engaging in goal directed behaviour, impulse control difficulties, lack of emotion awareness, limited access to emotion regulation strategies, and lack of emotional clarity (Gratz & Roemer, 2004). The items within the strategy subscale do not focus exclusively on cognitive strategies, and therefore was considered to be the most appropriate measure to assess for change when teaching an arousal control strategy.

The DERS has been found to have high internal consistency, test-retest reliability, and acceptable predictive validity and construct validity (Chapman, Leung, & Lynch, 2008; Gratz & Roemer, 2004). The Awareness subscale did not contribute to the overall construct of emotion regulation, and therefore the use of the total score was not recommended (Bardeen, Fergus, Hannan, & Orcutt, 2016)

A modified version of the DERS is recommended for use, and is thought to have greater reliability and validity than the original version (Bardeen, Fergus, & Orcutt, 2012; Bardeen et al., 2016). The measure was internally consistent both with regards to the overall scale ($\alpha$=0.97) and each of the five subscales ($\alpha$=0.88-0.95) (Bardeen et al., 2016). Additionally, the specific subscales of the measure correlated with other related measures (Bardeen et al., 2016). The modified version removed reverse worded items, and reduced the scale from 36 items to 29. The removal of reverse worded items will be of use when administering the psychometric assessment to adults with ID (Clare, 1993; Keeling et al., 2007c). Bardeen et al. (2016) concluded the subscales of the modified version of the DERS had improved loading on the overarching construct of emotion regulation, and therefore supported the use of the total score as a representation of emotion regulation.

The modified version of the DERS was administered to measure emotion regulation in this study. The psychometric assessment was completed at three time intervals; eight weeks prior to commencing treatment, immediately post-treatment, and eight weeks following the completion of treatment. The maximum potential total score was 145, whilst the minimum potential total score was 29. Higher scores on the measures indicate greater levels of emotion dysregulation. Bardeen et al. (2016) examined the measure on a sample of adults recruited from the community, the mean scale score for the community sample was 58.53 (SD = 23.40).

This measure was administered to each participant by the researcher using a visual Likert scale (Appendix 11). Each item was read aloud by the researcher, and was also presented to the participant in large printed form.

*Acts of Overt Aggression*

Difficulties in emotion regulation have been proposed to underpin a number of the dynamic risk factors and criminogenic needs of those who have committed sexual offences. Emotion regulation deficits are thought to be a significant factor in aggression in an ID population (Keulen-de Vos & Frijters, 2015). Therefore, consideration was given to the exhibition of aggressive behaviours within the sample as a representative measure of emotion dysregulation.

The Modified Overt Aggression Scale (MOAS) (Sorgi, Ratey, Knoedler, Markert, & Reichman, 1991) allows for the monitoring of observed acts of aggression (verbal aggression, aggression against objects, aggression against others, and deliberate self-injury). It also allows for the subsequent rating of these behaviours according to severity, and does not rely on self-report from the individual. The MOAS has been found to be a valid and reliable tool for use in adults with ID (Oliver, Crawford, Rao, Reece, & Tyrer, 2007). Participants' behaviour was monitored in the eight weeks prior to treatment, during the four-week treatment period, and in the eight weeks following treatment. From this scale a weighted score is yielded, this is numerical in nature and therefore it is possible to compare severity and frequency of incidents of overt aggression statistically over time.

This measure was completed from a review of the clinical notes, and did not require direct participant involvement. This data is routinely collected within the service.

*Acts of Observed Inappropriate Sexual Behaviour*

Participants' observed inappropriate sexual behaviours were recorded objectively using the St Andrews Sexual Behaviour Assessment Scale (SASBA) (Knight et al., 2008). The SASBA is found to have high construct and content validity, good interrater reliability, and good test-retest reliability (Knight et al., 2008). Participants' behaviour was monitored in the eight weeks prior to treatment, during the treatment period, and in the eight weeks following treatment. From this scale a weighted score is yielded, this is numerical in nature and therefore it is possible to compare incidents of inappropriate sexual behaviour statistically.

This measure was completed from a review of the clinical notes, and did not require direct participant involvement. This data is routinely collected within the service.

***Ethical considerations***

Ethical approval was sought through the Integrated Research Application System (IRAS). The research project gained a favourable opinion from the NHS Health Research Authority (HRA)[3], East of England – Essex Research Ethics Committee on the 8th of March 2017[4]. Organisational approval was obtained on the 7th of June 2017. The University of Birmingham research ethics committee then approved the research on the 16th of June 2017[5].

***Treatment of data***

Participants were assigned an identification number. This identification number was accessible only by the researcher. This identification number was recorded on the outcome measures and data, and no data is identifiable to participants.

[3] IRAS ID 202836
[4] 16/EE/0501
[5] ERN_16-0478

***Hypotheses***

*Hypothesis 1:* There will be an increase in average heart coherence from the first recording and the last recording. It is assumed engagement in biofeedback will result in improved HRV as assessed by average heart coherence.

*Hypothesis 2:* There will be a significant reduction in the scores attained on the Modified Difficulties in Emotion Regulation Scale from pre- to post-intervention, indicating an improvement in emotion regulation. It is assumed engagement in the biofeedback intervention will result in improved HRV and in turn improved emotion regulation.

*Hypothesis 3:* There will be a significant reduction in the average scores on the MOAS from pre- to post-intervention, indicating a reduction of aggressive behaviour. It is assumed biofeedback will result in improvements in emotion regulation, which in turn will result in reductions of aggressive behaviour.

*Hypothesis 4:* There will be a significant reduction in the average scores on the SASBA from pre- to post-intervention, indicating a reduction of inappropriate sexual behaviour. It is assumed biofeedback will result in improvements in emotion regulation, and in turn will result in reductions of inappropriate sexual behaviour.

## Results

### *Participants*

Participants were recruited from a low secure unit in a private hospital setting. All male patients were screened (*n*=30). One resident was screened out due to not having a diagnosed ID as the assessment process was still underway, and 11 patients were screened out as they did not have a history of sexual offending. The remaining 18 participants were screened for their capacity to consent by the Responsible Clinician and another member of the multi-disciplinary team. Nine patients were assessed as having the capacity to consent. Of those, eight consented to engage in the research. Figure 3 details the recruitment process.

The participants all had a diagnosed ID and were detained under either a criminal or civil section of the Mental Health Act (1983; as amended 2007). Participants were all detained under various sections of the Mental Health Act; four were detained under Section 3, three were detained under Section 37, and one was detained under Section 37/41. Participants ranged in age from 21 years 1 month to 43 years 1 month (average age = 31.31, SD = 7.54). All participants had mild ID; full scale intelligence quotient (FSIQ) scores ranged from 51 to 74 (average FSIQ = 63.88, SD = 7.18) as assessed by the WAIS-R, WAIS-IV or WASI-II (Wechsler, 1981; 1997; 2010). All participants had also been assessed in relation to their adaptive functioning and for the presence of developmental delays in childhood. Of the participants seven had additional diagnoses including BPD (*n* = 2), schizophrenia (*n* = 1), narcissistic personality disorder (*n* = 1), histrionic personality disorder (*n* = 1), anti-social personality disorder (ASPD) (*n* = 3), paraphilias (*n* = 1), childhood autism (*n* = 2), attention deficit hyperactivity disorder (ADHD) (*n* = 1), and generalised anxiety disorder (GAD) (*n* = 1). Table 3 provides details of each participant.

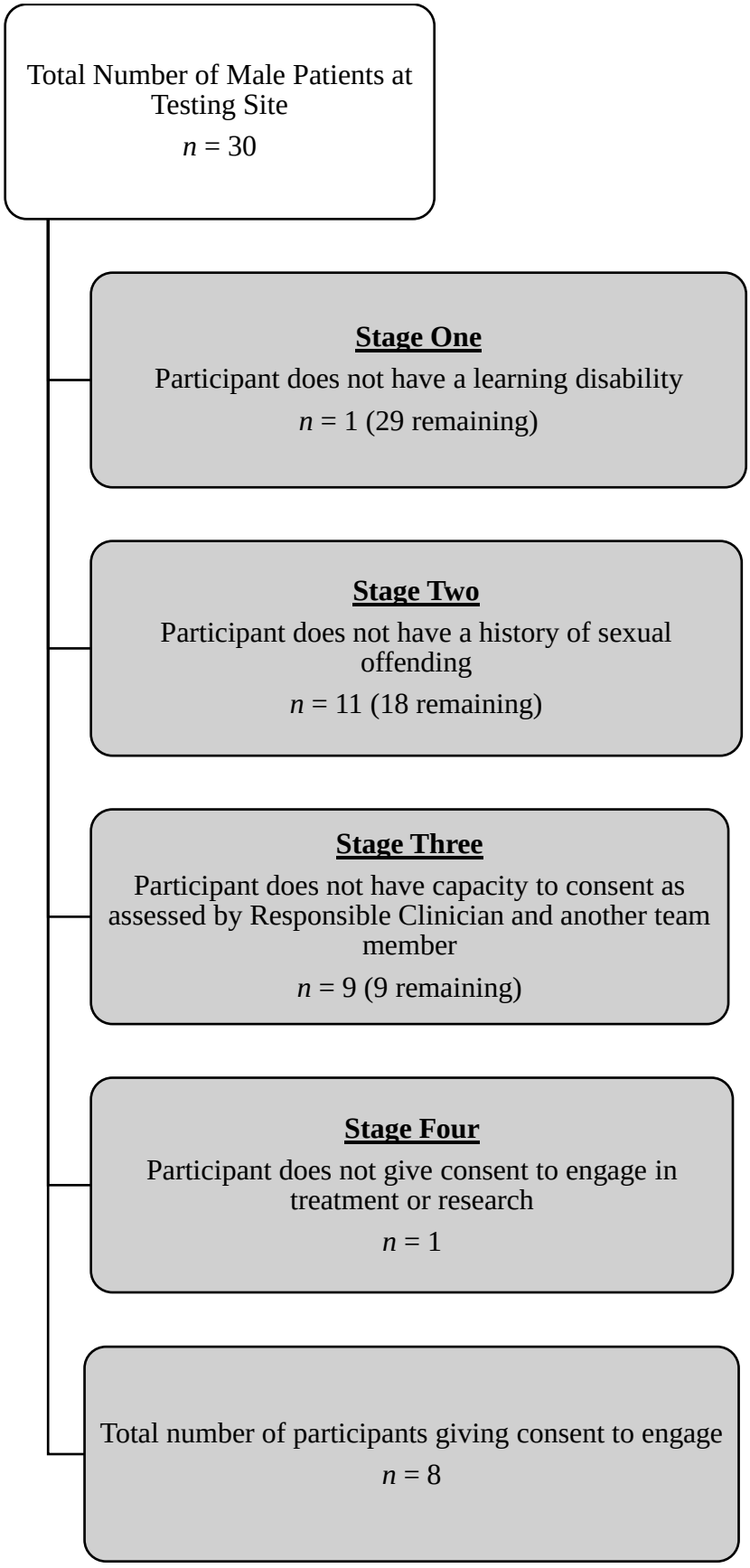


*Figure 3.* Summary of participant inclusion/exclusion process

**Table 3.** Participant information; age, IQ, section, and diagnoses.

| Age | FSIQ | Section | Diagnoses |
|---|---|---|---|
| 40 years 9 months | WAIS-IV FSIQ=65 | 37 | Mild ID; BPD |
| 31 years 4 months | WAIS-IV FSIQ=65 | 37/41 | Mild ID; Schizophrenia |
| 26 years 2 months | WAIS-IV FSIQ=51 | 37 | Mild ID |
| 43 years 1 month | WAIS-R FSIQ=68 | 3 | Mild ID; BPD; Narcissistic personality disorder; Histrionic personality disorder; ASPD; Paraphilias |
| 25 years 4 months | WAIS-R FSIQ=74 | 37 | Mild ID; ASPD |
| 30 years 1 month | WASI FSIQ=56 | 3 | Mild ID; Childhood autism; Epilepsy |
| 21 years 1 month | WAIS-IV FSIQ=65 | 3 | Mild ID; ADHD; ASPD |
| 32 years 8 months | WAIS-R FSIQ=67 | 3 | Mild ID; Childhood autism; GAD |

Of the participants, four had Police cautions or convictions for sexual offences in their histories. This included indecent exposure, sexual assault, indecent sexual assault, and abduction of a child. All participants had a history of harmful sexual behaviours towards others, the nature and severity of these behaviours varied. Behaviours classed as sexually harmful were assigned due to the lack of arrest, caution, or conviction. Some of the behaviours classed as sexually harmful would have been considered offences, however individuals evaded police attention and prosecution, probably as a result of their intellectual disability (Murphy et al., 2010; Singh et al., 2011). The behaviours included exposure, public masturbation, threats to rape, sexually inappropriate and offensive comments, sexual intercourse with a canine, possession of images of children and animals, attempts to sexually assault a female relative, rape of a female relative, inappropriate sexualised behaviour including touching, and touching the genital area of a female staff member without her

consent. Table 4 provides details of offences and sexually harmful behaviours committed by each participant. Table 5 provides details of the other types of offences committed by the sample as a whole.

**Table 4.** Participant information; offences and sexually harmful behaviour

| **Sexual offences** | **Harmful sexual behaviours** |
|---|---|
| Indecent exposure x2<br>Sexual assault on a female | Indecent exposure<br>Threats to rape<br>Sexually inappropriate comments |
| Sexual assault x3 | Sexually offensive comments |
| Caution for sexual assault x2<br>Arrested for sexual assault | Public masturbation<br>Indecent exposure<br>Sexually inappropriate behaviour |
| Indecent sexual assault against a three year old girl<br>Arrested for abduction of a seven year old boy | Sexual intercourse with a canine<br>Possession of indecent images of children and animals<br>Threats to rape |
| None | Attempts to sexually assault his 11 year old female cousin<br>Self-reported rape of 17 year old female relative - he was aged 18 years |
| None | Inappropriate sexualised behaviour<br>Grabbed a female staff member in her genital area and on her breasts<br>Whilst at a swimming pool approached a naked young man and asked him to sit on his lap |
| None | Indecent exposure<br>Sexually inappropriate touching of female staff |
| None | Sexually inappropriate comments/suggestions to female staff<br>During his late teenage years he showed children explicit sexual videos<br>Public masturbation |

**Table 5.** Other risk behaviours

| **Other risk behaviours** | **Number of participants displaying the behaviour on at least one occasion (%)** |
|---|---|
| Violence to others | 7 (87.5%) |
| Malicious letters and/or phone calls | 3 (37.5%) |
| Self-injurious behaviour | 5 (62.5%) |
| Fire-setting | 3 (37.5%) |
| Criminal damage | 6 (75%) |
| Substance and/or alcohol misuse | 3 (37.5%) |
| Robbery | 2 (25%) |
| Theft | 1 (12.5%) |
| Possession of an offensive weapon | 2 (25%) |
| False allegations | 2 (25%) |

All participants received concurrent pharmacological or psychological intervention during the research period. Of the participants, four attended a group programme focused on improving their motivation to change (participants 001, 004, 006, and 007), and five of the participants were prescribed regular psychotropic medication although one participant had his medication discontinued during the course of the study. Of the participants, three also received individual sessions with either a qualified or assistant psychologist; one participant was engaged in Cognitive Analytic Therapy (CAT) (participant 006), one participant was supported to review incidents of aggression (participant 002), and another was supported to develop his goals for the future (participant 007). All except one of the participants were prescribed PRN psychotropic medication.

### *Intervention*

*Compliance*

All eight participants who consented to engage in treatment completed at least one biofeedback session. The lowest number of sessions attended by a participant was five sessions ($n$ = 2). One participant attended six sessions, and two participants attended seven sessions. Of the participants, three attended all eight offered biofeedback sessions.

## Summary Statistics

### Hypothesis 1

*There will be an increase in average heart coherence between the first recording and the last recording.*

The biofeedback software programme calculated an average heart coherence each session. The average heart coherence is a calculation based on heart rate variability (HRV) (the difference in heart rate from one heartbeat to another), with coherence of 100% being HRV of ten seconds. Higher average heart coherence figures are considered to be preferable (Thurber et al., 2010; Wild Divine, 2014). It was expected that as the sessions progressed the participants would demonstrate improved average heart coherence.

The average heart coherence for each patient was recorded upon completion of each session. There were no significant trends observed for any of the participants. The data at first recording was not considered to be normally distributed therefore a non-parametric test was conducted. A Wilcoxon signed rank test showed no significant difference between average coherence scores from first recording, $z$ = -0.763, $p$ = 0.445. The effect size is suggested to be small ($r$ = 0.19).

