

# **The Utility of Polygraph With Mentally Disordered Sex Offenders**

**by**

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## **Abstract**

The use of post-conviction polygraph testing with sex offenders is used worldwide. However, to date there is no known study that has examined the utility of polygraph with mentally disordered sex offenders, which is the focus of this current thesis.

An introduction to polygraph outlines how the tool works, the three test types and the suggested psychological theories, that attempt to explain the psychophysiological responses observed in polygraphy.

Chapter 2 is a systematic literature review of the utility of polygraph post-conviction sex offender tests (PCSOT) with sex offenders in general, focussing on the areas of assessment, treatment and management. The review highlights key findings relating to recidivism, risk, disclosures, polygraph outcome and perceptions of the polygraph. Further to this, the review suggests that polygraph enhances the assessment of sexual offenders by leading to increased disclosures (victims, offences and sexual risk behaviours).

Additionally, this thesis introduces the Violence Risk Scale, Sex Offender version (VRS-SO) as a sexual risk assessment tool. A critique of this assessment considers the reliability and validity of the tool. The VRS-SO is used in the empirical study of this thesis, which investigates the use of polygraph with mentally disordered sex offenders in a high secure forensic setting. The key significant findings are that using polygraph with mentally disordered sex offenders was effective in eliciting more information about behaviours associated with risk. Specifically, eliciting an increase in the number of high risk behaviours; a broader range of paraphilic behaviours; the number of victims; the number of inappropriate sexual fantasies; the reported level of masturbation to

inappropriate sexual fantasies and the use of pornography. Offenders were also asked about their experience of polygraph. Thematic analysis of their responses suggested four main themes of risk, truthfulness, impact and knowledge. Finally, implications of this thesis are considered in addition to future research into the utility of polygraph.

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# **Chapter 1**

## **Introduction**

## **Polygraph Tool**

For many years, polygraph has been referred to as a ‘lie detector’. More recently in the UK, however, it has been cited as a ‘truth facilitator’ (Grubin, 2003; Wilcox and Gray, 2012). It is used widely in the United States, where polygraph was first developed, to aid in detecting deception in criminal cases (Synnott, Dietzel & Ioannou, 2015). Other uses have included employment screening, post-conviction sex offender testing, and more recently domestic violence, with a proposed domestic-abuse bill anticipated in the UK in 2020 to include the use of mandatory polygraph (Grierson, 2019). The polygraph was reportedly used in 55 countries world-wide in 2018 (American Polygraph Association, 2018), including China, India, Korea, Japan, Israel, Australia, Canada, Mexico, Russia, Singapore, South Africa, United Kingdom and others.

Polygraph was first introduced into a legal context in 1923 (*US v. Frye*) where the results were rejected by court, as polygraph was not considered to have support within the scientific community and therefore viewed to lack validity (Wilcox, 2009). This has since been the basis of much criticism of polygraph. However, this case and the resulting ‘Frye Standard’ was superseded by the ‘Daubert Standard’ (*Daubert v. Merrell Dow Pharmaceuticals*, 1993) in which the admissibility of contentious scientific evidence is considered on a case-by-case basis and decided by the courts (Wilcox, 2009). Polygraph is widely used and accepted in the court of law in many states of the USA. However, in the UK it is legislated within the Offender Management Act (2007) that polygraph evidence is inadmissible in a court of law.

The polygraph is considered to be a scientific instrument which records and displays psychophysiological arousal associated with lying (Walczyk, Sewell & DiBenedetto,

2018). The physiological measures recorded include relative changes to blood pressure, breathing movement activity and electrodermal activity in the palms or hands (Handler, Nelson, Krapohl & Honts 2010) and, more recently includes the recording of changes in pulse blood volume, with a finger sensor also known as a photoelectric plethysmograph (PLE).

It is assumed that when people experience fear, they experience autonomic changes within the body (Abrams, 1991). These autonomic changes are induced by a 'stress response' during lying and are predominantly outside conscious control (Grubin, 2008). For example, fear can lead to abrupt changes in electrodermal activity or sweating, an increase in cardiovascular activity, and a change in the breathing rate (Abrams, 1991). All of these changes can be measured by the polygraph; breathing movement activity is recorded via convoluted rubber tubes which are placed around the thoracic and abdominal chest area, electrodermal activity is recorded via two small metal plates or sticky pads, which are attached to the fingers, and a blood pressure cuff is used to record cardiovascular activity (Krueger, 2009). Nelson (2016) adds that field testing protocols recommend activity sensors (seat pad, arm pads or foot sensors to record movement) to be used to aid the detection of countermeasures and is a requirement by the American Polygraph Association (APA, 2011).

It is assumed that almost all people experience fear of being discovered when they lie (Wilcox, 2000). Therefore, the polygraph records autonomic responses (activated by the sympathetic autonomic nervous system) indicative of fear during a series of questions which, in turn, are used to establish whether the person is likely to be lying (Kokish, 2003). Thus, the polygraph itself does not detect lying, per se, but instead measures the

physiological arousal that is hypothesised as the product of lying (Gannon, Beech & Ward, 2008).

A polygraph test includes 3 types of questions concerning the matter under investigation: relevant, irrelevant and comparison. Since most individuals display some autonomic reactivity to almost any type of question, neutral or 'irrelevant' questions are used to establish a baseline of reactivity (Kleiner, 2002), usually at the beginning of the set of polygraph questions asked, and if required to return to baseline. Relevant questions are very specific and tap into the issue of interest, whereas irrelevant questions are unrelated to the incident. Further, comparison questions are designed to be unrelated to the specific incident but nonetheless emotionally provocative for truthful subjects, and to which both truthful and deceptive subjects are likely to respond 'no' to (Bashore & Rapp, 1993). This traditional type of comparison question is a probable-lie comparison (PLC) in which the polygraph examiner manoeuvres "the examinee into denying a common behavioural issue that is not the target of the examination" (Nelson, 2016 p.32). Nelson (2016) further highlights the criticism of this 'manipulative' technique as reported by Lykken (1998) and Saxe (1991). A less controversial type of comparison question developed more recently, is the directed-lie comparison (DLC) and is equally as efficient as the PLC (APA, 2011). The DLC question developed by Honts and colleagues (Honts & Raskin, 1988; Honts and Reavy, 2009) is transparent in directing the examinee to lie about a known behavioural issue that is not related to the relevant issue.

Comparison question responses are compared with relevant question responses in terms of magnitude or degree of response relative to each other (Nelson, 2016). In comparing

comparison and relevant questions within the same individual, any underlying anxiety or unrelated guilt is ‘averaged’ across the questions and reflected as a baseline response (Wilcox, 2009). A deceptive individual will generally exhibit greater responses to relevant questions and a truthful individual will generally exhibit greater responses to comparison questions (Nelson, 2016). This construct of deception or truth telling, is based on responses to relevant and comparison questions, and has been validated by various studies (Nelson & Handler, 2013; NRC, 2003). Thus, from the pattern of responding, an individual will be recorded as: ‘deception indicated’, ‘no deception indicated’, or ‘inconclusive’ (where no conclusion can be reliably drawn) (Ben-Shakhar, 2008). Other terms applied to the polygraph result include Significant Response (SR), No Significant Response (NSR) or No Opinion when applied to a multiple issue or screening test.

Multiple issue or screening polygraphs are utilised when there is often more than one aspect or issue being tested. For example, relevant questions may relate to sexual behaviour, where one question may ask “did you sexually touch your daughter’s breast?” and another may ask “did you ever touch Jane’s vaginal area?” These questions both encompass sexual contact with the daughter, but relate to different acts, and therefore it is possible that one elicits a truthful response and one elicits a deceptive response. It is not possible to provide mixed outcomes, so the overall outcome would be one of deception in the example given (Nelson, 2016).

All questions constructed for a polygraph examination require the individual to respond with a ‘yes’ or a ‘no’ (APA, 2009). These questions are formulated in the pre-test interview based on the information provided. Hence, the idea is not to elicit a physiological reaction to a question during the examination itself, simply as a result of



surprise or shock at being asked that question. The pre-test interview consists of: greeting the individual, providing an explanation of the procedure and instrument, obtaining the examinee's informed consent, determination of the suitability of the subject for testing, an acquaintance test<sup>1</sup> to establish a baseline to a known and deliberate lie, a structured interview to review the examinee's background, the case facts, and to obtain a detailed review of each issue of concern with an opportunity for the examinee to provide their version of all issues under investigation, and a review of the test questions to be asked during the polygraph examination (APA, 2009). Then the polygraph attachments are placed on the examinee and the questions asked of them. The results are analysed and then a post-test interview is conducted to discuss and explain the results from the test.

Three different question techniques can be applied in polygraph which include: i) the Relevant/Irrelevant question technique, which is considered to be transparent by the obvious nature of its questions (Saxe, Dougherty & Cross, 1985); ii) the Concealed Information Test (CIT) which is only considered when the examiner has information relating to the situation under investigation, that would only be known by the guilty person, and is not a test of detecting deception per se (Saxe et al, 1985); iii) the Comparison Question Test (CQT), which is both the most commonly used and criticised question technique, where there is concern regarding the manipulation of questions asked of the examinee (in that relevant and comparisons questions are not made explicit), thus referring to the bogus-pipeline (Saxe et al, 1985).

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<sup>1</sup> Acquaintance test orients the examinee to the polygraph procedure. The examinee is instructed to give a deliberate lie and a baseline of physiological responses is established. Studies have shown the acquaintance test may increase the accuracy of the polygraph result (Horowitz, Kircher & Raskin, 1986)

The bogus-pipeline effect is a finding that occurs when participants are made to believe they are attached to a device that detects lies accurately, (when in fact it is fake), and disclose information (Jones & Sigall, 1971). This has been likened to a placebo effect, by some (Rosky, 2013), and considered by others to possibly reflect an avoidance of being judged as a liar or simply an aid to enhance the focus upon answering the questions (Elliott, Egan & Grubin, 2017). Research conducted in the UK has explored this effect, specifically establishing that a bogus polygraph can elicit disclosures of offence related beliefs (Gannon, Keown & Polaschek, 2007) and generally increased disclosures using a polygraph that is less than 100% accurate (Elliott et al., 2017).

## **Theoretical Underpinnings of Polygraph**

### ***Bogus Pipeline Effect***

There are various theories or hypotheses offered in explanation of how the polygraph works. One is the bogus pipeline effect as described above, where it has been argued that participants are manipulated into believing the polygraph is infallible (Saxe et al., 1985) resulting in a need for 'self-preservation' to avoid being called dishonest (Roese & Jamieson, 1993). However, a recent UK study using University students by Elliott and colleagues (2017), found that when participants were attached to a bogus lie detector, they reported significantly more disclosures of dishonesty, irrespective of whether they believed it to be 100% or 75% accurate, compared with a control condition. As the polygraph has an established accuracy rate above 75% (NRC, 2003), this study concluded that the bogus pipeline effect was in fact not bogus, and participants did not need to be convinced of the polygraph as being 100%, for it to elicit

increased disclosures. It is suggested, this would indicate that the enhanced honesty elicited from a polygraph, is more likely a result of providing individuals with justification to reveal hidden information (Otter & Egan, 2007) or that the instrument is believed to provide evidence against them, much like eliciting confessions from police interviews where information is conveyed as already known by the police (Gudjonsson, 2003).

### **‘Psychological Set’ or ‘Salience’**

Another theory refers to ‘Psychological Set’ as referred to by field polygraph examiners, and relates to the fight-or-flight response in which the subject’s attention or emotional response is thus focussed on the question or issue that poses the greatest threat to them (Handler & Nelson, 2007). However, Nelson (2016) notes that this theory has not been upheld in light of the effectiveness of Directed Lie Comparisons (DLC: in which the examinee is asked to give a “no” response to a question about lying which is known to be a deliberate lie. So the DLC becomes a known Lie: Menges, 2004) and also with Psychopaths, who have been found to have low levels of fear conditioning and yet still respond (Birbaumer, Veit, Lotze, Erb, Hermann, Grodd & Flor, 2005).

The term ‘salience’ evolved from psychological set and describes the observed physiological responses in a polygraph, as ‘loading’ on to either the relevant questions or comparison questions, leading to a dishonest or truthful outcome, respectively (Krapohl & Horvath, 2010). The psychological basis for the differential salience is considered to be the mental effort or ‘cognitive load’ required to assert a lie or conceal the truth.

### ***Orienting Response Theory***

Palmatier and Rovner (2015) refer to the Orienting Response as a more likely explanation of disclosures made as a result of the polygraph. The concept of the orienting response is that “the more significant a stimulus, the larger the elicited response” (Palmatier & Rovner, 2015 p. 7). The magnitude of the response can also be affected by novelty/stimulus repetition, intensity and significance of the stimulus (Barry, 1990).

### ***Cognitive Dissonance***

A further theory relates to cognitive dissonance which is experienced when there is inconsistency. Humans prefer consistency, and will seek to reduce the discomfort caused by inconsistency (Festinger, 1957). The discomfort is observed as a physiological response (Handler and Nelson, 2012). However, as noted previously the DLC questions are equally as effective as the PLC questions (APA, 2011), therefore cognitive dissonance is not essential to differentiate truthful responses from deceptive ones.

### ***Behavioural conditioning framework and learning theory***

Polygraph results may also be understood within a behavioural conditioning framework and learning theory (Nelson, 2016). This suggests that truthful individuals have the opportunity to habituate to test questions in the pre-test interview and deceptive individuals are sensitised to the test questions as a conditioned response. Kahn, Nelson and Handler (2009) go on to hypothesise that the cognitive-behavioural theory suggests deception requires more complex cognitive and emotional demands than truth-telling,

hence an observed increase in response times and reactions to deception.

This is supported by more recent brain imaging studies on deception which “show that (1) lying is associated with activity in prefrontal brain regions that are critically involved in cognitive control” (p. 908), and that (2) there is no area associated specifically with truthfulness, therefore being truthful is considered the default state of the brain (Verschuere, Spruyt, Meijer & Otgaar (2011b). Lying therefore involves suppression of a truthful response, and arguably requires more cognitive effort.

It is clear that no one theory is accepted as yet and further evidence is required to establish a scientific theoretical grounding, which is still largely lacking in the field of polygraph research.

Despite increasing evidence of the benefits and utility of polygraph, there has been much criticism of it too, which can broadly be grouped into four categories: theoretical, ethical, accuracy and limitations (Nelson, 2016).

### **Criticism of Polygraph**

Firstly, the lack of a valid theory underpinning the effects of polygraph, has been a criticism by many (British Psychological Society, 2004; National Research Council, 2003; Saxe, Dougherty & Cross, 1985) and therefore perhaps why caution has been applied in the use and introduction of polygraph into the UK (Grubin, 2002; Grubin, 2006). Without an accepted valid theory it is argued that polygraph lacks construct validity (Cross & Saxe, 1992; Cross & Saxe, 2001; Lykken, 1998) because it is based on the premise that the response observed in polygraph is due uniquely to deception and

not to fear, anger, embarrassment, or another condition such as a medical or mental disorder (Ben-Shakhar, 2008; Cross & Saxe, 2001; Lykken, 1998). Hence, this increases the risk of finding innocent subjects guilty, resulting in miscarriages of justice.

Ethical issues are a particular area of criticism of polygraph. Specifically highlighted is the concern expressed about the government support in various countries mandating the use of polygraph, despite a considered lack of scientific basis (Nelson, 2012). Further ethical issues include the interpretations of responses which are not standardised and highly subjective (Ben-Shakhar, 2008; Cross and Saxe, 2001; National Research Council, 2003); that polygraph is used with a wide array of groups such as domestic violence perpetrators despite a lack of evidence of the utility of polygraph with this group (Wilson, Batye & Riveros, 2008); a lack of sufficient peer review of published studies (Lykken, 1998); and that an interrogative technique is employed in polygraph (Chaffin, 2011) to obtain confessions from deceptive results (Iacono, 2009) increasing the likelihood of a false confession. However, Grubin (2008) asserts that the interaction is 'interview' and not 'interrogation', to elicit truthful disclosures. Whereas Iacono (2009) supports the view that the interaction is one of interrogation, noting that most examiners are trained in skills to elicit confessions and have law enforcement backgrounds. This is certainly true in the US, however in the UK examiners may have a background in probation or even psychology.

Further criticisms of the polygraph particularly expressed by the BPS (2004) relate to damage to therapeutic relationships, by coercion to report behaviours and the impact of a false positive result. It was also considered that the polygraph is a violation of human rights, with offenders having to comply with a polygraph as part of their conditions of

release or treatment. Also related to risk, is the criticism that the polygraph if used consistently, could undermine the individuals' motivation to change, which relates to long term desistance from offending (Ward & Gannon, 2006).

A final ethical criticism of polygraph, is the psychological manipulation of offenders by "convincing them that that polygraph is much more accurate than it is" (Nelson, 2012), referred to as the Bogus Pipeline, as previously outlined. The deliberate deception of examinees is also questioned by Vess (2011) who reports that the very use of polygraph in sex offender management and treatment is an "attempt to give polygraph scientific credibility". Meijer, Verschuere, Merckelbach and Crombez, (2008) add that examinees are pressured to say "no" to comparison questions in a Comparison Question Test (CQT) technique by suggesting a confession will negatively influence the examiner's opinion, which could inflate the rate of false confessions. False positives can potentially lead to wrongful convictions and detaining individuals of their liberty, therefore the consequences are severe.

The third category of challenges to polygraph relate to its accuracy. In 2008 there was a noted lack of literature on the accuracy of PCSOT specifically, and without this Meijer et al. (2008) suggest confessions reported in a polygraph may be a product of intimidation, again referring to the bogus pipeline effect. The National Research Council (NRC, 2003) reported overall polygraph accuracy of laboratory studies to be .860 (AUC) and .890 (AUC) for field studies. However, other studies have reported rates of accuracy between .880 to .980 (Ansley, 1973, 1983, 1989, 1997; Honts & Peterson, 1997; Raskin & Honts, 2002; Raskin & Podlensny, 1979). A systematic review by the Office of Technology Assessment (OTA, 1983) suggested laboratory

studies accuracy of .832 and field studies of .847. It is clear there is great variability, and accuracy rates are considered to be overestimated due to selection bias of studies (Vess, 2011).

Further criticisms of the polygraph include: a susceptibility to the effects of ‘countermeasures<sup>2</sup>’ (NRC, 2003), where practiced use has been found to reduce accuracy (Honts, Raskin & Kircher, 1994); little knowledge of the possible adverse effects of regular polygraph testing in a post-conviction setting (Branaman & Gallagher, 2005; Cross & Saxe, 2001); poor sampling techniques (Ben-Shakhar, 2008); the impact of variation in examiner skills on accuracy (Heil & English, 2009); and a high rate of false positives (NRC, 2003). Whilst false positives are not a threat to public safety, it is recognised that they increase supervision and incarceration costs and are ethically very problematic, and false negatives do pose a significant threat to public safety (Rosky, 2013).

The final area of criticism relates to the limitations of polygraph practice and findings. There is a recognised lack of adequate controls in the design of polygraph studies, and a lack of any randomised control trials (RCT) as reported by Faigman, Fienberg, and Stern (2003). However, an RCT (which is considered the gold standard of research design) may prove difficult to achieve in a clinical setting, if indeed the polygraph is of value, it could be considered as unethical to conduct a RCT thereby denying some individuals a polygraph, potentially putting the public at risk. A further limitation of polygraph studies is the use of self-report data, both in the pre and post-test interview

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<sup>2</sup> Countermeasures are deliberate covert techniques, employed by examinees to alter the test data such that a truthful or negative result is achieved (Handler, Honts & Goodson, 2015). Common types of countermeasures employed include the use of substances, mental and physical strategies such as imagery or pain, and attempts to control the physiological measures recorded (breathing or heart rate).



stages, as evidence of accuracy (Grubin & Madsen, 2006; Kokish, Levenson, & Blasingame, 2005). This type of data is considered limited by recall bias, social desirability bias and self-serving answers (Maxfield & Babbie, 2011).

Finally, there is an acknowledged need for research to be conducted by those not invested in the outcome of polygraph (Rosky, 2013), and also a need for research on Mental Disorder as there is very little research relating to this on the impact of physiological measures (Rosky, 2013). Given the prevalence of mental disorder in the general and offender populations, as approximately 1 in 4 and 37% of the average monthly prison population report having mental health or well-being issues at any one time, respectively (McManus, Meltzer, Brugha, Bebbington & Jenkins, 2009; National Audit Office, 2017) any potential impact on accuracy is a severe limitation to current research.

### **Post-Conviction Sex Offender Testing (PCSOT) Polygraph**

Much of the criticism attributed to polygraph relates to its use more generally, and some of these criticisms have then been extended to PCSOT (NRC, 2003; British Psychological Society, 2004) which is the focus of this thesis.

There are three types of PCSOT: the Sexual History Examination (SHE) which obtains a fuller and more accurate account of an offender's sexual history, any unidentified paraphilic interests (including deviant sexual fantasies) and offence behaviour; the Instant Offence test, previously referred to as a specific issue denial test, which focusses on the elements of denial (either total or partial denial of an offence); and the Maintenance Test, which focusses upon an offender's compliance with treatment and adherence to conditions mandated by the Court (Wilcox, 2009). There is sometimes

reference to a Monitoring Test which is in response to specific concerns relating to new offences or of possible breaches (Wilcox, 2009) but is based on the maintenance test so is not a distinct test type.

There has been a substantial increase in the use of polygraph in adult community sex offender treatment programmes from 29% to 70% between 1992 and 2002 (McGrath, Cumming & Burchard, 2003). This is due to its ability, to provide fuller and more accurate information about an offender's past and present sexual behaviours and corresponding risks (Emerick & Dutton, 1993; English, Jones, Pasini-Hill, Patrick & Cooley-Towell, 2000; Heil, Ahlmeyer & Simons, 2003).

### ***Risk Management***

Therapists evaluating and/or treating sexual offenders need valid, reliable, information from the sex offender (Abel & Rouleau, 1990) about their past and current sexual behaviours and interest. Without this, the therapist is less able to identify the precise treatment needs of the patient (Abel & Rouleau, 1990), and is less able to accurately manage risk (Wilcox, 2009). However, it has been suggested that sexual offenders are extremely reluctant to disclose their offending histories (Blasingame, 1998), because of the potential consequences should they report a previously unknown risk, thus making risk assessment and treatment provision extremely difficult.

It is widely acknowledged that past behaviour is the best predictor of future behaviour (Rice, Harris & Cormier, 1992), and that the frequency of offending, the number of prior victims and the variety of unhealthy behaviours are all empirically linked to the risk of re-offending (Serin, Mailloux & Malcolm, 2001). As a result, it is vital that clinicians have accurate information on the offender's sexual history. Support for the

use of the polygraph is helping to achieve this aim and has been provided by English et al. (2000) such that they found PCSOT often identified new crimes, and previously unknown high-risk behaviours. Further, agencies in the United States that use the polygraph for post-conviction sex offender purposes reported that it greatly enhanced the number of disclosures made by the individual and that, as a result of this, it led to better management and supervision of the individual and more appropriate treatment (English et al., 2000). Some research has been conducted in the UK (Gannon et al, 2014; Grubin, 2010; Wilcox, Sosnowski, Warberg, & Beech, 2005) which has showed similar findings in relation to increased disclosures for those undertaking a polygraph and offender managers reporting an increase in supervision or changing focus in supervision as a result of the disclosure made during a polygraph.

### ***Disclosures***

Research has consistently shown that the polygraph increases disclosures of the number of offences (Ahlmeyer, Heil, McKee & English, 2000: English et al., 2003: Wilcox, 2002), the number of victims (Wilcox, 2002: Wilcox & Sosnowski, 2005), the range of paraphilias (Ahlmeyer et al., 2000: Wilcox & Sosnowski, 2005), the age of offending onset (Wilcox, 2002), and the number of high-risk behaviours, (Buschman, Bogaerts, Foulger, Wilcox, Sosnowski, & Cushman, 2010: Grubin, Madsen, Parsons, Sosnowski & Warberg, 2004) when compared to admissions through clinical interviews and file reviews. Additionally, the polygraph has been suggested to be effective as a ‘truth facilitator’ (Grubin, 2002): individuals can reveal information regarding their sexual history at three time points; when they are anticipating a polygraph examination, during the pre-test interview, or during the post-test interview (once the polygraph examination has been conducted an interview is conducted to discuss the results) (Krueger, 2009). It

is not uncommon for subjects to disclose information prior to the actual examination (Abrams, 1991, Blasingame, 1998), possibly owing to a fear of being found 'deceptive.' Further to this, Grubin and Madsen (2006), using a US sample of 176 sex offenders who had undergone a polygraph examination, found that 44% of individuals reported that they were more truthful with their probation officers than they otherwise would have been. Kokish, Levenson and Blasingame (2005) also found that the polygraph accurately identified truth-telling 92% and deception 82% of the time, suggesting that it is a reliable and valid instrument for use in post-conviction settings.

Crossover sexual offences are defined as those in which victims are from multiple age groups, multiple gender groups, and from multiple relationship categories (Heil et al., 2003). Typically, when offence crossover is disclosed, assigned risk level increases (Gannon et al., 2008). Thus, it is important that for risk assessment to be reliable information regarding cross-over offending be obtained. Abel and Rouleau (1990) have suggested that individuals with only one paraphilia are rather uncommon, and that the majority of sex offenders have multiple paraphilic interests, thus research needs to look into ways in which to increase the disclosures of such high-risk behaviours.

Research suggests that the level of cross-over offending increases as a result of a polygraph examination. For example, Heil et al. (2003) found that prior to the polygraph only 7.2% of a Colorado, US sample of 223 inmate sexual offenders had both child and adult victims, after the polygraph however, this rose to 70%. In addition, English et al. (2000) found that 232 adult sex offenders in the community of Colorado, US reported mixed gender victims only 10% of the time, post-testing this increased to 29%. Thus, the polygraph may not only be useful at increasing disclosures regarding sexual history, but this information may also be helpful in increasing our knowledge

and understanding of the prevalence of cross-over offending. Indeed, Cann, Friendship and Gozna (2007) conclude that at least 25% of convicted sexual offenders in England and Wales sentenced to at least 4 years in custody have engaged in some form of crossover behaviour.

### ***Community versus institutional setting***

The vast majority of research conducted in the field of post-conviction polygraph testing with sex offenders has been conducted in community-based samples in the United States as, arguably, the risk to the public is greatest in the community. Indeed, research on the use of the polygraph in such settings in the UK has been steadily increasing in recent years. Pilot studies have taken place (Gannon et al. 2012; Grubin, 2002; Grubin et al., 2004; Wilcox, 2002) but no study has considered the use of the polygraph in other settings such as mental health or prison in the UK.

### ***Accuracy***

Grubin and Madsen (2006) reported an overall PCSOT accuracy rate of 85% along with false positives of 15% and false negatives of 16%. Further studies have reported such accuracy rates exceeding 90% (Holden, 1997; Honts & Quick, 1995). A greater probability of false positive errors than false negatives was also suggested by many (Abrams, 1999; Raskin, 1999; Raskin & Honts, 2001).

### ***PCSOT Test Type and Utility***

As noted previously, the Sexual History Examination (SHE) obtains a fuller and more accurate account of an offender's sexual history, any unidentified paraphilic interests (including deviant sexual fantasies) and offence behaviour, the age at which these

commenced, all of which can increase the reliability of risk assessment and promote honest disclosure (English, Jones, Patrick & Pasini-Hill, 2003; Grubin, 2008; Levenson, 2009). This said, it is the least reliable of the PCSOT tests due to the breadth of behaviour covered in the individuals lifespan, which may be difficult to recall all details, and therefore increases the chances of a false positive error (Branaman & Gallagher, 2005), because it is a multi-issue test where the likelihood of dishonesty to one of the relevant questions is greater. The information obtained from the SHE can assist in the tailoring of treatment for the offender in addition to providing an opportunity for a more comprehensive assessment of risk (Wilcox, 2002, 2009). It is widely acknowledged that sex offenders minimise the extent of their offending, unhealthy sexual behaviours and/or fantasies (Ahlmeyer, Heil, McKee & English, 2000; Blasingame, 1998; Grubin, 2009). In spite of this, without valid, reliable, and detailed information pertaining to historical and current behaviours the treatment provided is likely to be insufficient in addressing and managing risk (Abel & Rouleau, 1990; Wilcox, 2009). As a result, polygraph testing has been introduced to validate sex offenders' self-reports (Hindman & Peters, 2001) and to facilitate the gathering of historical information pertinent to risk (Emerick & Dutton, 1993; English, et al., 2000; Heil et al., 2003), with many therapists believing that therapy cannot be conducted adequately without the polygraph (Abrams, 1991).

The use of the polygraph as a 'truth facilitator' is extremely important as risk assessment remains an inexact science (Cortoni, 2009). Support for this idea of polygraph as a truth facilitator has predominantly come from studies carried out in the United States and Canada. For example, English et al. (2000) found that PCSOT often identifies unknown crimes, high risk behaviours, and a broader victim profile.

Additionally, McGrath et al. (2007) using a sample of two hundred and eight adult male sexual offenders, found that during the polygraph examination, 4.3% admitted having had contact with a victim and 15.7% masturbating to offence-related sexual fantasies. It was estimated that between sixty and eighty per cent of these disclosures were not previously known about, and 96% of service providers rated such disclosures as 'helpful' or 'very helpful' in informing treatment and supervision. Finally, Hindman and Peters (2000) compared polygraphed and non-polygraphed sexual offenders on disclosures relating to male victims. They found that 30% of the former admitted to having a male sexual offence victim, compared to 17% of the latter, and the total number of victims increased from an average of 1.25 to 9 per person. Clearly, without the polygraph this information would have remained unknown and untreated (Levenson, 2009).

### ***Voluntary or mandatory polygraph***

Mandatory polygraph testing conducted in the Midlands region of England (during April 2010-December 2011), resulted in an increase in clinically significant disclosures (CSD's) as a result of the polygraph when compared to a control group (Gannon et al., 2014). Many of the studies exploring voluntary polygraph have been conducted in the UK (Gannon, et al., 2014; Grubin, 2006, 2010; Grubin et al., 2004; Madsen, Parsons, & Grubin, 2004).

Despite the developing use of post-conviction sex offender polygraph in the UK in recent years, there is no current research using polygraph with mentally disordered sex offenders. It is reasonable to conclude that the utility of polygraph already established

with sex offenders, may extend to those with mental disorder, as they are likely to have been included in studies to date, although not specifically identified in samples. It is possible that mental disorder may influence the physiological responses in a polygraph due to potentially higher levels of anxiety (leading to an increase in false positives); unknown neurocognitive deficits; or an observed increase in inconclusive results may occur due to possible dampened physiological responses as a result of neurocognitive deficits or medication(s).

### **Justification of Thesis**

Therefore, the aim of this thesis is to explore the utility of PCSOT polygraph with sex offenders who have a mental disorder. This includes a review of the existing research on polygraph with sex offenders, in general, as there is an absence of research on polygraph with mentally disordered sex offenders.

The purpose of the systematic review of the utility of polygraph with sex offenders will enable any comparisons to be explored with the empirical findings of a mentally disordered group of sex offenders and discussed thereafter. This thesis therefore addresses a gap in existing literature about the utility of PCSOT with mentally disordered offenders.

The findings will hopefully guide the current practice of polygraph and risk management of mentally disordered sex offenders in a high secure setting where it is currently delivered, and could inform the wider utility of PCSOT in other forensic settings.



## **Overview**

The literature related to the application and criticisms of general polygraph along with initial utility of PCSOT has been outlined in this introductory chapter.

Chapter 2 is a systematic review, which examines the utility of polygraph with sex offenders. The review explores the outcome measures reported on PCSOT identifying key findings relating to recidivism, risk, disclosures, polygraph outcome and offender views of polygraph.

Chapter 3 is an empirical research study that explores the utility of PCSOT polygraph with mentally disordered offenders in a high secure setting. Using a mixed method approach of quantitative and qualitative analysis, it aims to provide further information on material disclosed in a polygraph and how this relates to risk, in addition to exploring the subjective experience of those offered a polygraph and reasons for choosing or declining the assessment.

Chapter 4 examines the psychometric properties of the Violence Risk Scale-Sex Offender version (VSR-SO) which is used in the empirical study. The validity and reliability of the measure is discussed and evaluated, as a tool that is designed for a forensic population.

Chapter 5 is a summary of the overall findings of the thesis in relation to previous literature. Limitations of the thesis are discussed in addition to recommendations for future research.

## **Chapter 2**

### **The utility of polygraph with sexual offenders - a systematic review**

## **ABSTRACT**

**Aim:** To conduct a systematic review of the current literature on the utility of polygraph with male sexual offenders.

**Method:** A scoping exercise established the need to update a review of polygraph with sexual offenders by employing a systematic process with clear inclusion and exclusion criteria and applying a quality assessment. Data were then extracted and synthesised from the final studies and findings presented.

### **Results:**

34 studies met the inclusion criteria (qualitative, quantitative design or mixed design, male of any age, polygraph as part of assessment, treatment or management of sexual risk, excluding any study prior to 1970 or non-English papers), and, after applying a quality assessment cut-off score of 70% or greater, the final review included 10 papers. The included studies found that polygraphing subjects resulted in significant increases in disclosures of the number of victims, additional paraphilia's, lower age of onset of offending, and high risk behaviours. Reoffending rates, whilst significant, were only so for violent reoffending and not sexual reoffending. Both professionals (involved in the supervision of polygraph offenders and non-polygraph offenders) and participants having undertaken a polygraph or not, report the value and potential uses of polygraph for sexual offenders and other offenders.

