

The Post-Conviction Polygraph in Forensic Practice

By Elizabeth Elliott

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Statement of authorship

This thesis is submitted to the University of Nottingham in part fulfilment of the Doctorate in Forensic Psychology. The idea for the thesis was the author's own, and reflects her interest in the application of the post-conviction polygraph to forensic settings. I hereby declare that:

- I am the sole author of this thesis
- I have fully acknowledged and referenced the ideas and work of others, whether published or unpublished, in my thesis
- I have prepared my thesis specifically for the degree of Doctor of Forensic Psychology, while under supervision at the University of Nottingham
- My thesis does not contain work extracted from a thesis, dissertation or research paper previously presented for another degree/diploma at this or any other university.

Abstract

The aim of this thesis is to examine the impact of polygraphy disclosure and recidivism (particularly for sex offenders), gain greater understanding of some of the psychological mechanisms involved, and, in the light of this, consider the value of its application in forensic settings.

Chapter one presents a general introduction to the topic. Chapter two presents a systematic review of the relevant literature. In particular, it explores the utility of post-conviction polygraph testing amongst sexual offenders, with a primary focus upon its influence in facilitating disclosure. The findings are generally supportive of the view that the polygraph is a useful technique for eliciting additional information from offenders, which, in turn, can assist in achieving a more accurate understanding of current risk and criminal history. It is noted, however, that there continues to be a paucity of high quality research evidence, in particular, a lack of adequately controlled studies. Further research is needed to gain more secure understandings of the polygraph's potential.

Chapter three offers a critique of the use of the post-conviction polygraph in the monitoring, assessment and supervision of convicted sex offenders. This notes a degree of partisanship in arguments for and against its use. The chapter seeks to offer an analysis of available evidence concerning the utility of the post-conviction polygraph in encouraging disclosures amongst sexual offenders under investigation in both custodial and non-custodial settings. Those who support the use of the polygraph typically argue that such disclosure provides fuller histories of deviant sexual behaviour, admissions of previously unknown offences/victims, and increased reporting of other high-risk behaviours. However, noting the concerns of those opposed to its use, the ongoing challenges and shortfalls of the polygraph are also referenced. In the light of the analysis, it is proposed that the method should not be used in isolation but, where appropriate, in conjunction with a range of other assessment tools before reaching a risk-related conclusion concerning sexual offenders.

The 'bogus pipeline to the truth' effect is an argument used to challenge the veracity of polygraph data, as its underlying premise is that the value of the polygraph in eliciting disclosure is not grounded in its accuracy, but,

rather, in false claims regarding its ability to detect deception (which, as a result, will often elicit more truthful responses from those being tested). In other words, disclosure can be derived from psychologically manipulating examinees by convincing them that the lie detector is significantly more accurate than it actually is.

In chapter four, an empirical research study explores the bogus pipeline effect upon disclosures made by students who were earlier exposed to cheating behaviour. Participants experienced within-group cheating by a study confederate and later placed in one of three conditions in which they were asked about the occurrence of cheating within their group. Two groups were attached to a bogus lie detector and informed that this was either 75% accurate or 100% accurate. Control participants were not attached to the lie detector, but simply asked if they had been present in a group that had cheated. Findings demonstrated that those participants attached to a bogus lie detector were more likely to disclose cheating within their group than those asked in the absence of the machine. However, there were no significant differences in rates of disclosure between the 75% and 100% condition. The influence of suggestibility, personality and

gender upon disclosure amongst all conditions revealed no effects confounding the relationship.

A single case study is presented in Chapter five. It details some of the ways by which the psychologist can encourage a client with paranoid schizophrenia, and a history of sex offending, to reflect openly upon his psychological and behavioural circumstances. Subsequently, it considers whether a measure such as the polygraph, designed to encourage honest accounts and attributions, could be of value in work with those clients whose thought processes are distorted by psychotic conditions.

In contextualising this issue, the chapter describes and evaluates the usefulness of a ten week psychosis awareness group programme for a sexual offender treated within a medium security hospital. The influence of this psychoeducation programme on levels of understanding, disclosure and personal acceptance of his mental illness is discussed, and recommendations for further psychological work are made. Subsequently, the association between psychotic symptoms and sexual offending is explored, as is the suitability of a future polygraph for this client.

In Chapter six a synoptic discussion of the work presented concludes the thesis. This addresses the current position on the bogus pipeline paradigm. Finally, the chapter seeks to provide an informed position concerning the use of the post-conviction polygraph in forensic settings.

Chapter One

Introduction

1.1. Overview of the Polygraph

One of the most difficult challenges for legal and healthcare professionals working with sexual offenders is to obtain an accurate picture of an offender's criminal history. Efforts are made to reach accurate judgements of risk, based on self-report and corroborative information. In addition, self-report measures also tend to depend on individuals possessing a level of insight and capacity for personal reflection, which may not always be easily achieved amongst offenders (Mathie & Wakeling, 2011). Clinicians have attempted to overcome this difficulty by conducting risk assessments based on collateral information which often lacks crucial specific information concerning an offender's insight into their risk behaviour (e.g. McGrath, Lasher & Cumming, 2012). In light of such challenges, the apparently objective polygraph has been proposed as a tool for work with this population. Such a tool potentially offers additional data that can help the professional arrive at a more complete and valid understanding of an offender's past and current level of risk. This can help to inform judgements about the most appropriate monitoring and supervision requirements for a client's management.