Table six shows the average heart coherence for each participant for each session they attended. Several participants did not attend one or more sessions.

**Table 6.** Average heart coherence score by patient per session

| | **Session Number** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ID** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **001** | 52% | 50% | 53% | 57% | 54% | 52% | 60% | - |
| **002** | 61% | 51% | 34% | 71% | 38% | 63% | 53% | 56% |
| **003** | 72% | 77% | 83% | 78% | 76% | 68% | 72% | 69% |
| **004** | 61% | 52% | 44% | 53% | - | - | - | 61% |
| **005** | 89% | 81% | - | - | 83% | 86% | 87% | 92% |
| **006** | - | 80% | - | - | 60% | 53% | 56% | 65% |
| **007** | 49% | 44% | - | 52% | 39% | 60% | 36% | 51% |
| **008** | 43% | 39% | 43% | 37% | 34% | 53% | 48% | 38% |

**Hypothesis 2**

*There will be a significant reduction in the scores attained on the Modified DERS from pre- to post-intervention.*

Table seven shows the scores on the Modified DERS for each participant completed at each time point. Participant 008 did not complete the assessment at any of the time points due to his levels of anxiety. Of those who did complete the measure, six of the seven had lower scores on the Modified DERS at follow up compared with their score pre-intervention.

**Table 7.** Modified Difficulties in Emotion Regulation scores for each participant

| Patient ID | 8 weeks pre-intervention | Post-intervention | Follow-up – 8 weeks post-intervention |
|---|---|---|---|
| 001 | 107 | 108 | 97 |
| 002 | 95 | 74 | 82 |
| 003 | 59 | 59 | 62 |
| 004 | 92 | 97 | 87 |
| 005 | 97 | 83 | 78 |
| 006 | 118 | 123 | 86 |
| 007 | 38 | 42 | 36 |
| 008 | Did not complete | Did not complete | Did not complete |

Table eight shows the mean scores and standard deviations for the sample. There was a decrease in the mean weighted total score on the Modified DERS from pre-intervention to post-intervention, and again at follow-up.

The data at each time point was found to be approximately normally distributed, there were no outliers, and Mauchly's test of sphericity was non-significant. Therefore the parametric assumptions were met. A one-way repeated measures ANOVA was conducted to compare scores on the Modified DERS measure at time one (eight weeks pre-intervention), time two (post-intervention), and time three (eight weeks post-intervention). There was a non-significant effect for time, Wilks' Lambda = 0.482, $F$ (2, 5) = 2.689, $p$ = 0.161, multivariate partial eta squared = 0.518. The effect size for this analysis suggested a medium effect. Further analysis suggests a small effect size from time one to time two (Cohen's d = 0.276), a

medium effect size from time two to time three (Cohen's d = 0.67), and a large effect size from time one to time three (Cohen's d = 1.246).

**Table 8.** Means and Standard Deviations – Modified Difficulties in Emotion Regulation Scale

| **Time Period** | **N** | **Range** | **Mean** | **Standard Deviation** |
|---|---|---|---|---|
| Time 1 | 7 | 38-118 | 86.57 | 28.09 |
| Time 2 | 7 | 42-123 | 83.71 | 28.15 |
| Time 3 | 7 | 36-97 | 75.43 | 20.40 |

*Reliable Change Index*

The Reliable Change Index (RCI) is a statistical assessment which allows for the assessment of change in score over time on a case by case basis (Jacobson & Truax, 1991). Using the RCI it is possible to ascertain whether changes in scores for individual participants are statistically reliable. The RCI requires the standard deviation, and test-retest reliability for the measure in question. In this instance there was no test-retest reliability available for the Modified DERS, therefore the test-retest reliability from the original version of the DERS was utilised given the similarities between the measures. The procedures described by Jacobson and Truax (1991) were used to calculate the RCI for each participant. Change is considered to be reliable when the RCI is equal to, or greater than, 1.96. The scores compared to assess for reliable change were the pre-intervention scores, and the scores at follow-up (eight weeks post-intervention).

Table nine shows the RCI values for each participant, along with whether the participant achieved reliable change. This table shows only Participant 006 had achieved reliable change on a self-report measure of emotion regulation.

**Table 9.** RCI scores and indication of reliable change status for each participant

| **Participant** | **RCI** | **Outcome** |
|---|---|---|
| 001 | -0.87 | No reliable change |
| 002 | -1.13 | No reliable change |
| 003 | 0.26 | No reliable change |
| 004 | 0.44 | No reliable change |
| 005 | -1.66 | No reliable change |
| 006 | -2.79 | **Reliable change** |
| 007 | -0.17 | No reliable change |

**Hypothesis 3**

*There will be a significant reduction in the average scores on the MOAS from pre- to post-intervention.*

Table ten shows the average weighted total scores on the MOAS for each participant for the time period in the eight weeks prior to the intervention, during the intervention period, and in the eight weeks following the completion of the intervention. Of the participants, one showed a reduction in the frequency and severity of their aggressive behaviour from the period prior to the intervention to the period after the intervention. The remaining participants showed some increase, or little change.

**Table 10.** Modified Overt Aggression Scale (MOAS) average scores per participant

| Patient ID | 8 weeks pre-intervention | Intervention period | Follow-up – 8 weeks post-intervention |
|---|---|---|---|
| 001 | 85.5 | 56.75 | 46.25 |
| 002 | 1.63 | 3.25 | 0.88 |
| 003 | 0.63 | 0.75 | 0 |
| 004 | 30 | 55.25 | 37.38 |
| 005 | 30 | 59.5 | 32.75 |
| 006 | 20.13 | 13.25 | 27 |
| 007 | 2 | 1.75 | 2.5 |
| 008 | 1 | 6 | 1.25 |

Table 11 shows the mean scores and standard deviations for the sample. There was an increase in the mean weighted total score on the MOAS from the pre-intervention period to the intervention period. There was then a decrease in the mean weighted total score at the post-intervention period when compared with both the score for the pre-intervention period, and the intervention period.

The data for the pre-treatment period included one outlier, and the data at each time point was not found to be approximately normally distributed. Therefore the parametric assumptions were not met. A Friedman test was conducted to compare the average weighted total scores on the MOAS at time one (eight weeks pre-intervention), time two (during intervention period), and time three (eight weeks post-intervention). There was a non-significant effect for time; $\chi^2$ (2, $n$ = 8) = 1.75, $p$ = 0.417. The effect sizes between time one and time two ($r$ =

0.14), and time one and time three ($r$ = 0.105), are suggested to be small. The effect size between time two and time three suggests a medium effect $r$ = 0.368.

**Table 11.** Means and Standard Deviations – Modified Overt Aggression Scale

| **Time Period** | **N** | **Range** | **Mean** | **Standard Deviation** |
|---|---|---|---|---|
| Time 1 | 8 | 0.625-85.5 | 21.36 | 28.97 |
| Time 2 | 8 | 0.75-59.5 | 24.56 | 27.29 |
| Time 3 | 8 | 0-46.25 | 18.50 | 19.30 |

Further analysis was conducted on the MOAS scores for all eight participants using a single-case experimental design (SCED). No significant differences were found between the baseline period (up to 24 weeks pre-intervention) and the intervention and post-intervention period (four weeks intervention plus eight weeks follow-up), for any of the participants.

**Hypothesis 4**

*There will be a significant reduction in the average scores on the SASBA from pre- to post-intervention.*

Table 12 shows the average weighted total scores on the SASBA for each participant for the time period in the eight weeks prior to the intervention, during the intervention period, and in the eight weeks following the completion of the intervention. Of the participants, one showed an increase in sexualised behaviour as the intervention progressed, however the majority of participants demonstrated little change in the frequency and severity of their inappropriate sexualised behaviour from pre- to post-intervention.

**Table 12.** St Andrews Sexual Behaviour Assessment Scale (SASBA) average scores per participant

| Patient ID | 8 weeks pre-intervention | Intervention period | Follow-up – 8 weeks post-intervention |
|---|---|---|---|
| 001 | 3.25 | 4.5 | 12.5 |
| 002 | 1 | 6.25 | 1.5 |
| 003 | 0 | 0 | 0.5 |
| 004 | 0.5 | 0 | 0 |
| 005 | 0 | 1.25 | 0 |
| 006 | 0 | 0 | 0 |
| 007 | 0 | 0 | 0 |
| 008 | 0 | 0 | 0 |

Table 13 shows the mean scores and standard deviations for the sample. There was an increase in the mean weighted total score on the SASBA from the pre-intervention period to the intervention period, and again for the post-intervention period.

The data for both the pre-treatment period and the post-treatment period included one outlier, and the data at each time point was not found to be approximately normally distributed. Therefore the parametric assumptions were not met. A Friedman test was conducted to compare the average weighted total scores on the SASBA at time one (eight weeks pre-intervention), time two (during intervention period), and time three (eight weeks post-intervention). There was a non-significant effect for time; $\chi^2$ (2, $n$ = 8) = 1.412, $p$ = 0.494. The effect sizes between time one and time two ($r$ = 0.368), and time one and time three ($r$ =

0.28), suggest a medium effect. The effect size between time two and time three suggests a small effect $r = 0$.

**Table 13.** Means and Standard Deviations – St Andrews Sexual Behaviour Assessment Scale

| **Time Period** | **N** | **Range** | **Mean** | **Standard Deviation** |
|---|---|---|---|---|
| Time 1 | 8 | 0-3.25 | 0.59 | 1.13 |
| Time 2 | 8 | 0-6.25 | 1.50 | 2.47 |
| Time 3 | 8 | 0-12.5 | 1.81 | 4.35 |

Further analysis was conducted on a case-by-case basis on the SASBA scores for six of the eight participants using SCED. Participants 007 and 008 demonstrated no overt sexually inappropriate behaviour during the baseline period (up to 24 weeks pre-intervention), the intervention period, or the follow-up period, and therefore no analysis was conducted in relation to this. No significant differences were found between the baseline period (up to 24 weeks pre-intervention) and the intervention and post-intervention period (four weeks intervention plus eight weeks follow-up), for five of the participants.

The mean based count of non-overlapping data method of analysis was chosen as there was no trend in the baseline data, and the data for each time point was autocorrelated. Participant 004 demonstrated significant improvement between weighted SASBA scores from the baseline period (pre-intervention – 24 observations) (mean = 2.38, SD = 4.73), to the intervention period (intervention – four observations, and follow-up - eight observations) (mean = 0, SD = 0) ($p = 0.0243$).

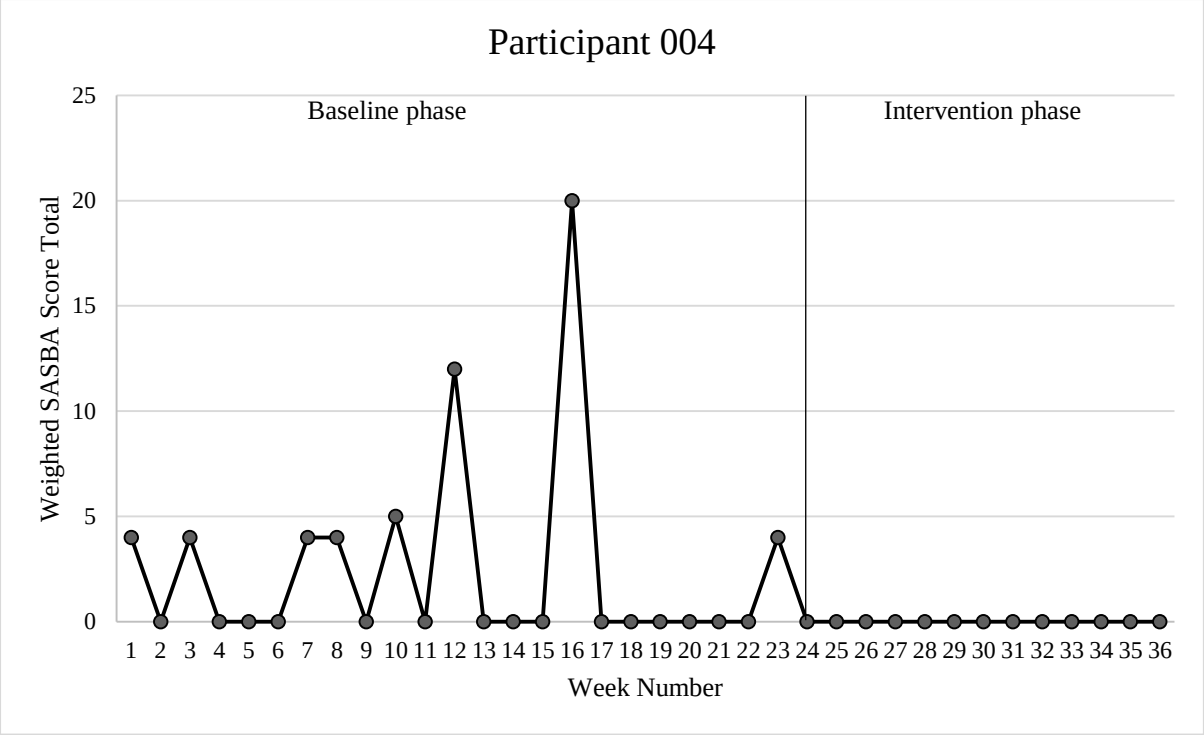


*Figure 4.* Participant 004 SASBA weighted score per week – single case experimental design

*Participant Feedback*

During the sessions, participants provided oral feedback on the intervention. During the course of the intervention six of the eight participants requested to continue accessing the biofeedback intervention following the end of the research study, two of the participants even enquired about the possibility of purchasing the biofeedback software and sensor hardware to enable them to use the intervention by themselves. One participant reported having found the biofeedback intervention sessions helpful, another reported having found the butterfly image useful in helping him focus. The latter reported having previously used relaxation CDs with less effect, although his progress within this intervention did appear to reignite his interest in other relaxation materials and mindfulness practices. Another participant reported having employed breathing techniques to cope when agitated on several occasions, and had begun to make use of mindfulness materials provided in a previous service.

Several participants were monitoring their own progress during the intervention, and expressed pride in themselves when they realised they had improved their average coherence score. One participant recognised that when he is highly anxious he finds it hard to listen, but the biofeedback intervention resulted in reduced feelings of anxiety because his heart rate was slower, and therefore he was able to listen better. This reflection was a development in insight for this individual.

Following the intervention participants were offered the opportunity to provide more formal feedback (Appendix 13). Of the participants, one had left the service and three declined to provide feedback. Of those who gave their opinion, all four indicated they would like to attend more biofeedback sessions. The participants highlighted enjoying certain elements of the sessions, and finding the following things as being helpful:

- "It relaxes you. It makes you think about concentrating on your breathing which I hadn't done before except doing karate"
- "It was relaxing and it helped me in seclusion to do deep breathing and problem solve"
- "It helps me a lot to stay focused on achieving goals"
- "I didn't know what it is until I did it with [researcher]. I think I could have used it in the community and then I wouldn't have come into hospital".
- "Helps me focus on my breathing. Made me realise sometimes I do it too fast"
- "It helped me to use it when I come back to keep calm. Made me realise I need to practice more when I'm upset and to talk to staff to help me breathe in sync"
- "It was awesome that the lines went up and down on the screen (seeing my pulse), taking deep breaths as well, relaxing and feeling calm"

- “The time was good, 10-15 minutes it was great. It’s like a game that you don’t need internet for”
- “To help me in the future when I get bothered and angry in my own time. I do it now in my room”
- “It was relaxing and very calming”
- “It helped me to be more relaxed. Very upbeat. Very quiet”
- “I just switched off, shut all the noise out, and concentrating on the butterfly on the computer”

Participants highlighted finding certain elements of the sessions difficult or unhelpful, including:

- “It was over at [treatment centre name] and there was noise from other people and disruptions. It was hard to keep focused”
- “I found it hard to keep in sync but it did get better as the course went on. Perhaps not long enough, I needed more sessions”
- “[I found it difficult] concentrating when I had other things on my mind”

All participants who provided feedback indicated they would recommend biofeedback to others, and provided additional comments such as:

- “[I would recommend biofeedback] to all the other patients because it does help”
- “[I would recommend biofeedback] to try and help them keep calm”
- “[I would recommend biofeedback] maybe to my family and friends. Maybe a couple of staff and patients. Maybe they can practice at home and help them relax. My Mum – it might help her when she is stressed.”