**Conclusion:** The studies included in this review support previous research findings and suggest that polygraph is a useful tool in aiding the assessment, treatment and

management of sexual offenders. Although the findings demonstrate the value of polygraph with sex offenders, caution is advised given the methodological flaws discussed.

## **BACKGROUND**

Since the introduction of PCSOT Polygraph in the 1970's, evidence of its utility has developed. As noted in the introductory chapter, many criticisms of polygraph as a whole have been applied to PCSOT. Only a small number of reviews have evaluated the accuracy of polygraphy, for different types of test (APA, 2011; Crewson, 2001). Crewson (2001) reported accuracy rates for diagnostic tests (often maintenance tests in PCSOT) as .880 and multi-issue tests (sex history tests in PCSOT) as .740. The majority of reviews aggregate the research findings, thereby misleading readers as to the accuracy of the test type used. The only meta-analysis to review different test types was that published by the APA in 2011. However, acknowledging many of the criticisms, it is of note that since some of the critical reviews such as NRC (2003) and BPS (2004) have been published, attempts have been made to improve the quality of polygraph research studies, and address some of the concerns expressed.

Research has consistently shown that the polygraph increases disclosures of number of offences (Ahlmeyer, Heil, McKee & English, 2000; Cook, Barkley & Anderson, 2014; English, Jones, Patrick & Pasini-Hill, 2003); the number of victims (Cook et al., 2014; Wilcox, 2002; Wilcox & Sosnowski, 2005); the range of paraphilias (Ahlmeyer et al., 2000; Wilcox & Sosnowski, 2005); the age of offending onset (Ahlmeyer et al., 2000;

Wilcox, 2002); and the number of high-risk behaviours, (Buschman, Bogaerts, Foulger, Wilcox, Sosnowski & Cushman, 2010; Gannon et al., 2014; Grubin, Madsen, Parsons, Sosnowski & Warberg, 2004) when compared to admissions through routine clinical interviews and file reviews or in comparison to another group. Additionally, the construction of the polygraph examination itself has been suggested to be effective as a ‘truth facilitator’ (Grubin, 2002): it is accepted that individuals can reveal information regarding their sexual history at three time points; when they are anticipating a polygraph examination, during the pre-test interview, or during the post-test interview. It is not uncommon for subjects to disclose information prior to the actual examination (Abrams, 1991; Blasingame, 1998), possibly owing to fear of being found ‘deceptive.’

Crossover sexual offences are defined as those in which victims are from multiple age groups, multiple gender groups, and from multiple relationship categories (Heil et al., 2003). Typically, when offence crossover is disclosed, assigned risk level increases (Gannon et al., 2008). Thus, it is important that for risk assessment to be reliable, information regarding cross-over offending should be obtained. Abel and Rouleau (1990) have suggested that individuals with only one paraphilia are rather uncommon, and that the majority of sex offenders have multiple paraphilic interests, thus research needs to look into ways in which to increase the disclosures of such high-risk behaviours.

Research suggests that the level of cross-over offending disclosures increases as a result of a polygraph examination. For example, Heil et al. (2003) found that prior to the polygraph only 7.2% of a Colorado, US sample of 223 inmate sexual offenders reported having both child and adult victims, after the polygraph however, this rose to 70%. In addition, English et al. (2000) reported that the 232 adult sex offenders in the

community of Colorado, US reported mixed gender victims only 10% of the time, post-testing this increased to 29%. Thus, the polygraph may not only be useful at increasing disclosures regarding sexual history, but this information may also be helpful in increasing our knowledge and understanding of the prevalence of cross-over offending. Indeed, Cann, Friendship and Gozna (2007) conclude that at least 25% of convicted sexual offenders in England and Wales sentenced to at least 4 years in custody have engaged in some form of crossover behaviour. Thus, more research is needed in this area.

With regards to the accuracy of PCSOT, Grubin and Madsen (2006), found that 44% of their sample reported that they were more truthful with their probation officers than they otherwise would have been. Kokish, Levenson and Blasingame (2005) also found that the polygraph accurately identified truth-telling 92% and deception 82% of the time, suggesting that it is a reliable and valid instrument for use in post-conviction settings.

The true value of polygraph is reported to be its impact upon recidivism rates. Cook et al., (2014) found in a 5-year follow up period, those who did not have a polygraph reoffended significantly more than the polygraph group on combined recidivism and violent recidivism but not sexual recidivism. This may indicate that polygraph was viewed as a deterrent from sexual offending, or the follow-up period may not be sufficient to establish an accurate sexual recidivism rate. In Konopasek & Nelson's (2015) mandated polygraph sample of 170 convicted sexual offenders in Oregon and Washington, US, reported 6.5% of their sample had perpetrated a new crime within a 5-year discharge period from a treatment programme. Likewise in McGrath et al.'s (2007) study they reported an overall recidivism rate of 6.3% over a 5-year follow-up. When compared with their pairwise matched sample, they did not find any significant

differences between the groups other than the polygraph group committed fewer violent offences.

In relation to risk, Cook et al.'s (2014) study found the 'no-polygraph' group to have significantly higher static-99 scores ( $p < .03$ ) than the polygraph group. This finding may be a result of the no-polygraph group fearful of being caught out and therefore higher risk. Alternatively, they could be cautious of disclosing past offences and possible repercussions of that. This study also found a third of recalls were attributable to the effects of polygraph, in that disclosures elicited led to a recall. Grubin (2010), in a large pilot study in the UK, reported that changes in risk assessment and supervision, was three times more likely if offenders had received a polygraph.

Whilst a few studies have reviewed the perceptions or experience of polygraph by professionals working with the polygraph examinees and/or offenders (Grubin, 2010; Grubin et al., 2004; McGrath et al., 2007), only one study (Spruin, Wood, Gannon & Tyler, 2017) is known to have examined qualitatively offender managers' and sexual offenders' views on the mandatory use of the polygraph in a community-based supervision. Polygraphed offenders and their offender managers, and non-polygraphed offenders and their offender managers, were asked about their experiences and perceptions of a mandatory polygraph. Thematic analysis identified four main themes: (1) truth detection, (2) perceptions of behaviour change, (3) perceptions of polygraph as part of supervision, and (4) national implementation of polygraph testing. Spruin et al. (2017) suggested several benefits of mandatory polygraph testing such as support for

supervision, including offenders making more high risk disclosures, motivating offender honesty, and aiding offenders' compliance with licence conditions.

The aim of this review is to systematically assess the highest quality research in considering the utility of polygraph in order to assist in the development of future studies.

### **Existing reviews**

To determine if the current review was justified, a scoping search was conducted on 21<sup>st</sup> November 2017 on the following databases and subject specific journals covering medical, psychological, social sciences:

Cochrane Database of Systematic Reviews (CDSR)

PROSPERO International prospective register of systematic reviews

[www.crd.york.ac.uk/prospero](http://www.crd.york.ac.uk/prospero)

Campbell Collaboration

Centre for Review and Dissertations (DARE)

MEDLINE bibliographic database (limited to reviews)

PsycINFO (limited to reviews)

Journal of polygraph (1972 – November 2018)



A search of the literature revealed four previous reviews of which only one was a systematic review of polygraph with sexual offenders. The other three papers were research studies. The one paper which was a relevant systematic review evaluated:

- i) The utility of post-conviction sex offender polygraph testing (Elliott & Vollm, 2016).

Elliott and Vollm (2016) reviewed the literature systematically employing the PRISMA (Preferred Reporting Items for Systematic Reviews) guidelines to review and evaluate outcomes for studies using PCSOT polygraph in the treatment and management of sexual offenders. The outcome was assessed based upon recidivism rates and disclosure. They identified 19 studies that met their eligibility criteria (a polygraph with questions focussing on sexual offending; polygraph in pre-conviction settings without clear evidence of individuals being guilty of the sex offence were excluded; published and unpublished studies if accepted for publication were included; studies with or without comparison or control groups were included; no restrictions with regards to individual characteristics or country of origin or reported language of study).

The primary finding of this review was that the polygraph appears to elicit an increased amount of offence-related disclosures associated with risk-related factors. These risk-related factors include “the number and variety of offense and victims, risk behaviours and violations of licence and treatment conditions” (Elliott & Vollm, 2016, page 19). The review revealed seven studies reporting an increase in the disclosure of crossover offending which relates to higher risk and sexual recidivism. Elliott and Vollm also identified that a possible reason for increase in disclosures could have been due to immunity from criminal prosecution which featured in many of the studies reviewed.

New information elicited from disclosures was also considered to be a possible product of ‘learning’ what is actually a ‘sex offence’ through the course of treatment and process of a polygraph, demonstrating a simple lack of prior knowledge of what constitutes a sexual offence. Therefore, once fully understood what a sex offence is, an increase in disclosures follows.

The review also notes a wide range of sample sizes across the studies from 25 to 635 (with 14 out of 19 studies having a sample size of 200 or less, or 9 studies out of 19 with 100 or less) and an age range from 13-76 years, but also notes some missing demographic data in three of the studies. So with small sample sizes in many of the studies and very few studies (4 out of 19) including a control group, the generalizability of the findings are noted as limited. In addition, Elliott and Vollm note that retrospective studies with the lack of an appropriate control group “make it difficult to disentangle the impact of therapy/supervision from the effect of the polygraph”. This, with the knowledge that sexual offender treatment can reduce recidivism, leads to the suggestion that an increase in disclosure from the polygraph may in fact be due the individuals also receiving psychological treatment, in which they are encouraged to be open and, in some therapies historically, were required to accept responsibility and acknowledge their offence(s). The systematic review highlights the lack of comparison of polygraph and non-polygraph groups both receiving treatment to determine how much additional disclosures are a result of the polygraph and not other factors such as treatment.

With regards to considering the impact of polygraph on recidivism, this review identified only two studies which had a follow-up period of 5 years or more, which was not considered by the authors of the review to be adequate, given low rates of

reoffending and low base rates of sexual offending (13.4%: Hanson & Bussiere, 1998). However, the two studies reported in this review found a decrease in recidivism rates for those that had a polygraph. This was only significant for violent reoffending. So Elliott and Vollm note the polygraph led to increased information about offenders' risk behaviours. This was not related to specific sexual risk. They go on to add that those who avoid taking the polygraph may benefit from increased supervision, as studies indicate they tend to reoffend more often.

A major confounding variable noted in most of the studies was voluntary participation. This is then not capturing those who decline, which was a large number, as reported in review, although no specific data was provided of the drop-out data. In addition, volunteers are likely to be "more compliant, and eager to please, making them more likely to disclose or adhere to experimenter effects during the polygraph" (Elliott & Vollm, 2016, page 21). This was confirmed by one of the studies reviewed which found that volunteering inmates were more likely to disclose victims than mandated parolees during the polygraph (Ahlmeyer et al, 2000).

Self-reported ratings of the polygraph utility were included in Elliott and Vollm's review as an outcome measure. They point out the likelihood of socially desirable responding in such studies, particularly if the therapist was present during the interviews. However, the review also refers to there being an equal possibility of offenders wishing to undermine the confidence of polygraph.

A substantial drop-out rate was noted but not provided in Elliott and Vollm's review, with the issue of how this can skew the data being noted. They were unable to systematically identify why offenders dropped out at different points in studies, but

noted the likely different subgroup this left from the original sample. Those that dropped out are considered by the reviewers to be more resistant and less compliant to disclosing in a polygraph. They added that it is possible that those who received a deceptive result on a polygraph may have dropped out.

Lastly, the type of polygraph test administered in the studies reviewed, varied greatly. Elliott and Vollm refer to the uncertainty of whether different test types impact upon the validity of the outcomes. Four of the included studies reviewed did not specify the type of polygraph test employed.

Elliott and Vollm summarise by concluding that polygraph may be useful in increasing offence-related admissions, which in turn can increase our understanding of the future management and risk of sexual offenders. This view however, is based upon some low quality studies within the review. They point out the methodological shortcomings in the literature and urge for more robust and rigorous methods to further develop the evidence base for the use of polygraph in the treatment and management of sexual offenders.

A further review was found in the Journal of Polygraph in 2016, and in this narrative review of polygraph with sexual offenders, Grubin (2016) refers to the accuracy of polygraph as reported by the National Research Council (2003) noting single issue tests to be 81-91% accurate but screening test (which is a test of multiple issues, such as the sex history examination) being less accurate. Also the screening tests are reported to have a higher false positive rate (Grubin & Madsen, 2006; Kokish et al., 2005).

Grubin (2016) notes a more recent move towards polygraph test outcome being expressed as a probability statement with confidence levels (Nelson et al., 2011). He

acknowledges the data set could be larger and needs to be validated but that it can aid the understanding of accuracy of polygraph.

The review highlights how many studies have reported the utility of polygraph in increasing the reporting of offence type and victims, deviant sexuality and risk behaviours (Ahlmeyer et al., 2000; Grubin et al., 2004; Heil et al., 2003; Hindman & Peters, 2001). However, many of the studies did not include an adequate control or comparison group. Only 2 UK studies did include an adequate comparison, one of which had a voluntary condition (Grubin, 2010) and the other a mandatory condition (Gannon et al., 2012 & 2014). Both studies found significant increases in the reporting of clinically relevant disclosures if receiving polygraph.

Grubin's review also refers to false admissions occurring but at a low rate. In using anonymous surveys two studies investigated this (Grubin & Madsen, 2006; Kokish et al., 2005) both reporting that less than 10% of offenders self-reported a false admission.

In reviewing professionals' experience of polygraph, it is reported that polygraph has a treatment benefit. In Grubin's 2010 study, 90% of probation officers rated the polygraph as somewhat or very helpful, as did Gannon et al., (2014). Although Rosky (2013) points out this does not necessarily improve the treatment outcome or reduce risk.

The final area reviewed by Grubin (2016) was that of recidivism. He notes two studies: one reporting 95% of sex offenders on probation or parole did not reoffend over 9 years when taking regular polygraph testing (Edson, 1991) and the other reporting 31% of polygraph group committing an offence over a 2 year period compared with 74% who were not receiving polygraph (Abrams & Ogard, 1986). A further study that employed a

randomised trial found that at a 5-year follow-up point there was a significantly lower rate of reconviction for non-sexual violence for polygraph group compared with a matched no-polygraph group (McGrath et al., 2007).

A further narrative review by Branaman & Gallagher (2005) highlighted the limitations. Branaman and Gallagher report on the validity of the CQT method used in polygraph, with one study noting an accuracy rate of 97% for guilty subjects and 93% accuracy for non-guilty subject (Raskin, 1989), and another study reporting 90% accuracy when inconclusive results were removed (Honts & Quick, 1995). They go on to note though that as highlighted by the National Research Council's review in 2002, many of the studies reviewing accuracy of polygraph were mock crime experiments.

The error rate is another area of investigation, with a greater probability of false positives than false negatives being found (Abrams, 1989; Raskin & Honts, 2001). The latter study identified 4 field studies which used the instant offence test (focusses on the elements of denial) and found the accuracy rate to be 98% for guilty subjects and 75% for innocent subjects. Branaman and Gallagher suggest the probability of error rate is expected to increase for maintenance (focusses upon an offender's compliance with treatment and adherence to conditions mandated by the Court) and sex history (obtains a fuller and more accurate account of an offender's sexual history, any unidentified paraphilic interests, including deviant sexual fantasies and offence behaviour) tests as the focus is broader.

The authors of this review, go on to discuss the intellectual ability of the test taker, reporting a study that has poor predictive validity, of specific incident polygraph tests with adults of an identified mental age of 12 (Abrams, 1974) which was supported in a

later study with children aged 9 to 13 (Abrams, 1975). In the second study the accuracy rate was poor up to age 11, but for 12 and 13 year olds the accuracy rate was similar to adults with average intellectual ability. It was concluded therefore that adults with borderline intellectual ability should not be tested.

Similar to Elliott and Vollm's review, Branaman and Gallagher note that a number of studies have found that sex offenders report significantly more offences with polygraph (Ahlmeyer et al., 2000; Abel et al. (1987) and a broader victim profile (English et al., 2000). This review concludes by noting the value of polygraph as a tool for sex offender treatment but that the validity of polygraph largely relates to specific incident tests and less with monitoring and sexual history disclosure tests.

Other than the review by Elliott and Vollm, these other reported reviews were not systematic and did not employ a systematic approach, therefore lacking robustness and introducing possible bias. Nevertheless, many of the findings are supported by Elliott and Vollm's systematic review, thereby establishing generalizability.

## **Current Review**

The current review was justified on the basis of a number of reasons: Whilst Elliott and Vollm's review was systematic and published within the last 5 years, the searches were conducted in November 2014 and evidence from the initial scoping exercise indicated that further research of a potentially greater quality had been published since this time, which should be considered in evaluating the utility of polygraph with sexual offenders. In addition to this, the search terms used were considered to be limited and therefore potentially missing relevant studies. Further, Elliott and Vollm (2016) did not include a

search of the Journal of Polygraph, a key Journal in publishing polygraph studies. This journal is only available to subscribing members of the APA. With a robust search employed of the literature, it is hoped further studies will be identified to expand the literature base.

It is also considered that Elliott and Vollm's review included some weak studies which impacts upon the overall quality of the summary of the findings. This and other reviews do not appear to have employed a systematic quality assessment. Whilst Elliott and Vollm refer to the use of the PRISMA guidelines this seems to have been limited to designing the structure of the review and evaluating the outcomes, and not to assessing the quality of the studies.

The aim of the current systematic review, therefore, was to evaluate the utility of polygraph with male sexual offenders, reviewing only studies considered to be of a high quality.

### **Review objective**

The purpose of this review was to draw together all existing empirical literature in this area in order to identify the relevant use of post-conviction polygraph (PCSOT) with male sexual offenders in their assessment and treatment of their sexual offence related behaviour. This is to better inform the assessment, treatment and management of sex offenders.



## **Review question**

*How effective is the PCSOT Polygraph in the assessment, treatment and management of male sexual offenders?*

## **METHOD**

### **Sources of Literature**

The following electronic data sources were utilised in the search:

- **PsychINFO** (1970 to week 2 November 2017, completed on the 22/11/2017)
- **Ovid MEDLINE** (1970 to week 2 November 2017, completed on the 22/11/2017)
- **EMBASE** (1970 to week 2 November 2017, completed on the 22/11/2017)
- **CINAHL Plus (EBSCO)** (1970 to week 2 November 2017, completed on the 22/11/2017)
- **Web of Science (Web of Knowledge)** (1970 to week 2 November 2017, completed on the 22/11/2017)
- **Polygraph journal** (1970 to November 2017)

The search employed restricted articles to 1970 onwards as the use of PCSOT was established at this time. Articles were also restricted to those that were written in the English language due to time constraints of translating studies.

In addition, bibliographies of retrieved papers were hand-searched for relevant studies that matched the inclusion criteria (see below). A number of experts in the field were also contacted. A key author in this area in the United Kingdom was contacted (Professor Don Grubin via email on the 24<sup>th</sup> November 2017), who advised contacting James Konopasek (emailed on 26<sup>th</sup> November 2017). Other experts in the field of polygraph were also contacted (Ray Nelson contacted via email on 24<sup>th</sup> November 2017, and Mark Handler via email on 24<sup>th</sup> November 2017). They were all contacted with regards to unpublished (e.g. papers in preparation) studies or information about pertinent studies that might only exist in the 'grey literature'. This was done in an attempt to reduce publication bias.

The internet search engine Google was also searched using phrases such as 'polygraph(y) and sexual offenders' and 'Post Conviction Sex Offender test (PCSOT)' in addition to 'lie detector'.

Specific internet sites were accessed that are known to utilise post-conviction sex offender polygraph in the management, monitoring and treatment of sex offenders such as Colorado Department of Corrections. Other sites accessed included NHS evidence, and Centre of Sex Offender Management (COSM: a national clearinghouse and technical assistance centre that supports state and local jurisdictions in the effective management of sex offenders).

## **Search terms / syntax**

The following search terms were utilised in the searches of the electronic databases noted above (these were informed by the initial examination of the empirical literature in this area, where alternative spellings or terms specific to a certain country, for example, were included):

*Polygraph\** OR *lie detect\** OR *psychophysiology\** OR *“post? Conviction sex offender”*  
OR *PCSOT* OR *“sex\* history”* OR *“maintenance exam\*”* OR *“maintenance test”*

AND

*“sex\* offen\*”* OR *“sex\* crim\*”* OR *“sex\* convict\*”* OR *p?edo\** OR *rapist* OR *rape*  
OR *molest* OR *perp\** OR *prison\**

## **Inclusion criteria**

### ***Participants***

To include research studies that are either qualitative or quantitative in nature (or mixed design) and are studies of sexual offenders that have undertaken a polygraph test. Studies in which some of the sample had not undertaken a polygraph by way of a comparison group to be included. Studies of Adult or Juvenile male subjects. Females were not included as they may respond differently on a polygraph.

### ***Interventions***

Studies examining polygraph as part of assessment, treatment or management of sexual offence related behaviour or risks.

### ***Outcomes***

Studies examining an evaluation of the polygraph which may include recidivism or disclosures. Qualitative studies looking at perception of polygraph and consumer evaluation.

### ***Study Design***

A range of study designs to be included due to the limited research in this area.

### **Exclusion criteria**

To exclude any studies before 1970 as Post-Conviction Sex Offender Testing was not introduced until the 1970's. Any study in which the full text is not available in English to be excluded. This was due to time constraints and a lack of available resources with which to translate non-English papers into English.

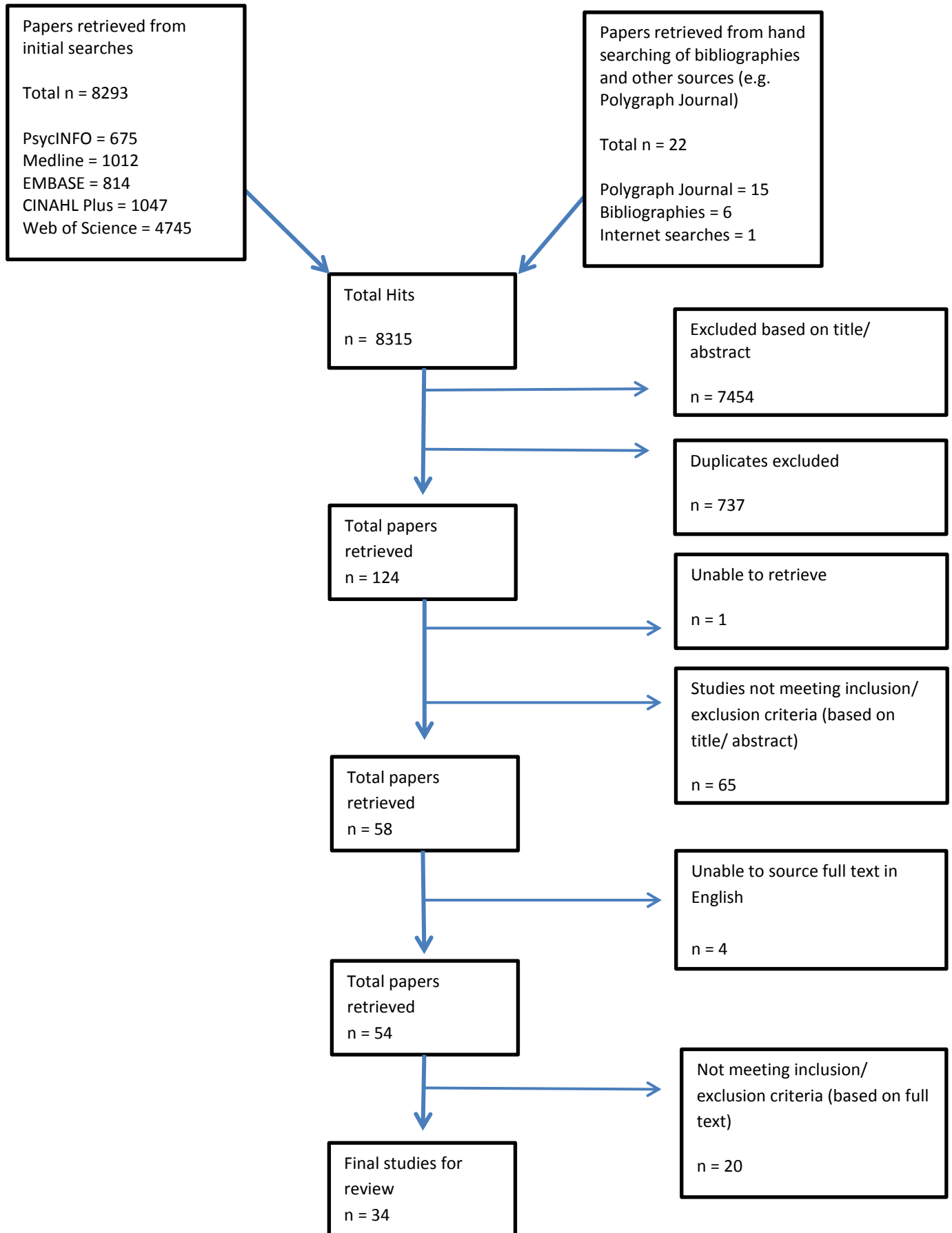
### **Study Selection**

All 8293 papers identified from the electronic databases, along with the 22 retrieved from hand searching of bibliographies and other sources, were manually sifted based on the title and abstract to eliminate irrelevant studies. In excluding 7454 papers based on title and abstract, in addition to 737 duplicate studies, a sample of 124 papers was yielded. The remaining papers were then reviewed by applying the inclusion/exclusion criteria to remove further irrelevant studies. The inclusion/exclusion criteria were developed from a review of the literature and from the initial scoping searches. All papers that did not meet these criteria were removed. This led to the removal of 65

papers not meeting the inclusion/ exclusion criteria. One additional paper could not be retrieved, yielding 58 papers. Full text versions of the remaining 58 papers were then obtained where possible, and re-examined with the same inclusion/exclusion criteria applied. Four papers could not be sourced in English for the full text, so were excluded. The remaining 54 papers were examined in full and 20 were excluded as they did not meet the inclusion/exclusion criteria. The final number of papers for review was thus 34. A flow chart of the number of studies at each stage of the selection process can be found in Figure 1. A list of the studies that were excluded at this last stage in the process along with details of why they were excluded can be found in Appendix A.

A quality assessment was applied to the final included studies (n=34) using specifically designed scoring protocols. One was designed for quantitative studies and another for qualitative studies in this review. The quality assessment criteria for quantitative studies were developed from a critical appraisal tool for systematic reviews (Critical Appraisal Skills Programme CASP, 2018) and intervention studies (Methods for the development of NICE public health guidance) which were modified to ensure relevance for this current review. The quality assessment protocols can be found in Appendices B (quantitative protocol) and C (qualitative protocol).

Figure 1. Flowchart of study selection process



## **Quality Assessment**

The methodological quality of the studies (n=34) that met the inclusion criteria was assessed. A quality assessment tool for quantitative studies was designed specifically for this study, utilising and adapting criteria from critical appraisal tools for systematic reviews and intervention studies as noted above. The questions related to representativeness of the sample, intervention, outcome measures, and study design. Each quality assessment criterion was scored from 0 –2 (0 – no, 1 – partial, 2 – yes) depending on the degree to which it met that criterion, with a maximum score being 40, where a higher score is indicative of a better quality study.

A quality assessment tool for qualitative studies was also designed for this study, utilising critical appraisal tool criteria for qualitative studies (as noted above). This quality assessment tool was applied to the one study identified as qualitative in nature. Each quality assessment criterion was scored from 0 –2 (0 – no, 1 – partial, 2 – yes) depending on the degree to which it met that criterion, with a maximum score being 20, where a higher score is indicative of a better quality study.

Please refer to Appendix B and C for quality assessment templates.

Total scores for both qualitative and quantitative assessments were calculated as a percentage and then a cut-off score was applied. By applying a cut-off value to the quality assessment scores it was possible to exclude further studies to ensure only high or ‘good’ quality studies were reviewed. So any study of less than 70% on the quality assessment was excluded from the final review. The number of papers removed by applying this cut off was 24, leaving 10 for final review. The value of 70% was arbitrary but has been applied in other systematic reviews such as Guhman (2014). See

Appendix D for quality assessment scores of all 34 papers reviewed. Those highlighted identify the final 10 studies included for review.

### **Inter-Rater Reliability**

To ensure reliability of the quality assessment scoring:

- a) Inclusion/ exclusion criteria (PICOS) applied to title and abstract only  
13 (of the 124 papers = 10%) studies were chosen at random and scored by a second coder (assistant psychologist). A Cohen's kappa inter-rater reliability coefficient  $k = .649$  was found between the two raters. Any Kappa's over .75 are considered "excellent", Kappa scores between .6 to .75 are deemed "good" and scores between .4 and .6 are considered "fair/moderate" (Cohen, 1969).
- b) Inclusion/ exclusion criteria (PICOS) applied to entire paper  
6 (of the 58 remaining papers = 10%) studies were chosen at random and scored by a second coder (assistant psychologist). A Cohen's kappa inter-rater reliability coefficient  $k = 1.0$  was achieved.
- c) Quality assessment criteria applied to  
4 (of the 34 remaining papers = 10%) studies were chosen at random and scored by a second coder (assistant psychologist). The PICOS Mean scores for these selected studies were significantly different [ $t(3) = -6.124, p = .009$ ] between the first and second coder ( $M = 26.75, SD = .96, M = 31.75, SD = 2.22$ , respectively). A Cohen's kappa inter-rater reliability coefficient  $k = .0$  was achieved.



Given that the inter-rater reliability of this review was found to be good and excellent respectively for parts a and b, it is suggested that initial sifting of the papers for review was reliable and consistent. However, it is of note that there is no inter-rater reliability for part c, where the quality assessment was applied. A lack of experience in this type of task is noted. The overall difference was of lower scores assigned by the second rater, thereby potentially excluding some of the studies when applying the 70% cut-off value.

## **DATA EXTRACTION**

A data extraction form was constructed to extract data for each individual study. Data were extracted from the final 10 papers eligible for review following the application of a cut-off score to the quality assessment scores. The details are summarised in Tables 1 and 2.

In this review the data extraction form used was an amalgamation of several example forms in order to produce a structure that was suitable for the included studies, in a similar manner as was done for the quality assessment checklist (see Appendix G). The data extraction form considered the following:

- Where the study took place and in what year
- The publication type
- The aims of the study
- The research design and inclusion or exclusion criteria for their methodology
- The sample size
- Methodology for data collection and selection
- Outcome measures used

- The analysis used and specific statistical techniques to produce findings
- Reported results and those relevant to the present review
- The reliability and validity of measures used and the findings produced from the study
- Any limitations of the study

In cases where information reported was either unclear or sparse, the information was recorded as “not known”.

## **RESULTS**

A total of 34 papers were quality assessed. After applying the quality assessment cut off value of 70% or greater for inclusion, the final number of papers reviewed was 10.

A data extraction form was developed and used to gather relevant data for review. Table 1 summarises the characteristics of each quantitative study, and Table 2 the qualitative paper.