Some participants stated they would change some things about the session, including:

- “Make it for a longer period. Get it started again quicker. Have less time away from it”
- “A new butterfly – a nice purple one. Maybe moon and stars in the background. Maybe music and lullaby’s”
- “I’d like nine weeks instead of eight”

## Discussion

The aim of the current study was to assess the feasibility and potential impact of a biofeedback intervention for ID sexual offenders. This study was guided by the recent developments in the theories and literature pertaining to sexual offending, and recommendations to evaluate interventions focused on improving emotion regulation with this offender population (Day, 2009; Gillespie et al., 2012). Biofeedback interventions were identified as being successful for a variety of psychiatric disorders (Gevirtz, 2013; Schoenberg & David, 2014), however there were no previous studies identified which examined biofeedback with sexual offenders.

The study evaluated the impact of a short-term biofeedback intervention on average heart coherence, self-evaluated emotion regulation, observed acts of aggressive behaviour, and observed acts of sexually inappropriate behaviour. The current study developed the literature base by examining the impact of biofeedback on improving emotion regulation in ID sexual offenders, however the extent to which this can be generalised is limited due to the small sample size and variation in disorders present in the sample..

### Hypothesis 1: How does biofeedback effect average heart coherence (a measure of HRV)?

This study did not demonstrate a significant improvement in average heart coherence from the first to the last biofeedback session. Participant 001 showed the most positive change between the first and last session he attended. Incidentally Participant 001 has since been able to engage in an anger management programme, and has recommenced the biofeedback intervention and shown further improvement. Participant 006 showed a decline in average heart coherence between the first and last session he attended. No other participants demonstrated noteworthy change from the first to last session attended.

Overall, it is possible that the intervention was insufficient in duration for participants to benefit and improve their average heart coherence and in turn HRV.

**Hypothesis 2: How does biofeedback effect self-assessed emotion regulation in ID sexual offenders?**

This study did not find a significant improvement in self-assessed emotion regulation following the biofeedback intervention. There were no significant changes in the scores on the Modified DERS scores between the three time points, however there was a gradual reduction in mean scores. There was a mean reduction of three points from pre-intervention to post-intervention. There was a mean reduction of 11 points from pre- intervention, to follow-up.

The mean total scale score on the Modified DERS for an average adult community population was 58.53 (SD=23.40) (Bardeen et al., 2016). The average score for the sample in this study was more than one standard deviation above that of the normative adult community population at times one and two. This suggests the current sample was more emotionally dysregulated than a general adult community population both before the intervention and immediately following the intervention. However, the average score for the study sample fell within one standard deviation when compared to an adult community population at time three. This suggests that whilst there was no significant change, there may have been an improvement in emotion regulation following the intervention, there was a medium effect size found suggesting a noteworthy change in score from pre-intervention to follow-up, although there was insufficient power to detect the change statistically due to the small sample size.

The slight improvement in mean score on the Modified DERS was not seen immediately following the intervention, however was observed at eight week follow-up. There are a

number of reasons that this may be the case. It may be possible that biofeedback had no impact on emotion regulation, and given the lack of improvement in HRV for most participants this may be the case. It is possible that other interventions impacted on emotion regulation. Alternatively it is possible the measure was not reliable and changes on the Modified DERS did not reflect improvements in emotion regulation.

It is possible that the biofeedback intervention did have a positive impact on self-assessed emotion regulation but the changes did not manifest until the follow-up assessment point for a number of reasons. Participants may not have changed how they respond to emotional stimuli for a long enough period of time to recognise this internal change. This would possibly impact upon the responses given to items on the Modified DERS immediately following the completion of the intervention. However, eight weeks following the completion of the intervention they would have had the opportunity to process and reflect upon the internal impact of the intervention, and have experienced some of the benefits which would be expected from improved emotion regulation.

Aldao et al. (2010) suggest self-reports on an individual's use of emotion regulation strategies could be influenced by mood. This could have impacted upon responses to the Modified DERS. It could be that those who experienced emotion dysregulation completed the measures at times when they were more dysregulated at times one and two, and at a more stable point at time three. Emotional variability and dysregulation could explain the variation observed in the scores between the three time points.

It is also important to consider the pre-intervention scores for this sample. This study operates on the premise that all participants experienced emotion dysregulation, however it is important to consider the individual scores of each participant prior to the intervention. Participant 003 scored 59, comparable to the average the community adult population

(58.53), whilst Participant 007 scored 38, almost one standard deviation below the community adult population. Therefore, little change would be expected for these participants as they would already be considered to be emotionally regulated. It is important when developing a treatment plan that individual need is taken into consideration, rather than assuming all offenders share similar needs (Ford & Rose, 2010). Ford et al. (2009) suggest using the self-regulation model as one potential method for establishing treatment need according to the specific pathway an offender is using.

Participant 006 demonstrated significant change according to the RCI, however it should be taken into consideration that he was also receiving a concurrent treatment (CAT) which may have also had an impact on his emotion regulation. Furthermore, Participant 006 demonstrated a decrease in HRV throughout the intervention suggesting that biofeedback may not have been responsible for the improvements in emotion regulation.

Furthermore, no assessment was conducted of socially desirable responding. Therefore, there is potential participants modified their responding in order to reflect improvements which were not really present. Although given the relative lack of improvement immediately following treatment it is unlikely this was the case.

**Hypothesis 3: How does biofeedback effect observed acts of aggression in ID sexual offenders?**

There were also no significant changes observed on the MOAS, suggesting there was no change in the frequency and severity of overt aggressive acts displayed by the participants during the three time periods. There was an increase in the mean weighted total score from pre-intervention to the intervention period, however the mean weighted total score decreased post-intervention. It is possible the intervention itself posed a challenge to the participants, and resulted in increased emotional challenges for each participant to cope with.

It is also worth noting the levels of aggression with the sample were very varied, with four participants demonstrating far lower levels of aggression, and four demonstrating higher levels of aggression. This suggests a range of other factors, aside from emotion dysregulation, are contributing to the display of aggressive behaviours. Although it is interesting to note that the four individuals displaying higher levels of aggression demonstrated higher scores on the Modified DERS (participants 001, 004, 005, and 006), and two of the individuals demonstrating lower levels of aggression were the two individuals whose scores on the Modified DERS were comparable to those of the community sample (participants 003 and 007).

Hypothesis 3 implies that improvements in emotion regulation will result in a reduction in aggressive behaviour. This does not account for the role of other factors in aggression such as instrumental aggression, and assumes all aggression results from emotion dysregulation. As a result it is unlikely to account for all of the variability in aggression found in participants.

**Hypothesis 4: How does biofeedback effect observed acts of sexually inappropriate behaviour in ID sexual offenders?**

There were no significant changes on the SASBA, suggesting there was no change in the frequency and severity of sexually inappropriate behaviour displayed by the participants during the three time periods. There was an increase in the mean weighted total score from pre-intervention, to the intervention period, and again post-intervention. Sakdalan and Collier (2012) also found an increase in sexually abusive behaviour during the period in which the participants were receiving treatment (DBT and CBT for sexual offenders), although following the intervention levels decreased.

There were generally relatively low levels of sexually inappropriate behaviour detected by the SASBA within this sample. There are a number of potential explanations for this. It is

possible the setting inhibited the ability, or desire, to engage in sexually inappropriate behaviour. For example, those who offended against children may not be motivated to engage in sexually inappropriate or offending behaviour in an adult inpatient setting. It is possible the SASBA is not a sufficiently sensitive measure to detect the more subtle behaviours which would be considered offence paralleling with regards to sexual offending. It is also possible staff were not attuned to the more subtle nature of sexually inappropriate behaviour when compared with the more frequent and overt aggressive behaviour displayed within the service.

The weighted total score for Participant 001 requires particular attention. He demonstrated a gradual increase in the frequency and severity of his sexually inappropriate behaviour (3.25 pre-intervention to 12.5 at follow up). No such increases were observed for any of the other seven participants, suggesting Participant 001 was an outlier, and distorted the mean weighted total score for the sample.

Given the low levels of sexually inappropriate behaviour and difficulties in measurement it was difficult to demonstrate change or significant improvement as a result of the intervention with a sample of this size.

**Strengths of the current study**

This study has shown a potential new direction in the treatment of sexual offenders, which warrants further investigation despite the non-significant findings. This study focused on a novel treatment for sexual offenders, particularly for ID sexual offenders, and therefore contributes to the literature pertaining to this offender population. Biofeedback has not previously been examined as a treatment component for this group, and this study explores an intervention which has been suggested may have utility (Gillespie et al., 2012). This study demonstrated the feasibility of this intervention with this population. However, it is important

to consider before further research or clinical practice, whether an intervention should be used solely on the basis of it being feasible to do so. The participants expressed finding the intervention useful, and more than half requested additional sessions.

This study focused on treatment of ID sexual offenders, and unlike the majority of studies identified in the systematic literature review, all of the participants had a diagnosed ID. Furthermore, the study did not just include those with a conviction for a sexual offence. Individuals with ID who commit a sexual "offence" are more likely to evade prosecution for their behaviour (Singh et al., 2011). There are a number of factors which increase the likelihood of this occurring; individuals may have their behaviour defined as challenging rather than offending (Holland et al., 2002), this increases the likelihood of them being diverted out of the CJS and into health and social care (Hayes et al., 2007). The perceived intent of the individual in the commission of an act also impacts on the likelihood of an individual with ID being prosecuted (Holland et al., 2002). Given the highlighted potential for individuals with ID to be diverted out of the CJS, it is imperative to include in the research studies all those who commit sexual acts which would be considered illegal. This should be regardless of whether an act has resulted in a conviction, in order to provide a truer reflection of current clinical practice.

Whilst this study used one self-report measure, it also utilised indirect observation measures, which potentially enhanced the reliability of the study. Furthermore, the behavioural data is routinely collected within the service, and could not be influenced by the researcher, reducing the risk for researcher bias on the findings.

There is less concern about treatment consistency than for other interventions due to the standardised nature of intervention when using a computer programme within a controlled environment.

## Limitations of the current study

There are several limitations identified with the current study. These limitations relate to a variety of factors including the sample, the measures used, and the study design.

This study does not account for the potential impact of ASD and emotion regulation, and several participants had co-morbid ASD. Studies have identified ASD as a potential risk factor in sexual offending (Heaton & Murphy, 2013; Murphy et al, 2010), although the nature of this risk factor is not currently fully understood, and warrants further consideration. Those with ASD have difficulties in a number of areas including understanding privacy norms, social behaviour, acceptable sexual behaviour, and sexual health education which may impact on risk of future offending (Hancock, Stokes, & Mesibov, 2017).

*Self-report measures*

There are some general limitations associated with the use of self-report measures with both offenders, and those with ID (Clare & Gudjonsson, 1993). Whilst attempts were made to overcome these difficulties - by using a measure with no reverse worded items, delivery via interview format, and use of a visual Likert scale – it still remains possible participants were unable to provide valid responses. For example, those with ID can display decreased accuracy when responding using a Likert scale (Finlay & Lyons, 2001).

The Modified DERS is thought to overcome some of the limitations of the original DERS scale, and would likely be more accessible to those with cognitive deficits, however there are still limitations associated with the measure. Neither the Modified DERS nor the original version have been normed with an ID population and this presents a limitation. The Modified DERS has no established test-retest reliability (Bardeen, 2017 – personal communication). This measure is a modified version of the DERS which has established test-retest reliability (Gratz & Roemer, 2004), however this does still inhibit the confidence with which the

apparent improvement in emotion regulation can be asserted. Furthermore, the results of the RCI may not be a true reflection of reliable change due to utilising the test-retest reliability from the original version of DERS, rather than the modified version utilised in this study. The Modified DERS has fewer items and different factors than the original version.

The times at which the measure was administered may have impacted the results. The Modified DERS was first administered eight weeks prior to intervention, and not administered again until immediately following the intervention. This period prior to the intervention may have been too long to demonstrate the biofeedback intervention was the factor impacting upon changes in scores on the Modified DERS. It may have been beneficial to instead administer the measure immediately prior to the intervention.

Since the commencement of the study and approval from the relevant ethics panels another measure of emotion regulation has been identified; The Regulation of Emotion Systems Survey (De France & Hollenstein, 2017). This measure is comprised of six factors; distraction, rumination, reappraisal, suppression, engagement, and arousal control. The items within the arousal control subscale focus on the slowing of heart rate and take deep breaths, and reducing physical tension. Given the focus on response modulation strategies this measure may have been a more appropriate measure in this study.

An additional limitation of note is the lack of assessment of socially desirable responding. It is possible participants were aware of the aims of the study, and adapted their responding accordingly to suggest they had made progress.

*Behavioural measures*

Behavioural measures were included in an attempt to overcome the limitations associated with reliance on self-report measures. The MOAS and the SASBA were both selected as outcome measures of behaviour (aggression and sexually inappropriate behaviour). However,

both these measures have limitations. Both measures rely on coding by a rater, whilst attempts have been made to standardise the process by which the codes are assigned, there is still potential for variability between raters. This is particularly the case when a behaviour arises which is not accounted for within the system, but would nonetheless warrant a rating; ie. "forces way into a room past a member of staff" or "pushes a door into staff". This would reduce the inter-rater reliability of the data produced, and reduce the validity of the findings. It is also possible there is some apathy in the reporting of aggressive or sexually inappropriate behaviours due to the frequency with which the care team are exposed to such behaviours. There may be variability between staff in the reporting of challenging behaviours, particularly those behaviours which may be considered less serious. This would result in an underestimation of the true prevalence of such behaviours within the sample, and the service as a whole.

The use of the MOAS in this study as an outcome measure operates on the assumption that violent and aggressive behaviour is a result of emotion dysregulation, and if emotion regulation were improved there would be a reduction in overt acts of aggression. However, this fails to take into account the potential role of instrumental aggression; the use of violence/aggression to achieve a goal without increased anger arousal (Anderson & Bushman, 2002). If instrumental aggression were a factor in aggressive acts then there would be no improvement following the intervention.

Another difficulty is the lack of consideration given to offence paralleling behaviour. It is possible behaviours of concern were still occurring but were not observed, or not captured by the recording systems embedded within the service. For example, frequent masturbation may indicate hypersexuality or sexual preoccupation, but if this behaviour were not observed or reported it would go unrated.

*Intervention*

It is possible the intervention period was too short to have had an impact on the participants involved in the study. The intervention was offered on eight occasions over a period of four weeks (twice a week), although not all participants accessed all offered sessions. Reasons for non-attendance varied; on occasion non-attendance resulted from lack of motivation and on others from risk behaviour at the time of the scheduled session prohibiting access to the intervention. Evidence suggests biofeedback can be a short-term intervention, with biofeedback studies focused on psychiatric disorders delivering between one and 28 sessions (Schoenberg & David, 2014). However, the participants all had diagnosed ID, and those with ID can require longer periods to benefit from interventions than their mainstream offender counterparts (Lindsay et al., 2011). Serran and Marshall (2006) suggest treatment should emphasise the importance of "overlearning" strategies. Furthermore, the emotion regulation strategy being taught in this intervention was likely unfamiliar to the participants, and therefore would be an effortful strategy. Gyurak et al. (2011) highlight the necessity of repetition to transform an explicit strategy to an implicit, and therefore automatic, strategy. Participants would be more likely to demonstrate benefit from a strategy which is automatic rather than effortful. Future research may wish to extend the intervention period in order to enhance the benefits experienced by participants.

Despite the standardised nature of this intervention it remains possible the presence of a facilitator had an impact on the participants. The facilitator interacted with the participant both before and after the intervention, and the impact of this was not accounted for or assessed.

The process model, and extended process model, both suggest failures in emotion regulation can occur in various stages. Individuals may fail to identify the point at which a regulatory strategy should be applied. If an individual has acquired a new strategy from the biofeedback

intervention, but continues to experience failures in identifying the point at which a strategy should be applied, then the individual will continue to experience emotion dysregulation. It may be that for an individual to derive the maximum benefit from the intervention they would need to be accessing a concurrent or subsequent treatment which teaches them to apply the intervention in the necessary situations, and to generalise the strategy being taught. Singh et al. (2011) highlighted that participants in their study were unsure how to apply the mindfulness skills in real life. Ducharme et al. (2012) delivered biofeedback alongside psychoeducation and CBT skills, and this may have assisted the participant in applying the strategy acquired through biofeedback in high risk situations. During this intervention Participant 006 was receiving CAT treatment during the research period. This may have improved his ability to apply the strategy acquired in biofeedback more effectively, alternatively it may have enhanced his ability to apply the CAT procedures.

Motivation may have an impact on the benefit an individual derives from the intervention. If a participant is not motivated to change their behaviour or to engage in intervention they would be unlikely to benefit from the biofeedback intervention.

It is important to consider the impact of the intervention on sexual offending behaviour. Due to time constraints it was not possible to do this explicitly within the scope of the current study and this presents a limitation.

Furthermore, this study outlined the potential for biofeedback as an intervention to improve participants ability to access subsequent offence related interventions, however did not evaluate whether this was in fact the case.