**Table 1. Characteristics of quantitative studies examining the utility of polygraph with sexual offenders (n = 9)**

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40 (%)
Ahlmeyer, Heil, McKee & English (2000)  Colorado USA	Male sex offenders under jurisdiction of Colorado Dept of Corrections  Comparison of Inmates (35) & parolees (25)	60	SHE	To evaluate the effects of polygraph testing on the disclosure of sexual offending behaviours among multiple data sources in known criminal justice settings  Data sources are: PIR, SHD form, 1 <sup>st</sup> polygraph, 2 <sup>nd</sup> polygraph	Disclosures  No. of victims & No. of offences  Polygraph outcome (DI, NDI)	Sig increase in mean no. of victim (p<.01) and offence (p<.01) admissions by source (from PIR, to SHD form, to Polygraph)  Parolees admitted fewer victims & offences than inmates (p<.01)  Sig increases in mean no. of admissions for sexual assault (p<.01) and additional paraphilia (p<.01) but not sig for frottage  Inmates reported a sig (p<.01) lower age of onset for sexual offending behaviours (12y for inmates and 23y for parolees)  DI - increase in mean and median no. of admissions across all stages NDI - increase in mean and median no. of admissions from PIR to SHD then tapered off at 1 <sup>st</sup> polygraph  5% inmates with DI admitted nothing whereas 21% parolees with DI admitted nothing DI- 50% inmates admitted high-risk behaviours and past sexual offences compared with 26% parolees  Substantial decline in info gained from 1 <sup>st</sup> to 2 <sup>nd</sup> polygraph (p<.05)	Only victims and offences quantified by the offender were used in data analysis therefore underrepresentation of the true no. of victims and offence likely  High rates of DI (80%)  Unique confounding effects of voluntary/ mandatory treatment participation, amount & intensity of treatment received and perceived threat on disclosures for inmates & parolees  Prior sexual criminal history not specified  Parolees- higher level of denial than inmates who sought treatment and admitted their sexual offending behaviour; Less time in treatment & less intensive treatment than inmates; may fear being revoked as consequences for deception not consistently applied	35 (88%)

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
Cook, Barkley & Anderson (2014)  Oregon USA	Adult male sex offenders in county of Oregon and released to county from prison Jan 1995- Aug 2005  93- polygraph 73- no polygraph  Community corrections	166	SHE	To establish how the SHPE influences the behaviours of sex offenders required to undergo a SHPE & whether or not there is a difference in recidivism between those offenders who have a SHPE and those who do not	Recidivism – sexual & non-sexual violent  5 year follow-up  No. of victims & type  Static-99	Polygraph provided more information than official records  Polygraph led to increased reporting of male, stranger & unrelated victims  Non polygraph gp had sig higher Static-99 scores (p<0.03)  Static-99 scores not sig different for polygraph gp who reoffended (p<0.946)  No polygraph gp reoffended sig more than polygraph gp (P=0.006) on combined recidivism Sexual recidivism was not sig (p= .295) Violent recidivism was sig (p=0.016)  Those who reoffended were on supervision sig longer prior to polygraph (p=0.001)	Reasons for not receiving polygraph (non-compliant with supervision & not in treatment; in treatment but not progressing to be ready for polygraph; avoided the polygraph)  Means were not equal. Adjusting led to no sig difference	31 (78%)

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
Gannon, Wood, Pina, Tyler, Barnoux & Vasquez (2014)  East & West Midlands compared with North of England  UK	Adult sexual offenders released into mandatory polygraph areas (east & west midlands) serving 1 year or more for sexual offence  Comparison gp-matched on rural/urban location, key demographics, risk & caseload stats  332 polygraph 303 comparison	635	Maint.	To examine whether a pilot project of mandatory polygraph testing would increase disclosures made by community-supervised sexual offenders compared with those receiving usual community supervision	CRD's  Polygraph result (DI, NDI, INC)  Risk (RM 2000)	<p>Higher risk offenders had higher % of DI results on 1<sup>st</sup> test compared with low risk offenders (p= .007)</p> <p>After gaining experience of polygraph the proportion of NDI/DI/INC results were more equal across all risk levels (p=.97 for 2<sup>nd</sup> test and p=.41 for 3<sup>rd</sup> test)</p> <p>Experience of polygraph testing associated with more sexual behaviour CRD's and less thoughts, feelings, attitude and historical info CRD's (p&lt;.0001)</p> <p>Polygraph offenders made sig more total CRD's after controlling for length of time 'at risk'. The majority made in pre-test phase (p&lt;.001)</p> <p>Polygraph did not sig alter the rate of CRD's made in regular supervision (p=.17)</p> <p>Odds of making at least one CRD in polygraph gp is 3.1 times greater than the comparison gp. This is stable across all risk levels.</p> <p>Higher no. of CRD's associated with DI result on 1<sup>st</sup> polygraph compared with NDI (p=.001) or INC (p=.04). No such effect on 2<sup>nd</sup> or 3<sup>rd</sup> test</p> <p>Offence type does not influence CRD's</p> <p>1/3 recalls (polygraph gp) attributable to effects of polygraph</p> <p>OM's (polygraph gp) &gt; 80% said test outcome was useful- polygraph gave confidence that offender was sticking to licence conditions followed by discloses risk and/or makes it easier to challenge</p>	<p>Comparison should have attended 6 mth interviews to match polygraph sessions</p> <p>Polygraph gp spent sig longer period of time 'at risk' in community- could allow for higher exposure to risk &amp; higher no. of CRD's</p> <p>Didn't include large no.s of adult/child offenders or mental disorder</p> <p>Not random allocation to gps</p> <p>Difficult to rule out effects of possible unidentified confounding variable (e.g. dynamic risk)</p>	35 (88%)

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
Grubin (2010)	Adult sex offenders taking part or waiting for treatment programme in 10 nominated probation areas across England	522	SHE Maint. Instant Offence	To determine the practicality of using polygraph in probations settings & provide a basis for assessing if polygraph can contribute sig to treatment & supervision of sex offenders	Test outcome – DI/ NDI/ INC  RM2000  Case managers views of risk (i.e. change), helpfulness of polygraph, treatment changes  Disclosures	53% SHE; 31% maintenance; 16% specific issue denial  Polygraph offender x14 more likely to make a disclosure than non-polygraph offender  Case managers reported polygraph offenders sig more likely to make disclosures relevant to their treatment or supervision compared with no-polygraph offenders ( $p < .0001$ ). Seriousness of disclosures not sig different.  Disclosures led to direct changes in risk assessment & supervision & new treatment targets x3 more frequently than non-polygraph offenders  Polygraph case managers more typically increase risk where risk was re-evaluated, whereas non-polygraph case managers more often decreased risk ( $p < .01$ )  Polygraph case managers reported increase in risk, change in supervision, change in treatment or initiation of another intervention in 41% cased compared with 27% for non-polygraph case managers  Case managers reported in 46% 1 <sup>st</sup> tests the exam had 'other' (qualitative) effects in relation to management of offender	N= estimated 43% those eligible  Found sig differences in ethnicity & previous convictions for sex offences between groups  Some forms from probation completed months after test so inaccurate  INC rate 32% in 1 <sup>st</sup> year – addressed in training and ↓ 15% in year 2  No details of those who refused testing  Did not match comparison offenders directly  Not a randomised control study	30 (75%)
UK	Comparison with those who don't take polygraph (4 probation areas)  All voluntary  342 had polygraph Non-polygraph group = 180							

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
Grubin, Madsen, Parson, Sosnowski & Warberg (2004)  UK	Adult male sex offenders  Community based sex offenders treatment programme in 3 English counties  Voluntary  Allocated to polygraph aware or polygraph unaware gp	32	Maint	To explore if polygraph testing would result in sex offenders engaging in less HRB's  Told their behaviour would be reviewed in 3mths	HRB at baseline, at 3 mths had a polygraph, and again at 6 months  HRB's measured pre, during and post polygraph	97% disclosed they had engaged in at least 1 HRB at time 1  During interview 41% reported some HRB's, compared with 84% in pre-test 78% failed polygraph 80% reported additional or new info about HRB's in post-test interview  Sig difference in HRB's reported at time 1 &2 (P= .019)  Time 2 disclosure: 62% disclosures to researcher. 7 passed (NDI) – 6 made no disclosures and NDI 6 failed (DI) – 4 made HRB's  71% passed polygraph at time 2 compared with 29% at time 1 (p< .001)  No difference in HRB's at time 1 for each group  20/21 men thought (via Questionnaire) polygraph helped them to avoid reoffending 57% said knowledge of polygraph led to them inhibiting their behaviour 52% reported more info to supervising probation officer	Some men in polygraph unaware gp at time 2 may conclude they still may get a polygraph base on experience at time 1 so extent of true unawareness is not clear  Considers false admissions to explain increase in disclosures  Considers decrease in behaviours at time 2 may not be a real improvement  High drop-out rate  Allocation to groups varied across probation areas and was not consistent or random allocation	30 (75%)

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
Jensen, Shafer, Roby & Roby (2015)  Inter-mountain west area  USA	Adult & Juvenile sexual offenders (97% male) in sex offender treatment agency in intermountain west area  Juveniles =86 Adults = 238  SHE part of treatment	324	SHE	To assess the difference between juvenile and adult sex offenders in terms of propensity for passing a sexual history disclosure polygraph as part of treatment	Age – categorical & continuous  SHE result-pass or fail	No sig difference in 3 adult age gps  Proportionally juvenile & adult offenders did not appear to differ sig in their polygraph outcomes. Confirmed by chi sq  Age not significantly associated with odds of passing SHE  Both gps failed a SHE 1/3 of the time	Included 11 female offenders  Not generalizable  Not random sampling  Sex offence type not included	28 (70%)
Konapasek & Nelson (2015)  Oregon & Washington  USA	Convicted adult male sex offenders  Oregon & Washington correctional treatment systems  Mandated for treatment in county 1994-2004	170	SHE	To explore the correlations among variables related to test results from sexual history polygraph testing, treatment outcome & sexual recidivism among convicted sex offenders	Polygraph outcome (Di/ NDI)  Static-99  Disclosure of sexual offence history  Recidivism	Recidivists = 39  Sig relationship with sexual recidivism & NDI result (p= .029) Sig relationship with sexual recidivism & age under 35 at time of NDI (p=.047) Sig relationship with successful completion of treatment & NDI result (p< .001) Sig negative relationship between sexual deviancy & treatment completion (p= .028) Static-99 approaching sig level relative to sexual recidivism  6.5% recidivists perpetrated new crime within 5 years discharge from treatment programme 22.9% failed to register/report  Recidivists: 9 of 11 didn't get NDI result in 6 mths (p= .047) 48 of 80 NDI in 6 mths were under 35 (p= .014) Denial was a factor for 35 of 80 NDI result in 6 mths (p= .000)	Type of sample- convenience  Sample size  Project design- investigatory, correlational survey. Not experimental so no control group  Cannot make causal inferences and generalizability unknown  Interaction effects not evaluated  Absence of data on nature & scope of reported sexual offence behaviours prior to and during polygraph testing  ASPD & Psychopathy referred to as same thing	29 (73%)



Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
McGrath, Cumming, Hoke, & Bonn-Miller (2007)	Male adult sex offenders in state of Vermont, convicted in 1995-2001	208	Maint.	To investigate if PCSOT results in reducing reoffending rates	Risk: Static-99 VASOR RRASOR	230 polygraph maintenance exams (mean=2.2 per individual) on ave 1 polygraph every 22.2 months	No baseline for pre polygraph disclosures obtained therefore authors estimated 60-80% reported HRB's were previously unknown to service providers	31 (78%)
Vermont state USA	104 – polygraph 104 – no polygraph  Pairwise matched  1/3 completed prison sex offender treatment in each group			Hypotheses: i) polygraph participants increase disclosures ii) new info would enhance supervision & treatment services iii) polygraph participants would reoffend lower rates	Recidivism-sexual, violent, other  Polygraph result (DI, NDI, INC)  Professional views of polygraph	68.7% NDI; 20% DI; 9.1% INC; 2.2 discontinued  96% service providers rated polygraph as helpful or very helpful in managing individual cases  Supervising officers found polygraph to be sig more helpful than treatment providers  Overall recidivism rate (5 year) = 6.3% Only sig between gp difference was polygraph gp committed fewer violent offences  Polygraph gp received lengthier community correctional supervision & community treatment  No risk measure predicted sexual recidivism AUC for Static99 = 0.63; RRASOR = 0.59; VASOR = 0.65	Assignment to treatment conditions not random  Couldn't identify no. of participants who as result of disclosures made charged with new non sexual violent offence or violation of supervision or returned to prison  Frequency of polygraphs	

Author & Location	Sample & Setting	N	Type of Test	Aim/ Objectives	Outcome measures	Findings	Limitations	Quality Score / 40
O'Connell (1997)	Adult male sex offenders	127	SHE	To establish what polygraph testing adds to sexual histories and how do findings compare with other studies of crossover	Disclosures of sexually deviant behaviour recorded on referral, after clinical interviews and after polygraph testing	<p>Polygraph testing led to sig more disclosures about deviant sexual behaviour than clinical interviews (<math>p &lt; .001</math>)</p> <p>Use of polygraph testing added sig to disclosures about paraphilic behaviours (<math>p &lt; .007</math>)</p> <p>Reports of the no. of different sexually deviant behaviours sig increased with polygraph testing (<math>p &lt; .000</math>)</p> <p>High degree of significance when comparing paraphilic behaviours before &amp; after polygraph testing (<math>p &lt; .000</math>)</p> <p>Subjects reported on ave x2 incidents of adult felony sexual offences after polygraph testing than known on referral or clinical interviews – not sig</p>	<p>Comparisons with other studies restricted due to different measures of sexual deviancy</p> <p>Some evaluations paid for by public agencies but most paid themselves limiting those of modest means</p> <p>If not suitable for community treatment not included, so sample probably better educated, higher incomes &amp; less deviant than those who go to prison</p> <p>3 confounding factors: 1) assessment of sexual history was less structured in clinical interview than polygraph 2) evaluator conducting clinical interviews had great faith in efficacy of polygraph, so may not have pressed too hard for info in clinical interview 3) wanting to 'pass' the test may have led to overestimation of deviant sexual histories</p>	28 (70%)

Abbreviations:

PIR – Presentence Investigative Report  
 SHE – Sexual History Examination  
 SHD – Sexual History Disclosure  
 SHPE – Sexual history polygraph examination  
 DI – deception indicated (polygraph result)  
 NDI – No deception indicated (polygraph result)

INC – Inconclusive (polygraph result)  
 Sig – Significant  
 CRD – Clinically relevant disclosure  
 OM – Offender Manager  
 RM2000- Risk Matrix 2000  
 PCSOT – post conviction sex offender test

RRASOR – Rapid risk assessment for sex offence recidivism  
 VASOR – Vermont assessment of sex offender risk  
 ASPD – Anti social personality disorder  
 HRB – High risk behaviour  
 Maint. – Maintenance

**Table 2. Characteristics of qualitative studies examining the utility of polygraph with sexual offenders (n = 1)**

Author & Location	Sample & Setting	N	Aim/ Objectives	Outcome measures/ Analysis	Findings	Limitations	Quality Score / 20 (%)
Spruin, Wood, Gannon & Tyler (2018)	Adult sex offenders on probation	47	To identify qualitatively the strengths & weaknesses of using the polygraph as an aid to supervising sexual offenders in the community	Semi-structured interviews via telephone to compare views of supervision and polygraph with and without polygraph	4 themes identified with sub-themes:  1. Truth detection (enhances high-risk disclosures & motivates honesty)  2. Perceptions of change in behaviour (perceived behaviour change under polygraph conditions & perceived behaviour change under regular supervision)  3. Perceptions of supervision (optimistic perceptions & critical perceptions)  4. National implementation of polygraph testing (polygraph use for sexual offenders, polygraph use for other offenders & opposition to polygraph use)	Participant selection not representative of all offenders and OM's  Small no.s – so can't generalise findings more widely or to females	18 (90%)
UK	comparison  Polygraph gp- in mandated area Non Polygraph gp – random selection from larger study (Gannon et al., 2014) & matched to polygraph gp on location, demographics & RM2000 scores  All voluntary participation  Polygraph gp=15 Non-Polygraph gp =10  Polygraph OM's = 12 Non-polygraph OM's =10			Thematic analysis using inductive approach			

## **Descriptive data synthesis**

Of the 10 final studies, six were conducted in USA and four in the UK. The average total sample size for all 10 studies was 229.1 (SD=118.6) with the number of participants ranging from 32 (Grubin et al., 2004) to 635 (Gannon et al., 2014). Of these 10 studies one was a qualitative study with a sample size of 47 (Spruin et al., 2018). All 10 studies included a polygraph group with an average polygraph sample size of 159.9 (SD=58.1) and the number of participants ranged from 15 (Spruin et al., 2018) to 342 (Grubin, 2010). Five of the 10 studies included a no-polygraph condition comparison group (Cook et al., 2014; Gannon et al., 2014; Grubin, 2010; McGrath et al., 2007; and Spruin et al., 2018). Of these five, the average sample size was 134 (SD= 46.2) with a range of participants from 10 (Spruin et al., 2018) to 303 (Gannon et al., 2014).

Three studies (Gannon et al., 2014; Grubin, 2010; Jensen et al., 2015) included a small number of females but were included in the review as they were a very small percentage of the total sample size and therefore unlikely to effect the overall results.

For seven studies the sample age ranged from 11 to 90 years old. Three studies only reported the average age for the different groups in the studies (Ahlmeyer et al., 2000; Gannon et al., 2014; Spruin et al., 2018).

Five studies reported on the type of sexual offences perpetrated by the participants. All five reported a large percentage of their sample being made up of child sexual offenders (Gannon et al., 2014; Grubin, 2010; Grubin et al., 2004; Konopasek & Nelson, 2015; McGrath et al., 2007).

Nine of the studies reported on ethnicity and their findings being representative of the sample in the area tested. The only study that did not report upon ethnicity was Jensen et al. (2015).

No study employed only the use of a specific incident test, 3 studies employed maintenance only polygraph tests (Gannon et al., 2014; Grubin et al., 2004; McGrath et al., 2007), with a further study (Spruin et al., 2018) reporting on a subset sample of one of the three studies, and five studies employed the sole use of the sexual history examination (Ahlmeyer et al., 2000; Cook et al., 2014; Jensen et al., 2015; Konopasek & Nelson, 2015; O'Connell, 1997). One further study employed all three types of polygraph test (Grubin, 2010).

The majority of studies (n=7) utilised a comparison group, of which six included a comparison between those who had a polygraph and those that did not (Cook et al., 2014; Gannon et al., 2014; Grubin, 2010; Grubin et al., 2004; McGrath et al., 2007; Spruin et al., 2018). Again recognising that Spruin et al.'s study reported on a subset from Gannon et al.'s study. One study included a comparison between inmates and parolees who had both received a polygraph (Ahlmeyer et al., 2000).

Three studies in the UK involved the use of voluntary polygraph only (Grubin, 2010; Grubin et al., 2004; Spruin et al., 2018) and six studies mostly in the USA employed mandatory polygraph testing only (Cook et al., 2014; Gannon et al., 2014; Jensen et al., 2015; Konopasek & Nelson, 2015; McGrath et al., 2007; and O'Connell, 1997). One study included both mandatory and voluntary polygraph groups (Ahlmeyer et al., 2000).

The study locations ranged from prison (n= 1) to the majority of studies being conducted on a community sample (n=7) and one in a treatment centre (n=1). It is unclear from one study if the treatment agency was a residential treatment centre or a treatment programme delivered in the community (Jensen et al., 2015).

Five studies evaluated sexual risk based on an assessment tool, of which three USA studies used the Static-99 (Cook et al., 2014; Konopasek & Nelson, 2015; McGrath et al., 2007) and

two UK studies used the RM2000 (Grubin, 2010; Gannon et al., 2014), with one other study that included RRASOR and VASOR (McGrath et al., 2007).

Three USA studies evaluated recidivism, all of which were over a five year follow up (Cook et al., 2015; Konopasek & Nelson, 2015; and McGrath et al., 2007).

Six studies evaluated disclosures (Ahlmeier et al., 2000; Cook et al., 2014; Gannon et al., 2014; Grubin, 2010; Grubin et al., 2004; and O’Connell, 1997). Six studies evaluated polygraph outcome (Ahlmeier et al, 2000; Gannon et al., 2014; Grubin, 2010; Jensen et al., 2015; Konopasek & Nelson, 2015; and McGrath et al., 2007) and four studies (Gannon et al., 2014; Grubin, 2010; McGrath et al., 2007; and Spruin et al., 2018) evaluated professional views of the polygraph along with two studies having evaluated participants’ views of the polygraph (Grubin, 2010; and Spruin et al., 2018). Two further studies evaluated polygraph across different age groups (Jensen et al., 2015; and Konopasek & Nelson, 2015).

Table 3 groups the studies according to outcome measures to aid the synthesis of the results.

## **Assessment and Treatment of Sexual Offenders**

### ***Voluntary or mandatory polygraph testing***

The polygraph was conducted on a voluntary basis for two studies (Grubin, 2010; Grubin et al., 2004) both of which were in the UK, and a further UK study (Spruin et al., 2018) in which the participants were mandated to take a polygraph as part of their licence conditions, but participated in the research on a voluntary basis. The majority of studies (n=6) utilised mandatory polygraph testing as part of treatment (Jensen et al., 2015; Konopasek & Nelson, 2015; McGrath et al., 2007; and O’Connell, 1997) or part of a community order/ mandatory trial (Cook et al., 2015; and Gannon et al., 2014 ). One further study utilised both voluntary

and mandatory polygraph testing, to compare inmates with parolees respectively (Ahlmeyer et al., 2000) finding that parolees admitted significantly fewer victims and offences than inmates.

### ***Disclosures***

All six studies reporting on disclosures noted an increase in the number of disclosures following polygraph, which included an increase in the numbers of reported victims and offences or high-risk sexual behaviours. Grubin et al. (2004) reported that 97% of their sample had in fact made disclosures in their first polygraph, relating to previously having engaged in at least one high-risk behaviour. One study found that polygraph led specifically to an increase in the reporting of male, stranger and unrelated victims (Cook et al., 2014) which are all related to increased risk of sexual reoffending (Hanson & Morton-Bourgon, 2005). Even after controlling for length of time ‘at risk’, Gannon et al. (2014) found that those undertaking a polygraph still made significantly more disclosures.

Interestingly two studies reported a substantial decline in the information gained from polygraph between a first and second test (Ahlmeyer et al., 2000; Gannon et al., 2014). The latter study specifically noting that this was for those with a DI (Deception Indicated: those found to be lying to relevant sexual behaviours asked in the polygraph) polygraph result. Other studies that considered the timing of disclosures, reported the majority of these being made in the pre-test phase (Gannon et al., 2014) or both pre-test and post-test polygraph (Grubin et al., 2004).

Two studies calculated an odds ratio of disclosing high-risk behaviours comparing non-polygraphed to polygraphed offenders: Grubin, (2010) reported an odds ratio of polygraph offenders being 14 times more likely to make a disclosure, and Gannon et al. (2014) noted the

polygraph group as being 3.1 times more likely than the comparison group to make a disclosure.

In addition to this, one study reported a significantly lower reporting of age of onset for sexual offending behaviour, particularly for the group of inmates who had taken a polygraph voluntarily (Ahlmeyer et al., 2000).

### ***Age***

Two studies considered the age of participants and this as a factor in the use of polygraph. Jensen et al. (2015) included juvenile (age ranged from 11 to 17) and adult males who undertook a sexual history examination. They found no differences in the polygraph outcome across three age groups and equally age was not found to be significantly associated with the odds of passing a polygraph.

Konopasek and Nelson's (2015) study, whilst not specifically setting out to investigate age, discovered a significant relationship between those aged under 35 at the time of a NDI polygraph result and sexual recidivism. They suggested this may reflect a level of motivation for disclosure and interact with age but requires further investigation.

### ***Polygraph outcome***

Two studies reported on inconclusive test result rates, which relates to the accuracy of polygraph. Grubin (2010) reported these as 32% in the first year, reducing to 15% in year two through training the examiners in further scoring analysis. McGrath reported a 9.1% inconclusive rate in the second study (McGrath et al., 2007).



One study evaluated the outcome of a sexual history examination for both adult and juvenile males, finding no difference between the groups with both failing a polygraph a third of the time (Jensen et al., 2015).

A DI result was found to be associated with higher risk offenders (Gannon et al., 2014), a higher rate of disclosures (Gannon et al., 2014; Ahlmeyer et al., 2000) and sexual recidivism (Konopasek & Nelson, 2015). Whilst more than half of those who achieved a NDI (No Deception Indicated outcome to questions relating to sexual behaviours asked in the polygraph) result within six months of testing, were under the age of 35 (Konopasek & Nelson, 2015).

One study notes the proportion of results (NDI, DI and INC) being equal after gaining experience of the polygraph (Gannon et al., 2014).

## **Management of sexual Offenders**

### ***Risk***

Five studies utilised a sexual risk assessment, of which three used the Static-99 and were all conducted in the USA (Cook et al., 2014; Konopasek & Nelson, 2015; and McGrath et al., 2007). None of these found a significant relationship between sexual risk and sexual recidivism, although Konopasek and Nelson's (2015) study was approaching significance. Cook et al. (2014) also found that those who did not have a polygraph had higher risk scores.

Two further studies conducted in the UK utilised the RM2000 (Grubin, 2010; and Gannon et al., 2014). Gannon et al. (2014) reported higher risk offenders were more likely to have a DI

polygraph result on their first test compared with low risk offenders, and after gaining experience of the polygraph there was no difference in the proportion of results across all risk levels. Grubin (2010), however, considered how risk may change as a result of any disclosures made during a polygraph. He reported polygraph case managers as typically increasing the risk rating of offenders following a polygraph, compared with non-polygraph case managers reducing risk. The study goes on to report that disclosures from polygraph led to direct changes in risk assessment, treatment and supervision as well as new treatment targets and these being three times greater than for non-polygraph offenders.

### ***Recidivism***

Three studies in this review explored the use of polygraph and its impact upon recidivism, all with a 5-year follow up period (Cook et al., 2014; Konopasek & Nelson, 2015; and McGrath et al., 2007). Cook et al. found that those who did not receive a polygraph reoffended within the 5 years significantly more than those who undertook a polygraph. The significant finding ( $p = .006$ ) was for both combined violent and sexual recidivism along with violent recidivism. The polygraph did not impact significantly upon sexual only recidivism. They also noted that those who reoffended were on supervision a significantly longer period of time prior to taking a polygraph examination.

McGrath et al.'s (2007) study reported an overall recidivism rate of 6.3% over the 5-year follow-up period, but there being no significant difference between those that had a polygraph and those that did not (5.8% vs. 6.7%). They did however note that those who had a polygraph were "significantly less likely to be charged with committing a new non-sexual offence" (2.9% vs. 11.5%) (p. 38: McGrath, et al., 2007). This was the only study that had a matched sample comparison so groups were evenly matched.

The third study (Konopasek & Nelson, 2015) reviewing recidivism reported a similar rate of overall recidivism as McGrath's study (6.5%). This was also a 5-year follow-up, specifically after discharge from a treatment programme. They found a significant relationship between sexual recidivism and a NDI result as well as with being under the age of 35 at the time of achieving a NDI result.

### ***Professional views***

Four studies assessed and reflected upon the views of professionals: both familiar (managing offenders receiving polygraph) and unfamiliar (polygraph not part of their offender management) with polygraph (Gannon et al., 2014; Grubin, 2010; McGrath et al., 2007; and Spruin et al., 2018).

Three of the four studies reported a large proportion of offender or case managers as finding the polygraph to be useful in managing sexual offenders (Gannon et al., 2014; McGrath et al., 2007; Spruin et al., 2018) and specifically giving them confidence that their offenders were complying with their licence conditions (Gannon et al., 2014), and being significantly more likely to disclose risk information relevant to their treatment or supervision (Grubin, 2010).

Grubin's 2010 study also reported that polygraph case managers indicated they increased risk level, supervision, made changes to treatment or initiated another intervention in 41% of polygraph cases compared with 27% for the non-polygraph case managers. Polygraph case managers also reported that in 41% of the first polygraph tests there were 'other' qualitative effects in relation to the management of the offender.

Interestingly, McGrath et al.'s study found supervising officers reported the polygraph as significantly more helpful than treatment providers.

Spruin et al.'s qualitative study examined the views of both polygraph offender managers and comparison offender managers who were not managing any sexual offenders receiving polygraph testing. In summary, all polygraph offender managers agreed polygraph was an excellent tool for enhancing supervision and did not need any further resources. They also unanimously supported the national introduction of polygraph. The majority of polygraph offender managers believed that the disclosures made would not have occurred without the use of polygraph and said they preferred supervision with the aid of polygraph compared with regular supervision. The majority also felt that polygraph shaped aspects of their offenders' actions in that some thought their offenders were trying to 'beat' the polygraph. A few polygraph offender managers felt the polygraph should be targeted at those with greater risk of reoffending, with nearly two-thirds believing it should be part of licence conditions for all sexual offenders and all high-risk offenders.

In the comparison offender manager group, all participants claimed they needed additional resources to support their supervision. The majority also thought the use of polygraph would lead to more disclosures and could be an effective tool for all high-risk offenders including sexual offenders, with some feeling it could be useful for those motivated to not reoffend. Many comparison offender managers noted that supervision sessions tended to focus on offenders' needs rather than offence risk-related behaviours. Several comparison offender managers thought polygraph had the potential to generate more honesty in supervision, and a small number felt regular supervision helped their offenders to think of their behaviour but also believing that using the polygraph would help to manage supervision sessions. Finally, a

minority of comparison offender managers felt polygraph could impact upon the trust with their offender, by improving the relationship.

### ***Participant views***

Only two studies in this review evaluated the views of those who have undertaken polygraph testing (Grubin et al., 2004; and Spruin et al., 2018), both of which are studies conducted in the UK. The views were collated via questionnaire (Grubin et al., 2004) and telephone (Spruin et al., 2018). Spruin et al.'s study also reported on the views of polygraph from comparison offenders.

Grubin et al. found that 20 out of 21 men thought that the polygraph helped them to avoid reoffending, and 57% reported that knowledge of the polygraph led them to inhibit their behaviour. In addition, 52% said that they reported more information to their supervising officer as a result of polygraph.

Results from Spruin et al.'s study indicated that the majority of polygraph offenders claimed polygraph made them focus on their licence conditions but also expressed negative views of the polygraph, such as it being a paper exercise or a means to recall back to prison. Most of them that made risk-relevant disclosures said they would not have done so without the polygraph. Nearly half of the polygraph offenders talked about making more risk-relevant disclosures during polygraph tests whilst others made disclosures to their offender managers. A third of polygraph offenders believe polygraph should target sexual offenders most at risk of reoffending as well as being beneficial for those at high risk of any reoffending. A

minority of polygraph offenders felt the polygraph had helped them to manage or change their behaviour.

The majority of comparison offenders reported talking to their offender manager about anything, but that the focus of their supervision sessions was mainly upon low-risk disclosures relating to thoughts, feelings, attitudes and historical information. A majority also believed that polygraph could not be useful in supervision with one offender noting a potential impact upon the trust in the relationship. In contrast, some comparison offenders agreed polygraph would be useful to help build trust. Only a few comparison offenders felt polygraph would help manage or change their behaviour but that it could be an effective tool for all sexual offenders and it could be useful with other types of 'high-risk' offenders.

**Table 3 –Synthesised evidence of studies on the utility of PCSOT and grouped by outcome measure**

<b>Study</b>	<b>Sample &amp; Setting</b>	<b>Outcome measures</b>	<b>Findings</b>
Ahlmeyer et al., 2000	<b>Comparison group</b>	Inmates and parolees	
Cook, Barkley & Anderson, 2014		Polygraph and no polygraph groups	
Gannon et al., 2014		Polygraph and no polygraph groups	
Grubin, 2010		Polygraph and no polygraph groups	
Grubin et al., 2004		Polygraph aware and polygraph unaware group	
McGrath et al., 2007		Polygraph and no polygraph groups	
Spruin et al., 2018		Polygraph and no polygraph groups	
Grubin, 2010	<b>Voluntary polygraph only</b>	Pilot in community	
Grubin et al., 2004		Community pilot	
Spruin et al., 2018		Polygraph In a mandated area but voluntary research participation	

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Cook et al., 2014	<b>Mandatory polygraph only</b>	Part of community order
Gannon et al., 2014		Mandatory trial
Jensen et al., 2015		Part of treatment
Konopasek & Nelson, 2015		Part of treatment
McGrath et al., 2007		Part of treatment
O'Connell, 1997		Part of treatment
Ahlmeyer et al., 2000	<b>Both Mandatory &amp; Voluntary polygraph groups</b>	Inmates – voluntary Parolees – mandatory

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Study	Sample & Setting	Outcome measures	Findings
Cook, Barkley & Anderson, 2014		<b>Risk</b> Static-99	<ul style="list-style-type: none"> <li>Non- polygraph gp had sig higher static-99 scores</li> <li>Static-99 scores not sig different for polygraph gp who reoffended</li> </ul>
Konopasek & Nelson, 2015			<ul style="list-style-type: none"> <li>Static-99 approaching sig level relative to sexual recidivism</li> </ul>
McGrath et al., 2007		Static-99, RRASOR, VASOR	<ul style="list-style-type: none"> <li>No risk measure predicted sexual recidivism</li> </ul>
Gannon et al., 2014		RM2000	<ul style="list-style-type: none"> <li>Higher risk offenders had higher % of DI results on 1<sup>st</sup> test compared with low risk offenders</li> <li>After gaining experience of polygraph there is no difference in the proportion of results across all risk levels</li> </ul>
Grubin, 2010			<ul style="list-style-type: none"> <li>Polygraph case managers typically increased risk whereas non-polygraph case managers more often reduced risk</li> <li>Disclosures led to direct changes in risk assessment &amp; supervision &amp; new treatment targets 3 times more frequently than non-polygraph offenders</li> </ul>
Cook, Barkley & Anderson, 2014		<b>Recidivism</b>	<ul style="list-style-type: none"> <li>No polygraph gp reoffended after 5 years sig more than polygraph gp on combined recidivism</li> <li>Sexual recidivism was not sig</li> <li>Violent recidivism was sig</li> <li>Those who reoffended were on supervision sig longer prior to polygraph</li> </ul>
Konopasek & Nelson, 2015			<ul style="list-style-type: none"> <li>6.5% recidivists perpetrated new crime within a 5 year discharge from treatment prog</li> <li>Sig relationship with sexual recidivism &amp; NDI result</li> <li>Sig relationship with sexual recidivism &amp; age under 35 at time of NDI</li> </ul>

McGrath et al., 2007		<ul style="list-style-type: none"> <li>• 6.3% recidivism rate over 5 year follow-up</li> <li>• Polygraph gp committed sig fewer violent offences (2.9% vs. 11.5%)</li> <li>• No sig difference between groups for sexual re-offences (5.8% vs. 6.7%)</li> </ul>
Ahlmeier et al., 2000	<b>Disclosures</b>	<ul style="list-style-type: none"> <li>• Sig increase in mean no. of victims and offences as a result of polygraph</li> <li>• Parolees admitted sig fewer victims &amp; offences than inmates</li> <li>• Sig increase in mean no. of admissions for sexual assault and additional paraphilia but not sig for frottage</li> <li>• Inmates reported sig lower age of onset for sexual offending behaviours (12 years for inmates, 23 years for parolees)</li> <li>• Substantial decline in info gained from 1<sup>st</sup> to 2<sup>nd</sup> polygraph</li> </ul>
Cook, Barkley & Anderson, 2014		<ul style="list-style-type: none"> <li>• Polygraph provided more info than official records</li> <li>• Polygraph led to increased reporting of male, stranger &amp; unrelated victims</li> </ul>
Gannon et al., 2014		<ul style="list-style-type: none"> <li>• Experience of polygraph testing associated with more sexual behaviour CRD's and less thoughts, feelings, attitude and historical info CRD's</li> <li>• Polygraph gp made sig more total CRD's after controlling for length of time 'at risk'. The majority made in pre-test phase</li> <li>• Odds of making at least one CRD in polygraph gp is 3.1 times greater than the comparison gp</li> <li>• Higher no. of CRD's associated with DI result on 1<sup>st</sup> test</li> </ul>
Grubin, 2010		<ul style="list-style-type: none"> <li>• The polygraph gp were 14 times more likely to make a disclosure than the non-polygraph gp</li> </ul>
Grubin et al., 2004		<ul style="list-style-type: none"> <li>• 97% of sample disclosed they had engaged in at least 1 high risk behaviour (HRB) at time 1</li> <li>• During interview 41% reported HRB's, compared with 84% at pre-test interview &amp; 80% reported additional info post-test</li> <li>• No difference in HRB's at time 1 between polygraph aware and unaware gps</li> </ul>

O'Connell, 1997		<ul style="list-style-type: none"> <li>• More disclosures about deviant sexual history with a polygraph</li> <li>• Sig more disclosures about paraphilic behaviours</li> <li>• No. of different sexually deviant behaviours sig increased with polygraph</li> <li>• 2 times more incidents of adult felony sexual offences after polygraph testing</li> </ul>
Ahlmeier et al., 2000	<b>Polygraph outcome</b>	<ul style="list-style-type: none"> <li>• 5% inmates with DI admitted nothing whereas 21% parolees with DI admitted nothing</li> <li>• DI result – 50% inmates admitted HRB's and past sexual offences compared with 26% parolees</li> </ul>
Gannon et al., 2014		<ul style="list-style-type: none"> <li>• Higher risk offenders associated with higher % of DI results</li> <li>• Proportion of NDI/DI/INC results equal after gaining experience of polygraph</li> <li>• Higher rate of disclosures associated with DI result on 1<sup>st</sup> polygraph</li> </ul>
Grubin, 2010		<ul style="list-style-type: none"> <li>• High INC rate in 1<sup>st</sup> year of study (32%) and reduced through training to 15% in year 2</li> </ul>
Jensen et al., 2015		<ul style="list-style-type: none"> <li>• Proportionally no sig difference in outcome for juveniles and adults</li> <li>• Both adults &amp; juveniles failed a SHE a third of the time</li> </ul>
Konopasek & Nelson, 2015		<ul style="list-style-type: none"> <li>• Sig relationship between NDI result &amp; sexual recidivism</li> <li>• 9 of the 11 recidivists did not get a NDI result in 6 months</li> <li>• 48 of 80 NDI's within 6 mths were under 35</li> </ul>
McGrath et al., 2007		<ul style="list-style-type: none"> <li>• 68.7% NDI; 20% DI; 9.1% INC; 2.2% discontinued</li> </ul>

Gannon et al., 2014	<b>Professional views</b>	<ul style="list-style-type: none"> <li>80% of Polygraph OM's said test outcome was useful, it gave confidence that offender was sticking to licence conditions followed by discloses risk and /or makes it easier to challenge</li> </ul>
Grubin, 2010		<ul style="list-style-type: none"> <li>Case managers reported polygraph offenders sig more likely to make disclosures relevant to their treatment or supervision compared with no-polygraph offenders. Seriousness of disclosures was not sig different</li> <li>Polygraph case managers reported increase in risk, supervision, change in treatment or initiation of another intervention in 41% cases compared with 27% for non-polygraph case managers</li> <li>Case managers reported in 46% 1<sup>st</sup> tests the exam had 'other' qualitative effects in relation to management of offender</li> </ul>
McGrath et al., 2007		<ul style="list-style-type: none"> <li>96% service providers rated polygraph as helpful or very helpful in managing individual cases</li> <li>Supervising officers found polygraph to be sig more helpful than treatment providers</li> <li>Polygraph OM's thought polygraph helped the offender focus more on their licence conditions</li> </ul>
Spruin et al., 2018		<ul style="list-style-type: none"> <li>Majority of polygraph OM's believed the disclosures would not have been made without the polygraph and said they preferred supervision using polygraph compared with regular supervision</li> <li>Some polygraph OM's thought their offenders were trying to 'beat' the polygraph</li> <li>All polygraph OM's agreed polygraph was an excellent tool for enhancing supervision and did not need any other resources beyond the polygraph. They also unanimously supported polygraph being introduced nationally</li> <li>Majority of OM's felt polygraph shaped aspects of their offenders' actions</li> <li>A few polygraph OM's felt polygraph should target those at greater risk of reoffending. Nearly two-thirds believed it should be part of licence conditions for all sex offenders and should be part of licence conditions for all high-risk offenders</li> <li>Several comparison OM's thought polygraph had the potential to</li> </ul>

		<p>generate more honesty in supervision</p> <ul style="list-style-type: none"> <li>• A small number of comparison OM's felt regular supervision helped their offenders to think of their behaviour , but a few also thought using the polygraph would help manage supervision sessions</li> <li>• Majority of comparison OM's also thought use of the polygraph would lead to more disclosures and could be an effective tool for all high-risk offenders including sexual offenders, and some felt it could be useful for those motivated to not reoffend</li> <li>• Many comparison OM's noted sessions tended to focus on offenders needs rather than offence or risk-related behaviours</li> <li>• Minority of comparison OM's felt polygraph could impact upon the trust</li> <li>• All comparison OM's claimed they need additional resources to support their supervision</li> </ul>
Grubin et al., 2004	<b>Participant views</b>	<ul style="list-style-type: none"> <li>• 20 out of 21 men thought via a questionnaire that polygraph helped them to avoid reoffending</li> <li>• 57% said knowledge of polygraph led to them inhibiting their behaviour</li> <li>• 52% reported more info to supervising probation officer</li> </ul>
Spruin et al., 2018		<ul style="list-style-type: none"> <li>• Nearly half of the polygraph offenders talked about making more risk-relevant disclosures during polygraph tests, and others made disclosures to their offender managers</li> <li>• Most that made risk-relevant disclosure said they would not have done so without the polygraph</li> <li>• Majority of polygraph offenders claimed polygraph made them focus on licence conditions but also expressed negative views of polygraph (doubting its accuracy and it being a waste of time/ money)</li> <li>• minority of polygraph offenders said it helped them manage/change behaviour</li> <li>• a third of polygraph offenders believe polygraph should target sexual offenders most at risk as well as beneficial for those who are high risk of any offending</li> <li>• Majority of comparison offenders said they could talk to their OM about anything but the focus of discussion was mainly focussed on low-risk disclosures relating to thoughts, feelings, attitudes and historical</li> </ul>

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		<p>information.</p> <ul style="list-style-type: none"> <li>• Almost half of comparison offenders stated their behaviour had not changed due to supervision, although a small number felt it had helped them manage or change behaviour</li> <li>• Only a few comparison offenders felt polygraph would help manage/change their behaviour but could be an effective tool for all sexual offenders and also thought it could be useful with other types of 'high-risk' offenders</li> <li>• Some of the comparison offenders agreed polygraph would be useful to help build trust</li> <li>• Majority of comparison offenders believed polygraph would not be useful in supervision with one feeling it would impact upon the trust</li> </ul>
Jensen et al., 2015	Age	<ul style="list-style-type: none"> <li>• No sig differences in 3 adults age groups</li> <li>• Age not sig associated with odds of passing a SHE</li> </ul>
Konopasek & Nelson, 2015		<ul style="list-style-type: none"> <li>• Sig relationship with age under 35 at time of NDI result &amp; sexual recidivism</li> </ul>

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## **DISCUSSION**

The aim of the systematic review was to draw together all existing empirical literature in the area of polygraph with sexual offenders in order to identify the relevant use of polygraphy with male sexual offenders in the assessment and treatment of their sexual offence related behaviours. The review set out to consider how effective the PCSOT Polygraph is in the assessment, treatment and management of sexual offenders.

In summary, seven studies in this review included a comparison or control group which in part may be due to applying a strict cut-off value to the quality assessment scores, thereby only reporting upon high quality studies which are likely to include comparison groups. The value of including a comparison group is to limit selection bias and determine the impact of polygraph as an independent variable. The inclusion of voluntary polygraph testing may have introduced a bias. This is evidenced in Spruin et al.'s study where many more individuals had undertaken a mandatory polygraph as part of the larger sample, but a small percentage consented for inclusion in this particular study. Those that declined to be included in the study may form a different cohort and possibly be less positive about the polygraph or it's so far reported findings. It was also noted that only the UK studies included voluntary research studies. This may reflect a relatively recent (in comparison with USA) introduction of polygraph into the country and be a result of caution in implementing polygraph widely until an evidence base is established in the UK.

### ***Assessment and Treatment***

Other information elicited from a polygraph that aids the assessment of sexual offenders relates to the age of onset of sexual offending. In Ahlmeyer et al.'s study comparing inmates with parolees, the reported age of onset was lower for inmates who were voluntarily undertaking the polygraph. It is possible that because they had volunteered for treatment their level of honesty was greater and they had an increased understanding of the need for honesty in order to progress through treatment.

The majority of the studies in this review indicate the usefulness of polygraph in eliciting increased disclosures about number of offences, type of offences and number of victims. This information is necessary to complete a sexual risk assessment and is relevant in assessing the needs of sexual offenders and also may relate to safeguarding issues in order to then identify the appropriate treatment and management. The usefulness of polygraph was reported by both professionals (supervising those with and without polygraph) and offenders (having undertaken polygraph and not having had a polygraph) alike.

Half of the studies in this review utilised a sexual history examination. It is believed that the majority of field polygraph tests conducted are in fact maintenance type tests which are considered to be slightly more reliable than Sexual history examinations (APA, 2011). Although the most accurate test type is considered to be the specific issue (APA, 2011).



## ***Management***

In assisting in the management of sexual offenders, this review identified how sexual risk, sexual recidivism, and professional and participant views of polygraph, can each contribute. Firstly, higher risk scores for comparison groups may be a reflection of those choosing not to have polygraph because they are possibly aware of being high risk or have something they do not wish to disclose or be discovered for fear of the consequences (Cook et al., 2014).

No significant relationship was found between sexual risk and sexual recidivism. The base rate of reoffending sexually is lower than violent offending (Falshaw, Friendship, Travers & Nugent, 2004), therefore may be less likely to achieve significance without extending the follow-up period and or having a larger sample size.

Professional views largely reported the benefits of polygraph in assisting in the management of sexual offenders, although some caution was expressed by comparison offender managers. Polygraph is considered in the studies of this review, to improve the confidence of offender managers in the adherence to licence conditions set for sexual offenders as well as aiding disclosures relevant to risk. Thus tailoring the treatment and management plans for offenders accordingly.

Both offenders and offender managers, whether they had involvement with polygraph or not, felt that polygraph was or could be useful, specifically targeting high- risk offenders in relation to being both sexually and non-sexually violent. This could be employed where risks are known. However, it is possible that those considered to be low risk may not have disclosed information which elevates their risk and therefore

inaccurately be identified as low risk offenders and be excluded from a potentially useful resource.

There are some differences and similarities with Elliott and Vollm's systematic review, which are important to note here. Some of the similarities in this review with Elliott and Vollm's include identifying the most common test type employed was the sexual history examination, with almost as many studies utilising a maintenance type test. The studies were also predominantly conducted on community samples, with the same study identified that reported one group in prison being compared with one group in the community.

The most common outcome reported in both reviews is the increased amount of disclosures reported from those who undertook a polygraph. The specific time in which these were disclosed (whether this is pre-test, during or post-test) was unclear in the studies within the current review.

Studies in both reviews reporting on recidivism were identical, except this review included an additional study (Konopasek & Nelson, 2015). However the findings were consistent in both reviews, showing a decrease in recidivism rates following a polygraph. This was only significant, however, for violent reoffending. The possible reasons for this are noted above.

At a very simplistic level, this review included 10 studies and Elliott and Vollm's review included nineteen studies. By employing a quality assessment cut-off value this review identified only high quality studies which elicited more studies with a control or comparison group. A comparison group is considered important in being able to make firmer conclusions from the findings. The gold standard of study is the randomised

control study, however in a clinical setting this is very difficult to achieve, particularly if it means one group not receiving a condition (in this case the polygraph) when it could be beneficial.

Other differences between the two reviews included Elliott and Vollm reporting that a majority of studies involved the voluntary administration of polygraph. Only this review commented upon studies utilising a risk assessment. Further to this, no study in this review included self-report of accuracy, which can include a bias. This may reflect a lack of quality in the studies evaluating the self-report of accuracy, hence the fact that they were not ultimately included. In fact, Elliott and Vollm noted a number of their included studies included immunity from further convictions if they undertook a polygraph, which may not be a true reflection of the level of disclosures.

Only two studies in Elliott & Vollm's review commented upon the utility of polygraph for offenders, from the offenders themselves, whereas this review included a more recent study that had qualitatively considered both professional and offender views of the utility of polygraph.

## **Limitations**

Some studies may not have been identified due to the search strategy employed or on-going implementation and therefore not published or available for review. It is acknowledged that bias is introduced in excluding non-English papers, however it was not possible to retrieve these papers. One further paper could not be located, as it was no longer available on the website reported and unfortunately this study has been referred to in a number of other polygraph studies. There are also further potential studies that

have not been published in the public domain, due to restriction to civilians, as it is understood that DODPI (Department of Defence Polygraph Institute) in USA conduct many polygraph studies but the data source is restricted and therefore not available for wider review. As extensive a review as possible was conducted of the 'grey' literature by contacting a number of key professionals in the field of PCSOT, both in USA and UK, but yielded only one additional study. However, it is possible that further literature exists that was not considered for review. Therefore, it is acknowledged that this review is still subject to publication bias, where studies are more likely to be accepted for publication if significant findings are reported.

Regarding the studies included in this review, some sampling bias is inherent in the administration of polygraph. All of the studies were conducted in the UK or USA with no other countries included in this review. There was also a wide range in the sample size with some very small sample sizes. Whilst many of the studies included a comparison group of participants, the majority of these did not receive a polygraph and were not matched on all key variables, with only one study (McGrath et al., 2007) pairwise matching their participants. No study reported random allocation to participant groups or provided details of those who refused a polygraph. Some studies also reported a high drop-out rate with little detail about the reasons for this. In addition to this, many of the studies utilised a retrospective methodology making it difficult to identify some of the possible confounding variables, such as therapy or supervision, and missing potential information as the study was not designed prospectively to include specific data.

The focus of this review was to evaluate the utility of PCSOT in male sexual offenders. Three studies in this review included females, however the numbers were very small in

a large sample therefore not considered to impact upon the overall results. However, future studies may consider the utility of polygraph with female sexual offenders as they are considered to be a different cohort from male sexual offenders. Further to this, only one study included the use of polygraph with juveniles, with the majority of studies including adult sexual offenders. So any conclusions about juveniles are limited and cannot be generalised.

Many of the studies refer to participants having received treatment but did not clarify the type of treatment, length of treatment, intensity of treatment or time since completion of treatment. As treatment aims to improve honesty and increase disclosure this is a likely confounding variable that is not accounted for in the studies reviewed.

Sexual offenders are a heterogeneous group (Harris, & Hanson, 2004), therefore it is difficult to generalise any of the results from these studies. Many of the studies in this review did not report upon the type of sexual offender participants were understood to be.

It is therefore unclear from these and other polygraph studies whether mentally disordered sex offenders were included in the samples. Only one study referred to mentally disordered offenders, acknowledging the likely presence of them in their study (Gannon et al, 2014), therefore confirming the need to investigate the use of polygraph with mentally disorder sex offenders.

## **Conclusions and Recommendations**

This systematic review included studies of a high quality in order to provide a basis for considering the utility of polygraph with sexual offenders. The review identified a number of studies that have contributed to the evaluation of PCSOT specifically with regards to its effectiveness in the assessment, treatment and management of male sexual offenders. Despite the limitations noted above, this review suggests that polygraph enhances the assessment of sexual offenders by leading to increased disclosures (victims, offences and sexual risk behaviours) and that it can potentially be applied to both juvenile and adult sexual offenders (ethical issues aside).

As noted in the limitations, a large proportion of sexual offenders offered polygraph declined and little is known about this group. It is possible that these may be of a higher risk category and therefore perhaps should be targeted for polygraph. These findings collectively then enable appropriate and specific treatment to be developed and delivered in order to target the identified risk, and hopefully reduce said risk of sexual and /or violent reoffending.

In correctly and adequately identifying the risks of sexual offenders, the management of these individuals can be enhanced. This review found that sexual recidivism is not significantly reduced by use of the polygraph. This is consistent with Elliott and Vollm's (2016) systematic review, who also note the need for extended follow-up periods due to low reoffending rates.

Importantly this review included the experience of polygraph for both professionals and participants identified from only one qualitative study. Key themes identified included truth detection, perceptions of behaviour change, perceptions of polygraph as part of

supervision and national implementation of polygraph testing in the UK. This is important in shaping the delivery of polygraph services potentially worldwide.

It is recommended that to ensure more rigorous research into the utility of polygraph in the future, high quality studies are conducted in more countries; across different settings (such as mental health, prison or treatment centres); with various groups of individuals such as females, intellectual difficulty, mental disorder in order to establish generalizability of the polygraph findings to different groups and settings. It is also important to consider what type of offenders may be most suitable for polygraph testing particularly to maximise a limited resource in the UK at this point in time.

## **Chapter 3**

**Polygraph with mentally disordered offenders:**

**The utility of post-conviction sex offender testing (PCSOT)**

**in a secure hospital**



## **ABSTRACT**

Post-conviction sex offender testing is widely used across the world, with increasing evidence of its utility (Elliott & Vollm, 2016) and being increasingly used in the UK, particularly with sex offenders in the community (Gannon, et al., 2014; Grubin, 2010). With a rise in mental health difficulties, particularly in forensic settings (NAO, 2017), the chances of a polygraph examinee having a recognised mental disorder are sufficient to warrant exploring the use of polygraph with this group. This study evaluated the utility of PCSOT with 25 adult male mentally disordered offender patients detained under the MHA (1983) in a high secure forensic setting. Data relating to sexual behaviours across the lifespan were collated from file, pre-polygraph (which includes the pre-test interview of the polygraph), and post-test polygraph (in the post-test interview phase). VRS-SO and RM2000/S sexual risk assessments were completed on file information in order to establish sexual risk and evaluate the impact of polygraph on risk. A retrospective evaluation of polygraphs conducted between 2008 and 2018, identified significantly more disclosures made during the pre-test interview compared to file information alone, specifically relating to the number of reported victims, number of types of paraphilic behaviour, the use of pornography, total number of reported paraphilias, high-risk behaviours, level of masturbation and reported inappropriate sexual fantasies. In addition, semi-structured interviews were conducted with a sub-sample of patients (n=6) to elicit any themes regarding reasons for taking or declining a polygraph. Thematic analysis identified four themes: risk, truthfulness, impact and knowledge. The findings support the utility and value of polygraph in a forensic setting, and the thematic analysis findings also indicate areas for development for

polygraph. Limitations of the study, and recommendations for future research is identified.

## **INTRODUCTION**

The introductory chapter and systematic review introduction describe the increasingly widespread use of polygraph, outlining its value in assessing, treating and managing risk of sex offenders. To summarise, many studies have found polygraph to elicit increased information (when compared with self-report of history, clinical interviews or file information) relating to static risk factors such as offence history, victims, crossover of victim age, sex or relationship with perpetrator (English et al, 2000; Heil et al, 2003; Hindman & Peters, 2001; Wilcox & Sosnowski, 2005; Wilcox et al, 2005). In knowing these risk factors more accurately, Beech and Ward (2004) identify that this can aid professionals understanding of the individual's psychological risk factors. Once identified, these risk factors can be modified in treatment and monitored.

Polygraph studies particularly in the community, are valuable in monitoring dynamic risk factors (Gannon et al, 2014; Grubin et al., 2004; Wilcox, et al, 2005). However, motivation to change is important in the desistance from sexual offending (Ward & Gannon, 2006) and Gannon, Beech and Ward (2009) argue that repeated polygraph testing could damage therapeutic relationships with professionals managing or treating the risk.

The systematic review highlighted a number of high quality polygraph studies that have included a risk assessment tool, to evaluate sexual risk (Cook et al., 2014; Gannon et al., 2014; Grubin, 2010; Konopasek & Nelson, 2015; McGrath et al., 2005). Of those that

did, two UK studies used the RM2000, reporting an increase in the level of risk as a result of disclosure made in the polygraph (Gannon et al., 2014; Grubin, 2010). The other studies used the Static-99, in relation to recidivism. Whilst many studies report upon the value of polygraph in the community where dynamic risk is being assessed, the most commonly used sexual risk assessment is a static risk assessment tool.

It has also been previously highlighted that since, the BPS (2004) expressed concerns about the utility and accuracy of polygraph, important studies have been conducted in the UK attempting to address the concerns. This began with a pilot study by Wilcox and Sosnowski (2005) and subsequently followed by larger UK studies evaluating the utility of polygraph with convicted sex offenders in the community (Gannon, et al., 2013; Grubin, 2010). Both of these larger studies are referred to in the systematic review, with Grubin (2010) finding that polygraphed offenders were 14 times more likely to make at least one disclosure. This then prompted the widespread enforcement of the Offender Management Act (2007) section 28 in the UK, in which mandatory polygraph testing was arranged for sex offenders identified as high risk according to the Risk Matrix 2000<sup>3</sup> (RM2000, Thornton, 2010) and have a sentence of 12 months or longer. This led to a subsequent study, to evaluate a mandatory pilot of polygraph with sex offenders (n= 635) in the Midlands area of England (Gannon, et al., 2014). The outcomes were very similar, reporting significantly more clinically relevant disclosures (CRD's) after controlling for length of time at risk as a result of the polygraph when compared with a matched sample.

Some interesting findings from earlier UK studies, reported increased disclosures,

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<sup>3</sup> RM2000 is a risk assessment designed to predict the risk of future violent offending, sexual offending or both. Further detail of this assessment can be found in the materials section of this chapter (p98).

noting most admissions were made in the pre-polygraph test once they had experienced polygraph (Grubin et al, 2004). It was thus suggested by Grubin et al. (2004) that the polygraph acted as a deterrent. Further to this, Harrison and Kirpatrick (2000) reported that the benefit of periodic polygraph testing is on motivation within treatment. This contradicts the earlier reporting of effect upon motivation by Gannon et al. (2009).

### **Polygraph and Mental Health**

With regards to the use of polygraph with mental health difficulties, the general advice from the APA is to be cautious when using the tool with individuals of a low Intelligence Quotient (IQ), although no specific indication of what 'low' is, is offered, and not to use with those who are actively psychotic (APA, Model policy for the evaluation of examinee suitability for polygraph testing, unpublished). There are no known studies that have evaluated polygraph and IQ. However, Abrams explored the developmental age to establish cognitive ability to undertake a polygraph. In 1974 Abrams reported the predictive validity of instant offence tests to be poor with adults with a mental age of 12. A further study by Abrams (1975) found this to be true for 9-13 years olds too and therefore recommended not to test those of a borderline intellectual ability.

Other authors have hypothesised that suggestibility, trait anxiety, neuroticism and obsessive qualities may affect test outcome (Gudjonsson, 2003). If indeed the theory of polygraph recording a fear response is correct, then the result may be increased false positives.

A small number of studies have considered the use of polygraph with individuals identified with high levels of psychopathy (Barland & Raskin, 1975; Hammond, 1980; Raskin, Barland & Podlesny, 1977; Raskin & Hare, 1978). The hypothesis is that these individuals experience general physiological hypo-responsivity (reduced fear response), making polygraph examinations difficult to conduct because they do not fear being caught out in a lie (Meijer & van Koppen, 2008; Verschuere & Ben-Shakhar, 2011). However, Raskin and Hare (1978) found there to be no significant difference between psychopaths (as defined by Cleckley's (1964) criteria) and a non-psychopath group, in terms of accuracy rates. The study did however, note that the psychopaths demonstrated stronger reactivity in heart rate deceleration, and electrodermal activity. These findings suggest that polygraph is equally effective with psychopaths as non-psychopaths.

However, it is of note that these studies were conducted over 40 years ago and that the definition of 'psychopathy' was not always clear. In comparison, a more recent study by Verschuere, Crombez, Clercq & Koster in 2005, reported that male sex offender psychopaths had reduced levels of responding on the electrodermal channel of the polygraph when using a CIT test type.

Only one study could be found that has used the polygraph with individuals who have a diagnosis of mental illness (as defined according to the DSM-IV). This study examined the feasibility of polygraph with psychotic patients in an open acute ward (Hirschmann, Guzner and Lev-Ari, 2014) in which they noted that patients with schizophrenia or schizoaffective disorder had reduced physiological responses, due to the mental disorder and medication effects, which may affect the validity of polygraph tests. However, the Hirschmann et al. (2014) study found that patients believed, the psychotic-content of their delusions to be true, but in other areas of testing (not associated with psychotic

beliefs) their responses were consistent with the general population. This therefore supports the use of polygraph with mentally ill patients as long as the psychotic content is not the test focus.

Some studies have reviewed the effect on polygraph of certain prescribed drugs taken by mental health patients. Waid, Orne, Cook and Orne (1981) found meprobamate (which is an anxiolytic drug for reducing anxiety, and has an analgesic effect) increases the ability to avoid detection in one concealed information test (CIT) study. Gatchel, Smith and Kaplan (1983) found propranolol (which is a beta blocker and affects the heart and circulation) increased the number of inconclusive results in a comparison question test (CQT). Whilst these medications are not exclusively prescribed to those with a mental disorder, they are not uncommon medications, prescribed for mentally disordered individuals, and may impact on physiological responses. A further study by Iacono, Boisvenu and Fleming (1983) found neither diazepam (benzodiazepine used to treat anxiety disorders) nor methylphenidate (also known as Ritalin, used to treat attention deficit hyperactivity disorder or ADHD, and is a central nervous system stimulant) affected accuracy of detection using a CIT test technique.

Perhaps we would not expect to see any difference in these drugs across comparison and relevant question responses just as some of these studies found, because any effect from the drugs will be seen equally across all question types, relevant and comparison, therefore the relative difference in responses across questions would not be affected. If indeed the effect of some of these drugs, however, was to dampen physiological responses across the board, then an increase in inconclusive results is to be expected.

With extremely limited research in the area of any type of polygraph being used with mentally disordered individuals, there are no known studies to have explored the utility of PCSOT in a forensic or psychiatric setting. Recent statistics show that one in four adults are diagnosed with a mental illness during their life, and that many more individuals will experience changes in their mental well-being (National Audit Office, 2017). Given these statistics, many PCSOT studies conducted in the community will have included mentally disordered offenders. However they have not necessarily identified any potential differences or similarities in how this group may respond physiologically in a polygraph. Equally, no polygraph study has been found to have validated this population sample. Ten per cent of the English prison population were receiving treatment for mental health illnesses in March 2017. The relevance of this is that whilst they may not have a polygraph in prison, upon release, however, high risk sex offenders (according to the RM2000 and have a sentence of 12 months or longer), will be mandated to take a polygraph test on release into the community (according to the Offender Management Act, 2007 section 28). Therefore, it is important to know whether there are differences in the way this population responds to polygraph compared to a non-mentally disordered population.

When considering the impact of disclosures in a high secure forensic setting, the potential of the polygraph is evident. There are currently four high secure hospitals within the United Kingdom. One of the shared aims is to protect the public from individuals deemed to pose a high-risk of harm, and identified as suffering from a mental disorder. Due to the risk posed by these individuals, it is imperative that

supervision and treatment is tailored to the specific needs of the patient and that all risk factors are identified, before transfer to lower levels of security.

## **Research Aims**

The current study aimed to explore the utility of polygraph in a high secure forensic setting to inform risk assessment and treatment. The study aimed to evaluate whether the polygraph can, indeed, be used as a ‘truth facilitator’ within a secure setting, and the implications that this may have for risk assessment and treatment are discussed.

A further aim of the study was to gain the views of the patients themselves: both those that undertook the polygraph and those who declined, to understand their reasons for choosing or declining the polygraph, and their experience thereafter if they engaged in a polygraph. This may then inform the understanding and delivery of a polygraph service in a forensic setting, including addressing those factors that may increase the likelihood that individuals will consent to being polygraphed.

### **Study hypotheses:**

- The level of disclosures of high-risk behaviours and range of paraphilias will increase as a result of the polygraph.
- The polygraph examination will result in more disclosures of cross-over offending than that previously identified from the file review.



- The level of risk as measured by the VRS-SO and RM 2000 is likely to be the same or higher post polygraph as compared to pre-polygraph (it is unlikely to reduce) because of greater disclosures
- A DI (Deception Indicated) result on the polygraph is more likely to have a higher level of sexual risk

There were no specific aims or hypotheses for the qualitative component as this was exploratory.

## **METHOD**

### **Participants**

This study involved patients detained in a high secure Hospital, diagnosed with a mental disorder as recognised by the International Statistical Classification of Diseases and Related Health Problems (ICD-10), which is a medical classification list by the World Health Organization (WHO, 1992).

### ***Quantitative Sample:***

The sample included 25 adult male patients detained for a period of time in a high secure Hospital between April 2008 and April 2018, (thereby meeting the criteria of having a mental disorder and being detainable under the Mental Health Act (1983), and being of a ‘grave and immediate risk to the public or self’) and, in addition, had

undertaken at least one PCSOT during this time period. They were considered by their Responsible Clinicians (RC's) to have capacity to consent to the polygraph at the time of the polygraph assessment.

The mean age of this sample at time of first polygraph assessment was 42.4 years (SD = 6.27). The majority of the sample were White British (n= 20) followed by Black British (n=3) and White Other (n=2). In terms of marital status, 22 were single, 2 were divorced and 1 was married. The primary diagnosis categories were Dissocial Personality Disorder (n = 12), Paranoid Schizophrenia (n=5), Bipolar Affective Disorder (n=3), Emotionally Unstable Personality Disorder (n=2), Schizoaffective Disorder (n=1), Paedophilia (n=1), and Psychopathic Disorder (n=1). All participants were detained under the Mental Health Act (1983), (n=11) under section 47/49, (n=7) under section 37/41, (n=6) Notional 37 and (n=1) under section 38. The average total length of stay in a high secure Hospital was 89.2 months (SD= 64.06, range 16-282) and length of admission prior to polygraph was 58.3 months (SD = 50.28, range 9-184).

In relation to the pre-polygraph risk category according to the RM 2000/S, 12% (n=3) were categorised as low risk, 8% (n=2) as medium risk, 40% (n=10) as high risk and 32% (n=8) as very high risk of reoffending sexually in the future (with 8% not rated due to no formal conviction for a sexual offence).

All 25 patients had undertaken some form of treatment prior to a polygraph but details of the nature of treatment was unclear from available records.

### *Qualitative Sample:*

This sample included six adult male patients detained in a high secure Hospital (criteria of which noted above) in September 2018 and had either previously undertaken, or been offered and declined, a polygraph at any point during their admission to a high secure Hospital. To have been offered a polygraph assessment historically, each individual had to have a previous conviction for a sexual offence or had committed an offence in which a sexual element was clearly identified. The informed consent process involved the Responsible Clinician establishing capacity to give informed consent then the researcher reviewed the study information sheet and consent form with each potential participant.

Of the 10 patients identified as potential participants, 5 had undertaken a polygraph and are a subset of the quantitative sample, and 5 had declined. 2 were considered by their Responsible Clinician and Clinical Team to lack capacity or it was believed that approaching them could destabilise their mental health. Of the 8 remaining potential participants, 2 declined, leaving 6 patients consenting to undertake a semi-structured interview to discuss their experience of and/or views of polygraph, depending on if they had undertaken a polygraph or declined a polygraph previously. Of the 6 consenting participants 4 had undertaken a polygraph, and 2 had declined. The interviews ranged in length of time from 4 to 24 minutes ( $M=12.33$ ,  $SD = 8.23$ ).

The mean age of this sample at interview was 50.33 years ( $SD= 9.11$ ). The sample consisted of 5 patients being White British and 1 was White Other. Four individuals were single and 2 were divorced. Two of the sample had a primary diagnosis of Personality Disorder, 2 with Paranoid Schizophrenia, 1 with Schizoaffective Disorder

and 1 with Bipolar Affective Disorder. All participants were detained under the Mental Health Act (1983), (n=4) under section 47/49, (n=2) under section 37/41. The average length of stay in the Hospital prior to interview was 126.7 months (SD= 94.31, range 25-282). Currently three of the participants are placed in the mental illness pathway and three in the personality disorder pathway.

In relation to risk category according to the RM 2000/S three were categorised as low risk, one as medium risk, one as high risk and one as very high risk of reoffending sexually in the future.

All 6 patients had undertaken some form of treatment prior to interview but details of the nature of treatment was unclear from available records.