*Sample*

A number of limitations are present for the sample. The study recruited and evaluated a small number of participants, limiting the generalisability of the findings, and potentially impacting

upon the lack of significant findings. The study did not include a control or comparison group, therefore any changes may not have resulted from the intervention, and rather could have been a product of the environment, concurrent treatment, or a regression to the mean. The study did not assess for the risk level of each participant. It is possible that those who were higher risk responded less favourably to the intervention as a result of their level of risk. Finally, the pre-intervention scores on the Modified DERS for two of the participants were within one standard deviation of the average score for the community sample, indicating they were not reporting any difficulties with emotion regulation prior to the intervention. These two participants demonstrated very little change in their scores at the three assessment points. On reflection these two participants could have been excluded from the intervention, given that they had no emotion regulation needs to address according to psychometric assessment. However, at the point of first assessment it was unclear if they were simply more regulated when completing the measure, or were generally well regulated. This will require further consideration in future research.

*Theory*

Theories pertaining to emotion regulation have been rapidly developing since the mid-1990's (Gross, 2015), however there is still much to be understood about the exact nature of emotion dysregulation, and the field as a whole is described as being in its "infancy" (Aldao, 2013 pg.156). The role of mindfulness, and other such interventions, in relation to emotion regulation are not fully understood. Whilst it is recognised that mindfulness based practices can result in improvements in emotion regulation, the mechanism by which this occurs are not fully understood (Aldao et al., 2010; Farb, Anderson, Irving, & Segal, 2014; Gross, 2015).

A further limitation within this field of study is that most often research has been conducted with healthy participants, despite the acknowledgement that disruptions to emotion regulation

strategies are implicated in a variety of psychological disorders (Aldao, 2013). This limits our understanding of emotion regulation, and in turn, emotion dysregulation in populations where this may be identified as a treatment need.

## Conclusion

This study examined a novel treatment for sexual offenders, specifically those with ID, and examined the feasibility and impact of biofeedback in improving emotion regulation. The results did not reveal any significant improvements following the biofeedback intervention. However, more than half of the participants stated they would be interested in completing more biofeedback sessions in the future, and explained the benefits they had experienced as a result of the intervention such as "it helped me in seclusion to do deep breathing and problem solve", and "it helps me a lot to stay focused on achieving goals".

Whilst this study did not produce significant results, it did demonstrate the feasibility of this intervention with this offender population. There are a number of factors which may have impacted upon the non-significant results produced; the duration of the intervention, the small sample size, the lack of a control or comparator group, the nature of the sample (all ID sexual offenders), and the measures used to assess the outcome of the intervention.

The study addressed specific recommendations to explore interventions focused on improving emotion regulation with a sexual offender population (Day, 2009; Gillespie et al., 2012).

## Implications for practice

The current study suggests biofeedback has the potential to be of benefit to ID sexual offenders, although consideration would need to be given to the needs of individual before the intervention was offered, and to the types of concurrent treatment needed to maximize benefit from the biofeedback intervention. Consideration should be given to how the

intervention will be generalised by the individual, for example pairing the intervention with a visual stimuli which can be carried by the participant as a reminder to use the strategy. Alternatively it may be necessary to pair the intervention with a more cognitive focused intervention such as an anger management group programme to directly teach participants how and when to apply the strategy.

There were some non-significant improvements in self-assessed emotion regulation following the intervention, although these should be considered with due caution. Biofeedback is an easily accessible intervention, which was not resource intensive in the commission of this research. The biofeedback used in this procedure is a visual intervention which appeared to be an important factor for some of the participants. Mindfulness can be considered an abstract concept, biofeedback may have been able to transform this concept into something more concrete. The intervention was received well by the participants, with more than half requesting additional sessions. Participants responded well to the immediate feedback element of the intervention, and this appeared to be a motivating factor for some of those involved.

**Recommendations for future research**

There are a number of factors researchers may wish to consider when exploring biofeedback as an intervention for ID sexual offenders in the future. Firstly, there continued to be issues of validity and reliability with the psychometric assessment of emotion regulation. There was a lack of test-retest reliability for the Modified DERS. It would be beneficial for this to be established before any further research is conducted using this measure as an outcome. Whilst consideration was given to the accessibility of the Modified DERS with this population, there was no established validity of the measure with an ID population, nor was a normative sample available in relation to this population. Alternatively The Regulation of Emotion

Systems Survey could be explored further as a potential outcome measure when evaluating biofeedback interventions.

Future research should consider exploring the impact of biofeedback on mainstream sexual offenders, not just those with ID. Future research should examine the intervention with a larger sample size, and should include a control group with which to compare the sample receiving the intervention. It may also be beneficial to deliver the intervention for a longer period of time, or conduct a comparative study in which two samples receive the intervention in different intensities or for different durations. This would allow for the establishment of ideal treatment length with this population. It would also be of use to observe overt aggressive and sexually inappropriate behaviours for longer periods, both before and after the intervention. This would allow for a more accurate assessment of the impact of the intervention.

Future research should also consider the process through which the strategy is taught and applied. It would be beneficial to consider concurrent treatments which would support the generalisation of the strategy. It would be worthwhile to explore whether the strategy is best applied by itself or in conjunction with other interventions. It may be beneficial to give consideration to the self-regulation model when selecting offenders who may benefit from this intervention. Offenders within the approach-automatic pathway have been thought to potentially benefit from interventions which encourage critical thinking regarding the consequences for their actions and which also focus on learning to manage their emotions (Keeling & Rose, 2012).

It may be worthwhile for future research to consider which, if any, interventions would be suitable concurrent or subsequent treatments to support the generalisation of strategies acquired within the biofeedback intervention.

It would be beneficial for future research to consider the impact of the intervention on sexual offending behaviour. Furthermore, it would be beneficial to assess the extent to which biofeedback enhances an individuals' ability to access and benefit from subsequent offence related interventions.

# Chapter Five

## Discussion

This chapter provides a summary of the work covered within this thesis, including a review of the main findings. Recommendations for future research and implications for clinical practice are outlined.

### *Overall aims of the thesis*

The assessment and treatment of ID sexual offenders continues to be an evolving field. It is beneficial to give consideration to the progress to date, and to potential future directions for the field. This thesis aimed to provide an overview of the treatment evaluated within published literature, a critique of a psychometric assessment developed specifically for this offender population, and evaluated a novel treatment for this population, targeting a specific criminogenic need – emotion regulation.

### *Summary of findings*

Chapter one outlined the reasons it is necessary to consider ID sexual offenders as a distinct and separate population from mainstream sexual offenders. Adults with ID who sexually offend cannot be assessed and treated in the same way as their mainstream offender counterparts. Assessments designed for the mainstream offender population are often inaccessible due to complexity of the language used, the presence of reverse worded items, and the lack of normative samples with those with ID (Clare & Gudjonsson, 1993; Finlay & Lyons, 2002; van Sonderen et al., 2013). Treatment programmes designed for the general sexual offender population are not appropriate for an ID sexual offender population as these programmes fail to take into consideration responsivity issues specific to ID offenders (Clare, 1993; McKenzie et al., 1997; Wilcox, 2004). According to the RNR principles, in particular the responsivity principle, it is imperative that treatment takes into consideration general

responsivity issues (the type of intervention used, i.e. cognitive social learning interventions are the most effective). It also highlights the importance of identifying specific responsivity issues which involves taking biological, psychological, and social factors into consideration (Bonta & Andrews, 2007). The presence of ID is a pertinent responsivity issue to be addressed in delivering effective treatment to this offender sub-population.

This chapter also considered the prevalence rates of sexual offenders with ID. It is important to consider the prevalence of offending to understand the breadth of the problem. The exact prevalence of those with ID amongst the sexual offender population is unclear, however those with ID do undoubtedly sexually offend. Offenders with ID are distinct from the mainstream sexual offender population due to the responsivity issues therefore there is a need to explore treatment and assessments developed specifically for ID sexual offenders (Simpson & Hogg 2001b).

Chapter two examined the literature relating to the treatment of ID sexual offenders. This review provided an update on the current position of treatment from the last review (Courtney & Rose, 2004), and identified future treatment directions. The previous review found this area of study was still developing, and was yet to establish a solid research base. The current review found only 15 new studies evaluating the treatment of ID sexual offenders. The majority of the identified studies evaluated CBT interventions (Craig et al., 2006; Craig et al., 2012; Heaton & Murphy, 2013; Keeling et al., 2006; 2007b; Murphy et al., 2007; Murphy et al., 2010; Newton et al., 2011; Rose et al., 2012; Williams et al., 2007), however did begin to examine new treatment directions including DBT (Sakdalan & Collier, 2012) and mindfulness (Singh et al., 2011). All studies showed some degree of promise for the intervention being examined.

The systematic literature review highlighted a number of difficulties with the research relating to this offender sub-population. The identified studies suffered from methodological limitations including; small sample sizes, lack of control or comparison groups, short follow-up periods of sexually offending/abusive behaviour, not all participants had a diagnosed ID, lack of standardised and therefore repeatable treatment programmes, and lack of consideration to, or identification of, concurrent treatment. Additionally, there continues to be a lack of randomised controlled trial (RCT) studies in this area which presents a significant weakness.

The ideal treatment length/intensity is yet to be ascertained; Lindsay et al. (2011) suggested a far longer length of treatment was necessary in order for participants to benefit from the intervention, however there is no specific research on ideal treatment length.

The impact of staff support was often not considered, operationalised, or examined. This presents a significant weakness, particularly in relation to the treatment of ID sexual offenders. Those with ID are often supported throughout treatment, and beyond the end of intervention by specialist staff (Lindsay, 2009b). Rea et al. (2014) gave specific consideration to the impact of support from others on skill generalisation of relapse prevention plans, comparing how individuals behaved when treatment staff were supporting a community outing compared with when an adult unknown to the individual was supporting. However, in the available studies the role of staff support in skill generalisation was rarely considered, and warrants further examination.

A further difficulty arose from the psychometric assessments used to evaluate the treatment identified within this review. There are very few measures from which to choose. This makes evaluating treatment with this offender sub-population difficult. The psychometric measures used in the identified studies were either adapted versions of measures developed for the

mainstream offender population, or were measures developed specifically for ID sexual offenders. Those measures which were adapted for use with ID offenders may not have been valid or reliable for use with this sub-population, and lacked a relative normative sample. Even those measures which had been specifically developed for use with offenders with ID (QACSO, SAK, ASK) were not without issues relating to the normative samples, reliability, and validity. Concerns were also raised about the relevance of measures to the risk factors which should be targeted within treatment, for example most research examined sexual education using the SAK, despite a lack of evidence that poor sexual education is a dynamic risk factor for ID sexual offenders (Michie et al., 2006; Talbot & Langdon, 2006).

Chapter three examined the psychometric properties of the QACSO (Lindsay et al., 2004; 2007b). The QACSO is a measure of cognitive distortions relating to sexual offending. The QACSO was the most commonly used measure in the research identified in the systematic literature review. It is one of few measures developed specifically for ID sexual offenders. It is important to examine the psychometric properties of this measure given the reliance on it to evaluate the limited available research.

The QACSO was found to have a number of strengths and limitations. The QACSO was specifically developed for ID sexual offenders, and there were a number of strengths identified relating to the accessibility of the measure. The measure is administered as an interview. Reading the scale to respondents overcomes reading difficulties commonly found with individuals with ID. Administering the measure in this way also allows for the assessment of basic sexual knowledge prior to administration of the subscales, enabling the administrator to ensure the respondent would be able to understand the scale items (Lindsay et al., 2004). However, the interview format may increase the risk of socially desirable responding due to the presence of an administrator at the time of responding. The response scale did not utilise a Likert scale, overcoming a potential barrier for this population (Finlay

& Lyons, 2001). However, when using yes/no responses there is an increased risk of acquiescence (Finlay & Lyons, 2002). When using the measure clinically there is the option to include a "don't know" response, reducing the risk of acquiescing (Finlay & Lyons, 2002), however this option is not available when using the tool for research purposes.

The measure had good face validity. The majority of the scales were found to have good content validity, particularly the scales related to rape and attitudes to women, and offences against children (Lindsay et al., 2006a; 2011). The measure was generally considered to have good construct validity. Sexual offenders with ID who had not received treatment scored higher on the measure than offenders who had received treatment, and non-offenders, suggesting the measure was assessing a construct present in untreated ID sexual offenders (Langdon & Talbot, 2006; Lindsay et al., 2007b). However, there are concerns about the construct validity of the homosexual assault scale (Lindsay et al., 2007b). It was suggested the scale may instead reflect homophobic attitudes (Lindsay et al., 2007b). Concerns have also been raised that the homosexual assault scale fails to account for sexual orientation (Langdon & Murphy, 2010). Most of the scales showed good internal reliability (Broxholme & Lindsay, 2003; Lindsay et al., 2004; 2007b; Szlachcic et al., 2015), however there have been conflicting findings about the internal reliability of the scales (Lindsay et al., 2004; 2007b; Szlachcic et al., 2015). Most of the scales showed acceptable test-retest reliability (Broxholme & Lindsay, 2003; Lindsay et al., 2007b). However, the concurrent validity of the measure has not been examined, despite a potentially suitable tool being in existence (SOSAS). Furthermore, the normative samples are relatively small.

A significant limitation is the uncertainty about which version of the tool is being used in research. Different research papers relating to the QACSO refer to the measure containing 60, 63, 92, 107, and 108 items (Broxholme & Lindsay, 2003; Heaton & Murphy, 2013; Lindsay et al., 2004; 2007b; Murphy et al., 2007; Szlachcic et al., 2015). This variation in the number

of items is not insignificant, and undermines the certainty with which findings from the available research can be concluded.

Chapter four presented an empirical study of a novel treatment with ID sexual offenders. The study examined the impact of biofeedback in improving emotion regulation in ID sexual offenders. Emotion regulation has been linked theoretically to sexual offending/reoffending (Keeling et al., 2009; Thakker & Ward, 2012; Ward & Beech, 2006; Ward et al., 2006), and identified as a treatment need worthy of consideration (Blagden et al., 2017; Day, 2009; Gillespie et al., 2012; Serran, 2017; Zaremba & Keiley, 2011). Mindfulness, and in turn biofeedback, have been identified as interventions potentially of benefit in improving emotion regulation (Gillespie et al., 2012; Gross, 2015). This study delivered a heart rate variability (HRV) biofeedback intervention to eight ID sexual offenders in eight regular sessions over four weeks. There was no significant effect of treatment on average heart coherence (a measure of HRV), the Modified DERS (a self-report measure of emotion regulation), the MOAS (a behavioural measure of overt aggression), or the SASBA (a behavioural measure of inappropriate sexual behaviour). There were no significant improvements. Overall there was a gradual non-significant improvement observed in the group mean score on the Modified DERS. At this time it is not possible to conclude that biofeedback improves emotion regulation. However, this was intended in part as a feasibility study, and has demonstrated the possibility of using this intervention with this offender population in a practice setting. This study has highlighted a potential avenue to explore with regards to the treatment of ID sexual offenders and sexual offenders more widely. The study itself had several methodological limitations, which, if they were to be overcome, may increase the potential of determining if this is an effective treatment.

This study was subject to many of the same problems as the research studies identified within the systematic literature review. The study included only eight participants – a small sample

size, lacked a control/comparison group, used convenience sampling, and all participants were receiving varying concurrent treatments, the impact of which is unknown.

This study also experienced difficulties with regards to the outcome measures used. The Modified DERS is a relatively new measure, and little work has been done regarding reliability and validity, other than by the authors themselves. Whilst the measure overcame some of the methodological issues associated with the original version, and had incidentally increased accessibility for those with ID, it was not without flaw. The measure was not normed with an ID population. The measure lacked test-retest reliability, undermining the confidence of any findings, particularly in a pre-post study design. Since the commencement of the study an alternative measure of emotion regulation has been identified (The Regulation of Emotion Systems Survey; De France & Hollenstein, 2017), which may be have been a more appropriate measure in this study. The study did not include a measure of socially desirable responding. There is potential that participants were "faking good", distorting the outcomes of the Modified DERS. The measures relating to observation of aggressive or sexually inappropriate behaviour prevented a reliance on self-report measures. However, there were potential difficulties with these measures due to apathy in reporting observed behaviours, problems with coding behaviour, lack of monitoring of offence paralleling behaviour, and the lack of attention given to the role of instrumental aggression.

There are also potential ways in which the efficacy of the intervention could be improved. It is possible the intervention period was too short to have had an impact on emotion regulation, particularly when considering the duration of time over which the pattern of emotion dysregulation had developed. Furthermore, no consideration was given to generalisation of the strategy being taught during the intervention. It may be necessary to provide specific teaching around when to use the strategy, including the types of situations which may arise, and the point at which the strategy would be most beneficial. Emotion dysregulation can

result from failures at different stages of the emotion regulation process, and the application of the biofeedback intervention in this research study failed to take this into account.

Finally, a limitation arises from the theoretical base pertaining to emotion regulation itself. Emotion regulation as a field is rapidly expanding, however emotion regulation theorists indicate our understanding of emotion regulation continues to be in its infancy (Aldao, 2013). This limits researchers' ability to explore emotion regulation as a risk factor for sexual offending and as a potential treatment need.

This study highlighted the difficulties in conducting research in clinical settings with offenders with ID. The ethics committee stated the research could not include those lacking capacity. This restricted the sample size, but more significantly as a clinician there is still an expectation that individuals lacking capacity receive effective treatments. It is not possible to ascertain if this treatment would be effective for those lacking capacity when they are restricted from the research. Assessment of capacity in this study related to the ability to consent to treatment in the context of research, rather than the ability to access and benefit from the treatment.

**Conclusions and Recommendations**

This thesis focused primarily on the treatment of ID sexual offenders, however also gave consideration to the assessment of the offender population, and how the available psychometric measures impact on treatment findings.

Overall, this thesis concludes there has been progress with regards to the assessment and treatment of ID sexual offenders as a specific offender population, and highlights areas in which further progress could potentially be made.

The empirical study within this thesis examines a novel treatment for sexual offenders, and ID sexual offenders. The study did not produce any significant findings, and there were

mixed outcomes on an individual basis. The study demonstrated the feasibility of this type of intervention with this offender population, and highlighted a future research direction.

*Implications for Practice*

The findings from this thesis with regards to the assessment and treatment of ID sexual offenders have implications for researchers and clinicians working in the field. The assessment of sexual offenders should be approached cautiously, particularly in research. The available psychometric measures often present difficulties with regards to reliability and validity, and in most instances lack an appropriate normative sample. Psychometric assessments, particularly those developed specifically for ID offenders, have a significant role to play in research, however appropriate caution should be observed when interpreting outcomes from treatment studies. Psychometric assessments contribute to developing our understanding of individuals in this sub-population, however in clinical practice these measures should be incorporated within a clinical formulation, rather than interpreted and reported in isolation.

The systematic review identified interventions of utility with this offender population. CBT was the primary intervention type identified, however the importance of adapting these interventions was highlighted in all the studies. Clinicians identifying appropriate treatment when working with ID sexual offenders should consider the importance of the adaptations made to the intervention. Almost all of the interventions examined in this review delivered treatment in a group setting, therefore the impact the group structure may have had on the success of the intervention should be considered when implementing interventions. Treatment may not have the same efficacy if delivered on an individual basis.

The current study examined a novel treatment with ID sexual offenders, addressing recommendations that treatment should not remain focused on cognition, and instead should

begin to focus on the role of emotion in offending (Gannon & Ward, 2017). This study demonstrated biofeedback is a feasible intervention for ID sexual offenders in a practice setting. Biofeedback as an intervention would not necessarily constitute the bulk of any intervention package, however may have a role to play in improving emotion regulation. This may be to address emotion regulation as a specific treatment need relating to sexual offending, or as an intervention to improve emotion regulation sufficiently to enable an offender to access other relevant interventions. It may be necessary to pair this intervention with other interventions to optimise its utility.

*Recommendations for future research*

There have been a number of areas for future research identified during the course of this thesis. There continues to be uncertainty about the prevalence of sexual offending by individuals with ID, and this remains an outstanding area to address. Future research directions were identified from the systematic literature review. The evaluation of treatment for ID sexual offenders could be improved. It would be beneficial to evaluate treatment using an RCT, particularly CBT group interventions as this is the treatment model most often adopted. This is particularly pertinent given the recent evaluation of sexual offender CBT treatment programmes in prison which suggested that those who were treated recidivated at a greater rate than those who were not (Mews et al., 2017). Evaluating treatment using an RCT would address several methodological issues identified in the systematic literature review, including small sample size, lack of control group, and concurrent treatments. It would also be beneficial for researchers to examine the impact of staff support within the group setting, the impact of concurrent interventions, and the ability of the interventions to reduce recidivism with this offender population. Establishing the optimum treatment length/intensity with ID sexual offenders would be of worth, given the variance in the length of the treatments available.

It would be beneficial to improve the psychometric measures available to assess the dynamic risk factors, specifically with ID sexual offenders. This would improve the confidence researchers and clinicians have in treatment and research findings.

Future research into the effectiveness of biofeedback as an intervention should address the limitations outlined in the thesis. This includes repeating the intervention with a larger sample size, including a control group, and delivering the intervention for a longer period. Lindsay et al. (2011) suggest delivering treatment over a longer period, rather than a shorter more intense period, is preferable for adults with ID who sexually offend. For example, it may be beneficial to deliver eight weekly sessions, rather than twice weekly sessions. Further work should also be done to establish the test-retest reliability of the Modified DERS, and to establish the validity of this - or another emotion regulation measure - with an ID population.

It is important to remain realistic about the limitations of biofeedback in improving emotion regulation. Recognising the limitations will allow for more lateral thinking about the way in which biofeedback can improve emotion regulation. For example, this intervention does not address the cognitive elements of emotion regulation (reappraisal/problem solving). Biofeedback may increase the ability an individual has to access more cognitive strategies, although this is conjecture and is not currently supported by empirical research. This would also encourage consideration being given to the application and generalisation of the strategy being taught in the biofeedback intervention, and which, if any, concurrent interventions would support the application of the strategy. For example, it may be a complimentary strategy to teach concurrently with a DBT based intervention or an anger management programme. Particularly given the emphasis in both these interventions on controlled breathing and mindfulness (Linehan, 2015; Naeem, Clarke, & Kingdom, 2009).

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**Appendix 1**

**Inclusion Criteria**

First Author:

Title:

Journal:

Date:

1. Population

| | Yes | Unclear | No (Exclude) | Comments |
|---|---|---|---|---|
| Do the participants have a learning disability? | | | | |
| Are the participants aged 18 and above? | | | | |
| Are the participants male? | | | | |

2. Intervention

| | Yes | Unclear | No (Exclude) | Comments |
|---|---|---|---|---|
| Does the treatment focus on sex offenders? | | | | |

3. Comparator

| | Yes | Unclear | No | Comments |
|---|---|---|---|---|
| Is there a control or comparative group present? | | | | |
| Are pre-and post-outcome measures examined? | | | | |

4. Outcome

| | Yes | Unclear | No (Exclude) | Comments |
|---|---|---|---|---|
| Does the study produce quantitative data relevant to sexual offending treatment needs? (ie. psychometric measures) | | | | |

5. Other

| | Yes | Unclear | No | Comments |
|---|---|---|---|---|
| Is the study after 2002? | | | (Exclude) | |
| Is the study already examined in Courtney and Rose (2004)? | (Exclude) | | | |
| Is the study in English? | | | (Exclude) | |

**Appendix 2**

**Quality Assessment for Quasi-Experimental Studies**

A quality assessment was adapted specific to the topic of the current review. The quality assessment was adapted from existing quality assessments for quantitative studies that are not RCT's (Critical Appraisal Skills Programme, 2013; Law et al., 1998; Long, Godfrey, Randall, Brettle & Grant, 2002).

| **Author:**<br>**Year:**<br>**Article Title:**<br>**Source:** | | |
|---|---|---|
| **Question** | **Main Information** | **Additional Comments** |
| Are the aims/ purpose of the study clearly identified? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0) | |
| What is the design on the study? | ☐ RCT<br>☐ Cohort (group of sex offenders followed over time with control group. The allocation of controls is not done by the investigator)<br>☐ Single Case Design (One client or a group over time)<br>☐ Before-After Design (Group assessed before and after treatment) | |
| **<u>Participants</u>** | | |
| Is the sample size justified and appropriate for the aims of the study? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |

| | | |
|---|---|---|
| Is the sample described in detail, including demographic details? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Is there a comparison group? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| If there is a comparison group, is it comparable to the treatment group with regard to participant characteristics? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Are all confounding factors identified? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| **Ethics** | | |
| Was ethical approval sought and granted? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Have ethical issues been adequately addressed? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |

| **Biases** | | |
|---|---|---|
| **Sample Bias** | | |
| Did the participants volunteer for treatment, or were they legally mandated to attend? | ☐ Voluntary attendance (2)<br>☐ Legally mandated (1)<br>☐ Other | |
| **Measurement Bias** | | |
| How many outcome measures were used? | | |
| Is it possible for investigators to have influenced outcomes? | ☐ Yes (0)<br>☐ Partially (1)<br>☐ No (2)<br>☐ Don't Know (0) | |
| Do all outcome measures rely on self-report? | ☐ Yes (0)<br>☐ Partially (1)<br>☐ No (2)<br>☐ Don't Know (0) | |
| **Intervention Bias** | | |
| Was each intervention carried out the same for all participants? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Was inter-rater reliability of intervention delivery identified and explained? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Did participants receive other treatment at the same time as receiving the examined intervention? | ☐ Yes (0)<br>☐ Partially (1)<br>☐ No (2)<br>☐ Don't Know (0) | |

| | | |
|---|---|---|
| How long was the intervention? (Could it have been too short to have had an impact?) | | |
| **Attrition Bias** | | |
| Is follow up reported? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Was the whole sample followed up at all time intervals? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Were drop-outs reported and accounted for in analysis? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| **<u>Outcomes</u>** | | |
| Were outcome measures conducted before and after treatment and at all follow ups? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Were the outcome measures relevant to the aims? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Are assessment measures standardised? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |

| | | |
|---|---|---|
| Are assessment measures reliable with learning disability clients? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Are assessment measures valid for learning disability clients? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| **Interventions** | | |
| Are all intervention conditions clearly described? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| **Results** | | |
| Can the results be applied to the relevant population (learning disabled sexual offenders)? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Are the results reported in terms of statistical significance? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |
| Is the method of statistical analysis appropriate? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |

| | | |
|---|---|---|
| Is the clinical relevance of the findings explained? | ☐ Yes (2)<br>☐ Partially (1)<br>☐ No (0)<br>☐ Don't Know (0) | |

Maximum Score of 54

The following quality assessment is proposed

| **Quality Score (Percentage)** | **Methodological Quality** | **Risk of Bias Rating** |
|---|---|---|
| 38 – 54 (approximately 70%-100%) | Strong Methodological Quality | Low risk of bias |
| 21 – 37 (approximately 40% - 70%) | Intermediate Methodological Quality | Moderate risk of bias |
| 0 – 20 (approximately 0% to 40%) | Weak Methodological Quality | High risk of bias |

Lees-Warley (2014) used similar percentage cut-offs in their methodological quality scores and risk of bias ratings.

**Appendix 3**

**Data Extraction Form**

Date of Data Extraction:

Author:

Date:

Article Title:

Source (Volume, Pages):

| | |
|---|---|
| | **Population Characteristics** |
| Sample size | |
| Average IQ | |
| Average age | |
| Gender of participants | |
| | **Methodological Characteristics** |
| Study design | |
| Recruitment procedures | |
| | **Intervention Method** |
| Details of intervention | |
| Details of comparative condition | |
| Intervention duration | |
| | **Measurement of outcomes** |
| Outcome measures used | |
| Validity and reliability of outcome measures with a learning disability participant group | |
| Dropout rates and reasons | |

| | |
|---|---|
| Time intervals of measurement | |
| Length of follow up | |
| | **Analysis** |
| Method of statistical analysis | |
| Magnitude and direction of results | |
| | **Conclusions** |
| Strengths | |
| Limitations | |

## Appendix 4

## Quality assessments

| | Craig et al. (2006) | Craig et al. (2012) | Heaton & Murphy (2013) | Keeling et al. (2006) | Keeling et al. (2007b) | Lindsay et al. (2011) | Michie & Lindsay (2012) | Murphy et al. (2007) | Murphy et al. (2010) | Newton et al. (2011) | Rea et al. (2014) | Rose et al. (2012) | Sakdalan & Collier (2012) | Singh et al. (2011) | Williams et al. (2007) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Clear description of aims** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **Sample size appropriate for aims of study and justified** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| **Sample described in detail, including demographic details** | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 |
| **Presence of a comparison group** | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Comparison group comparable to treatment group** | N/A | N/A | N/A | N/A | 1 | 2 | 1 | N/A | N/A | 1 | N/A | N/A | N/A | N/A | N/A |
| **Confounding factors identified** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Ethical approval sought and granted** | D/K | D/K | 2 | D/K | 2 | D/K | D/K | D/K | 2 | D/K | 2 | D/K | 0 | D/K | D/K |
| **Ethical issues adequately addressed** | D/K | D/K | 2 | D/K | 2 | D/K | D/K | 2 | 2 | D/K | 2 | D/K | 1 | D/K | D/K |
| **Recruitment of participants** | D/K | 1 | 1 | 1 | 1 | D/K | D/K | 2 | 2 | 2 | D/K | 2 | Unclear | D/K | D/K |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Investigators influence on outcomes** | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | 2 | D/K | D/K | D/K | D/K |
| **Outcome measures rely on self report** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 |
| **Consistency of delivery of intervention** | 2 | 2 | 2 | 2 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 |
| **Inter-rater reliability of intervention delivery** | D/K | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Participants receiving only intervention being examined** | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | D/K | 0 | D/K | D/K |
| **Reporting of follow-up** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | D/K | 1 | 2 | 2 | 2 |
| **Follow up of whole sample** | 2 | 0 | 1 | 1 | 2 | 2 | 0 | 2 | 1 | 0 | 2 | 1 | 2 | 2 | 0 |
| **Reporting and accounting of drop-outs in analysis** | 2 | D/K | D/K | 0 | 2 | D/K | D/K | 1 | 0 | 1 | N/A | 0 | 2 | 2 | 0 |
| **Outcome measures conducted before and after treatment and at all follow ups** | 2 | 1 | 2 | 2 | 2 | 2 | D/K | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **Outcome measures relevant to aims** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Assessment measures standardised** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 2 |
| **Assessment measures reliable with LD clients** | 1 | 2 | 2 | 1 | 1 | 2 | D/K | 2 | 2 | 1 | D/K | 1 | 2 | D/K | 1 |
| **Assessment measures valid with LD clients** | 1 | 2 | 2 | 1 | 1 | 2 | D/K | 2 | 2 | 1 | 2 | 1 | 2 | D/K | 1 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Intervention clearly described** | 1 | 2 | 2 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 2 |
| **Results applicable to LD sexual offenders** | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Results reported with regards to statistical significance** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 0 | 0 | 2 |
| **Method of statistical analysis appropriate** | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 |
| **Clinical relevance of the findings explained** | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| ***Risk of Bias Score out of 54*** | 34 | 29 | 35 | 27 | 32 | 31 | 25 | 33 | 37 | 24 | 28 | 26 | 29 | 22 | 30 |
| ***%*** | 63% | 54% | 65% | 50% | 59% | 57% | 46% | 61% | 69% | 44% | 52% | 48% | 54% | 41% | 56% |

**Appendix 5**

**Number of items, and number of knowledge assessment questions (Lindsay et al., 2004).**

| **Scale** | **Items** | **Knowledge assessment questions** |
|---|---|---|
| Rape and attitudes to women | 25 | 1 |
| Voyeurism | 10 | 0 |
| Exhibitionism | 11 | 1 |
| Stalking and sexual harassment | 16 | 0 |
| Dating abuse | 10 | 0 |
| Homosexual assault | 12 | 2 |
| Offences against children | 18 | 3 |
| Social desirability | 5 | 0 |

**Appendix 6**

**Distribution of 'A', 'B', and 'C' items for each scale (Lindsay et al., 2004).**

| **Scale** | **'A' items** | **'B' items** | **'C' items** | **Total items** |
|---|---|---|---|---|
| Rape and attitudes to women | 11 | 6 | 8 | 25 |
| Voyeurism | 8 | 1 | 1 | 10 |
| Exhibitionism | 5 | 4 | 2 | 11 |
| Stalking and sexual harassment | 10 | 6 | 0 | 16 |
| Dating abuse | 8 | 1 | 1 | 10 |
| Homosexual assault | 5 | 3 | 4 | 12 |
| Offences against children | 12 | 3 | 3 | 18 |
| Social desirability | N/A | N/A | N/A | 5 |

**Appendix 7**

**α values of final items by subscale (Lindsay et al., 2004; Lindsay et al., 2007b).**

| **QACSO Subscale** | **α value of final scale items** |
|---|---|
| Rape and attitudes to women | 0.83 |
| Dating abuse | 0.86 |
| Voyeurism | 0.82 |
| Exhibitionism | 0.82 |
| Stalking | 0.79 |
| Homosexual assault | 0.68 |
| Offences against children | 0.86 |