## **Materials**

### ***Polygraph Instrument***

The polygraph instrument used was initially a Lafayette 4000 series (LX4000) and upgraded to a Lafayette 5000 (LX5000) series in 2011. There should be no difference in the outcome of the results in upgrading the system. The polygraph records respiration using pneumo-tubes placed around the chest, electro-dermal activity or skin resistance (galvanic skin response) using electro-pads which are placed on the fingers, which are then connected to wires and thus to the polygraph. Further, cardiovascular activity (blood pressure and volume changes) is recorded using a partially inflated cuff on the arm. All measures are simultaneously recorded throughout the polygraph examination and the tracings displayed and recorded on a standard laptop for subsequent analysis by

the examiner. Participants also sat on a sensor pad that records any bodily movement during testing, which can be associated with the employment of countermeasures.

Each polygraph assessment included reviewing and signing of an agreement, a consent form, detailing the procedure and noting confidentiality limits. A review of possible health conditions was conducted to ensure appropriateness of testing on the day. The pre-test interview phase included an acquaintance test to acquaint the individual to the instrument and establish a baseline for deception, as they were instructed to respond to a simple lie. Then a review of all past sexual behaviours, as well as general honesty was conducted in order to form the questions for the assessment. A series of questions (typically 10-12) were reviewed to ensure each one was understood clearly and a yes or no response was given in response to each question. The set of questions were repeated so at least 3 series were conducted, as required by the APA standards.

The post-test phase of each polygraph involved scoring of the output by noting changes in the three physiological measures, as per accredited training. A question and its answer (as a pair) are known as a 'spot'. The "value" of a spot was determined by looking at the variance between a spot with a relevant question versus one with a control question. If the overall value for a question or spot was above a cut off then they were considered to be "Deceptive" or have "Significant Responses", if below a cut-off value then considered "Non deceptive" or to have "No Significant Responses" and if in between they were considered "Inconclusive" results. Using the information gained from this scoring method, a note was then made of the assessment outcome: 'Deception Indicated' or 'Significant Response', 'No Deception Indicated' or 'No Significant Response' or 'Inconclusive.' The results of the assessment were then discussed with the participant and any explanation for the results sought.

### ***Evaluation of Polygraph***

The results of the polygraph assessments were hand-scored at the time of administration and then verified using the Objective Scoring System, version 3 (Nelson, Handler and Krapohl, 2007) both of which are scoring methods supported by the APA.

### ***Risk Matrix 2000/Sex scale (RM2000/S)***

The Risk Matrix 2000/S, is an actuarial measure of risk widely used in the UK to measure risk of future sexual offending of adult male sex offenders and was developed by Thornton in 2002. This scale along with two others, form the Risk Matrix 2000 (RM2000). The RM2000 assesses ‘static’ indicators of risk of re-offending and uses simple factual information about offenders’ past history to divide them into categories that differ substantially in their rates of reconviction for sexual or other violent offences (Thornton, 2002). The predictive accuracy of the RM2000/S has been established in a UK sample of untreated sex offenders, where Thornton, Mann, Webster, Blud, Travers, Friendship, & Erikson (2003) obtained AUC of .75 in terms of predicting sexual reconviction. Further to this, a meta-analysis of sex offender risk scales by Hanson & Morton-Bourgon (2005) found moderate predictive accuracy for sexual recidivism in the RM2000/S (mean weighted  $d = .67$ , 95% CI of .56 to .77,  $n = 2,755$ ). A more recent meta-analysis by Helmus, Babchishin and Hanson (2013) found the Sex scale provided the best predictive accuracy for sexual recidivism, approaching a large effect size ( $d = .74$ ).

There are two stages to categorise an offender using the RM2000/S. In stage one, information about the offender's current age, the number of separate court appearances for sexual offences and the number of court appearances for any significant criminal offence, is utilised in order to place the offender into a preliminary risk category. In the second stage, four additional risk factors are scored, such as whether the offender had any male victims, whether he had offended against a stranger, if he had never been married, and whether he had been convicted of any non-contact sexual offences, such as indecent exposure, all of which have been shown in the literature to be associated with increased risk of re-offending sexually (e.g. Hanson & Bussière, 1998). Depending on the presence of these aggravating factors, the final risk category may increase and will be labelled as either low, medium, high or very high risk.

### ***Violence Risk Scale-Sex Offender version (VRS-SO)***

The VRS-SO (Wong, Olver, Nicholaichuk, & Gordon, 2003) was developed to assess the risk of sexual violence for forensic clients using both static and dynamic risk factors identified from meta-analyses (such as Hanson and Bussiere, 1998; Hanson and Morton-Bourgon, 2005). It is a 24-item clinician rated scale comprised of 7 static items relating to criminal history and victim and offender demographic details, along with 17 dynamic items that are potentially changeable. The dynamic items have detailed descriptions to rate 0-points and 3-points and a rating of 1 is considered if "less positive" than the 0-rating description, or a rating of 2 if "less serious" than the description for 3 points. The dynamic items are also subdivided into three factors: Sexual Deviance, Criminality, and Treatment Responsivity.

In recognising that dynamic items can change, particularly following treatment, the VRS-SO includes a 'stages of change' rating to reflect the change of behaviour relating to each dynamic item. The stages of change that behaviour moves through is from pre-contemplation, to contemplation, to preparation, to action and then maintenance as identified in the Trans Theoretical Model of change (TTM: Prochaska, Diclemente and Norcross, 1992). Following an intervention, change is quantified by rating the stage of change for each dynamic item and if progression is made from one stage to the next in a positive direction, this is scored as a 0.5-point reduction.

The predictive accuracy of the VRS-SO has been established in a study where Olver et al. (2007) obtained AUC of .74 in terms of predicting sexual recidivism. They also found all three factors correlated significantly with sexual recidivism (AUC values from .59 to .65).

### ***Semi-Structured Interviews***

A semi-structured interview was developed to establish any themes to understand why some individuals in a high secure Hospital choose to undertake a polygraph and why others decline (using a modified semi-structured interview). Careful consideration was given to the wording of questions, utilising simple language to enable all patients to understand what was being asked.

The interview questions were broad in scope to allow for a range of responses, and were reviewed with senior psychologists in a high secure Hospital to consider the appropriateness of the questions for the intended sample. The interview questions for those who have undertaken a polygraph, ask how useful or not they feel the polygraph



has been, what informed their decision making, whether any further disclosures were made, any changes in their engagement, and whether they feel that the polygraph examination had led to any direct changes in the risk assessment or treatment provision for the patient. For those that declined, the questions related to their reasons for declining and any changes in their engagement and treatment since the time of declining to undertake a polygraph. Please refer to Appendix I for the full semi-structured interview schedules. It is noted that a dictaphone was used to record all interviews.

## **Ethics**

The original prospective polygraph study received ethical approval by the University of Birmingham's Research Governance committee on 14<sup>th</sup> May 2015 (ref: RG\_15-086), and the South Central – Berkshire B Research Ethics Committee on 30<sup>th</sup> June 2015 (ref: REC 15/SC/0327) followed by West London Mental Health NHS Trust Research and Development committee on 2<sup>nd</sup> July 2015 (ref: COLNW1501).

Attempts to collect data prospectively, however, proved difficult to recruit to, yielding very low numbers, therefore, a substantial amendment was submitted to conduct a retrospective review of polygraph in a high secure Hospital in 2017. This involved a retrospective evaluation of polygraphs already undertaken with an additional qualitative exploration of service user experience of the polygraph.

Consent at the time of the polygraph was sought for the assessment, but not sought again for the purpose of the quantitative evaluation, as the data was anonymised and collected through routine clinical services as per Health Research Authority (HRA) guidance, and it was considered ethically more distressing to contact patients who had

left the Trust, of which was the majority of the sample. The service evaluation received approval by the high secure Hospital's Clinical Audit Group on 11<sup>th</sup> May 2018.

The qualitative component of this study received ethical approval by the University of Birmingham's Research Governance committee on 27<sup>th</sup> April 2018 (ref: RG\_15-086 AM01) and subsequently by the South Central – Berkshire B Research Ethics Committee on 10<sup>th</sup> May 2018 (ref: REC 15/SC/0327/AM02). HRA approval was received on the 15<sup>th</sup> May 2018 followed by the West London Mental Health NHS Trust Research and Development committee approving the study on 5<sup>th</sup> June 2018 (ref: COLNW1501).

## **Quantitative Procedure**

A review of clinical case records of patients that had previously undertaken a polygraph at a high secure Hospital was conducted. Data collected included information relating to the individual's age, length of stay, index offence, sexual offending history, mental health diagnosis and order of detention under the MHA<sup>4</sup> (1983), and if engaged in previous psychological treatment. Based on the clinical case records available at the time point of first polygraph, a RM2000/S and VRS-SO risk assessment was completed.

This data along with data gathered during and relating specifically to the polygraph were collated, encrypted and stored on a password protected Trust laptop, to ensure the safety and confidentiality of this material.

Polygraph data collated pertains to the outcome of the polygraph, index offence details

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<sup>4</sup> Mental Health Act (1983) sections: 37/41 - Hospital Restriction Order      Section 38 – Interim Hospital Order  
47/49 - Transfer from Prison with restrictions      Notional 37 – restriction direction has ceased but still detained

(type of offence, victim type, age of victim, gender of victim), pre-test admissions, post-test admissions and sexual behaviours admitted to (type and number of). A full list of sexual behaviours can be found in Appendix J. A small number of individuals had repeated polygraphs, which were collated and reviewed for any initial findings.

The RM2000/S and VRS-SO risk assessments were reviewed as noted above, pre polygraph and repeated post polygraph assessment to include any information disclosed during the polygraph, to consider what practical implications the polygraph has on risk assessment.

Parametric tests were run on all variables, and if assumptions were violated then non-parametric analysis was applied.

### **Qualitative Procedure**

Initial identification of suitable subjects was conducted by Responsible Clinicians and Clinical Teams, applying the inclusion criteria of adult male patients that have previously undertaken a polygraph or been offered and declined a polygraph in a high secure Hospital and had capacity to consent to the study. Those identified were then approached with an information sheet to consider if they wished to participate in the study, and given the opportunity to ask the researcher any questions. If they agreed the consent form was reviewed and both verbal and written consent was recorded. Consent forms were stored in a secure location, in an office on site at the high secure Hospital, with a locked door.

Issues relating to confidentiality, and the right to withdraw were discussed, noting that participation was voluntary and would have no impact upon their treatment or pathway.

Interviews were arranged at a suitable time for all and conducted in an interview room on the patient's ward. A semi-structured interview was used to gather information relating to their experience and reasons for taking the polygraph, or choosing to decline a polygraph, and was recorded using a Dictaphone. The interview was recorded from the start of the first question and stopped upon completion of the last question.

The interviews were transcribed under an anonymous reference number to maintain confidentiality, and stored on an encrypted server on a password encrypted Trust computer.

Thematic analysis was used to explore any possible themes and differences between those that agreed to take a polygraph and those that declined.

### ***Rationale for Thematic Analysis***

“Thematic analysis is the process of identifying patterns or themes within qualitative data” (Maguire and Delahunt, 2017, p. 3352). This method of analysis was chosen over other qualitative methodologies as it is flexible and not tied to any epistemological or theoretical perspectives (Braun and Clarke, 2006). It is also a method more suited to a diverse sample within a mental health setting that are heterogeneous and have a range of complex needs.

The goal of this thematic analysis was to identify patterns or themes in the data relating to polygraph in a high secure forensic setting and to use these to inform and develop the practice of polygraph.

### ***Coding process***

The data were organised and coded into small chunks of meaningful data using a theoretical thematic analysis, as the study was concerned with addressing specific research questions pertaining to reasons for choosing or declining the polygraph. Each segment of data that were relevant to the research questions were coded, using open coding.

The transcripts were read numerous times and codes generated by hand. Maguire and Delahunt (2017), note that whilst it is useful to have two or more individuals coding, it is not essential. Due to time constraints it was not possible to have any additional people coding this data.

The codes were examined and emerging themes identified.

## **RESULTS**

### **Quantitative data**

Of the 25 patients who had undertaken a polygraph, 20 had been convicted of a sexual offence as their index offence (8 had been convicted of Rape, 11 of Indecent Assault and 1 of a non-contact sexual offence), 2 had previous convictions for sexual offences, and 3 did not have any convictions for a sexual offence but concerns had been

expressed about sexual offence elements within their offending, therefore potentially posing a sexual risk.

Those that received repeated polygraphs were conducted when specific concerns or an intervention had been completed, therefore the time between polygraphs varied across the small sample. The range of time between repeated polygraphs ranged from three months to two years.

Table 4 shows the number of people making (previously unknown from file records), admissions to high-risk behaviours at the pre-test and post-test polygraph phase, and the final test result for the first and subsequent polygraph tests. In examining the polygraph outcome data, a large proportion of this sample (80%) made admissions during the pre-test phase of the first polygraph. Of the 21 that completed the polygraph 57% (n=12) went on to make post admissions. These admissions pertained to additional high-risk behaviours such as inappropriate sexual fantasies or further undisclosed sexual behaviours. In the first polygraph a greater proportion (66.7%) resulted in a DI / SR outcome. In Table 4 it can be seen that a number of individuals undertook repeated polygraph testing in which admissions were made either in the pre or post polygraph phase of testing or both. In subsequent polygraphs there was some variability in the outcomes and the numbers are small, therefore it was not possible to conduct any meaningful analysis.

Table 4. Number of individuals that made admissions during a Polygraph and Polygraph outcome data

	1 <sup>st</sup> Polygraph			2 <sup>nd</sup> Polygraph			3 <sup>rd</sup> Polygraph			4 <sup>th</sup> Polygraph		
<b>N</b>	25			6			2			1		
<b>Pre-test admissions (%)</b>	20 (80%)			3 (50%)			1 (50%)			1 (100%)		
<b>Post-test admissions (%)</b>	10 (48%)			1 (16.7%)			1 (50%)			0 (0%)		
<b>Polygraph Outcome</b>	<b>DI/SR</b>	<b>NDI/NSR</b>	<b>INC</b>	<b>DI/SR</b>	<b>NDI/NSR</b>	<b>INC</b>	<b>DI/SR</b>	<b>NDI/NSR</b>	<b>INC</b>	<b>DI/SR</b>	<b>NDI/NSR</b>	<b>INC</b>
<b>N (%)</b>	14 (66.7%)	4 (19%)	3 (14.3%)	2 (33%)	4 (67%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)

## Quantitative Analysis

Hypothesis 1: The level of disclosures of high-risk behaviours and range of paraphilias will increase as a result of the polygraph.

Table 5 below shows the number of disclosures reported pre, during and post polygraph.

The results of the Friedman Test indicated that there was a statistically significant difference in the number of high-risk behaviours<sup>5</sup> reported across the three time points (file, pre polygraph, post polygraph)  $\chi^2(2) = 38.42, p < .001$ .

Post-hoc comparisons were performed in which a Wilcoxon Signed Rank Test revealed a statistically significant increase in the number of high-risk behaviours reported from file to pre-polygraph, ( $z = -4.32, p < .001$ , after Bonferroni adjustments), with a large effect size ( $d = 1.50$ ). There was also a statistically significant difference found in the number of high-risk behaviours reported from pre-polygraph to post-polygraph, ( $z = -3.35, p = .002$ , after Bonferroni adjustments), with a large effect size ( $d = 1.07$ ).

A one-way repeated measures ANOVA was conducted to compare the mean number of paraphilic behaviours<sup>6</sup> reported at Time 1 (from file information), at Time 2 (the pre-polygraph phase) and again at Time 3 (post-polygraph). The means and standard deviations are presented in Table 3. There was a significant effect for time, Wilks' Lambda = .65,  $F(2, 23) = 6.20, P = .007$ , with a large effect size ( $d = 1.47$ ). Planned comparison t-tests were applied to make comparisons between the three time points. T-tests revealed a significant difference between the number of paraphilias reported between file and pre-polygraph  $t(24)$

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<sup>5</sup> High Risk Behaviours are sexual behaviours strongly associated with increased risk of re-offending

<sup>6</sup> Paraphilic behaviours are those listed in Appendix J associated with risk of sexual offending (referred to as deviant paraphilic sexual interests by Wilcox et al., 2005)



= -3.57,  $p = .002$  (2-tailed) with a medium effect size ( $d = .71$ ). A t-test comparing the number of paraphilias reported from pre-poly phase to post-polygraph phase was non-significant  $t(24) = .000$ .

A further Friedman Test indicated that there was a statistically significant difference in the number of inappropriate sexual fantasies masturbated<sup>7</sup> to, reported across the three time points (file, pre polygraph, post polygraph)  $\chi^2(2) = 26.00$ ,  $p < .001$ . The means and standard deviations are shown in Table 5.

Post-hoc comparisons were performed in which a Wilcoxon Signed Rank Test revealed a statistically significant increase in the number of reported inappropriate sexual fantasies from file to pre-polygraph,  $z = -3.50$ ,  $p < .001$ , after Bonferroni adjustments, with a large effect size ( $d = 1.12$ ). There was no statistically significant difference found in the number of reported inappropriate sexual fantasies from pre-polygraph to post-polygraph.

The results of a Friedman Test to compare the reported level of masturbation as a result of polygraph, so across time (file, pre-polygraph and post-polygraph) revealed a statistically significant increase in the level of masturbation (self-reported as frequency in a week) reported  $\chi^2(2) = 12.00$ ,  $p = .002$ . The means and standard deviations are reported in Table 5.

Post-hoc comparisons were performed in which a Wilcoxon Signed Rank Test revealed a statistically significant increase in the reported level of masturbation from file to pre-polygraph,  $z = -2.33$ ,  $p = .04$ , after Bonferroni adjustments, with a medium effect size ( $r = .70$ ). There was no statistically significant difference found in the level of masturbation reported from pre-polygraph to post-polygraph.

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<sup>7</sup> Inappropriate sexual fantasy is defined as a thought or image pertaining to sexual behaviour that could constitute or lead to a sexual offence if realised

*Table 5. Number of disclosures reported pre, during and post polygraph*

		File	Pre-poly	Post-poly	p	Post-hoc P	Effect size (d)		
No of Victims	Mean	2.12	95.96	95.96	<.001	File – pre-poly <.001 (adj)	1.35		
	(SD)	(2.70)	(288.53)	(288.53)					
	Median	1.00	4.00	4.00					
	Range	10.00	1100	1100					
High-Risk Behaviours	Mean	11.48	156.44	155.00	<.001	File – pre-poly <.001 (adj)	1.50		
	(SD)	(10.99)	(309.58)	(309.97)					
	Median	8.00	50.00	50.00					
	Range	54.00	1278.00	1279.00					
								Pre-poly – post poly .002 (adj)	1.07
No of Paraphilias	Mean	7.68	11.72	11.72	.007	File – pre-poly .002 (adj)	1.47		
	(SD)	(5.19)	(5.91)	(5.93)					
	Median	8.00	11.00	11.00					
	Range	18.00	28.00	28.00					
								Pre-poly – post-poly ns	-
No of inappropriate sexual fantasies	Mean	0.72	1.76	1.76	<.001	File – pre-poly <.001 (adj)	1.12		
	(SD)	(0.46)	(2.83)	(2.83)					
	Median	1.00	1.00	1.00					
	Range	1.00	15.00	15.00					
								Pre-poly – post-poly ns	-
Level of masturbation	Mean	0.40	1.16	1.16	.002	File – pre-poly .04 (adj)	.70		
	(SD)	(0.50)	(2.94)	(2.94)					
	Median	0.00	1.00	1.00					
	Range	1.00	15.00	15.00					
								Pre-poly – post-poly ns	-

*Cohen's d effect size: 0.2=small, 0.5=medium, 0.8=large*

Table 6 highlights the percentage increase in behaviours reported prior to polygraph and during a polygraph.

*Table 6. Pre to Post Polygraph reporting of sexual behaviour*

<b>Increase in masturbation (%)</b>	<b>Use of pornography (%)</b>	<b>Increase in inappropriate Sexual fantasies (%)</b>	<b>Abuse (%)</b>
32%	60%	88%	0%

Hypothesis 2: The polygraph examination will result in more disclosures of cross-over offending than that previously identified from the file review.

A Wilcoxon Signed Rank Test was conducted to compare the mean number of victims reported prior to the polygraph (in file information) to during the polygraph (pre-polygraph). No comparison was made with the post-polygraph data as no further information is gathered in relation to number of victims in the post-test phase of the polygraph. The means and standard deviations for number of reported victims are presented in Table 5. A Wilcoxon Signed Rank Test revealed a statistically significant increase in the number of victims reported from file to polygraph,  $z = -3.94$ ,  $p < .001$ , with a large effect size ( $d = 1.35$ ).

With regards to age and gender of victims Table 7 reports the number and percentage of each category, both pre-polygraph (file information) and from polygraph. It can be seen that there are no differences in the reported age or gender of victims as a result of the polygraph.

Table 7. Victim age and gender reported at file and during polygraph.

	Victim Age				Victim Gender			
	Adult only	Child only	Both	No victims	Male only	Female only	Both	No victims
<b>File</b>								
<b>N</b>	10	9	4	2	4	15	4	2
<b>(%)</b>	(40%)	(36%)	(16%)	(8%)	(16%)	(60%)	(16%)	(8%)
<b>Polygraph</b>								
<b>N</b>	10	9	4	2	4	15	4	2
<b>(%)</b>	(40%)	(36%)	(16%)	(8%)	(16%)	(60%)	(16%)	(8%)

Hypothesis 3: The level of risk as measured by the VRS-SO and RM2000/S is likely to be the same or higher post polygraph as compared to pre-polygraph.

Paired-samples t-tests were conducted to evaluate the impact of polygraph on the VRS-SO scores. The means and standard deviations for VRS-SO total scores and factor scores are presented in Table 8. No statistically significant differences were found in the VRS-SO scores as a result of the polygraph.

Table 8. VRS-SO data

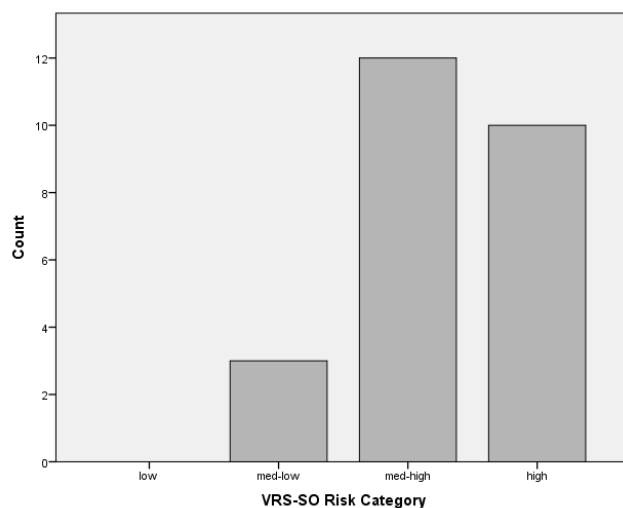
VRS-SO	Mean (SD)				T value (DF)	Sig (2 tailed)
	Pre Poly		Post Poly			
Total <sup>1</sup>	50.24	(8.23)	50.00	(8.06)	.457 (24)	.652
Z Value						
Factor 1 <sup>2</sup>	12.16	(2.90)	12.42	(2.87)	-.845	.398
Factor 2 <sup>2</sup>	17.28	(4.62)	18.02	(3.72)	-.071	.943
Factor 3 <sup>2</sup>	6.68	(1.31)	6.72	(1.07)	-.568	.570

<sup>1</sup> T Test (parametric assumptions met)

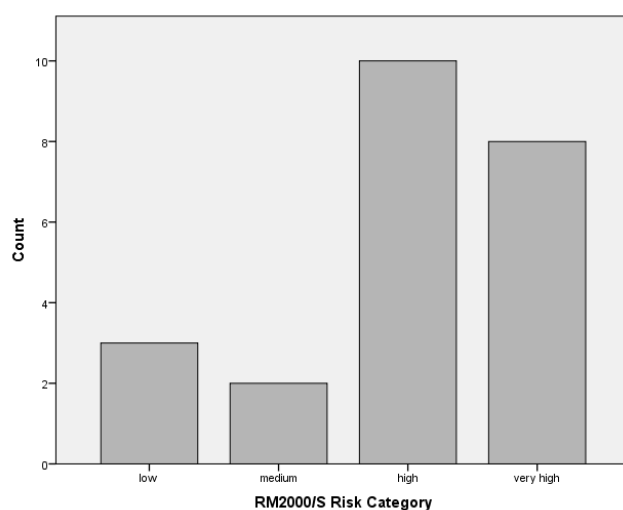
<sup>2</sup> Wilcoxon Signed Ranks Test

Figures 2 and 3 represent the number of patients that undertook a polygraph in relation to their risk category on the VRS-SO and RM2000/S. Both graphs highlight the greater proportion of individuals that are classified as medium high or high risk in the VRS-SO and high or very high risk on the RM2000/S. As there was no change in the risk categories from file to polygraph, only the pre-polygraph scores are represented.

*Figure 2. Total number in each VRS-SO risk category*



*Figure 3. Total number in each RM2000/S risk category*



Hypothesis 4: A Deception Indicated or Significant Response result on the polygraph is more likely to have a higher level of sexual risk

The relationship between polygraph outcome and risk category as measure by VRS-SO was investigated using Chi-square analysis which indicated no significant association between risk category and polygraph outcome,  $\chi^2(4) = 1.988$ ,  $p = .738$ . Chi-square analysis also yielded a non- significant association between RM2000/S risk category and polygraph outcome,  $\chi^2(6) = 2.123$ ,  $p = .908$ .

Tables 10 and 11 represent the number of individuals identified in each risk category according to the RM2000/S (Table 9) and VRS-SO (Table 10). Both tables highlight the greater proportion of individuals identified in the higher risk categories.

*Table 9. Polygraph outcome according to risk category on the RM2000/S*

	<b>Risk Category RM2000/S</b>			
<b>Polygraph outcome (n =19)</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Very High</b>
<b>DI / SR</b>	2	2	5	4
<b>NDI / NSR</b>	1	-	1	2
<b>INC</b>	-	-	1	1

*Table 10. Polygraph outcome according to risk category on the VRS-SO*

	<b>Risk Category VRS-SO</b>			
<b>Polygraph result (n=21)</b>	<b>Low</b>	<b>Medium/Low</b>	<b>Medium/High</b>	<b>High</b>
<b>DI / SR</b>	-	3	6	5
<b>NDI / NSR</b>	-	-	2	2
<b>INC</b>	-	-	2	1

## Qualitative Analysis

Six participants were interviewed about their experience of and reasons for taking a polygraph (n=4), or choosing to decline a polygraph (n=2).

In coding the transcript data, for the polygraph group and no-polygraph group, thematic analysis yielded the following themes and sub-themes highlighted in table 11.

*Table 11. Themes and Sub-themes identified from thematic analysis for polygraph and no-polygraph groups*

Themes	Sub-themes	Polygraph Group	No Polygraph Group
Risk	Anxiety	✓	✓
	Therapeutic Relationship	✓	✓
	Risk Reduction	✓	✓
	Timing	✓	✓
Honesty	Challenge honesty	✓	✓
	Enhance honesty	✓	X
	Choice	✓	✓
Impact	Outcome	✓	X
	Disclosures	✓	X
	Pathway	✓	X
	Future participation	✓	✓
Knowledge	Accuracy	✓	✓
	Experience	✓	X
	Lack of knowledge	✓	✓

Upon further review, many of these themes overlapped, and yielded 4 overall themes, with sub-themes. The four themes and sub-themes identified are summarised in table 12.

*Table 12. Main themes and Sub-themes identified from thematic analysis for both polygraph and no-polygraph groups*

Main Theme:	Risk	Honesty/ Truthfulness	Impact	Knowledge
<b>Sub-Themes:</b>	<ul style="list-style-type: none"> <li>• Anxiety</li> <li>• Therapeutic Relationship</li> <li>• Risk Reduction</li> <li>• Timing</li> </ul>	<ul style="list-style-type: none"> <li>• Challenge honesty</li> <li>• Enhance honesty</li> <li>• Choice</li> </ul>	<ul style="list-style-type: none"> <li>• Outcome</li> <li>• Pathway</li> <li>• Disclosures</li> <li>• Future participation</li> </ul>	<ul style="list-style-type: none"> <li>• Experience</li> <li>• Lack of Knowledge</li> <li>• Accuracy</li> </ul>

### ***Theme 1- Risk***

This theme referred to the risk to oneself and liberty, and how it may impact upon therapeutic relationships with professionals involved in their care. It also refers to the timing of a polygraph in the treatment pathway and the possible impact upon risk reduction.

#### *Sub-theme Anxiety:*

Irrespective of agreeing to or declining a polygraph anxiety was expressed by many, whether this was anxiety as to why they had been asked to undertake a polygraph or anxiety about the outcome and what may be discovered, uncovered or even asked.

Examples of this include:

#### Polygraph Group

*“What if there is something deep rooted, something that could come out in there so you*

#### No- Polygraph Group

*“self-conscious level of somebody who maybe didn’t know something about their*



*are a little bit cagey”*

*sexuality... it’s a terrible way to find out”*

*“I had been smoking a bit of cannabis... I was worried about it coming up on the detector machine”*

*“what if they might get wrong readings”.*

*“You don’t know what is going to be said”*

*“I was perplexed as to why I was having one”*

*“a bit physically sick to be honest”. “I can’t think about it if I look in the mirror”.*

*“you’re honest and it comes across as you’re not, it’s going to upset the guy... on a downward slope... it’s quite wounding”.*

#### Sub-theme Therapeutic Relationship:

Various concerns were expressed regarding the possible damage to the therapeutic relationship particularly with the clinical team, by being asked to undertake a polygraph. There was a sense of being disbelieved, or trying to be caught out, and having to prove something to clinical teams or Responsible Clinicians about their behaviour or risk. Some felt pressure to engage in recommended therapies or assessment, not uniquely to polygraph.

Examples of this include:

#### Polygraph Group

*“rolling over doing what I’m told”*

*“might look to them like I am trying to hide something” [if didn’t do it]*

#### No- Polygraph Group

*“...that once and for all, they can get rid of these ideas of this behaviour that they think that they can stop worrying about and get on it because it just seemed, it’s just quite embarrassing for me and quite uncomfortable for me to be accused of things I have not done”*

*“trying to catch you out”*

*“prove to people they are wrong... I am not a danger to anybody no more”*

Sub-theme Risk Reduction:

Polygraph was considered to be helpful in assisting others’ understanding of the index offence, by exploring and being questioned on the details of the index offence. That undertaking and potentially proving non engagement in offence behaviours may subsequently lower risk. It may also prove to others that their concerns are unfounded and they no longer pose a threat to the public.

Examples of this include:

Polygraph Group

*“Put clinical team minds at ease, my risk might be lowered”*

*“help people understand more about my offence than just what is written, rather than just my and her statement”*

*“I hoped it would help not to have to think about certain things that I find quite disturbing, to lower my risk of reoffending”*

*“prove... I am not a danger to anybody no more... so people understand he’s got nothing to hide”*

*“so you know you’re not sending somebody back on the street who has lost the plot and they don’t know what to do. It’ll help people in the long run to understand behaviour patterns”*

No- Polygraph Group

*“ I could put their minds at ease and I suppose my risk would be dropped even lower”*

### Sub-theme Timing:

The timing of being offered a polygraph both within their pathway and being sensitive to other on-going issues such as medication changes or a number of requests was considered important. A polygraph was considered to be more appropriate at the start of the therapeutic pathway, and certainly before undertaking numerous therapies; that perhaps if earlier in the treatment pathway, other treatment may be unnecessary.

Examples of this include:

#### Polygraph Group

*“why all of a sudden” being asked to undertake a polygraph*

#### No- Polygraph Group

*“I feel that if the polygraph was done at start of when my team started going down that path, I might have taken it”*

*“one thing after another” in terms of clinical team requests to undertake therapies*

## **Theme 2- Honesty/Truthfulness**

Polygraph is focussed upon truthfulness and seeking the truth. It's suggested that being asked to undertake a polygraph leads to individuals assuming they are considered as untruthful or deceitful. A polygraph can be an explicit challenge to one's honesty and can damage the therapeutic relationship (link to sub-theme therapeutic relationship in the theme of risk). There were also some benefits identified that were considered to aid an honest review of past and present behaviours. The final area of this theme relates to the importance and value of a polygraph being voluntary.

### Sub-theme Challenge Honesty:

It can lead to individuals feeling uncomfortable or offended when asked to undertake a polygraph. This can be perceived as a challenge of the details of offence history as well as current sexual behaviours and interests. This also links to the therapeutic relationship being tested and others perceptions of them.

Examples of this include:

#### Polygraph Group

*“prove to people they are wrong... I’m not that person no more”*

*“it might look to them like I’m trying to hide something”*

*“quite uncomfortable to be accused of things I have not done”*

#### No- Polygraph Group

*“felt so offended, my index offence had nothing to do with sex”*

### Sub-theme Enhance Honesty:

This sub-theme identified various experiences in which the polygraph aided or enhanced the sharing of some information and enabled a more honest discussion and sharing of past and current sexual behaviours.

Examples of this include:

#### Polygraph Group

*“it’s difficult to talk about ‘it’ [sex] to anybody else”*

*lies turned out ok because they were only silly little things, like I lied to someone why I’m in or I’d lie about where I’m going, just silly things like if I lied to anyone on the ward, well yeah I do it all the time”*

#### No- Polygraph Group

*“to help me, to benefit me so good thing to do”*

*“talking about my offence would be beneficial”*

*“help share the things that might be in your head... help say them out loud”*

*“polygraph is there to check any anomalies in whatever I’ve said in therapy and the need to clarify”*

#### Sub-theme Choice:

To have the choice to undertake a polygraph was very important for all. Whilst some felt obliged to undertake it, and maybe *“eager to please”* their clinical team, others felt empowered to choose to take it or not.