## Appendix 8

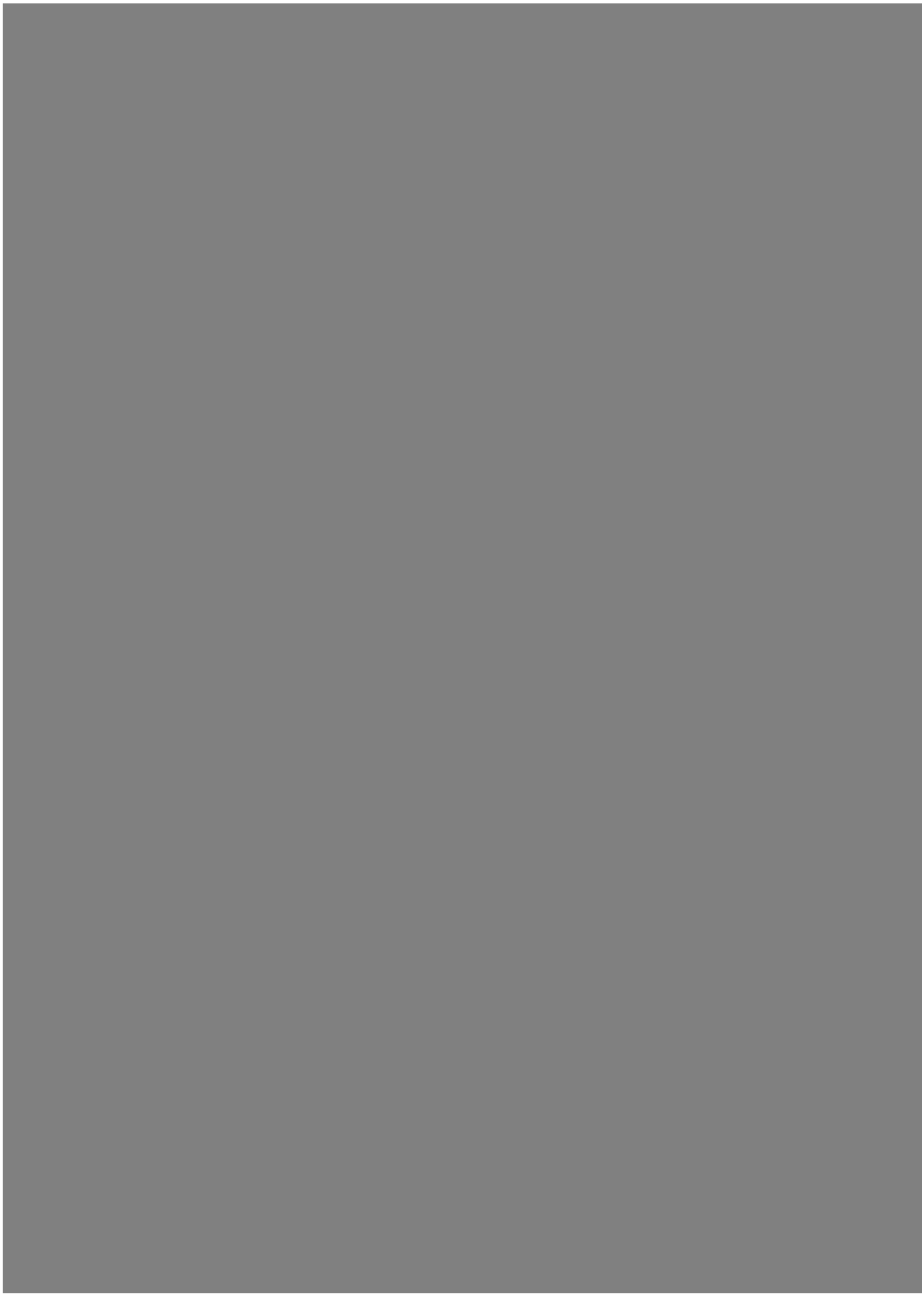
**α values of final items by subscale (Szlachcic et al., 2015).**

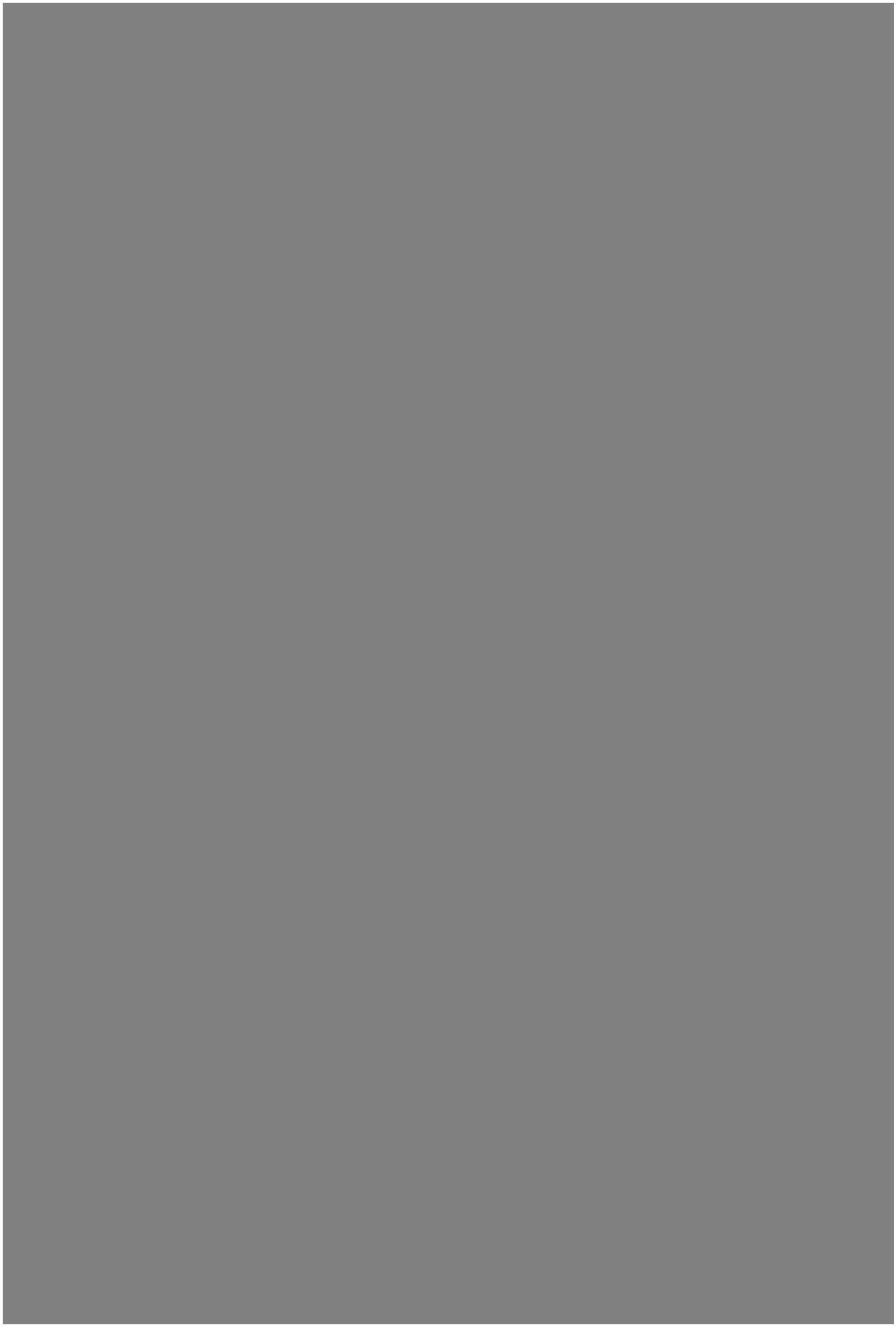
| **QACSO Subscale** | **α value of final scale items** |
|---|---|
| Rape and attitudes to women | 0.80 |
| Dating abuse | 0.62 |
| Voyeurism | 0.73 |
| Exhibitionism | 0.69 |
| Stalking | 0.79 |
| Homosexual assault | 0.21 |
| Offences against children | 0.80 |
| Social desirability | 0.32 |

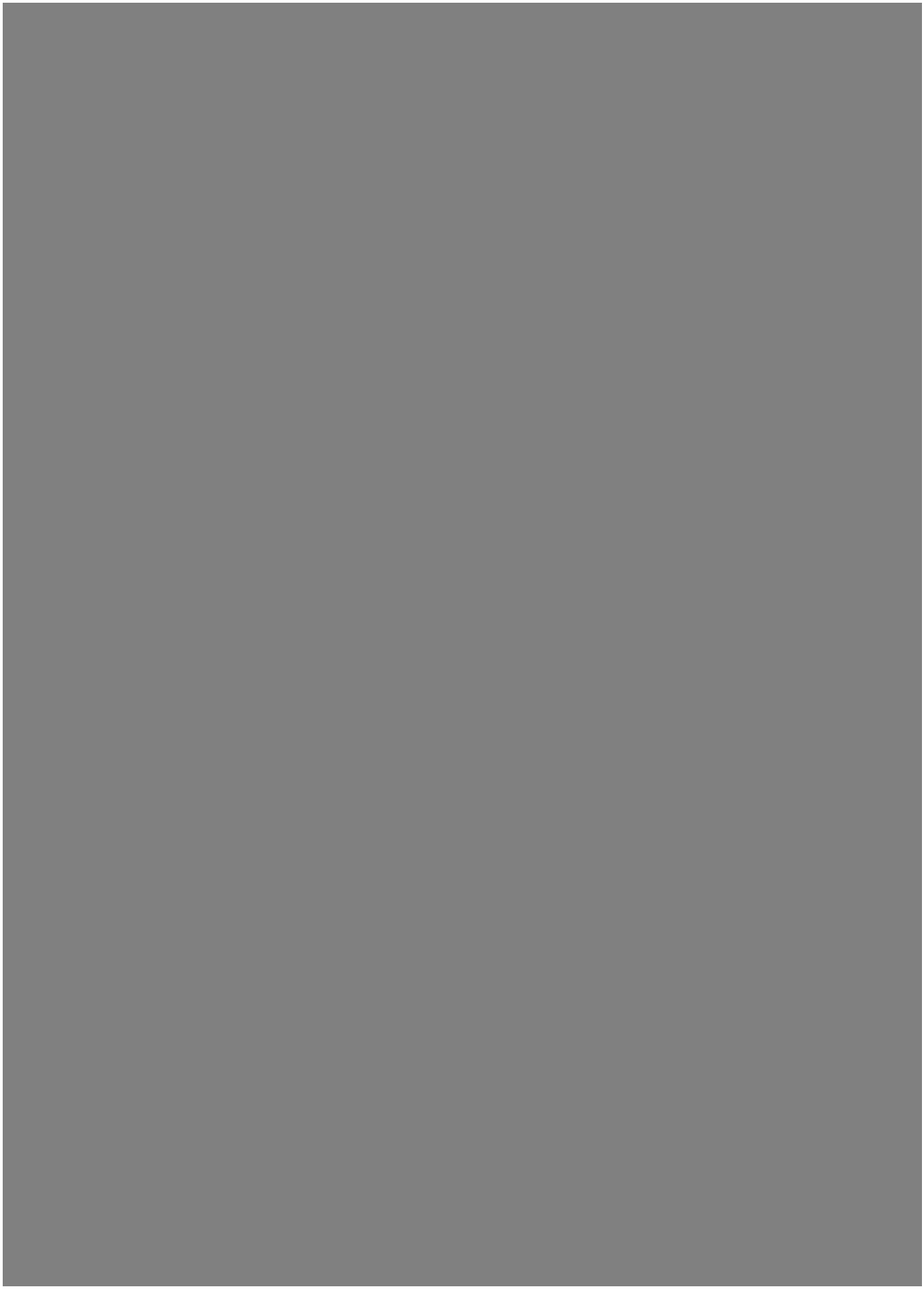
**Appendix 9**

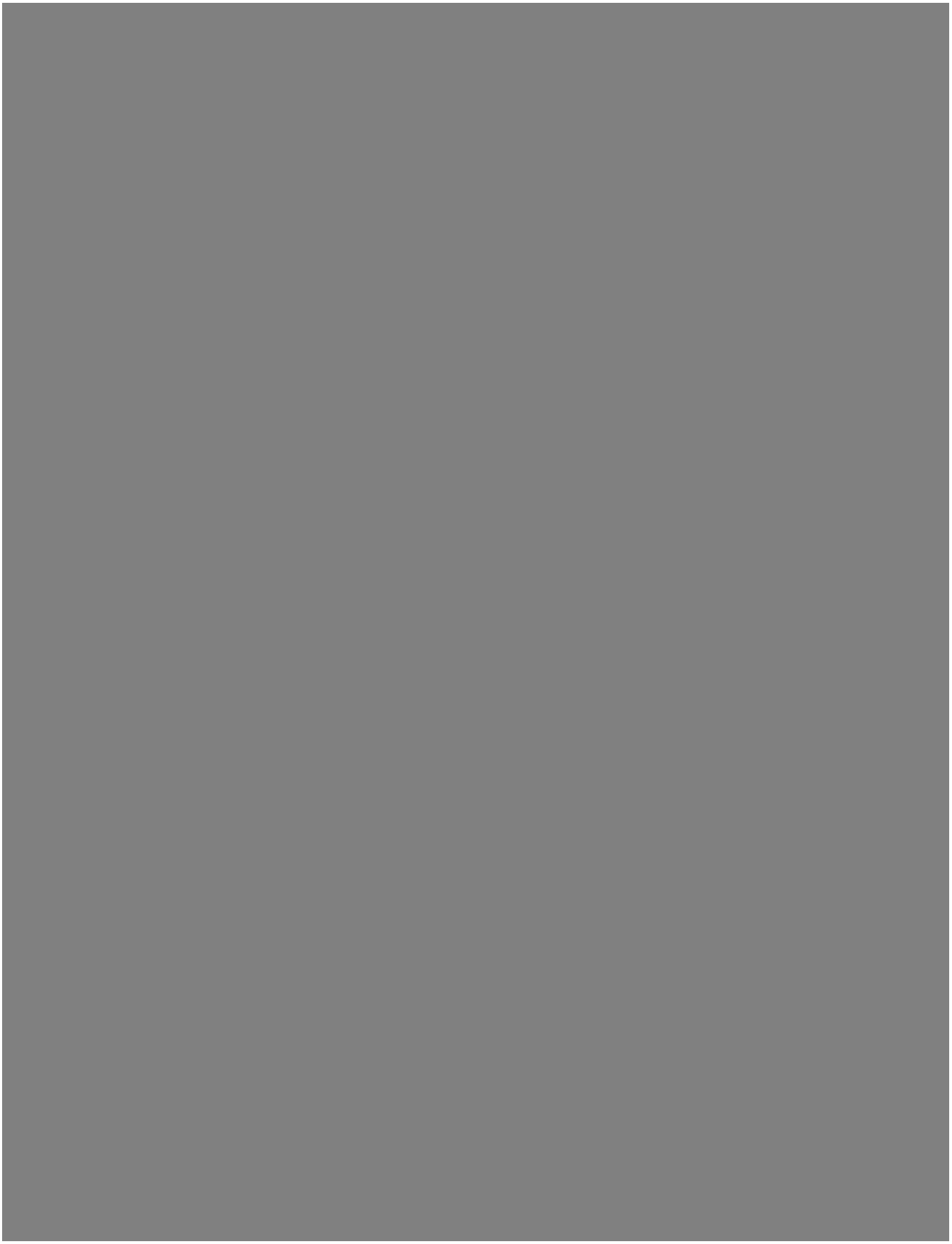
**Correlation values per group by subscale (Broxholme & Lindsay, 2003).**