Examples of this include:

#### Polygraph Group

*“did it as part of my treatment”*

*“wouldn’t have done it if any concerns”*

*“sharing information about my life through my own choice”*

#### No- Polygraph Group

*“not going to continue [jumping] through hoops. It’s good I’ve been confident to say no... I had the option, I had the choice”*

### Theme 3- Impact

This theme relates to the impact of the polygraph, in terms of what was recalled of the polygraph for those that undertook it and positive consequences of this. In addition the impact upon the pathway and progression beyond high secure services. There was also an impact identified upon individuals who had a polygraph in terms of the disclosures made and their experience of this.

#### Sub-theme Outcome:

The majority of individuals could not recall the polygraph outcome or result as it had for some, been a long time since their polygraph, or it had not been of particular relevance to them. It was also noted that there had been no impact for many whether they had taken a polygraph or chosen not to.

For those that had experienced an impact, it was identified that it helped them share information, or had triggered more reflection of offences within therapy, and a sense of accomplishment from completing a polygraph.

Examples of this include:

#### Polygraph Group

*“thought a lot about my crime, it was kind of hard not to when asked these questions”*

*“as far as I can remember it was positive”*

*“felt like I’d accomplished something... it was just answering questions”*

#### No- Polygraph Group

Sub-theme Disclosures:

No concerns were expressed about making disclosures, in fact it was considered to be positive and helpful in others understanding and enabling information to be discussed or disclosed that had previously been difficult to.

Examples of this include:

Polygraph Group

*“help [others] understand more about [the] offence, not just what’s written”*

*“help share the things that might be in your head... help say them out loud”*

*“I had answered questions with [therapist] so I’d been down that road before. Not asked anything new”*

No- Polygraph Group

*“I’m not hiding anything”*

Sub-theme Pathway:

For most the pathway was not directly altered by having a polygraph but all acknowledged a polygraph could help move forward and step down to a lower secure service. For one it had a great impact upon confirming mental health services and not prison as the appropriate pathway.

Examples of this include:

Polygraph Group

*“I can move forward onto an RSU”*

*“turned out quite well, [RC] didn’t think prison was right for me”*

No- Polygraph Group

### Sub-theme Future Participation:

Future engagement in polygraph was considered by most as a possibility and that it had a place in high secure services with a variety of individuals, although noting those that may be taking medication could be sleepy and therefore not suitable or those with reading difficulties may not be appropriate to test.

Examples of this include:

#### Polygraph Group

*“treat it as any therapy session”*

*“Why on earth shouldn’t we use it all the time to get the truth out of people... should be used with sex offenders and normal prisoners and normal patients”*

*“I advise people in the future to just take the polygraph and if you’ve got nothing to hide you’ve got nothing to worry about”*

#### No- Polygraph Group

*“good in certain ways. In telling the truth and what’s happening and would you ever offend again”*

## **Theme 4 - Knowledge**

The final theme identified relates to pre-existing knowledge of the polygraph prior to taking one, as well as recall of the polygraph itself and the perceived accuracy of the polygraph.

### Sub-theme Accuracy:

Individuals either identified it should be 100% accurate and because it’s not 100% accurate it does not have any value. This leads to a lack of confidence in the result. Having said this, a need of proof was identified: to prove one’s honesty or prove no longer a risk to others.



Examples of this include:

Polygraph Group

*“100% accurate”*

*“it’s not something they do every day of the week”*

*“but not all [are] guilty on Jeremy Kyle, they say the lie detector is wrong”*

No- Polygraph Group

*It’s not 100% accurate so doesn’t have mean anything”*

Sub-theme Experience:

The experience of polygraph was a limited recall of the different stages, most remembered the attachments in different forms and being asked questions.

Examples of this include:

Polygraph Group

*“asked explicit questions”*

*“hooked up... fingers... chest... blood pressure... box of wires”*

No- Polygraph Group

Sub-theme Lack of Knowledge:

This theme relates to limited personal knowledge of the polygraph, which was predominantly based upon watching the Jeremy Kyle television programme and all individuals referring to the polygraph as a ‘lie detector’. The perceived knowledge of the polygraph by others was also limited. It does not appear to have been discussed amongst peers and with staff for either group, or the perception has been one of surprise that a polygraph has been suggested. However, for some a desire to learn more about polygraph was indicated.

Examples of this include:

Polygraph Group

*“it finds out the truth and makes sure I’m not telling lies”*

*“it’s a lie detector”*

No- Polygraph Group

*“staff say they wouldn’t do it”*

*“it’s a lie detector”*

*“I want to know more about polygraph”*

## **DISCUSSION**

It is encouraging to note, whilst the majority of the sample had a primary diagnosis of personality disorder (as they may be more likely to have capacity to consent), a number with a primary diagnosis of mental illness were considered appropriate and agreed to take a polygraph. Due to sample size it was not possible to compare these groups.

It is unsurprising that a high proportion of the sample had an identified higher risk of sexual offending according to the RM2000/S or VRS-SO risk categories prior to polygraph testing, given they were residing in a high secure forensic setting. It is of note that some could not be rated on the RM2000/S in particular as they did not have a sexual offence conviction, but had been offered a polygraph due to concerns about their sexual risk. This is most likely due to the nature of their offences, for example, having a conviction for murder, where a lack of evidence has not resulted in a sexual conviction. Polygraph was therefore a useful tool here in exploring sexual behaviour and risk in those who had not been convicted of sexual offences but for whom concerns over sexual offending behaviour had been expressed.

Having noted the high proportion of the quantitative sample being within a higher risk category, it is of note that in comparison, half of the qualitative sample had a low risk on the

RM2000/S which may be reflective of their willingness to participate in the study. Due to the low numbers it is not possible to draw any conclusions from this.

Of the sample as a whole, more information was elicited from the use of a polygraph, specifically relating to the number of reported victims, number of sexual behaviours, the use of pornography, number of reported paraphilias and high-risk behaviours, level of masturbation and reported inappropriate sexual fantasies. This did not result in an increase in risk category, however, as noted above, although it can be argued that the information disclosed during a polygraph is relevant to their treatment and therefore by understanding their behaviour and learning alternative ways of managing their sexual interests within treatment, they could potentially lower their risk.

The risk assessment tools employed in this study whilst assessing both static and dynamic risk factors, are not sensitive to change in measures of sexual deviance, which is largely the information gathered that increased as a result of the polygraph. An alternative risk assessment could be the Structured Assessment of Risk and Needs (Thornton, 2002). It is also important to acknowledge the initial level of risk was high for a large proportion of the participants. Therefore any increased disclosures would be unlikely to increase the overall risk level any further.

Had an increase in the level of risk been found as a result of the polygraph, the potential consequences include an impact upon the therapeutic relationship, potentially withdrawing from therapies and engagement with staff, thereby increasing risk further and impacting upon pathway progress. Further consequences could be an increased length of stay in hospital, or even return to prison if not engaging meaningfully.

Alternatively the sexual history examination may not elicit risk related behaviours rated in the risk assessment tools used (RM2000 and VRS-SO). By nature of being in a high secure

hospital, many of the risks are managed and therefore limits both the opportunity to engage in high risk behaviours, but also those that are scored in the risk assessment tools.

Interestingly there was no change in reported level of historical abuse experienced by this sample. Previous studies (Grubin, 2006) have noted a significant decrease in the reporting of abuse. It is highly likely that given the length of time these patients have resided in a therapeutic setting, they have had the opportunity to disclose or revoke any reports of past sexual abuse.

The proportion of NDI/NSR results in the first polygraph of (67%) is greater than Grubin's (2010) study of 48% for Sex History examinations. It is of note that in a second polygraph the proportion of NDI/NSR outcomes was greater, suggesting that experience of polygraph increases honesty, thereby supporting Grubin's finding (2010). The experience could be one of learning its accuracy (Gannon et al, 2014) or absence of negative consequences following previous disclosures in a polygraph. Whilst this finding should be viewed with caution due to the small sample, this suggests that the polygraph still has value even in repeated testing as noted by Gannon et al, (2014) and Grubin (2010).

As other studies using community samples have found (English et al., 200; Gannon et al., 2014; Grubin, 2010), this study, using a sample of sex offenders detained in a high secure setting, found the use of polygraph resulted in an increase in the reported number of high-risk behaviours when compared with file information, with a large effect size. It is possible that this information may have equally been elicited from an interview, as arguably the information shared was prior to the testing phase of the polygraph (with the attachments connected and questions asked). It is therefore not possible to conclusively suggest that polygraph alone elicits additional high-risk information, which should be controlled for in future studies. However, having been in a high secure hospital for an average of 7.4 years,

this information had not been recorded or at the very least elicited from this sample. It was evident from the file review and polygraph assessments that most participants had never been explicitly asked the number of times they had engaged in each sexual behaviour, until the polygraph assessment. So, arguably, there could be value in reviewing the Sex History questionnaire with participants and not having a polygraph, which would lend support for the bogus pipeline effect. However, as previous research has highlighted many times (Heil et al., 2003; Wilcox et al., 2005), polygraph leads to increased disclosures when compared with self-report, clinical interviews or file information.

This suggests that polygraph can be a useful tool in a forensic setting. It could be argued that in a medium secure setting where exposure to risk stimuli (such as victims in the community or freedom to act upon sexual urges with less restriction or observation) is greater, the polygraph could have a valuable place in the treatment and management of those with a sexual risk in wider forensic services.

A statistically significant reduction in the number of high-risk behaviours reported from pre-test phase polygraph to post- test phase polygraph is considered to be a result of a few patients retracting (in the post-test interview) the level of some disclosures made in the pre-test phase. It is unclear as to why this may be: possibly due to unhappiness with the result and an unconscious desire to undermine the result or a desire to be seen in a more positive light. Whilst the findings had a medium effect size, future qualitative studies may elicit more information to understand this.

Analysis of the reported number of paraphilic behaviours at different time points also found a statistically significant increase from file to pre-polygraph phase. As noted previously, many patients had not been asked to provide details of their paraphilic behaviours prior to a polygraph. This is somewhat concerning as all had undergone treatment prior to the

polygraph, many of which had completed sex offender work. Whilst it is not possible to conclusively suggest polygraph alone results in an increase in disclosures, in this study it was certainly a tool with which to more accurately elicit information pertaining to sexual behaviours, as it covered an exhaustive list of sexual behaviours across the lifespan. This is relevant in order to provide the most appropriate treatment and inform risk assessment.

In comparing percentages from pre to post polygraph, statistical analysis found reporting of both inappropriate sexual fantasies and level of masturbation to significantly increase, with a large and medium effect size respectively. This is particularly relevant in a high secure setting where there is limited exposure or access to stimuli related to sexual behaviours. For example, in a high secure setting access to sexually explicit material is only approved by the patient's clinical team, and residing within a secure perimeter greatly limits contact with the outside world, including having no access to the internet. Therefore, these increased behaviours may have greater significance of risk in a high secure setting.

Therefore if a reduction in these behaviours (where they are high) is established over time during their stay in a high secure Hospital, this could indicate a reduction in risk. The polygraph could be used to verify this, in conjunction with clinical risk assessment tools and professional judgement.

Therefore, hypothesis 1 was supported and the level of disclosures of high-risk behaviours and paraphilias increased from file to pre-test polygraph phase.

With regards to cross-over offending, there was no difference in the reported age or gender of victims which specifically relates to cross-over offending. This, therefore, does not support previous findings of increased cross-over offending (Heil, et al., 2003).

The significant increase in number of victims disclosed during the pre-test polygraph phase in this study is considered to be due to the nature in which the sexual behaviour details are gathered. In other words, when explicitly asked the number of times they engaged in a given sexual behaviour, this differed from the response given when asked directly and simply “how many victims” they have. The majority of the sample provided the number of victims they have been convicted for to the latter question. When asked the number of times they had engaged in a behaviour (and therefore may have resulted in a victim), details were not actively sought of the gender, age or relationship to the victim. Therefore no differences were found in the age or gender of victims reported as a result of the polygraph.

Hypothesis 2, therefore, was partially supported, in that a significant increase in the number of victims was found from file to pre-test polygraph, but no increase in disclosures were made with regards to age or gender of victim(s). Future polygraph assessments could explore gender and age of victims relating to the disclosed sexual behaviour such as frottage or indecent exposure in order to establish potential cross-over offending. This would be important in identifying treatment needs and management of risk.

Research by Grubin, (2010) found risk category to increase as a result of polygraph because of disclosures made of further sexual behaviours thus increasing the level of risk. This study did not find any significant difference in the level of sexual risk as a result of polygraph, therefore hypothesis 3 was not supported.

It is possible that the data collected in a polygraph were not reflected in the risk assessment tools used. Whilst the VRS-SO is sensitive to change, any information disclosed in a polygraph may take time to translate to real change in therapy and therefore ultimately risk reduction. The RM2000/S is not sensitive to dynamic change in risk therefore only likely to increase as a result of a polygraph eliciting disclosures. Future studies therefore should

consider controlling for polygraph (have a polygraph and no-polygraph group) and repeating a Sexual Risk Assessment tool at a later time point such as 6 months to a year later, to establish any effect upon sexual risk as a result of polygraph.

The final hypothesis was that high risk sexual offenders would be more likely to have a DI/SR outcome on a polygraph, which would indicate a level of deviance associated with being dishonest. Whilst a trend is evident from tables 11 and 12, statistical analysis found that the proportion of DI polygraph outcomes was not significantly different in the risk categories for both the VRS-SO and RM2000/S. The same was true for NDI/NSR and INC outcomes. All of this suggests that high risk offenders are no more likely to have a DI/SR polygraph result than low risk offenders. It is possible, however, that a larger sample size may yield a different finding.

Thematic analysis of participant views of polygraph testing, which included those who had engaged in a polygraph and those who had declined revealed overall 4 main themes: risk, honesty/truthfulness, impact and knowledge. There were no great differences between those that undertook a polygraph and those that did not, within the themes of risk, knowledge and honesty. Whilst the polygraph group experienced polygraph as enhancing honesty, the no-polygraph group experienced it as challenging, which may indicate why they chose to decline. Within the theme of impact, those in the no-polygraph group did not identify anything other than potential future participation. Having not experienced the polygraph it may be difficult for them to consider the impact, however they could identify many risks associated with taking a polygraph. Two of these themes were similar to themes identified in Spruin et al.'s study (2017), which were labelled as truth detection and perceptions of polygraph as part of supervision, therefore supporting the findings from this study.



Findings suggest similar concerns or anxieties with regards to what the polygraph may uncover and potential impact upon the therapeutic relationship sometimes by even the mere mention of polygraph. However, despite these concerns, the polygraph was considered to assist in making disclosures and sharing what may be ‘in one’s head’. This supports the notion of polygraph as a ‘truth facilitator’ (Grubin, 2004). In addition to these findings, despite concerns, there was a view that polygraph could assist in risk reduction by proving honesty.

By providing some insight into how polygraph is perceived and experienced in a high secure setting by those tested and not tested, the findings of this study add to existing research. The findings indicate patients are largely positive about polygraph and that it has some value in a forensic setting, suggesting its applicability to a variety of offenders and mental health patients. It was very important for polygraph to be voluntary to allow choice and potentially protect the therapeutic relationship. The polygraph is considered by participants to be a lie detector but also to facilitate truth-telling.

The impact of the polygraph for many was positive in enhancing engagement in therapy or even assisting in clarifying a mental health pathway over prison.

## **Limitations**

There are some limitations to the current study, such as the small sample size. However the quantitative sample was largely reflective of the Hospital population in terms of ethnicity of those with a sexual offence history. A small sample size and it being within a very specialist service limits the generalizability of the findings. Therefore, the findings cannot be

considered as representative of all patients asked to take a polygraph in a high secure hospital setting, or indeed more widely beyond this setting.

A long evaluation period in this study introduces confounding variables, such as increased development in polygraph and adaptations in delivery and scoring, so a lack of consistency in the delivery and scoring of the polygraph, as well as recall of information about the polygraph was limited after a long time period for many participants. This was in fact reflected upon in the semi-structured interviews of the qualitative part of this study.

A further limitation is the confounding variable of treatment and its impact upon willingness to make disclosures. Records did not reflect all details of treatment attempted or completed, therefore it was not possible to evaluate the effect or interaction of treatment on polygraph disclosures.

It is acknowledged that in the thematic analysis, researcher bias is possible in identifying the themes, as the researcher conducted the semi-structured interviews and coded the data. It is also highly possible that those interviewed may have adjusted their responses as they were interviewed by the same individual that conducted the polygraph with them. This is a major confounding variable in this study.

A further flaw in the empirical study is the recording of masturbation levels and inappropriate sexual fantasies. These are not mutually exclusive and would have been useful to also record the number of inappropriate sexual fantasies each subject had masturbated to, thereby reflecting more accurately upon sexual risk, as masturbation levels in and of itself is not a factor associated with sexual risk.

## **Conclusion**

Both qualitative and quantitative findings from the current study indicate that polygraph has utility in a high secure forensic setting, in enhancing disclosures, which can inform treatment with the purpose to reduce risk. However, despite increased disclosures in the study, this did not impact upon the risk level. This could be due to an already high level of risk for many, as to be expected perhaps in a high secure hospital, therefore further disclosures could not impact upon the risk level. It is also possible that the risk assessment tools employed were not sensitive to the disclosures made, which related to increased inappropriate sexual fantasy and increased masturbation to these fantasies. Although the sample size was small, polygraph can provide more information about sexual behaviours in those with a diagnosis of mental illness or personality disorder, and could have utility in other secure settings where exposure to risks are arguably greater. The findings of this study support previous research suggesting the utility of polygraph. This study thus extends the findings to a mentally disordered population.

It may be beneficial to conduct further longer term studies of polygraph in secure settings, potentially conducting further qualitative studies to establish the value and experience of polygraph amongst patients and staff, paying particular attention to factors that facilitate participation and those which hinder participation. Staff and patients alike may benefit from awareness training of polygraph and dissemination of the findings of this study.

In light of limited research from the 1970's on polygraph and psychopathy (Barland & Raskin, 1975; Gatchel, et al., 1983; Hammond, 1980), which is often linked with a personality disorder, it would be beneficial to explore the effect of polygraph on specific mental disorder diagnoses in a larger sample study. It is considered that some mental health diagnoses (such as Dissocial Personality Disorder where there may be higher levels of

pathological lying associated with the diagnosis) may be more likely to result in a deceptive or significant response polygraph outcome.

In a larger sample study, it may be helpful to compare this group with those who have been convicted of a sexual offence to establish any possible similarities or differences between these groups.

In the empirical study of this thesis, the thematic analysis highlighted the lack of knowledge of polygraph. In a high secure setting there is no authorised access to the internet, therefore, it is considered reasonable to suggest that this sample did not attempt to employ any well considered countermeasures which could affect accuracy. Should they have had access to the internet it is reasonable to suggest the attempted employment of countermeasures may be observed.

It is not possible to comment upon any potential effects of repeated polygraph testing due to such small numbers, so habituation or sensitisation (Branaman & Gallagher, 2005) remains a possibility.

The VRS-SO authors note it is best practice to conduct a file review and interview to complete the risk assessment too. The empirical study initially set out to be a prospective study, however it was not possible due to low uptake. Therefore a retrospective study was conducted and the VRS-SO data were based on file reviews only. This is an obvious limitation of the empirical findings relating to the VRS-SO in this thesis.

## **Chapter 4**

### **Critique of the Violence Risk Scale-Sexual Offender version (VRS-SO)**

## INTRODUCTION

The assessment of sexual risk is complex but a vital part of risk management of sexual offenders. Interventions to reduce the risk of sexual violence are crucial and assessment of sexual risk is key in identifying the appropriate treatment needs to target. There has been a development of sexual risk assessment tools over recent years from an actuarial approach, to structured professional judgement tools, and more recently ‘mechanical’ risk assessments (quantitative tools in which items are selected based on literature or theory rather than their statistical relationship with the criterion as with purely actuarial tools (Tully, Chou & Browne, 2013)).

The Violence Risk Scale-Sexual Offender version (VRS-SO) is considered a mechanical risk assessment tool that’s design is based on the widely accepted risk, need responsivity principles (Andrews and Bonta, 2006). It includes both static and dynamic risk factors that have been identified by various meta-analyses such as Hanson and Bussiere (1998) and Hanson and Morton-Bourgon’s (2005) work.

Dynamic risk factors are variables that are related to recidivism and are amenable to change. Measures of dynamic risk can contribute incremental validity for predicting recidivism beyond static factors (see Craissati & Beech, 2003, for a review).

The VRS-SO is a sexual offender risk assessment and treatment planning tool designed to (a) assess the risk of sexual recidivism for forensic clients using both static and dynamic variables, particularly for those being considered for release from incarceration to the community on conditional release or at the expiry of detention and (b) identify dynamic risk variables to be targeted for sexual offender treatment, and (c) evaluate possible changes in

risk in the dynamic variables as a result of treatment or other possible change agents. It is a sex offender risk assessment tool designed to inform and guide sex offender treatment.

This review examines the Violence Risk Scale –Sexual Offender version (VRS-SO: Wong, Olver, Nicholaichuk and Gordon, 2003). An overview and critique of the instrument will be provided and assessed in terms of its validity, reliability and clinical utility.

### **Description of assessment**

The VRS-SO is a 24-item clinician-rated scale comprising 7 static items (i.e., criminal history, and victim and offender demographics) and 17 dynamic items identified as empirically, theoretically or conceptually related to increased risk for sexual recidivism. Each item is rated on a 4-point (0, 1, 2, 3) Likert-type scale based on a thorough file review and a semi-structured interview. Higher ratings indicate a closer link to inappropriate sexual or non-sexual behaviours therefore indicating an increased risk for sexual recidivism. Dynamic items receiving a 2 or 3 rating are considered to be criminogenic (i.e. linked to sexual offending) and therefore appropriate targets for treatment. Dynamic items receiving a 0 or 1 rating are not considered criminogenic and are generally not intended to be treatment targets.

Using statistical actuarial procedures a pool of 24 static items were identified from the literature that correlated with sexual recidivism. Approximately half of a sample (n=152) was cross validated on the other half of the sample (n=169). Variables with the strongest univariate relationships to outcomes were retained and rescaled to a 4-point format. The remaining 7 static items were thus developed and can be summed to produce a static item total.

It is noted in the manual that a detailed review of the sex offender prediction and treatment literature was conducted to develop the dynamic component of this assessment (Olver, Wong, Nicholaichuk and Gordon, 2007).

The VRS-SO scoring manual includes a detailed rating criteria for each static and dynamic item. Each dynamic item has an “objective” section that briefly describes the underlying construct (e.g. deviant sexual preference) together with detailed descriptions for 3-point and 0-point ratings for the item. A 0-rating indicates the item in question has no relationship with sexual violence, and 3-rating indicates there is a consistent and significant relationship with sexual violence. Raters are instructed to consider a 1-rating as “less positive” than those described by a 0-rating, and a rating of 2 as “less serious” than those described by a 3-rating.

The dynamic items are potentially changeable and changes to these items are assessed and quantified using a modified application of the transtheoretical model of change (TTM: Prochaska, Diclemente & Norcross, 1992). The model postulates that individuals who modify their problem behaviours move through a series of stages: the pre-contemplation, contemplation, preparation, action and maintenance stages. The stages of change correspond to the improvements that the client demonstrates by developing positive coping skills and strategies that are stable, sustainable and generalizable with respect to the dynamic item.

All treatment targets (dynamic items rated 2 or 3) are given a stages of change rating pre-treatment to assess motivation and readiness for change. Post treatment the stages of change are re-rated on all dynamic items identified as treatment targets. Change is quantified as by comparing the stages of change rating for each dynamic item at pre-treatment with that at post-treatment. Progression from one stage to the next indicates a positive change, and as



such the risk should be lowered. Advancing from one stage to the next is scored as a 0.5 reduction in the pre-treatment rating of the item. The total point deductions for each dynamic item identified at post-treatment are summed across all 17 dynamic items to produce a total change score. The total change score is subtracted from the total pre-treatment dynamic score to obtain the total post-treatment dynamic score.

The authors argue that some of the rating criteria for the VRS-SO and other risk assessment tools are based on observable behaviours in a community setting and are not possible in restrictive environments (e.g. prison or mental health settings). The stages of change descriptions for each dynamic item were specifically developed to capture offence paralleling behaviours relevant to treatment and are observable in forensic settings.

### **Level of Measurement**

A Psychological test is considered to be a good test if the data it is based on are interval level, is reliable and valid, and has appropriate norms (Kline, 1986).

With respect to the VRS-SO, the presence of a zero point might appear to indicate a ratio scale, which is the optimum level of data. However, this is artificially imposed by the method of scoring, and it is at best an interval scale. It cannot be claimed that a score of 40 is twice as risky as someone with a score of 20. Kline (2000) suggests that the assumption of an interval scale is acceptable provided that an instrument is of practical utility, though the long term goal for psychology should be to establish ratio scales.

### **Reliability**

Reliability of a test refers to its stability over time and its internal consistency.

### ***Test- retest Reliability***

Reliability of the VRS-SO stages of change was evaluated by Olver et al. (2007) who found the correlation change scores between two sets of ratings to be a reasonable correlation ( $r = 0.68$ ).

Correlations between pre- and post-treatment dynamic scores were found to be very highly correlated ( $r = .95$ ) by Olver, Nicholaichuk, Kingston and Wong (2014). The same correlation coefficient was reported in Olver, Beggs Christofferson and Wong's (2015) study. Good correlation in test-retest reliability has been demonstrated in this study, however the authors of the research also produced the assessment tool.

### ***Internal consistency***

In the normative study of 2006, Wong and Gordon reported good internal consistency ( $\alpha = .93$ ) and acceptable internal consistency was found by Olver et al., (2007): Pre- treatment dynamic items ( $\alpha = .81$ ), static items ( $\alpha = .67$ ) and combined scale total ( $\alpha = .84$ ). It is noted that Olver et al.'s study used a split half reliability method which inherently underestimates true reliability.

### ***Inter-Rater Reliability***

In one study (Olver et al., 2007) the inter-rater reliability (IRR) of the dynamic items was assessed on 35 randomly selected cases (10.9% of sample) and evaluated with intraclass

correlation coefficients (ICC's). All reported ICC's were significant at  $p < .001$  (pre-treatment dynamic item total ICC = .74 and post-treatment dynamic total ICC = .79).

The IRR of the factor-analytically derived factors were also significant at  $p < .001$ .

Factor	Pre ICC	Post ICC
Sexual Deviance	.72	.73
Criminality	.77	.80
Treatment Responsivity	.66	.73

Another study by Beggs & Grace (2010) rated twenty-three cases (10.6% of the sample) independently by two raters. The majority of dynamic items had significant single measure coefficients for both pre- and post-treatment. Average measure ICC's for scores on the three dynamic factors (sexual deviance, criminality and treatment responsivity) were all significant for both pre- and post-treatment and ranged between  $rICC = .79$  and  $rICC = .95$  (average  $rICC = .88$ ). Total Dynamic scores showed very good IRR for both pre- and post-treatment ( $rICC = .90$  and  $.92$  respectively and both had  $p < .001$ ). Overall, the reliability of the VRS-SO dynamic scores was acceptable and comparable with levels reported by Olver et al. (2007).

## Validity

A test is considered valid if it measures what it claims to measure (Kline, 2000).

### ***Concurrent validity***

If a test is found to correlate highly with another test of the same variable which is administered at the same time then this is said to possess concurrent validity (Kline, 2000).

Olver and colleagues (2007) found the VRS-SO to be positively correlated (all  $ps < .001$ ) with the Static 99 static actuarial risk measure developed and validated on a large international sample of sex offenders (Hanson and Thornton, 1999). Therefore supporting concurrent validity with the static total score ( $r = .70$ ); the dynamic total (pre) and (post) ( $r = .37$  and  $.35$ , respectively); and VRS–SO total (pre) and (post) ( $r = .55$  and  $.54$ , respectively); and VRS–SO static and dynamic item totals were also significantly correlated (pre- $r = .48$ , post- $r = .45$ ).

Canales, Olver and Wong (2009) found the sexual deviance factor of the VRS-SO and the Screening Scale for Paedophilic Interests (SSPI; Seto and Lalumiere, 2001) to be significantly positively correlated ( $r = .43$ ,  $p < .001$ ). They also found the sexual deviance factor to be significantly positively correlated with female and male child profiles and pubescent male profiles on phallometric PFE (per cent full erection) indexes (all  $Ps < .001$ ). It was not significantly correlated with female stimuli therefore providing support for discriminant validity (which demonstrates low or negative correlations with variables that are dissimilar to it). However the subgroup numbers were small in this study and the raters were not blind to the phallometric results.

Beggs and Grace (2010) independently assessed the concurrent validity of the VRS-SO also with the Static-99. Correlations between the Static-99 and VRS-SO scores were found to be positive (all  $ps < .001$ ):  $r = .81$  with the VRS-SO Static scale;  $r = .53$  with pre-treatment

Dynamic;  $r = .48$  with post-treatment Dynamic;  $r = .76$  with pre-treatment Total; and  $r = .73$  with post-treatment. Additionally, the Static and Dynamic components of the VRS-SO were correlated with each other pre-treatment ( $r = .49, p < .001$ ), and post-treatment; ( $r = .43, p < .001$ ). These correlations are comparable with those reported by Olver et al. (2007).

### ***Predictive validity***

The area under the curve statistic (AUC) in receiver operating characteristic (ROC) analyses is the preferred method when assessing predictive accuracy of risk assessment tools. The AUC result can be interpreted as the probability that a randomly selected recidivist would have a higher score on a risk instrument than a randomly selected non-recidivist (Hanson, 1997). An AUC value of .50 represents a chance prediction, whereas an AUC of 1.0 represents a perfect positive prediction. Table 13 offers comparisons of AUC and Cohen's  $d$  (1969) alongside verbal descriptors, adapted from Rice and Harris (2005).

Table 13. AUC and Cohen's  $d$  effect size comparisons (adapted from Rice & Harris, 2005).

<b>AUC</b>	<b>Cohen's <math>d</math></b>	<b>Verbal descriptor</b>
0.556	0.200	Small
0.639	0.500	Moderate
0.714	0.800	Large

In one study (Olver et al., 2007) four different sets of predictive validity analyses were conducted.

First, correlation coefficients ( $r$ ) and ROC analyses to investigate the relationships of the predictors with sexual and non-sexual violent recidivism were reported. When compared with the Static 99 the VRS-SO static, dynamic and factor scores were all significantly correlated ( $p < .05$ ) with sexual recidivism and had significant AUC values confirmed by none of the 95% confidence intervals for the AUCs falling below .50. The three factors of the VRS-SO however indicated different relationships with sexual and non-sexual violence. All three factors correlated significantly with sexual recidivism (AUC values from .59 to .65). However, non-sexual violence was positively correlated with Criminality and negatively correlated with Sexual Deviance (AUC values from 0.35 for Sexual Deviance and .67 for Criminality). It is postulated by Olver and colleagues, that these opposing correlations may account for the weak correlations between the dynamic total score and non-sexual violence (AUC value pre .53 and post .55). The VRS-SO also significantly predicted sexual (AUC value .74) and non-sexual (AUC value .60) violent recidivism with a stronger prediction for sexual recidivism.

Second, the Cox Regression analyses are reported in incremental validity (see below).

Third, life tables survival analysis (Hanson & Thornton, 1999) involves measuring the relative cumulative sexual recidivism failure rates of four VRS-SO risk groups (low, moderate-low, moderate-high, high) over a 10 year follow-up. Olver et al., reported significant differences in failure rate observed among the four risk groups overall, ( $\chi^2(3) = 36.51, p < .001$ ), and in pairwise comparisons. The 'high' group failed at a higher and faster rate than did the 'moderate-high' ( $\chi^2(1) = 5.25, p < .05$ ); 'moderate-low' ( $\chi^2(1) = 25.06, p < .001$ ); and 'low' ( $\chi^2(1) = 18.87, p < .001$ ) groups.

The ‘moderate-high’ group had higher failure rates compared with the ‘moderate-low’ ( $\chi^2 (1) = 9.70, p < .01$ ); and ‘low’ ( $\chi^2 (1) = 10.24, p < .01$ ) groups. No significant difference was observed between the ‘moderate-low’ and ‘low’ groups, ( $\chi^2 (1) = 2.60, p < .107$ ).

Fourth, predictive validity was also evaluated through examining the relationships between risk groups derived from VRS-SO total scores with per cent sexual recidivism for each of the four groups. The percentages of offenders sexually recidivating<sup>8</sup> in each risk group were evaluated in a 3-, 5-, and 10-year follow-up window. All VRS-SO risk groups were found to be significantly associated with sexual recidivism at all follow-up windows:

3 years	$\chi^2 (3) = 33.85,$	$\varphi = .33,$	$p < .001;$
5 years	$\chi^2 (3) = 34.31,$	$\varphi = .34,$	$p < .001;$
10 years	$\chi^2 (3) = 36.31,$	$\varphi = .44,$	$p < .001.$

In Beggs and Grace’s (2010) study of 218 men convicted of a sexual offence against a child in New Zealand they reported similar findings to Olver et al. (2007). They noted AUC values of 0.70 static; 0.78 dynamic pre-treatment; 0.81 dynamic post-treatment; 0.79 total pre-treatment; and 0.80 total post-treatment.

Beggs and Grace (2010) also evaluated predictive validity of the VRS-SO with the Static-99 for sexual, violent, and general recidivism. The Static-99 and VRS-SO static scales were

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<sup>8</sup> defined as any conviction for a new sexual or non-sexual violent offence following first release to the community after programme participation. A sexual offence is any conviction for an offence that was clearly sexual in nature or was sexually motivated as determined by reviewing police reports. A non-sexual violent offence was an offence against a person that was not sexually motivated

significantly related to sexual recidivism, and the latter also predicted general recidivism, whereas correlations with violent recidivism were weaker for both measures. The Dynamic and Total scales of the VRS-SO significantly predicted sexual recidivism for both pre- and post-treatment scores, with correlations ranging from  $r = .38, p < .001$ , for pre-treatment Total to  $r = .42, p < .001$ , for post-treatment Dynamic. Similarly, all VRS-SO factor scores were significantly related to sexual recidivism both pre- and post-treatment, ranging from  $r = .27, p < .001$ , for pre-treatment Sexual Deviance to  $r = .36, p < .001$ , for post-treatment Sexual Deviance. Pre- and post-treatment VRS-SO Dynamic and Total scales were also significantly related to general recidivism (nonsexual and nonviolent), although correlations and AUC values were generally lower than those for sexual recidivism. Criminality factor scores were more strongly correlated with general recidivism than sexual ( $r = .38$  and  $.36$ , both  $ps < .001$ , respectively, for pre- and post-treatment), and also significantly predicted violent recidivism. In contrast, Sexual Deviance and Treatment Responsivity factor scores did not predict general or violent recidivism. The VRS-SO Dynamic and Total scales were significantly related to violent recidivism, but correlations were lower than for sexual recidivism, averaging  $r = .20$ . Overall, these results are generally comparable with those reported by Olver et al. (2007), although in their data VRS-SO static scores were a stronger predictor of sexual recidivism compared with Beggs & Grace's sample, whereas Dynamic, Factor and Total scores were somewhat weaker predictors.

Beggs and Grace (2010) also utilised the same categories as Olver et al. and found rates of sexual recidivism were significantly different across the risk categories,  $\chi^2(df = 3) = 37.32, p < .001$ , and the percentage reconvicted of a sexual offence increased monotonically with each risk category (low = 3.8%, moderate-low = 8.6%, moderate-high = 23.8%, high = 56.2%).



Utilising pairwise comparisons (generalized Wilcoxon,  $df = 1$ ) Beggs and Grace found the high-risk group had a significantly higher rate of recidivism compared to all other groups:  $c2 = 8.08, p < .01$ , with moderate-high;  $c2 = 29.37, p < .001$ , with moderate-low; and  $c2 = 45.60, p < .001$ , with the low-risk group. Additionally, the moderate-high group reoffended at a significantly higher rate than the moderate-low and low-risk groups,  $c2 = 5.12, p < .05$ , and  $c2 = 13.07, p < .001$ , respectively. Whilst these results support the use of the VRS-SO risk categories to discriminate according to the likelihood of reoffending, it is noted that the recidivism rates were somewhat lower in this study than that of Olver et al.'s (2007) at the 10-year follow up.

Olver, Beggs Christofferson, Grace and Wong (2014) reported 5 year follow-up rates of sexual and violent recidivism of 10.9% and 22.5% respectively. When reviewing specific groups they found significant lower rates of sexual and violent recidivism in the 'already ok' group compared with the 'improved' and 'unchanged' groups ( $ps < .001$ ) but not the 'recovered' group. Significantly lower rates of sexual and violent recidivism were found in the 'recovered' group relative to the 'improved' and 'unchanged' groups ( $p < .005 - P < .001$ ). No significant difference between the 'improved' group and 'unchanged' group on either sexual or violent recidivism was found.

Olver, Beggs Christofferson and Wong (2015) evaluated the clinical significant change (CSC) method with the VRS-SO, reporting promising predictive validity for some of the four CSC groups identified in their study. This was a large sample of 945 treated heterogeneous sexual offenders across three samples in Canada and New Zealand. Therefore individual

estimated rates of recidivism can be applied using the reliable change (RC) index values provided for each CSC group or pre-treatment or change scores.

### ***Incremental validity***

Incremental validity is whether a measure or factor increases the predictive ability beyond that provided by an existing assessment.

Olver et al (2007) found a higher correlation of the VRS-SO static items with the Static 99 than the dynamic items with the Static 99 suggesting little overlap between the dynamic items and the Static 99. Cox regression analyses examined incremental contributions of dynamic variables in predicting sexual recidivism over and above that made by static variables. Significant independent contributions were made by the VRS-SO static item total (Wald (1) = 22.64,  $p < .001$ ); and dynamic item total, (Wald (1) = 6.27,  $p < .012$ ). Independent contributions were also observed when these analyses were repeated for the Static 99, (Wald (1) = 7.76,  $p < .01$ ); and the dynamic items, (Wald (1) = 18.67,  $p < .001$ ). The results indicate that the total dynamic score made significant incremental contributions to predicting sexual recidivism over and above that of the Static 99. The dynamic items also showed incremental validity for sexual recidivism predictions beyond the VRS-SO static items.

Cox regression survival analysis after controlling for pre-treatment static risk using Static-99R (Helmus, Thornton, Hanson and Babchishin, 2012) scores, resulted in both pre-treatment and post-treatment dynamic scores significantly and uniquely predicting violent and general recidivism with medium accuracy of AUC values of .66 to .69 (Olver et al., 2014). Post-treatment dynamic scores also significantly and uniquely predicted sexual recidivism. It is

noted that the “AUC magnitudes were generally quite consistent for a given risk measure across all three outcomes, but the correlations increased in magnitude for higher base rate outcomes” (Olver et al., 2014).

Using the same method of analysis Beggs & Grace’s (2010) results using the Static-99 were the same. In a further study, Beggs and Grace (2011) found that only Sexual Deviance contributed to the predictive validity of the VRS-SO change score.

### ***Construct validity***

Construct validity is the assessment of the extent to which a test measures a theoretic construct (Groth-Marnat, 2003).

Canales, Olver and Wong (2009) explored the construct of sexual deviance in the VRS-SO of a group of 124 heterogeneous sexual offenders in a maximum security forensic psychiatric setting. Correlations ( $r = .26$  to  $.35$ ,  $p < .01$ ) between sexual deviance factor scores and phallometric PFE (per cent full erection) indexes support convergent validity of the VRS-SO at factor and individual item levels.

In a subset of their sample of 218 offenders, Beggs and Grace (2010) examined the relationship of identified risk-need domains to the VRS-SO. They reported correlations between the psychometric domains and the VRS-SO including positive correlations between the psychometric dimension of Sexual Interests and the VRS-SO’s Sexual Deviance factor ( $r = .32$ ), Pro-Offending Attitudes and the VRS-SO’s Treatment Responsivity factor ( $r = .34$ ), Anger/Hostility and the VRS-SO’s Criminality factor ( $r = .19$ ), and Overall Deviance and the

VRS-SO total dynamic score ( $r=.34$ ). Thus providing evidence for the construct validity of the psychometric domains and the VRS-SO's dynamic factors, although noting the low correlation coefficient for criminality factor.

In a second study, Beggs and Grace (2011) reported convergent validity for the VRS-SO when comparing three methods for assessing treatment change with a sample of adult male sexual offenders against children ( $n = 218$ ) who completed a prison-based cognitive-behavioural treatment programme between 1993 and 2000. They found significant correlations between change scores on the VRS-SO total Dynamic and Sexual Deviance factors and the psychometric battery ( $r = 0.23$  to  $0.69$ ). In addition, significant correlations between change scores on the VRSO-SO total Dynamic and all three factors and the Standard Goal Attaining Scale (SGAS: Hogue 1994) were reported. Therefore supporting the convergent validity of the different methods for assessing treatment outcome. However, this data were based on low risk offenders.

### **Normative Data**

A normative study by Wong and Gordon in 2006 was conducted based on 918 male federal offenders in Canada. They reported good internal consistency ( $\alpha = .93$ ) and interrater reliability ( $ICC = .92$  to  $.97$ ). It correlated highly with other assessments such as the Psychopathy Checklist-Revised (PCL-R)  $r = .83$ ,  $p < .001$ ; General Statistical Information for Recidivism (GSIR)  $r = -.63$ ,  $p < .001$ ; and the Level of Service Inventory-Revised (LSI-R)  $r = .82$ ,  $p < .001$ .

AUC values for violent and non-violent recidivism with 1, 2 and 3 year follow-up results were reported, with all  $ps < .001$ .

Follow-up period(years)	Violent recidivism	non-violent recidivism
1	.73	.71
2	.74	.71
3	.72	.71

An unpublished study (Stewart) reviewed a sample of female offenders and reported an AUC value  $> .80$  VRS-SO total scores.

## Conclusion

The VRS-SO demonstrates good reliability and validity. Specifically it demonstrates test-retest reliability of the pre- and post-treatment measures, although limited research has investigated the reliability of the stages of change within the VRS-SO. It also demonstrates acceptable internal consistency but is likely to be underestimated due to the split half reliability method employed. The VRS-SO also has highly significant IRR for dynamic scores and factor scores.

Much of the research has correlated the VRS-SO with the Static-99 risk assessment tool, which whilst has much reported validity and reliability, is by no means the only risk assessment tool used with sexual offenders in clinical practice. Limited research has evaluated the validity of the VRS-SO with other risk assessment tools, and is essential in developing the concurrent validity of the VRS-SO further. In addition to this, all reported data collected in the studies were based on file only information. The authors note that whilst

it is possible to complete the VRS-SO on file only information, it is best practice to conduct a file review and interview. Future studies should evaluate the reliability and validity of the VRS-SO based on file review and interview.

A greater focus has been on evaluating the predictive validity of the VRS-SO. Overall research indicates the VRS-SO dynamic and three factor scores significantly correlate with sexual, violent and general recidivism with moderate levels of magnitude.

In order to evaluate different risk groups of sex offenders attempts have been made to predict sexual recidivism, however assignment of risk groups has varied across studies (from low, medium, high to already ok, unchanged, recovered and so on) with varying results. Therefore making it difficult to compare findings and be meaningful in clinical practice. Further to this, using such labels to identify groups of sexual offenders in relation to risk may be misinterpreted. Therefore a clear systematic definition of functional groups would be beneficial.

The dynamic items of the VRS-SO appear to demonstrate incremental validity for sexual recidivism beyond the static items. Less analysis of the change scores has been conducted to date.

Much of the research reported has been conducted by various authors of the assessment tool, and therefore have an invested interest in the research findings. However, encouragingly some independent studies such as Beggs and Grace (2010, 2011) have been conducted which report consistent findings with the other research. Further independent research is essential to strengthen the reliability and validity of this assessment tool.

The VRS-SO is intended to be an assessment tool for those incarcerated in prison or mental health settings and has been validated on such a sample. However much of the research has

been conducted in Canada and New Zealand and would therefore benefit from cross validating the VRS-SO with other forensic settings, various types of sexual offenders, across various cultures and international studies in order to increase its generalizability.

This risk assessment tool is employed in the empirical research study as described in the previous chapter. It was chosen due to its development for and validation in mental health settings, in addition to the changes of stage to reflect dynamic change of risk.

## **Chapter 5**

### **Discussion**



## **Aim of Thesis**

The aim of the thesis was to explore the utility of PCSOT polygraph with sex offenders who have a mental disorder. Each chapter is described and the findings summarised below.

## **Summary of Findings**

The introductory chapter outlined polygraph as a tool, describing how it works and the possible theories underpinning the observed effect of polygraph. Many criticisms of polygraph have been made and are outlined in this chapter. It goes on to describe post-conviction sex offender testing (PCSOT) polygraph, specifically highlighting the different types of test and general findings.

In chapter 2, the literature review systematically examined the empirical studies available on the utility of post-conviction sex offender testing with male sex offenders. The review explores the outcome measures reported on PCSOT, identifying key findings relating to recidivism, risk, disclosures, polygraph outcome and views of polygraph. The review included studies of a high quality and identified a number of studies that have contributed to the evaluation of PCSOT specifically with regards to its effectiveness in the assessment, treatment and management of male sexual offenders. Despite the limitations noted above, this review suggests that polygraph enhances the assessment of sexual offenders by leading to increased disclosures (victims, offences and sexual risk behaviours) and that it can potentially be applied to both juvenile and adult sexual offenders (ethical issues aside).

Gannon, et al., (2014) reported low numbers of mental disorder in their study, therefore highlighting a possible difference in this group, but were unable to evaluate due to the small numbers. Given the prevalence of mental health difficulties in prison and community, the

need for further research to explore the utility of polygraph with this client group was highlighted. This issue was addressed by the empirical study described in chapter 3.

Chapter 4 examined the psychometric properties of the Violence Risk Scale: Sex Offender version on the basis of it being a sexual risk assessment tool constructed for the forensic population. This assessment was used in the empirical study in chapter 3. The risk assessment tool measures both static and dynamic risk factors, and with a 'stages of change' measure that is designed to identify relevant dynamic risk variables to target in treatment, evaluate possible change in dynamic risk following intervention and assess the risk of sexual recidivism. The validity and reliability of the measure is discussed and evaluated.

The critique suggested that the VRS-SO is a reliable and valid tool. It has test-retest reliability of the pre and post treatment measures, incremental validity and acceptable internal consistency. It also has highly significant inter-rater reliability for dynamic scores and factor scores. The VRS-SO is highly correlated with the Static-99 risk assessment tool which also has much reported validity and reliability.

A limitation of this assessment tool is a lack of research evaluating its validity with other risk assessment tools, which relates to concurrent validity. In addition, the data collected in the studies to evaluate the tool were based on file only and the authors suggest the tool is most effective when conducted with file review and interview. Much of the research of this tool has been conducted in New Zealand and Canada, with little in the UK.

Chapter 3 detailed an empirical study exploring the utility of PCSOT polygraph with mentally disorder sex offenders in a forensic setting. Using a mixed-method design with the aim of exploring the utility of polygraph in a high secure forensic setting to inform risk assessment and treatment of sex offenders. A further aim was to gain the views of polygraph from those offered the assessment. No other known study has evaluated the use of polygraph

with a group of mentally disorders sex offenders. In addition, this study used interviews to explore the understanding of polygraph and reasons for choosing or declining to take a polygraph.

The results revealed significant increases in reporting of high risk behaviours, paraphilic behaviours, number of victims, number of inappropriate sexual fantasies, frequency of masturbation to deviant fantasies and the use of pornography, all from file information to pre-test polygraph phase. In addition to this, 80% of the sample made admissions during the pre-test of the polygraph, and 48% went on to make post-test admissions.

There was no significant difference found for age or gender of victims reported from pre-polygraph to post polygraph, which previous studies had found (Heil et al, 2003), and could be due to low numbers and the recording of data in the polygraph test.

Whilst a greater proportion of participants were higher risk on the RM2000/S and VRS/SO, there was no correlation found between risk category and a DI/SR outcome. However a trend was observed, which is consistent with other studies such as Gannon et al. (2014) and Grubin (2010). Unlike Grubin's 2010 study where an increase in risk was observed as a result of information disclosed as part of the polygraph, this empirical study did not find a change in the risk categories from pre to post polygraph.

The thematic analysis revealed four themes and three to four sub-themes in each main theme. The themes related to risk (with sub-themes of anxiety, therapeutic relationship, risk reduction and timing), truthfulness (with sub-themes of challenges to honesty, enhances honesty and choice), impact (with sub-themes of outcome, pathway, disclosures and future participation) and knowledge (with sub-themes of experience, lack of knowledge and accuracy). The main difference between the polygraph and no-polygraph groups was a lack

of awareness of understanding of the potential impact of polygraph upon pathway and progress in treatment.

The study concluded that both the qualitative and quantitative findings indicate that the polygraph has utility in a high secure forensic setting, in enhancing disclosures and aiding the treatment and management of risk.

### **Practical and Theoretical Implications**

The current study contributes to the existing literature on the use of polygraph with sex offenders, adding to a steadily growing research base on the PCSOT. Uniquely, the empirical study in this thesis explored the use of polygraph with mentally disordered sex offenders as it was identified in the review as lacking. This study demonstrated the utility of polygraph with this population. Both the review and empirical study identified a number of positive outcomes from using the PCSOT relating both to risk assessment and management, although acknowledging the empirical study did not support the impact of polygraph on risk assessments applied in this study.

Disclosures made in the pre-test interview of this study, like other studies found (Gannon, et al.; 2014, Grubin, 2010), do not support the bogus pipeline effect, as additional (albeit small numbers) polygraphs still resulted in further admissions in subsequent polygraphs. If the bogus pipeline effect were correct, we might expect to see the opposite.

Hypotheses by researchers such as Hirschmann et al. (2014) have suggested that some subsets of offenders may perform differently on a polygraph, with different physiological responses. For example, those with high psychopathic traits are considered to have lower physiological arousal levels compared with a 'normal' population (Birbaumer et al., 2005).

However, overall studies have indicated that there is no difference between psychopaths and others on physiological measures. Importantly, these findings are dated and not conclusive. So further polygraph testing of psychopaths and other subgroups of offenders should be evaluated before drawing any firm conclusions.

In the empirical study of this thesis, increase in the reporting of sexual fantasy and masturbation is believed to be new information, therefore, not known to the individual's Clinical Team. It is possible that this information was known prior to the polygraph but not recorded, therefore to ensure accurate risk information it would be prudent to record such behaviour in future services when elicited.

Some research has suggested that therapists believe that therapy cannot be conducted adequately without polygraph (Abrams, 1981) and probation officers report similarly with respect to supervision in the community (Grubin, 2010). With this in mind, there is a concern or risk that those managing the sexual risk of an individual in their setting, may come to depend upon the polygraph. The risk is that this may be at the expense of clinical judgement and experience which may therefore be dismissed, discredited or disbelieved, and lead professionals to ultimately become de-skilled in assessing risk.

With regards to the therapeutic relationship, Vess (2011) noted the likely damage to this, is as a consequence of an inaccurate polygraph result. Contrary to this, the findings of the empirical study in this thesis, reported an individual highlighting a self- confessed inaccurate polygraph result, but did not feel this had impacted upon the therapeutic relationship. Like other assessments such as the Psychopathy Checklist Revised (PCL-R: Hare, 2003) or any assessment with a faking bad/good scale, the results may not be desirable for the examinee, however, this does not necessarily damage the therapeutic relationship. Qualitative findings in the empirical study suggest that the therapeutic relationship could indeed be enhanced by

the use of polygraph.

### **Strengths and Limitations of Thesis**

The most commonly cited limitation of polygraph studies identified in both the literature review and empirical research study, is the sample sizes. However, this can be difficult to achieve in clinical settings, particularly if conducting voluntary polygraph testing.

It was discovered during the literature review and from experience as a polygraph examiner that a wealth of unpublished data and studies exists such as by the Department of Defense Polygraph Institute (DoDPI) agency in US, where polygraph has been used consistently for many years, but is not accessible to the public. However, many of the researchers working in DoDPI publish in the Polygraph Journal. It is hoped therefore that key findings in polygraph are not 'hidden' from the public.

Many studies also reflected upon the high drop-out rates, which can introduce a bias in the studies and therefore limit the generalizability of said findings.

It is also noted in one of the studies of the literature review (Gannon et al., (2014) that there is an absence of any polygraph use with mentally disordered sex offenders, which this empirical study sought to rectify, and supported many previous findings using PCSOT.

### **Further Research**

A larger sample study is recommended to compare mental disorder diagnoses and the effects polygraph may have on them. It is anticipated that those with a personality disorder may have higher DI results due to the association of pathological lying being associated strongly with

some personality disorders such as Dissocial personality disorder. As noted previously, the use of polygraph with mentally ill patients, may reflect differences in reduced physiological responses due to medication, and potentially have an increased inconclusive polygraph rate. Much more research is required in this area.

The results of a polygraph if found deceptive, may impact upon therapeutic relationship and therefore treatment progress. This is hugely significant in mental health services where costs to detain and treat are high. There is also the obvious cost to the patients themselves in a secure service, where their liberty is restricted.

The use of polygraph testing is controversial, and it is not yet admissible as evidence in UK courts. However, the value of polygraph testing as a management tool has been clearly demonstrated within the literature, and the current study has shown that polygraph has potential utility in a mental health forensic population.

This thesis represents a starting point and that much more research is needed to determine the value and the differential impact of polygraph testing with different clinical populations.

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## Appendices

## Appendix A

### Papers excluded based on full text

No	Paper	Reason for exclusion
1	Balmer, A. S., & Sandland, R. (2012). Making monsters: The polygraph, the plethysmograph, and other practices for the performance of abnormal sexuality. <i>Journal of Law and Society</i> , 39(4), 593-615.	Review of theory. Not an empirical study
2	Branaman, T. F., & Gallagher, S. N. (2005). Polygraph testing in sex offender treatment: A review of limitations. <i>American Journal of Forensic Psychology</i> , 23(1), 45-64.	Review of limitations of polygraph. Not an empirical study.
3	Chang, S., & 이재석. (2007). The implications and limitations of polygraph examination on sex crimes. <i>Korean Criminal Psychology Review</i> , 3(2), 161-184.	Full text not available in English
4	Cook, R. D. (2011). Predicting recidivism of the convicted sexual offender using the polygraph and the static-99. ProQuest Information & Learning; US)	Thesis which was later published. Published paper is included in review.
5	Hagler, H. L. (1995). Polygraph as a measure of progress in the assessment, treatment, and surveillance of sex offenders. <i>Sexual Addiction &amp; Compulsivity</i> , 2(2), 98-111	Not an empirical study
6	Hindman, J., & Peters, J. M. (2001). Polygraph testing leads to better understanding adult and juvenile sex offenders. <i>Federal Probation</i> , 65(3), 8-15	Review of unpublished research studies by first author on the impact of polygraphy on adult and juvenile sex offenders self-reports of offences and their history of personal victimisation.
7	Konopasek, J. E. (2012). Micro-level social learning correlates of sex offender recidivism: Expeditious sexual history disclosure via polygraph testing. ProQuest Information & Learning; US).	Thesis. Core research is published in a journal which is included in the review.
8	Leszczynska, A. (2013). The utility of polygraph examinations in treatment and supervision of sex offenders. [Uzytecznosc badan poligraficznych w terapii i kontroli osob skazanych za przestepstwa przeciwko wolnosci seksualnej.] <i>Seksuologia Polska</i> , 11(2), 48-55.	Full text not available in English. Only abstract available in English. The abstract indicates review. Not an empirical study
9	Robilotta S.A., Mercado C.C., & DeGue, S. (2008). Application of the polygraph examination in the assessment and treatment of internet sex offenders. <i>Journal of Forensic Psychology Practice</i> , 8(4), 383-393.	Not an empirical study
10	Schlank, A. M., & Shaw, T. (1996). Treating sexual offenders who deny their guilt: A pilot study. <i>Sexual Abuse: Journal of Research and Treatment</i> , 8(1), 17-23.	Evaluation of denial intervention. Not an empirical study of polygraph
11	Van Nostrand, T. L. (2010). Measuring collaboration: An assessment of the containment model effort used to manage sex offenders in the community. ProQuest Information & Learning; US).	Thesis. Not an empirical study of polygraph specifically

12	박미량. (2016). Polygraph use for convicted sexual offenders on probation: An introduction of post-conviction sexual offender testing (PCSOT). <i>Korean Journal of Probation</i> , 16(1), 253-298.	Full text not available in English
13	조윤오, & 이미정. (2016). A study on the limitation and consideration of polygraph for post-conviction sex offenders. <i>Korean Association of Public Safety and Criminal Justice Review</i> , 25(4), 289-314.	Full text not available in English
14	Abrams, S. (1972) Validity of the polygraph. <i>Polygraph</i> , Volume 1 (2), 97.	Not an empirical study
15	Matzke, N. R. (1987). Polygraph and the treatment of sex offenders. <i>Polygraph</i> , Volume 16 (2), 126-128	Not an empirical study
16	Baranowski, G. H. (1998). Managing sex offenders in the community with the assistance of polygraph testing, <i>Polygraph</i> , Volume 27 (2), 75-88	Not an empirical study
17	Heil, P., Ahlmeyer, S., McCullar, B. & McKee, B. (2000). Integration of polygraph testing with sex offenders in the Colorado dept of corrections. <i>Polygraph</i> , Volume 29 (1), 26-35	Review of polygraph. Not an empirical study
18	McKay, B. (2000). The state of polygraph testing on sex offenders under community supervision in Texas. <i>Polygraph</i> , Volume 29 (1), 36-39	Review of the views of probation on polygraph. Not an empirical study
19	Lundell, R.G. (2000). Sex offender testing : still basic polygraph. <i>Polygraph</i> , Volume 29 (1), 40-43	Not an empirical study
20	Abrams, S. & Simmons, G. (2000). Post-conviction polygraph testing : Then and Now, <i>Polygraph</i> , Volume 29 (1), 63-68	Not an empirical study
21	Holden, E. J. (2000). Pre and post-conviction polygraph: building blocks for the future procedures, principles and practices. <i>Polygraph</i> , Volume 29 (1), 69-116	Not an empirical study
22	Handler, M., Nelson, R. & Blalock, B. (2008). A focussed polygraph technique for PCSOT and law enforcement screening programs, <i>Polygraph</i> , Volume 37 (2), 100-111	Not an empirical study
23	Handler, M., Nelson, R. & Blalock, B. (2009). A focussed polygraph technique for PCSOT and law enforcement screening programs. <i>Polygraph</i> , Volume 38 (1), 77-88	Not an empirical study
24	Grubin, D. (2016). Treatment of sex offenders: strengths and weaknesses in assessment and intervention polygraph testing of sex offenders. <i>Polygraph</i> , Volume 45 (2), 97-116	Not an empirical study

## Appendix B

### Quality Assessment Form for Quantitative Studies

Yes criteria fully met = 2

Partial criteria met = 1

No criteria is not met = 0

Unclear or insufficient information

Question	Score			U	Comments
	Y (2)	P (1)	N (0)		
<b>Screening Questions</b>					
Is there a clear hypothesis/ research question? (Is the reader aware of the nature of study?)					
Is the study addressing polygraph with convicted male sexual offenders?					
<b>Participants – representativeness of the sample/sampling bias</b>					
Was the sample representative of the defined population? (i.e. sexual offenders in the setting of the study. Was the sample biased in any way such as voluntary subjects?)					
Was the description of participant's background/demographic factors clear and comprehensive?					
Was a control/ comparison group included? (Y = control, P = comparison, N = no control or comparison group)					
Was the sample size large enough? (N=<50, P=50-100, Y=>100)					
Were drop-out rates included? (including stage of drop-out)					
Were the eligibility criteria for participants specified?					
<b>Intervention</b>					
Was the same polygraph test type used for all participants?					
Was the polygraph scored blind by another examiner? (include IRR results if reported) or the use of a polygraph scoring algorithm applied?					
Was the validity of the polygraph noted?					
Was the standardisation of the polygraph described? (pre-test, acquaintance, physiological measures, test, post-test)					
<b>Outcome Measures</b>					
Was the outcome measured in the same way for all participants?					



Were the results well reported? (e.g. effect size, significant vs non-significant results discussed?)					
Are the results of the study reliable? (are the design/ methods of the study sufficiently flawed to make the results unreliable? Can the results be generalised to other populations?)					
<b>Study Design</b>					
Was an appropriate method used to answer the question? (Design? Sample?)					
Was there any reference to time-frame (of assessing polygraph) considered in the analysis?					
Was the analysis robust? (multivariate vs, bi-variate vs inappropriate or unclear)					
Were confounding variables considered and accounted for adequately in the design (e.g. by matching) and / or analysis?					
Has the limitations of the study been discussed (e.g. use of self-report etc)					

**Quality Score:**        / 40

**No of Unclear:**

**Percentage Score:**        %

## Appendix C

### Quality Assessment Form for Qualitative Studies

Yes criteria fully met = 2

Partial criteria met = 1

No criteria is not met = 0

Unclear or insufficient information

Question	Score			U	Comments
	Y (2)	P (1)	N (0)		
<b>Screening Questions</b>					
1. Was there a clear statement of the aims of the research? (goal of research, why it is important, relevance etc)					
2. Is a qualitative methodology appropriate?					
<b>Appropriate Research Design</b>					
3. Was the research design appropriate to address the address the aims of the research? (is a rationale discussed for how they decided the method to use?)					
<b>Sampling</b>					
4. Was the recruitment strategy appropriate to the aims of the research? (have the selection of participants been described, have they explained why the participants selected were the most appropriate to provide access to the type of knowledge sought by the study, discussions around recruitment)					
<b>Data Collection</b>					
5. Were the data collected in a way that addressed the research issue? (was the setting justified; is it clear how the data were collected semi-structured interview or focus groups; methods chosen justified; is the method explicit; were the methods modified during the study and if so how and why?; is the form of data clear e.g. tape recordings, notes; has saturation of data been discussed?)					
<b>Reflexivity (research partnership relations/ recognition of research bias)</b>					
6. Has the relationship between researcher and participants been adequately considered? (Is the researchers own role examined for potential bias and influence during:					

formulation of research questions; data collection including sample recruitment and choice of location; how the researcher responded to events during the study and whether they considered the implications of any change in the research design)					
<b>Ethical Issues</b>					
7. Have ethical issues been taken into consideration? (are there sufficient details of how the research was explained to participants to assess whether ethical standards were maintained; did the researcher discuss issues raised by the study such as informed consent, confidentiality or how they handled the effects of the study on the participants during and after the study; if approval was sought from the ethics committee)					
<b>Data Analysis</b>					
8. Was the data analysis sufficiently rigorous? (is there an in-depth description of the analysis process; if thematic analysis used is it clear how the themes were derived from the data?; did the researcher explain how the data presented were selected from the original sample to demonstrate the analysis process?; is sufficient data presented to support the findings; is contradictory data taken into account?; is the researchers own role critically examined for potential bias and influence during analysis and selection of data for presentation?)					
<b>Findings</b>					
9. Is there a clear statement of findings? (are the findings explicit?; is there adequate discussion of the evidence both for and against arguments made?; has the credibility of their findings such as triangulation, respondent validation or more than one analyst been discussed?; are the findings discussed in relation to the original research questions?)					
<b>Value of the research</b>					
10. How valuable is the research? (is the contribution the study makes to existing knowledge or understanding discussed e.g. in relation to current practice or policy or relevant research-based literature; are new areas of research					

identified?; have they discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used)					
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**Quality Score:**        /        20

**No of Unclear:**

**Percentage Score:**        %

## Appendix D

### Quality Assessment scores for final papers reviewed

No	Paper	Quality Assessment
1	Abrams, S. & Ogard, E. (1986). Polygraph surveillance of probationers. <i>Polygraph</i> , volume 15 (3), 174-182.	43%
2	Ahlmeier, S., Heil, P., McKee, B., & English, K. (2000). The impact of polygraphy on admissions of victims and offenses in adult sexual offenders. <i>Sexual Abuse: Journal of Research and Treatment</i> , 12(2), 123-138.	80%
3	Bourke, M. L., Fragomeli, L., Detar, P. J., Sullivan, M. A., Meyle, E., & O'Riordan, M. (2015). The use of tactical polygraph with sex offenders. <i>Journal of Sexual Aggression</i> , 21(3), 354-367.	53%
4	Buschman, J., Wilcox, D., Krapohl, D., Oelrich, M., & Hackett, S. (2010). Cybersex offender risk assessment. an explorative study. <i>Journal of Sexual Aggression</i> , 16(2), 197-209	50%
5	Buschman, J., Bogaerts, S., Foulger, S., Wilcox, D., Sosnowski, D., & Cushman, B. (2010). Sexual history disclosure polygraph examinations with cybercrime offences: A first dutch explorative study. <i>International Journal of Offender Therapy &amp; Comparative Criminology</i> , 54(3), 395-411.	50%
6	Clark, M. W. (1997). Characteristics of juvenile sex offenders who admit versus those who deny their offenses. ProQuest Information & Learning; US).	63%
7	Cook, R., Barkley, W., & Anderson, P.B. (2014). The sexual history polygraph examination and its influences on recidivism. <i>Journal of social change</i> , 5, 1-10	78%
8	Emerick, R. L., & Dutton, W. A. (1993). The effect of polygraphy on the self report of adolescent sex offenders: Implications for risk assessment. <i>Annals of Sex Research</i> , 6(2), 83-103	53%
9	English, K., Jones, L., Pasini-Hill, D., Patrick, D., & Cooley-Towell, S. (2000). The value of polygraph testing in sex offender management. Denver, USA: Colorado Department of public Safety.	33%
10	English, K., Jones, L., Patrick, D., & Pasini-Hill, D. (2003). Sexual offender containment: Use of the post conviction polygraph. <i>Annals of the New York Academy of Sciences</i> , 989, 411-427.	40%
11	Gannon T.A., Wood J.L., Pina A., Tyler N., Barnoux M.F.L., & Vasquez, E. A. (2014). An evaluation of mandatory polygraph testing for sexual offenders in the united kingdom. <i>Sexual Abuse: Journal of Research and Treatment</i> , 26(2), 178-203	88%
12	Grubin D., Madsen L., Parsons S., Sosnowski D., & Warberg, B. (2004). A prospective study of the impact of polygraphy on high-risk behaviors in adult sex offenders. <i>Sexual Abuse: Journal of Research and Treatment</i> , 16(3), 209-222.	75%
13	Grubin D., & Madsen, L. (2006). Accuracy and utility of post-conviction polygraph testing of sex offenders. <i>British Journal of Psychiatry</i> , 188 (MAY) (pp 479-483)	60%
14	Grubin, D. (2010). A trial of voluntary polygraphy testing in 10 English probation areas. <i>Sexual Abuse-a Journal of Research and Treatment</i> , 22(3), 266-278.	75%