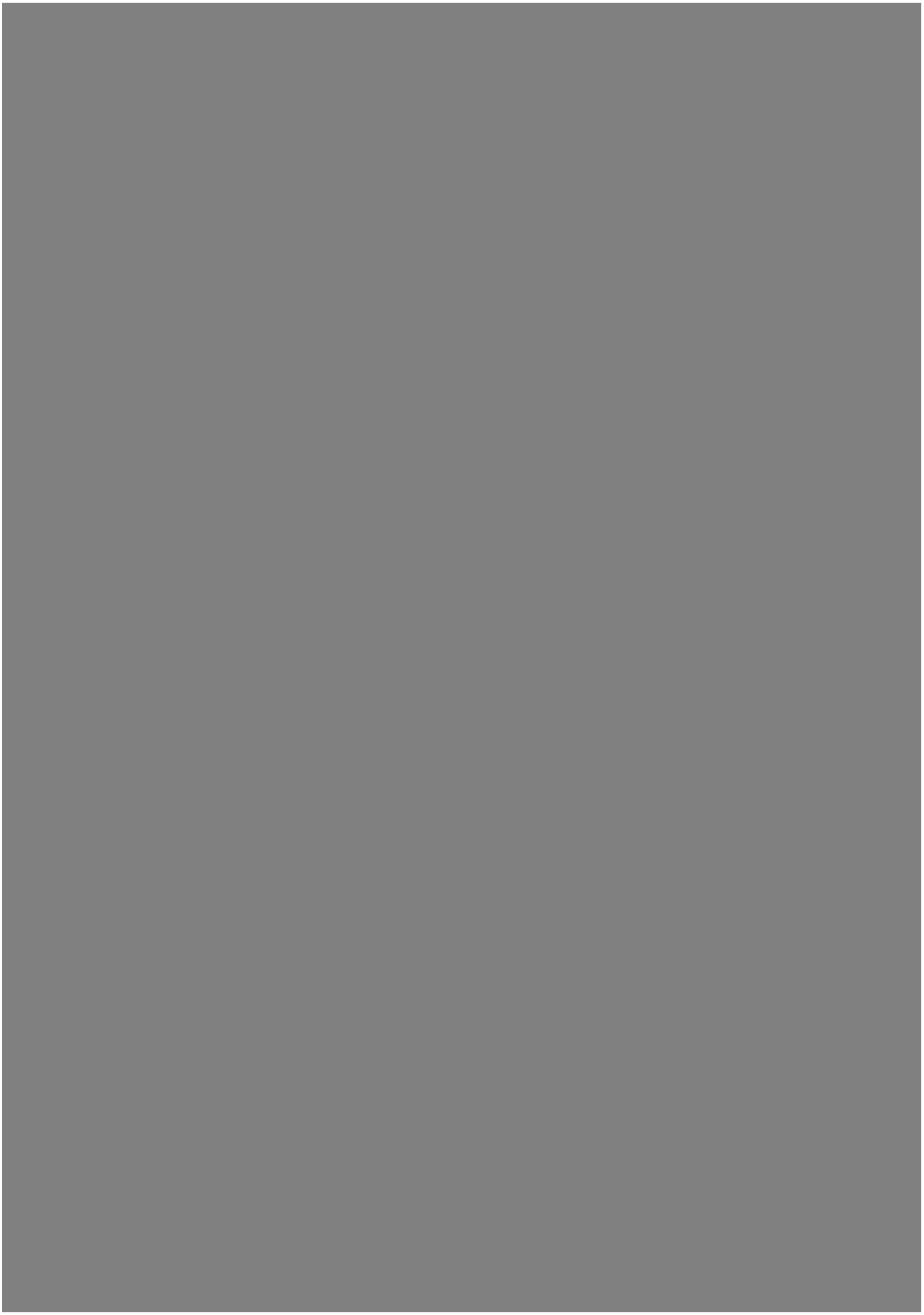
| QACSO Subscale | LD sex offenders | LD non-sex offenders | Non-sex offenders without LD |
|---|---|---|---|
| Rape and attitudes to women | 0.669 | 0.481 | 0.312 |
| Voyeurism | 0.668 | 0.810 | 0.663 |
| Exhibitionism | 0.896 | 0.805 | 0.852 |
| Dating abuse | 0.798 | 0.577 | 0.588 |
| Homosexual assault | 0.557 | 0.807 | 0.797 |
| Paedophilia | 0.726 | 0.797 | 0.779 |
| Revised QASCO total score | 0.962 | 0.839 | 0.899 |