15	Grubin, D., Joyce, A., Holden, E. J., Janssen, D. F., Pfafflin, F., & Rehder, U. H. (2014). Polygraph testing of "low risk" offenders arrested for downloading indecent images of children. <i>Sexual Offender Treatment</i> , 9, 2-12.	48%
16	Harrison, J.S. & Eliot, R.S. (1999). Polygraphing the adolescent sex offender in the residential setting. <i>Polygraph</i> , Volume 28 (2), 176	18%
17	Harrison, J.S. & Kirkpatrick, B. (2000). Polygraph testing and behavioural change with sex offenders in an outpatient setting: an exploratory study. <i>Polygraph</i> , Volume 29 (1), 20-25	38%
18	Heil, P., Ahlmeyer, S., & Simons, D. (2003). Crossover sexual offenses. <i>Sexual Abuse: Journal of Research and Treatment</i> , 15(4), 221-236.	50%
19	Ho, D. K., Collins, N., Vinestock, M., & Das, M. (2013). Polygraph testing of sex offenders in a high secure hospital. <i>The Psychiatrist</i> , 37(4), 141-143.	33%
20	Jensen, T. M., Shafer, K., Roby, C. Y., & Roby, J. L. (2015). Sexual history disclosure polygraph outcomes: Do juvenile and adult sex offenders differ? <i>Journal of Interpersonal Violence</i> , 30(6), 928-944.	70%
21	Kokish, R., Levenson, J. S., & Blasingame, G. D. (2005). Post-conviction sex offender polygraph examination: Client-reported perceptions of utility and accuracy. <i>Sexual Abuse: Journal of Research and Treatment</i> , 17(2), 211-221.	33%
22	Konopasek, J. (2015). Expeditious disclosure of sexual history via polygraph testing: Treatment outcome and sex offense recidivism. <i>Journal of Offender Rehabilitation</i> , 54(3), 194-211.	53%
23	Konopasek, J. E. & Nelson, R. (2015). Sex history disclosure and sex offender recidivism. <i>Polygraph</i> , Volume 44 (2), 56-70	73%
24	Madsen L., Parsons S., & Grubin, D. (2004). A preliminary study of the contribution of periodic polygraph testing to the treatment and supervision of sex offenders. <i>Journal of Forensic Psychiatry and Psychology</i> , 15(4), 682-695.	60%
25	McGrath, R. J., Cumming, G. F., Hoke, S. E., & BonnMiller, M. O. (2007). Outcomes in a community sex offender treatment program: A comparison between polygraphed and matched non-polygraphed offenders. <i>Sexual Abuse: Journal of Research and Treatment</i> , 19(4), 381-393.	78%
26	O'Connell, M. A. (1998). Using polygraph testing to assess deviant sexual history of sex offenders. ProQuest Information & Learning; US).	70%
27	Renshaw, K. L. (1994). Child molesters: Do those molested as children report larger numbers of victims than those who deny childhood sexual abuse? <i>Journal of Addictions &amp; Offender Counseling</i> , 15(1), 24-32.	45%
28	Schenk, A. M., Cooper-Lehki, C., Keelan, C. M., & Fremouw, W. J. (2014). Underreporting of bestiality among juvenile sex offenders: Polygraph versus self-report. <i>Journal of Forensic Sciences</i> , 59(2), 540-542.	35%
29	Spruin, E., Wood, J. L., Gannon, T.A., & Tyler, N. (2017). Sexual offender's experiences of polygraph testing: a thematic study in three probation trusts. <i>Journal of sexual aggression</i> , Vol. 24, no. 1, 12-24	90%
30	Stovering, J., Nelson, W. M., & Hart, K. J. (2013). Timeline of victim disclosures by juvenile sex offenders. <i>Journal of Forensic Psychiatry &amp; Psychology</i> , 24(6), 728-739.	48%

31	Van Arsdale, A., Shaw, T., Miller, P., & Parent, M. C. (2012). Polygraph testing for Juveniles in treatment for sexual behaviour problems: an exploratory study. <i>Journal of Juvenile Justice</i> , 1, 2, 68-79.	45%
32	Wilcox, D. T., Foss, C. M., & Donathy, M. L. (2005). A case study of a male sex offender with zoosexual interests and behaviours. <i>Journal of Sexual Aggression</i> , 11(3), 305-317.	10%
33	Wilcox, D. T., & Sosnowski, D. E. (2005). Polygraph examination of british sexual offenders: A pilot study on sexual history disclosure testing. <i>Journal of Sexual Aggression</i> , 11(1), 3-23.	55%
34	Wilcox, D.T., Sosnowski, D.E., Warberg B. & Beech, A. R. Sex history disclosure using the polygraph in a sample of British sex offenders in treatment, 2005, 34, 3, 171-183	58%

Shaded papers are those that obtained 70% or greater on the quality assessment.

## Appendix E - Quality assessment of included quantitative studies

Study	Participants – representative ness of the sample	Validity/stand ardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph double scored or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study	Overall quality assessment score ( /40)
Ahlmeier, Heil, McKee, & English (2000)	Somewhat representative. Male sex offenders, ave age of inmates & parolees only, range unknown. Incarcerated offenders voluntarily participated. Paroled subjects were mandated to engage in sex offender treatment. Unclear if this was standard or for this study	Validity of polygraph is noted as 98%  All elements of Polygraph described clearly	No of victims No of offences Age at onset for sexual offending behaviours	Oct '95-Sept '98  Polygraph in 90 days after admission or paroled	Algorithm used	Bi-variate	No previous polygraph for Parolees when they were in the facility	Yes  Only victims & offences quantified by the offender used in data analysis, so poss underreporting High rates of DI Voluntary 'v' mandatory treatment participation Fear of revocation from parolees Prior sexual criminal history not specified	35



Study	Participants – representative ness of the sample	Validity/standardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Cook, Barkley & Anderson (2014)	<p>Largely Representative</p> <p>Convicted sex offenders - mandated to have a polygraph vs no polygraph , in the community of a rural area</p> <p>Females were excluded from analysis as Static 99 not normed for them</p>	<p>No validity</p> <p>Detailed description of 3 parts of test and physiological recordings</p>	<p>Sexual recidivism</p> <p>Non sexual violent recidivism</p>	<p>Sexual offenders supervised in the participating county from January 1999 to August 2005</p> <p>Polygraph taken at different time points but not specified</p>	No	Bi-variate	Levene's test to see if variances were equal	<p>Reasons for not being polygraphed = non- compliant with supervision &amp; not in treatment; in tx but not progressing to be ready for polygraph; overlooked and not had polygraph; avoided the polygraph</p> <p>NOT specifically identified</p>	31

Study	Participants – representative ness of the sample	Validity/standardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Gannon, Wood, Pina, Tyler, Barnoux, & Vasquez (2014)	<p>Somewhat representative</p> <p>Mostly male sexual offenders (inc 1 female in polygraph group and 3 females in comparison group). Included as female ‘n’ very small in a large sample Asked to volunteer in areas where polygraph mandated &amp; comparison area</p> <p>Mean ages provided only</p>	<p>Validity not noted</p> <p>Standard procedure of polygraph described in detail</p>	Clinically relevant disclosures (CRD) via offender managers and polygraph	<p>Data collection 1<sup>st</sup> April 2010- 21<sup>st</sup> December 2011</p> <p>Polygraph in 1<sup>st</sup> 3 months of release</p>	Quality assured by Behavioural measures (Dallas, US)	Bi-variate (ANOVA, ANCOVA)	<p>Matched comparison group on rural/urban composition, key demographics, risk and caseload statistics</p>	<p>Low numbers of adult &amp; child offenders or mental disorder</p> <p>Not random allocation</p> <p>Difficult to rule out effects of possible unidentified confounding variables (e.g. dynamic risk)</p> <p>Comparisons should have attended 6 mths interview to match polygraph sessions</p>	35

Study	Participants – representative ness of the sample	Validity/standardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Grubin (2010)	<p>Somewhat representative</p> <p>Mostly adult male sexual offenders (1 female) in community waiting for or in treatment</p> <p>Polygraph voluntary</p> <p>Age range from 19-90 years for polygraph gp and 18-81 years for comparison gp</p>	<p>Standard procedure of polygraph described in detail</p> <p>6 polygraph examiners</p> <p>Validity not noted</p>	<p>Risk</p> <p>Disclosures</p> <p>Treatment changes</p>	2 years between Sept 2003 & Sept 2005	No evidence	Chi Square Odds ratio	<p>Possibility of confounding variable being voluntary but not adjusted for</p>	<p>Some forms from probation completed months after test, so inaccurate</p> <p>INC rate of 32% 1<sup>st</sup> year but addressed in training and 15% year 2</p> <p>No information on those who refused testing</p> <p>Comparison offenders not matched (and comparison areas not direct match)</p> <p>Not randomised controlled study</p>	30

Study	Participants – representative ness of the sample	Validity/standardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Grubin, Madsen, Parsons, Sosnowski, & Warberg, (2004)	<p>Somewhat representative</p> <p>Adult male sexual offenders in the community</p> <p>Polygraph voluntary</p> <p>Mostly child sexual offenders</p> <p>Age range 22-67 years</p>	<p>Refers to validity but no values given</p> <p>Standard procedure for polygraph referred to but not described</p>	<p>Disclosures of high risk behaviours</p> <p>Time of disclosures</p> <p>Experience of polygraph</p>	<p>Interview then 1<sup>st</sup> polygraph after 3 mths</p> <p>2<sup>nd</sup> polygraph 3 mths later</p> <p>No reference to dates of data collection</p>	No evidence	Bi-variate	<p>No sig between 2 groups on age, victim no's &amp; victim characteristics or Static-99</p> <p>Same researcher interviewed at baseline, time 1 and time 2</p> <p>2 polygraph examiners APA accredited and PCSOT expertise</p>	<p>Allocation to groups varied in probation area, so not consistent or random</p> <p>Some men in polygraph unaware condition at time 2 may not have been truly unaware due to previous experience at time 1</p> <p>Considers false admissions to explain increase in disclosures</p> <p>Notes high drop-out rate</p>	30

Study	Participants – representative ness of the sample	Validity/standardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Jensen, Shafer, Roby & Roby (2015)	<p>Somewhat representative</p> <p>97% of large sample Male sexual offenders (Juvenile &amp; Adult)</p> <p>Mandatory Polygraph as part of sex offender treatment agency in Intermountain West Area.</p>	<p>Validity referred to but no values reported</p> <p>Only test phase of polygraph described</p>	<p>Polygraph outcome (pass, fail)</p> <p>Age</p>	Data collection from 2000-2012	No evidence	Logistic Regression	<p>Polygraph administered in 1<sup>st</sup> 4 weeks of treatment</p>	<p>Refer to validity &amp; reliability of polygraph</p> <p>Not generalizable</p> <p>Not random sampling</p> <p>Did not consider sex offence type</p>	28

Study	Participants – representative ness of the sample	Validity/stand ardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
Konopasek & Nelson (2015)	Representative  Convicted male sex offenders  Polygraph mandated by courts/probation	Validity of PCSOT reported as 0.850  Polygraph procedure not reported	Polygraph result Risk Age when NDI result achieved Sexual deviance Psychopathy Denial  Sexual recidivism	Evaluated for 5 years after treatment or discharge from supervision	No evidence	Bi-variate	Research assistants extracted data to ensure principal author blind to identity and alleviate possible bias	Sample type, size, project design- non-experimental, no control group, unknown generalizability , interaction effects not evaluated	29
McGrath, Cumming, Hoke & Bonn-Miller (2007)	Somewhat representative  Adult male sex offenders in the community  Control group had same treatment but no polygraph	Validity not noted  Standardisation of polygraph partially noted-set of questions and what it measures	Risk measures- Static-99 VASOR RRASOR  Recidivism-sexual, violent, other  Polygraph result (DI, NDI, INC)  Professional views of polygraph	1995- 2001 under community correctional supervision	No evidence	Chi square Paired sample t-test AUC	Examined variations in sex offending detection rates in counties participants resided so calculated a risk metric	Not randomly allocated to groups	31

Study	Participants – representative ness of the sample	Validity/stand ardisation of intervention	Outcome measures (standardised and reliable?)	Time frame for polygraph considered?	Was the Polygraph scored blind or an algorithm used?	Type of analysis used?	Confounding variables considered and adjusted for?	Limitations of study reported	Overall quality assessment score ( /40)
O'Connell (1998)	<p>Somewhat representative</p> <p>Adult males with allegations of sex offence but not necessarily all had a conviction for sex offence</p> <p>All received a polygraph as part of assessment in one specialised treatment centre</p>	<p>Referred to validity but no reporting of studies or statistics</p> <p>Described pre-polygraph interview, questions, summary</p>	<p>disclosures of sexually deviant behaviour was recorded at 3 separate points: on referral, after clinical interviews, after polygraph testing</p>	<p>Files of sex offender evaluations conducted between 1983 and 1996</p>	<p>No evidence</p>	<p>Multivariate</p>	<p>Assessment of sexual history was less structured in clinical interview than polygraph</p> <p>Evaluator conducting clinical interviews had great faith in efficacy of polygraph, so may not have pressed too hard for info in clinical interview</p> <p>Wanting to 'pass' the test may have led to overestimation of deviant sexual histories</p>	<p>Comparisons with other studies restricted due to different measures of sexual deviancy used</p> <p>Some evaluations paid for by public agencies, but most paid themselves which limits many of modest means</p> <p>Those not suitable for community treatment not included in study – so sample probably better</p>	<p>28</p>

								educated, higher incomes and less deviant than those who go to prison  3 confounding factors noted  Retrospective study	
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## Appendix F - Quality assessment of included qualitative studies

Study	Research design appropriate?	Recruitment strategy appropriate?	Data collected in a way that addressed the research issue?	Relationship between researcher + participants adequately considered?	Ethical issues taken into account?	Data analysis sufficiently rigorous?	Clear statement of findings?	How valuable is research?	Overall quality assessment score ( /20)
Spruin, Wood, Gannon, & Tyler (2017)	Used thematic analysis to identify, analyse & report patterns in qualitative data	Subjects not randomly allocated to groups but randomly selected for study  Research voluntary	SSI via telephone to obtain perceptions of supervision with polygraph & without polygraph  Setting was predetermined by MOJ  Method explicit  No modifications noted  Used induction approach to investigate overall views	Postgrad researchers trained in qualitative interviews to remove bias  Data analysed blindly by independent reviewer	Provided info sheet outlining aims of study & voluntary, could withdraw anytime (up to 2 mths after interview)  Consent form to read, sign, & return Confidential unless risk to self or others  Consent forms not numbered & stored securely  Debriefed after interview &	Data analysed blindly by independent reviewer  No previous involvement with authors  Coding without knowledge of hypotheses  Researchers in original pilot confirmed & validated themes  Used inductive approach	More than one analyst of the themes  4 themes each with sub-themes Describes numbers with similar findings  Explicit findings	Notes potential value of polygraph in motivating honest interactions between offender and offender manger  Enhances previous research, suggesting benefits of polygraph as truth facilitator & increase relevant disclosures  Supports previous	18

			<p>rather than specific questions</p> <p>Saturation of data not discussed</p>		<p>thanked, copy of debrief sheet sent to probation office</p> <p>All in accordance with BPS ethical guidelines</p>			<p>research- helps offenders abide to listen conditions</p>	
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## **Appendix G**

### **Data Extraction form**

The following information was extracted from each included study for inclusion in Table 1:

#### **Data Extraction Form**

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##### **General Information**

Date of Extraction:

Author(s):

Year:

Title:

Source:

Type of publication:

Country of origin:

---

##### **Study Characteristics**

Location of study:

Aims / objectives of study:

Study design:

Study type (quantitative or qualitative):

Inclusion/ exclusion criteria:

Recruitment of participants:

---

**Participant's characteristics**

Age range:

Ethnicity:

Class:

Nationality:

Offence type:

Diagnosis:

Other:

---

**Method**

Brief outline of study and data collection:

Quality Assessment Score:

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**Outcome measures**

What was measured at baseline?:

What was measured after polygraph?:

Were the polygraph results double scored?:

What was the outcome measure? (disclosures, recidivism, accuracy or utility):

Attrition:

Other information:

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**Analysis**

Statistical Analysis:

Confounding variable assessed?:

Results:

Any missing data:

Limitations:

Other information:

## **Appendix- H**

### **Study Information sheet & Study consent form**

## Information Sheet for Participation in Research Study

*(For patients)*

Name of Researcher: Nikki Collins

Date: April 2018

**Title of Project: The utility of polygraph in a secure Hospital.**

You are being invited to participate in a research study. Before you decide to take part, you need to understand why the research is being done and what it could involve for you. Please take time to read the following information carefully. If there is anything that you are not clear on or you would like further information, I will be happy to discuss any questions.

Please feel free to ask any questions you may have or if you would like more information. Take time to consider whether or not you wish to take part.

### **What is the purpose of the study?**

This study aims to look at the use of the polygraph within [Name] Hospital with patients who have a known history of sexual offending (either a conviction for a sexual offence or known sexual behaviour which may constitute a sexual offence). The research will look at the experiences of those undertaking a polygraph and reasons for taking such as assessment, or reasons for choosing not to for those that have declined.

(NOTE: This study is sponsored by the University of Birmingham, and will contribute to the researcher obtaining a Doctorate academic qualification).

**Why have I been chosen?**

You have been contacted to take part in the research as you have been identified as a patient who has either agreed to have a polygraph in the past, or has declined to take the polygraph.

**Do I have to take part?**

No. Your participation is entirely voluntary. Your care and treatment will not in any way be affected by deciding that you do not want to take part in this research.

If you do, you will be given a consent form to sign stating that you fully understand what taking part in this research involves.

**What does taking part in the research involve?**

If you do take part in the study you will be giving permission for the researcher to interview you. The interview will ask questions about your reasons for either choosing to take a polygraph or deciding not to take a polygraph. You will be interviewed once, and the interview will take approximately 60 minutes. If during the interview there are any questions that you do not want to answer, you can just tell the researcher this and this is absolutely fine. To ensure that what you tell the researcher is accurately captured, the interview will be audio-recorded using a Dictaphone and then transcribed (typed up by the interviewer). The researcher will then analyse the transcription of your interview to look for any themes. Quotes of some of what you have said may be used as examples to illustrate themes, however these quotes will be anonymised which means that you cannot be identified by them. All information discussed in the interview will be anonymous.

We would also like to access your patient files in order to collect information from reports about known sexual behaviours (e.g. offences) and demographic information which will be fully anonymised and presented as a whole group in the research findings.

**What happens to the information I give you?**

The information that you provide through the interview about your experience and reasons for either choosing to or not take a polygraph will be audio recorded and transcribed and quotes



may be used to illustrate themes. All information you give will be held strictly in accordance with the Data Protection Act (1998).

If you disclose information that puts either yourself or a third party at risk, there is a duty to disclose this information to your clinical team and/or the appropriate authorities.

### **Will my taking part in the study be kept confidential?**

Yes. All the information about your participation in this study will be kept confidential. The procedures for handling, processing, storage and destruction of data are compliant with the Data Protection Act 1998.

The only time that confidentiality may not be maintained is if you discuss any issues that indicate a specific risk to yourself or others. This can include risk of self-harm, violence or disclosures of abuse. If this occurs it is part of our duty of care to forward this information to your clinical team to ensure your safety and the safety of others.

The information we collect from you will not have your name or any other personal information that can identify you, it will include only a participation number to identify it. There will be a 'key' linking the participation number and patient name, but it will be stored and locked away separately from all other information that has the participant number on it, this way you cannot be identified from the information you share. If you have had a polygraph then your data will already be stored on an encrypted Trust Laptop and therefore stored securely. The research information collected will be stored for no longer than 10 years and after this time it will be securely destroyed. All of these procedures include the use of your case file information. No data is reported for individual participants so any descriptive information from case file will be reported with other participants to ensure your anonymity.

### **What are the benefits of me taking part in this study?**

You can contribute to the evaluation of the usefulness of the polygraph in secure settings, have an opportunity to speak about your experiences and provide suggestions for the future. A polygraph can potentially identify treatment needs and ensure the most appropriate treatment is offered. This could potentially reduce the length of stay in Hospital. Equally if you have chosen not to take a polygraph, this is very useful information to help evaluate and improve the polygraph service.

**Will I be paid to take part in this research?**

There is no payment for taking part in this research. No travel costs will be incurred as the researcher will visit you on your ward.

**What are the risks of me taking part in this study?**

You may be asked some questions that you do not wish to answer. However, you will not be obliged to answer these questions even if you give consent to take part.

**What if I decide to withdraw from the study?**

This is absolutely fine, you can choose to withdraw at any time. Your participation is voluntary. If you decide to withdraw from the study no further information will be collected from your medical file. If you withdraw after 3 weeks of interview any information collected until this point will be included in the study.

Any decision you make to withdraw, at any time, or a decision not to take part at all, will not affect your individual rights or the level of care you receive.

**What happens after I have taken part?**

All the findings will be collated and presented as a written report. You can request a summary of the findings and we can discuss any questions you may have. The study will be written up for academic purposes and possible publication in a journal. All identifiable information will be removed to ensure your participation remains anonymous and confidential.

**What if there is a problem?**

If you have a concern about any aspect of this study, you should ask to speak with the researcher who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the hospital nursing staff or you can contact PALS via letter to:

PALS, West London Mental Health NHS Trust, Trust Headquarters, St Bernard's Site, Uxbridge Road, Southall, UB1 3EU.

All complaints, verbal or written, will be acknowledged within a maximum of 3 working days to ensure your complaint is being looked into. If a delay occurs you will be informed and an

explanation given. Often a prompt explanation and an apology will be appropriate, but if you are not satisfied with this resolution further steps including mediation and an internal review and finally ombudsman review can be conducted.

**Contact Details:**

If you wish to contact me regarding the research please ask a member of nursing staff to contact Nikki Collins.

Alternatively you can contact Dr Sean Jennings at University of Birmingham, as the sponsor contact for this research. (Telephone [REDACTED])

Thank you for taking your time to read this, and consider taking part

Nikki Collins

Forensic Psychologist & Polygraph Examiner

## Patient Consent Form

**Study Title: The utility of polygraph in a secure Hospital**

*Thank you for considering taking part in this research. The person organising this research **must** explain the project to you before you agree to take part. If you have any questions arising from the information Sheet or explanation already given to you please ask the researcher before you decide whether to participate. You will be given a copy of this Consent Form to keep for your records.*

**Please initial**

1. I confirm I have read and understood the information sheet (version 4, 24.04.18) provided and have had the opportunity to ask any questions and that all my questions have been answered to my satisfaction. ☐
2. I understand that the researcher will write a brief entry in my notes to let the clinical team know I have taken part in the study ☐
3. I agree to being interviewed. I understand that the information I provide in the research interview will be anonymised, and kept confidential. ☐
4. I understand that my medical records will be accessed for the purposes of gathering data about sexual behaviours noted in my file and demographic information. This information will be handled in accordance with the terms of the Data Protection Act 1998. ☐
5. I understand that my data and medical records may be accessed by authorised sponsor representatives and representatives from the NHS Trusts research and development (R&D) office where relevant to ensure the proper conduct of the study. I give permission for my data to be accessed by these individuals ☐
6. I understand that I can withdraw my participation in the study without giving a reason, however if I withdraw 2 weeks after the interview any data collected from my participation to that point of time will remain in the study for analysis. ☐
7. I agree to take part in this research study. I have read the information sheet, or had it read to me, and I have been given a copy to keep. ☐
8. I would like to be sent information on the outcome of the study when it is over ☐

### **Participants Statement**

I ..... agree that the above named research study has been explained to me, and to my satisfaction, and I agree to take part. I have read this consent form and the Information Sheet about the project and understand what the research study involves.

Signed: .....

Date: .....

### **Researcher's Statement**

I ..... confirm that I have carefully explained the nature, demands and foreseeable risks (where applicable) of the proposed research to the participant

Signed: .....

Date: .....

You will be asked to sign three copies of this consent form: (1) One copy will be kept in the study file records in a secure cabinet, (2) a copy will be saved in your medical records on the hospital's IT system and (3) a copy for yourself to take away and keep.

## **Appendix I**

### **The utility of polygraph in managing sexual risk in a secure hospital**

#### **Semi structured Interview Questions**

##### **Polygraph Group**

#### **A What was your experience of the polygraph?**

The different parts: explanation of the process; the interview; the polygraph; the results

How did you feel agreeing and participating in the polygraph?

If you have undertaken more than one, how has your experience changed?

How did you feel about possibly disclosing information you had not previously shared?

How do you feel about it now? Is there anything that helped you disclose/ share new information?

#### **B What knowledge did you have about polygraph before the assessment?**

How did you gain this knowledge?

How informed do you think others (e.g. clinical team, nursing etc) are of the polygraph?

#### **C What were your reasons for taking a polygraph?**

What did you hope would happen in the polygraph? And after?

To what degree were your expectations met or not?

What concerns (if any) did you have about taking a polygraph?

#### **D Can you tell me about the outcome?**

How accurate do you feel the assessment was?

What was the response from others following your assessment?

What was the impact of the polygraph? (for example upon your treatment and pathway)

How would you feel about taking a polygraph in the future?

**E** What benefits (if any) are there to having a polygraph?

**F** What costs/risks are/have been associated with having a polygraph?

**G** Do you have any suggestions or improvements in the use of polygraph in the future?

**H** Any other comments you would like to make about polygraph?

**The utility of polygraph in managing sexual risk in a secure hospital**

**Semi structured Interview Questions**

**Non Polygraph Group**

- A**     What are your views of the polygraph?
- How much do you know about polygraph?
- Would you like to know more?
- What concerns do you have about polygraph?/ Do you have any concerns about polygraph?
- How informed do you think others are of polygraph? E.g. nursing staff, clinical team, patients etc
- How could any questions or concerns you have been addressed?
- B**     Can you describe your reasons for declining to have a polygraph?
- Is there anything that would have led you to consider taking a polygraph?
- C**     What impact if any did declining the polygraph have on you?/ Do you think declining the polygraph has impacted you in anyway?
- (views from staff, peers)
- D**     Can you describe any potential benefits/ risks for the polygraph?



## **Appendix J**

### **List of Paraphilic behaviour recorded in data collection**

<b>False Imprisonment</b>	<b>Choking</b>
<b>Hypersexuality</b>	<b>Stealing clothes for sexual purposes</b>
<b>Exhibitionism</b>	<b>Phone sex calls</b>
<b>Frottage</b>	<b>Cottaging</b>
<b>Paedophilia</b>	<b>Sexual contact with under 16 (female)</b>
<b>Masochism</b>	<b>Sexual contact with under 16 (male)</b>
<b>Sadism</b>	<b>Sexual play with children</b>
<b>Voyeurism</b>	<b>Setting fires for sexual reasons</b>
<b>Masturbation in public</b>	<b>Paid someone for sex</b>
<b>Hurt someone during sexual activity</b>	<b>Fetish</b>
<b>Stalking</b>	<b>Bondage</b>
<b>Taking images for sexual purposes</b>	<b>Use of weapon (during or to elicit sexual contact)</b>
<b>Urophilia</b>	<b>Use of substances (for sexual contact)</b>
<b>Coprophilia</b>	<b>Touching without permission</b>
<b>Cruising</b>	<b>Touching whilst asleep</b>
<b>Sex with animals</b>	
<b>Sex with dead people</b>	
<b>Visiting children areas</b>	
<b>Threesome</b>	
<b>Swingers clubs/ lap dance bars</b>	
<b>Auto-erotica</b>	
<b>Threats of sexual contact (includes use of force or intimidation)</b>	

## Appendix K

### Risk Matrix 2000/Sexual

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#### Step 1: Scoring Risk Factors

1. Age at commencement of risk (i.e. from date of release, or current date if release is not yet decided):

Age at Commencement of Risk	Points
18 -24	2
25 – 34	1
35 and above	0
Number of points	

2. Number of distinct court appearances where sentenced for a sexual offence including the index offence:

Sexual Sentencing Appearances	Points
1	0
2	1
3 or 4	2
5 or more	3
Number of points	

3. Number of distinct occasions sentenced for a criminal offence (including sexual offences) including the index offence:

Criminal Sentencing Appearances	Points
1 – 4	0
5 or above	1
Number of points	

<b>TOTAL POINTS STEP ONE</b>	
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Total Points Step One	Initial Risk Category
0	Low
1 or 2	Medium
3 or 4	High
5 or 6	Very High

Step 2: Aggravating Factors

1. Any male victim of a sexual offence?

Yes = 1      No = 0

2. Any stranger victim of a sexual offence?

Yes = 1      No = 0

3. Ever had stable live-in relationship lasting at least two years?

No = 1      Yes = 0

4. Any non-contact sexual offence?

Yes = 1      No = 0

**Increase by one risk group if two or three aggravating factors are present**  
**Increase by two risk groups if all four aggravating factors are present**

<b>FINAL RISK CATEGORY</b>	<b>LOW</b>	<b>MEDIUM</b>	<b>HIGH</b>	<b>VERY HIGH</b>
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## Appendix L

### Violence Risk Scale- Sexual Offender version (VRS-SO) Score Sheet

#### Static Factors

Risk Factor		Codes	Score	I or N
S1	Age at Time of Release	Under 25 years	3	
		25 to 34 years	2	
		35 to 44 years	1	
		45 years or older	0	
S2	Age at First Sexual Offense	Under 20 years	3	
		20 to 24 years	2	
		25 to 34 years	1	
		35 years or older	0	
S3	Sex Offender Type	Mixed (both adult and child victims)	3	
		Child molester (child victims only)	2	
		Rapist (adult victims only)	1	
		Incest (related victims predominantly)	0	
S4	Prior Sexual Offenses	4-4+ prior arrests/charges/convictions for a sexual offense	3	
		2-3 prior arrests/charges/convictions for a sexual offense	2	
		1 prior arrests/charge/conviction for a sexual offense	1	
		No prior arrests/charges/convictions for a sexual offense	0	
S5	Unrelated Victims	4 or more unrelated victims	3	
		2-3 unrelated victims	2	
		1 unrelated victim	1	
		No unrelated victims (related victims only)	0	
S6	Number and Gender of Victims	2 or more male victims & any number of female victims	3	
		2 or more female victims <i>or</i> 1 female and 1 male victim	2	
		1 male victim only	1	
		1 female victim only	0	
S7	Prior Sentencing Dates	11 or more prior sentencing occasions	3	
		5-10 prior sentencing occasions	2	
		2-4 prior sentencing occasions	1	
		0-1 prior sentencing occasions	0	
Total Static Factor Score		Before Treatment		
		After Treatment		

*If it is necessary to omit a Static or Dynamic Factor, the rater should indicate whether the omission is because there is insufficient information (I) or because the item is not applicable (N).*

**For Stage Of Change:**

P/C = Precontemplation/ Contemplation

P = Preparation

A = Action

**Use these symbols to indicate****the Stage of Change:****O** = Pre-treatment**X** = Post-treatment**# of Stages changed:**

no change = 0

1 stage = .5

2 stages = 1.0

**DYNAMIC FACTORS AND TOTAL SCORES**

	RATINGS										
	Pre-Tx (a)	F 1 †	F 2	F 3	Stage of Change ††	# of Stages changed x .5 (b)	Post- Tx (a-b) †††	F 1	F 2	F 3	I or N
<b>D1</b> Sexually Deviant Lifestyle	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D2</b> Sexual Compulsivity	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D3</b> Offence Planning	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D4</b> Criminal Personality	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D5</b> Cognitive Distortions	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D6</b> Interpersonal Aggression	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D7</b> Emotional Control	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D8</b> Insight	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D9</b> Substance Abuse	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D10</b> Community Support	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D11</b> Release to High Risk Situations	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D12</b> Sexual Offending Cycle	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D13</b> Impulsivity	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D14</b> Compliance with Community Superv.	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D15</b> Treatment Compliance	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D16</b> Deviant Sexual Preference	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>D17</b> Intimacy Deficits	0 1 2 3				P/C P A M	1.5 1 .5 0					
<b>Total Dynamic Factor Score →</b>	Pre-Tx:	Factors: 1 2 3			<b>Total Dynamic Factor Score →</b>	Post-Tx:	Factors: 1 2 3				
<b>Total Static Factor Score From Previous Page →</b>					<b>Total Static Factor Score From Previous Page →</b>						
<b>Total Static + Total Dynamic Factor Score →</b>					<b>Total Static + Total Dynamic Factor Score →</b>						

Indicate if Clinical Override was used: Yes ☐ No ☐

† To calculate scores for Factors 1 (Sexual Deviancy), 2 (Criminality), &amp; 3 (Treatment Responsivity): Place Pre-Tx score in the corresponding shaded box to the right

(Note: D7 is excluded). Tally each column (F1, F2, F3) and enter total score in appropriate box.

†† For treatment purposes, specify whether the client is in Precontemplation or Contemplation stage by circling (O) or marking (X) the 'P' or 'C' stage for pre- and post treatment, respectively.††† If there is a deterioration during treatment, 'b' score is added to 'a' score for the corresponding Dynamic Factor