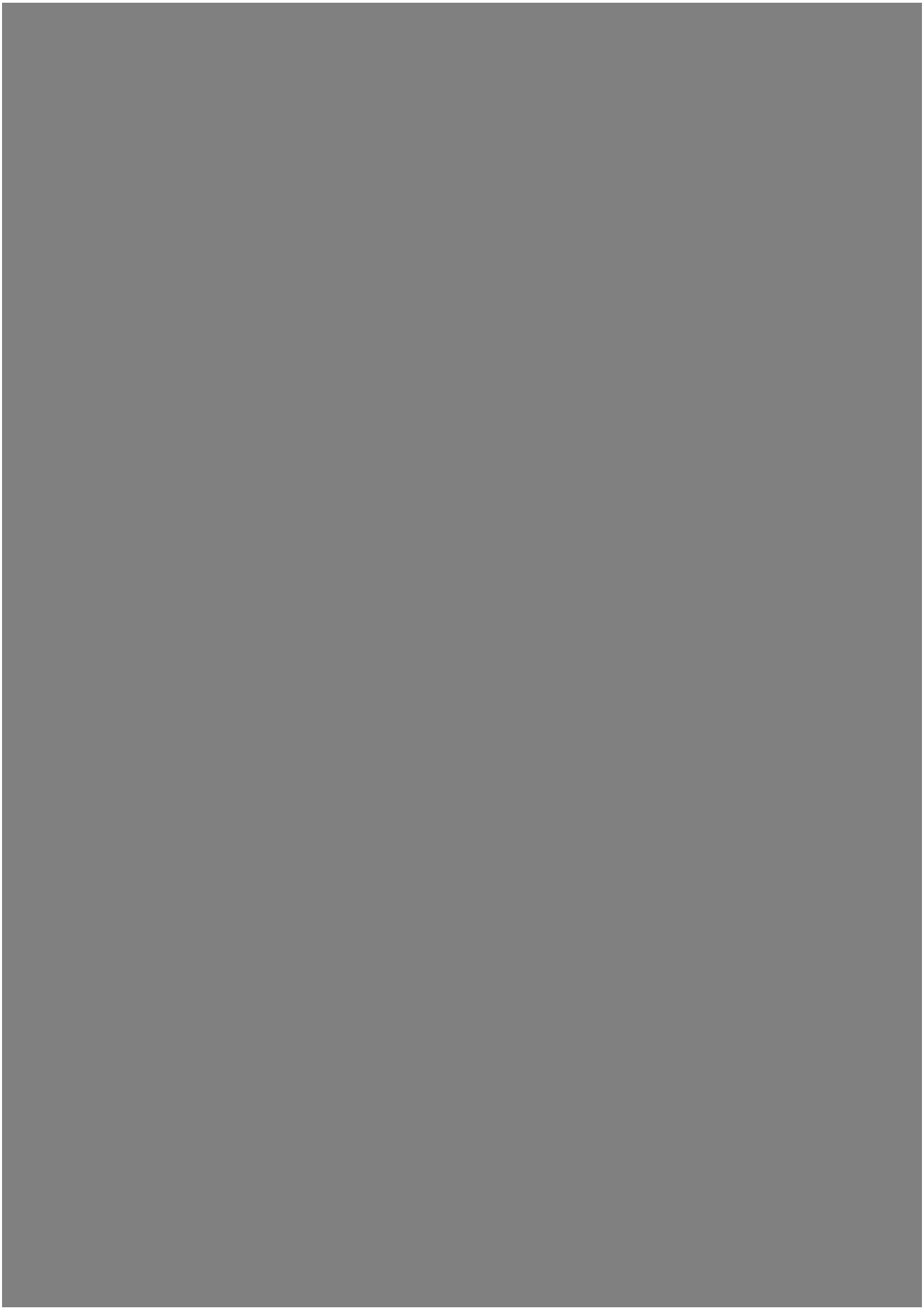


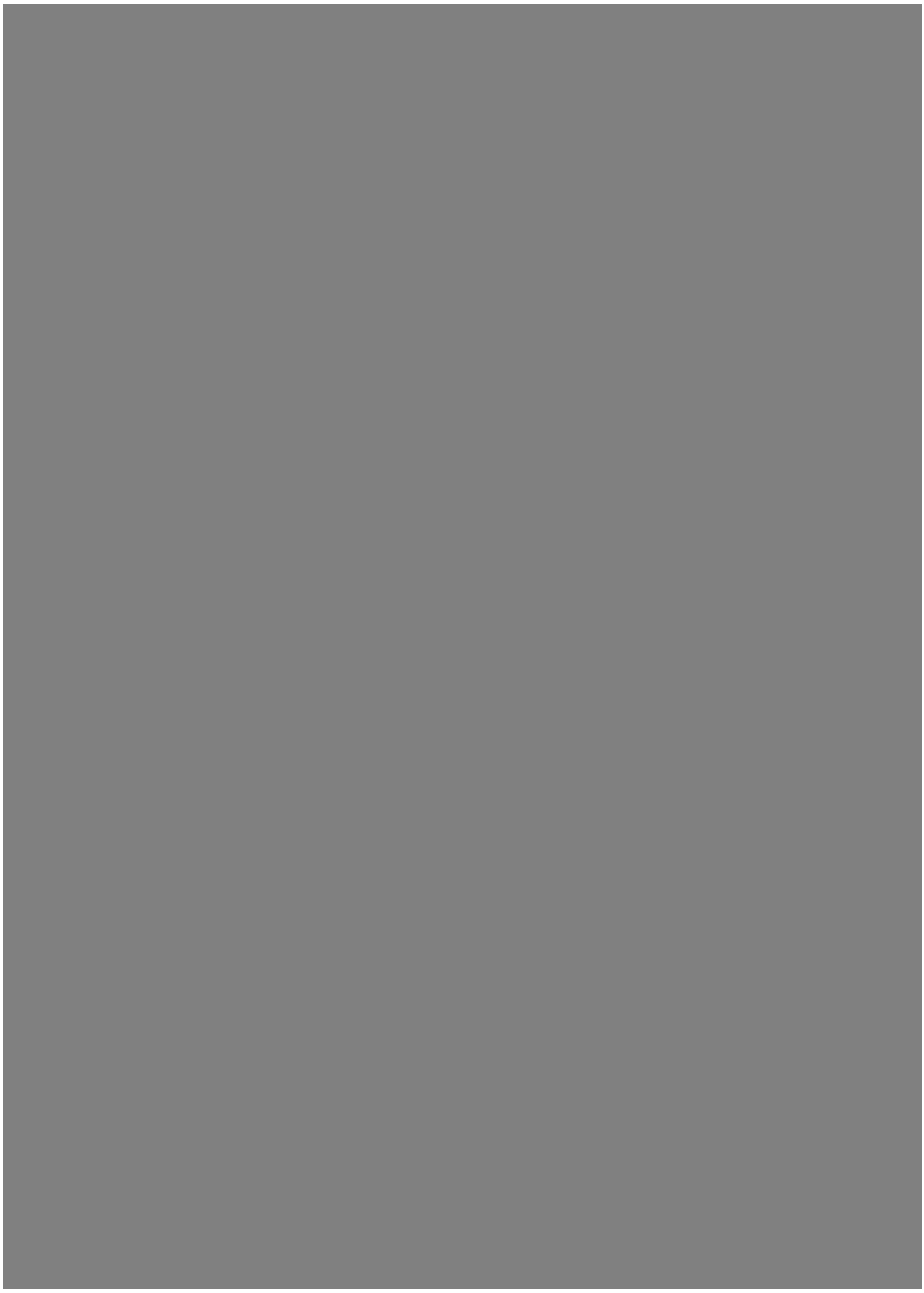


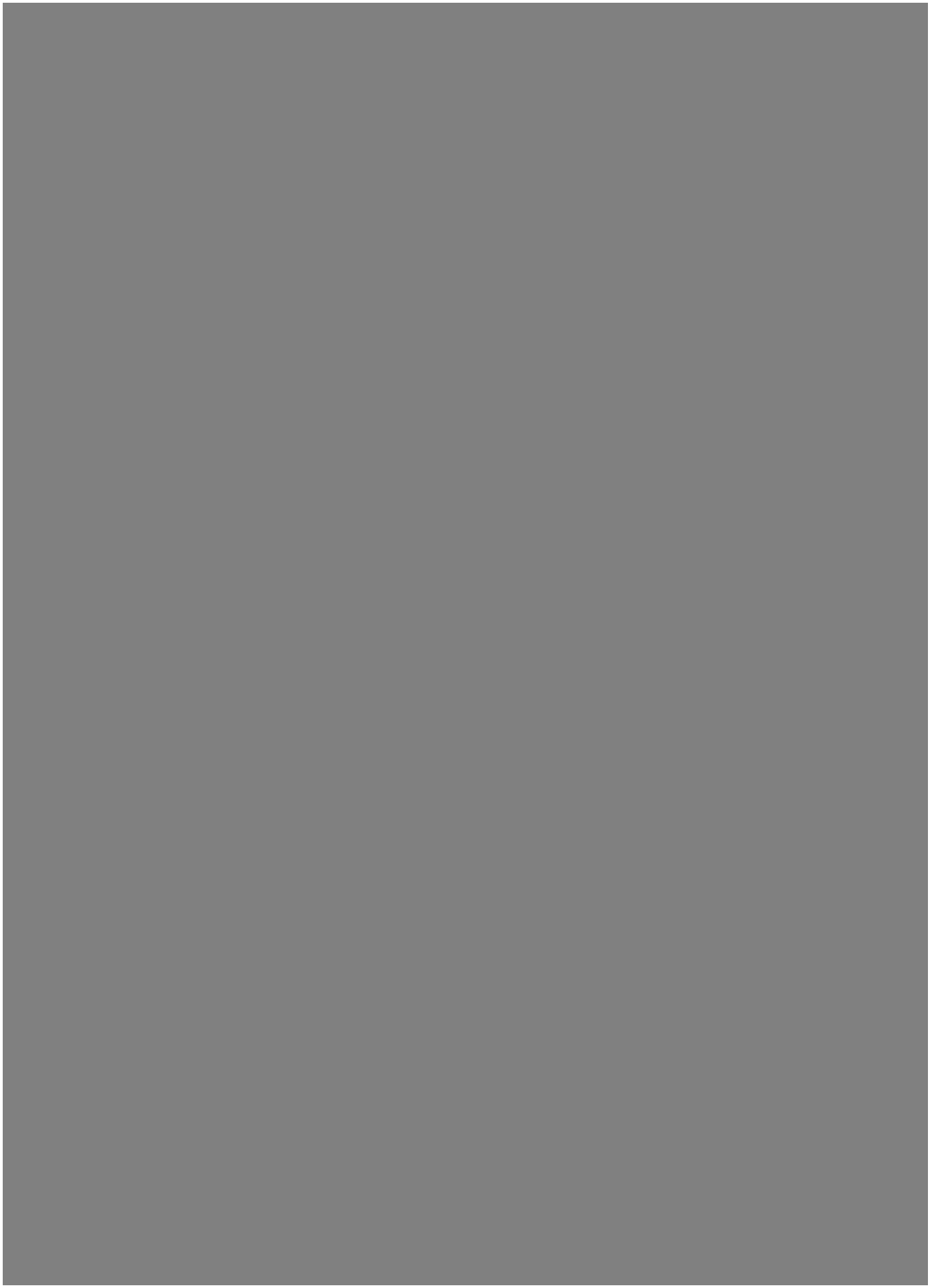


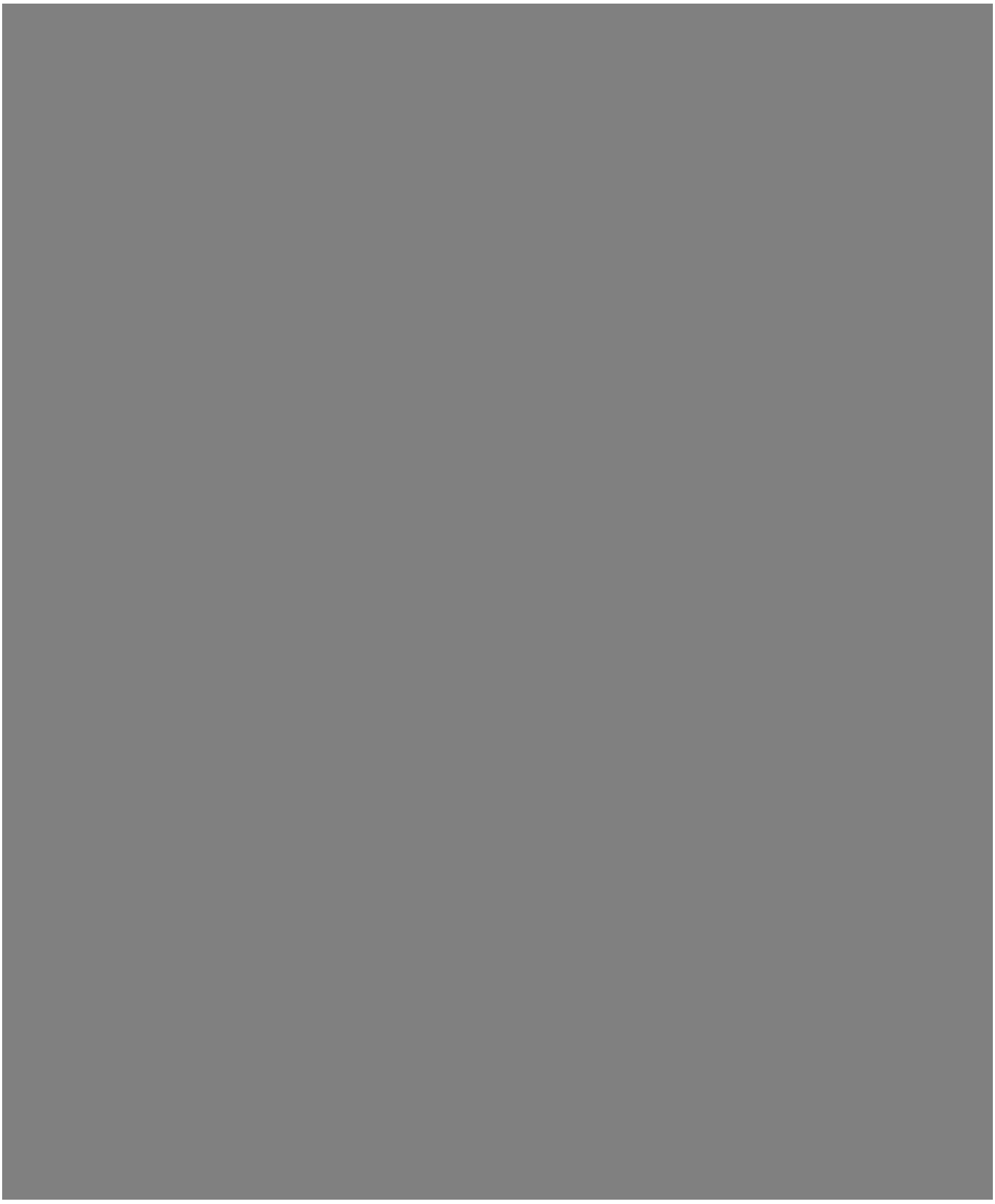


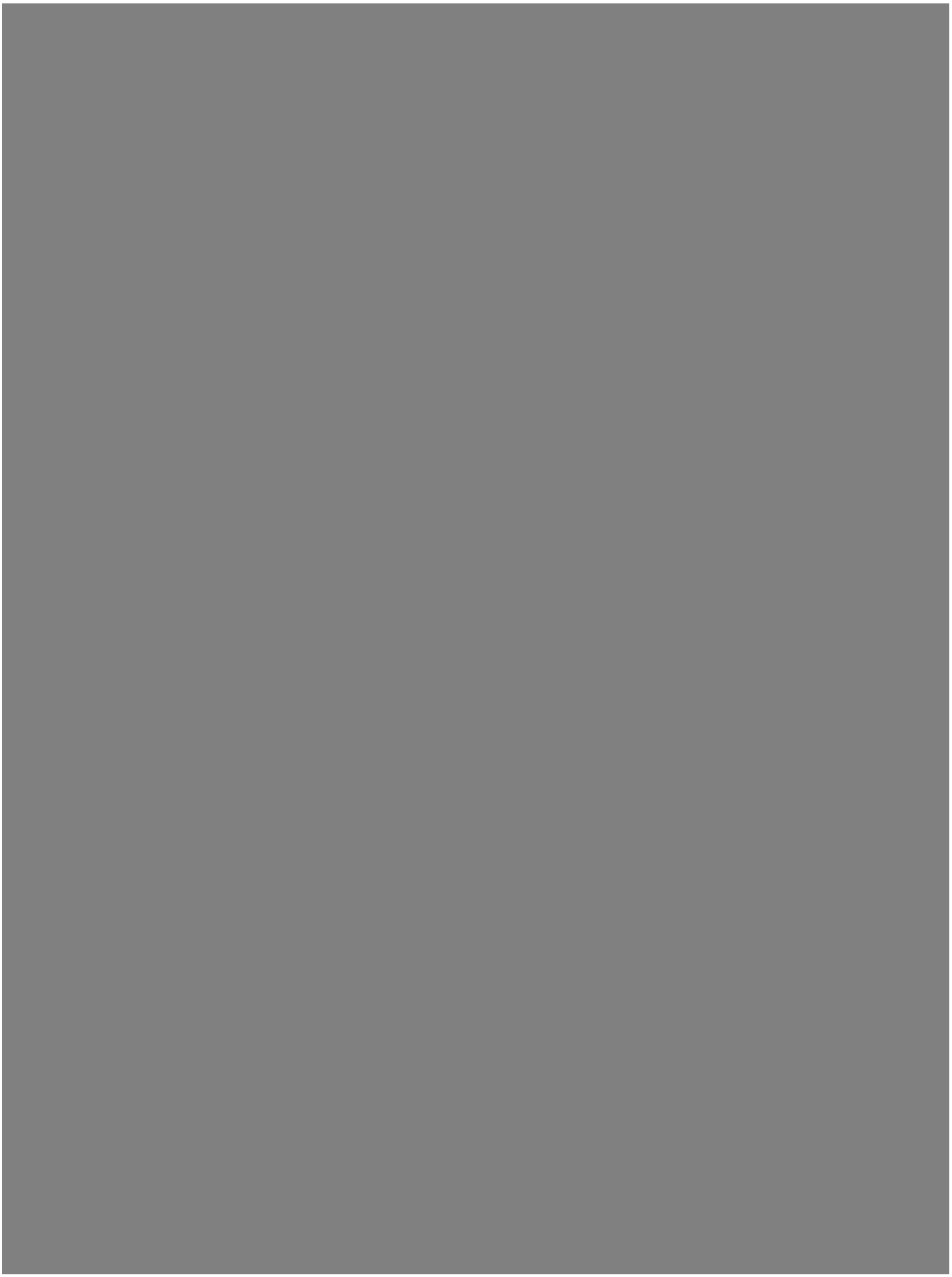


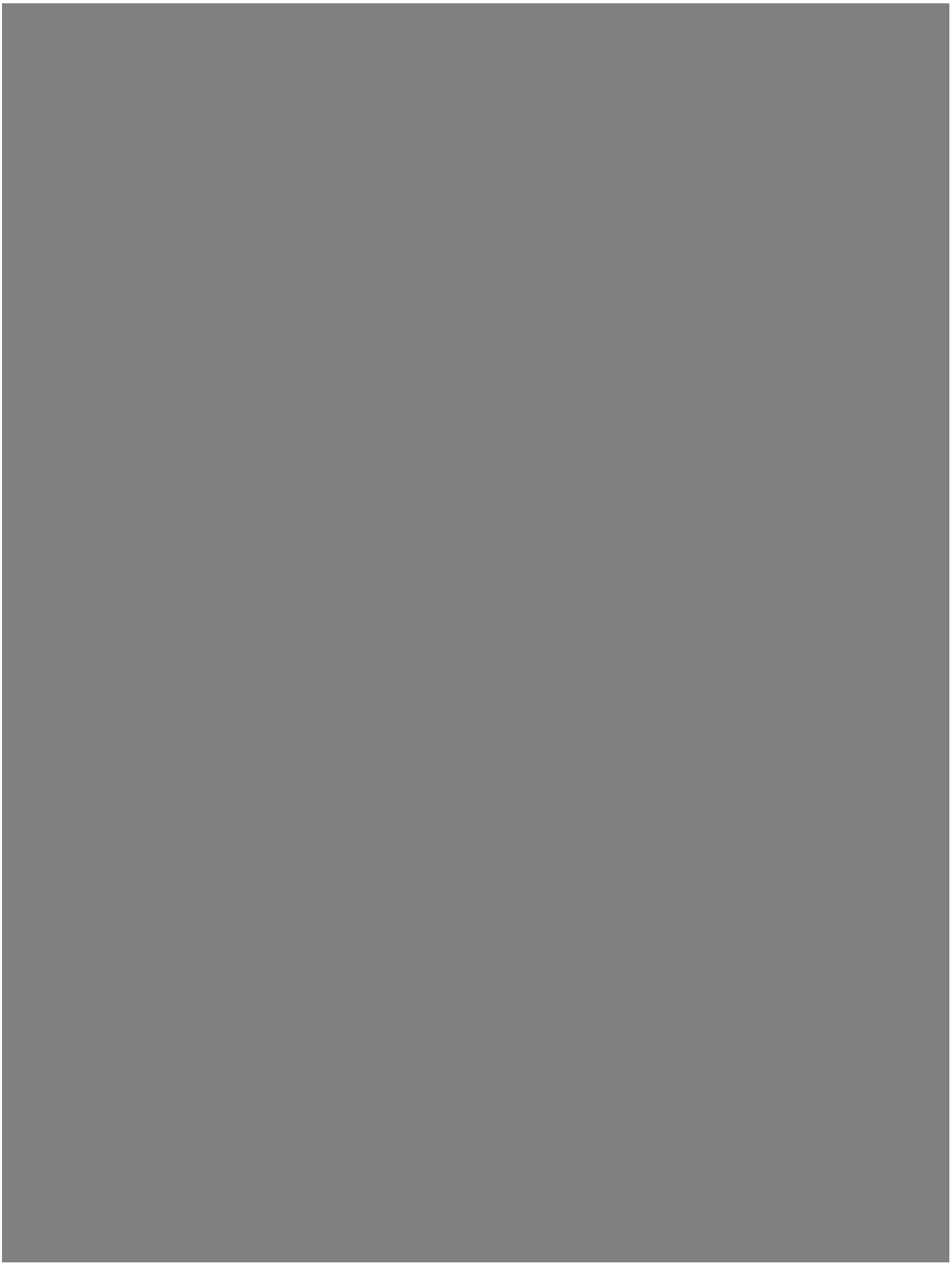


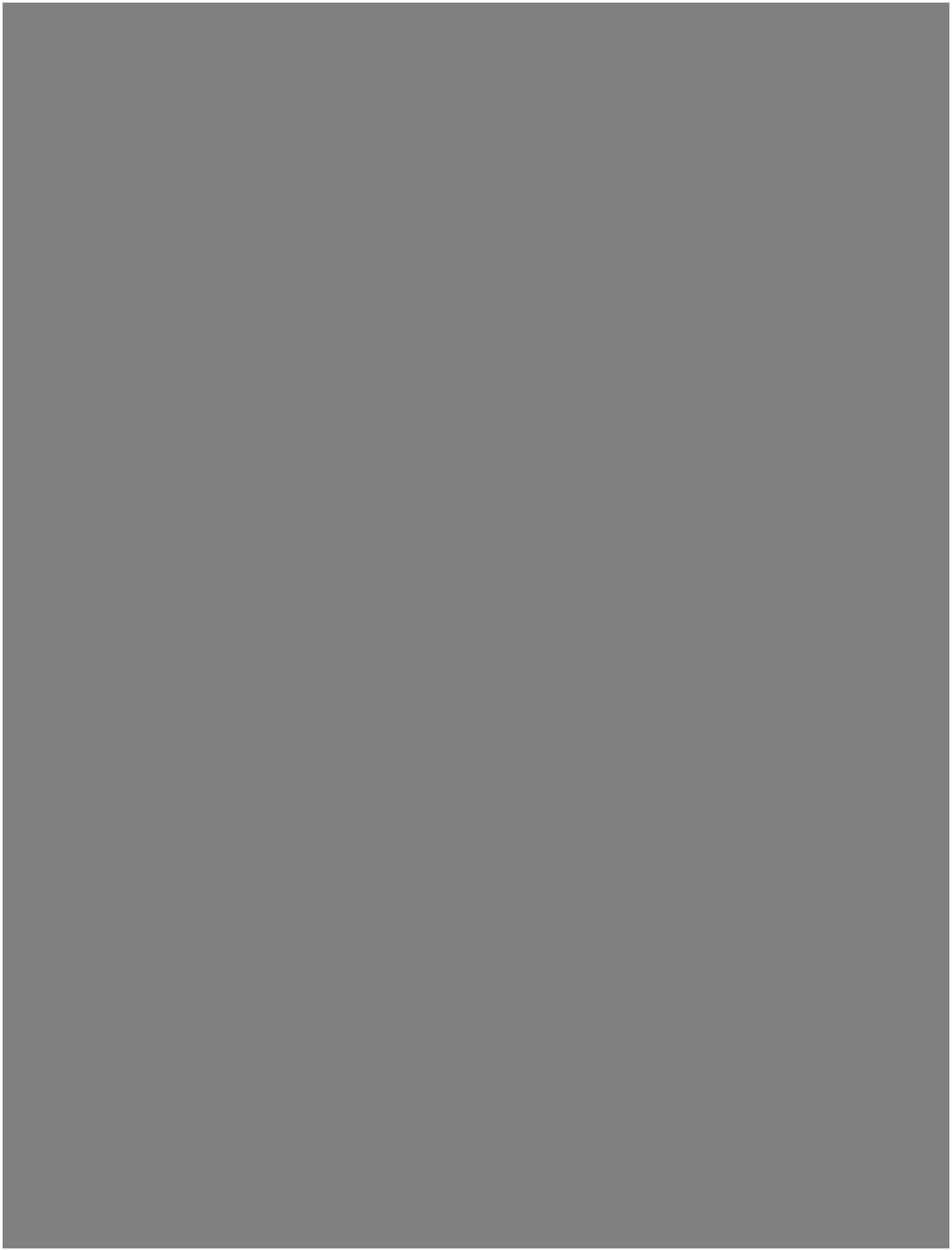












**Appendix 11**

**Visual Likert Scale**

**Appendix 12**

## Glossary

| | |
|---|---|
| **ABAS** | Adaptive Behaviour Assessment Scales |
| **ADHD** | Attention Defecit Hyperactivity Disorder |
| **ASD** | Autism Spectrum Disorder |
| **ASK** | Assessment of Sexual Knowledge |
| **ASOTP** | Adapted Sex Offender Treatment Programme |
| **BPD** | Borderline Personality Disorder |
| **BPS** | British Psychological Society |
| **CA** | Community adult |
| **CAT** | Cognitive Analytic Therapy |
| **CBT** | Cognitive Behaviour Therapy |
| **CJS** | Criminal Justice System |
| **CRI** | Coping Response Inventory |
| **CSS** | Criminal Sentiments Scale |
| **DBT** | Dialectical Behaviour Therapy |
| **DERS** | Difficulties in Emotion Regulation Scale |
| **DoH** | Department of Health |
| **HMP** | Her Majesty's Prison |
| **HRV** | Heart rate variability |
| **ID** | Intellectual Disability |
| **IRI** | Interpersonal Reactivity Index |
| **ITSO** | Integrated Theory of Sexual Offending |

| | |
|---|---|
| **M-ABCS** | Modified Abel and Becker Cognition Scale |
| **MOAS** | Modified Overt Aggression Scale |
| **MSI** | Multiphasic Sex Inventory |
| **MSIS** | Miller Social Intimacy Scale |
| **NTS** | Non-treatment staff |
| **NS** | Nowicki-Strickland Locus of Control |
| **PDS** | Paulhus Deception Scale |
| **QACSO** | Questionnaire on Attitudes Consistent with Sexual Offending |
| **RCI** | Reliable Change Index |
| **RCT** | Randomised Controlled Trial |
| **RM2000** | Risk Matrix 2000 |
| **RNR** | Risk-Need-Responsivity |
| **RPP** | Relapse Prevention Plan |
| **RRASOR** | Rapid Risk Assessment for Sex Offence Recidivism |
| **RSQ** | Relationship Scales Questionnaire |
| **SAK** | Sexual Attitudes and Knowledge Scale |
| **SASBA** | St Andrews Sexual Behaviour Assessment Scale |
| **SCRS** | Self-Control Rating Scale |
| **SIS** | Social Intimacy Scale |
| **SOOT** | Sex Offenders Opinion Test |
| **SOSAS** | Sex Offences Self-Appraisal Scale |

| | |
|---|---|
| **SOTP** | Sex Offender Treatment Programme |
| **SSKAAT-R** | Socio-Sexual Knowledge and Attitudes Assessment - Revised |
| **SVR-20** | Sexual Violence Risk-20 |
| **TC** | Therapeutic Community |
| **TS** | Treatment staff |
| **UCLA-R** | UCLA Loneliness Scale - Revised |
| **VABS** | Vineland Adaptive Behaviour Scale |
| **VES/A** | Victim Empathy Scale/Adapted |
| **WAIS** | Wechsler Adult Intelligence Scale |