The polygraph (also referred to as a lie detector) is a tool, which measures levels of arousal in the peripheral nervous system. It is primarily used as a means to gauge truthfulness, and has been the primary technical method for 'objective' lie detection during the last century (Levenson, 2009). The polygraph measures certain physiological responses such as heart rate, breathing rate, blood pressure and skin resistance, changes in which are thought to indicate whether the subject is lying. Modern polygraph equipment consists of a laptop computer linked to devices, which simultaneously measure breathing rate, heart rate, blood pressure and galvanic skin response/perspiration (Ho et al., 2013)). Changes in these measures are charted over the course of the interview.

It is important to note, however, that the term 'lie detector' can be misleading in several respects. Firstly, the polygraph measures an examinee's arousal in response to specific questions, some of which may be threatening or difficult, and which lead to evasion or a lie. The underlying premise is that when individuals tell a lie,

they exhibit higher levels of physiological arousal in the automatic nervous system, as they fear the possibility of being exposed. The majority of polygraph tests with sex offenders involve comparison of physiological arousal following control questions for which the examinee is instructed to give a truthful response ("Is today (*the day of the week*)?") with responses to investigation-relevant questions which are arguably anxiety provoking due to their intrusive and occasionally sexual content ("Since community release, have you accessed indecent images of a child?") (Handler, Honts & Goodson, 2015). In attempts to move attention away from the polygraph as a 'lie detector', practitioners now commonly refer to it as a means of credibility assessment (Raskin et al., 2014).

1.2. The Post-Conviction Sex Offender Test

The testing of sex offenders, using a polygraph, in the context of treatment and supervision is often referred to as Post-Conviction Sex Offender Testing (Kokish, 2004). This thesis has a particular focus on polygraph testing within this context, which, despite considerable fluctuation in popularity, is currently attracting renewed interest because of the presence of an increasing amount

of research debating its utility in criminal cases (Han, 2016).

This type of polygraph testing is used with individuals who have known criminal convictions for sexual offences. The focus of the PCSOT is not upon the examination outcomes as such, but on facilitating disclosure from offenders. In practice, this means that when client deception is indicated during a test, better- informed treatment and management can be introduced in light of the disclosures given. In addition, when disclosures are seemingly not made despite a deception indicated outcome, this may point to a need for increased supervision.

Relevant disclosures can be obtained either prior to an upcoming polygraph, during, or following, the test. It will typically cover issues concerning victims, offence type, age of onset, and engagement in so-called high-risk behaviour. Advocates for PCSOT from both practice and research backgrounds (Grubin, 2010; Ho, et al., 2013; Konopasek & Nelson, 2015) argue the method can assist professionals with tasks such as victim identification, understanding the scope of an offender's behaviour, and

ascertaining their level of compliance (Budd, Burbrink, & Connor, 2016). Indeed, some advocates from research and practice also argue that the introduction of the polygraph can discourage reoffending (Grubin et al., 2004; Kokish, Levenson & Blasingame, 2005), whilst others dispute this view (Malooney, 2011; Meijer, 2008).

There are four primary types of polygraph examination that are used in treatment for sex offenders. In the initial stages of assessment and therapy, Sexual History Examinations explore an offender's sexually deviant history. The Monitoring polygraph focuses upon behaviour carried out by offenders during their periods of supervision and therapy. The third type is known as the Maintenance polygraph, which verifies treatment and supervision compliance on a periodic basis. The fourth type is the Specific Issue Test, which is used to explore specific offences and risk behaviours (Kokish, Levenson & Blasingame, 2005).

There are a number of arguments against the use of the polygraph, which will be discussed in depth throughout the relevant sections of this thesis. Such arguments

include the likelihood of false negative and false positive rates (Rosky, 2013), and the influence of participant countermeasures (see Maschke & Scalabrini, 2005). With regard to its application in forensic settings, critics often refer to the polygraph's compromised utility in work with psychopathic individuals, who are overrepresented amongst forensic cases (Vess, Murphy & Arkowitz, 2004). Some researchers argue that psychopathic individuals have decreased physical arousal when lying, and that an ability to deceive is an inherent characteristic of the disorder so such individuals will not be identified by polygraph methods (Book et al., 2006), whilst others dispute this claim (e.g. Patrick & Iacono, 1989).

One particular area of interest regarding the polygraph concerns the notion of the 'the bogus pipeline effect', which is studied in this thesis. This states that offenders produce more risk-relevant information during polygraph interviews, not because of the results produced by the technology itself, but, rather, because of a "bogus pipeline to the truth" effect. Because of this, it is argued, individuals are likely to disclose socially undesirable information about themselves (e.g. criminal activity) if they are attached to a device they believe can accurately

determine whether they are telling the truth. In effect, a polygraph would work as a technological placebo. Valuable research has been conducted in support of this theory, with regards to disclosing offence-supportive thoughts that are indicative of risk (Gannon, Keown, & Polaschek, 2007). This work is considered later in this thesis.

The popularity of the PCSOT in the United States has grown following its application within a 'containment approach to managing sex offenders' (English, Heil & Veeder, 2016), which encourages the use of PCSOT in collaboration with treatment and supervisory agents. This popularity may be linked to the perception that the US criminal justice system is in some senses more authoritarian, than for example, many European countries. The PCSOT is used to some extent in all US states, and thirty-five states regularly incorporate the PCSOT into the supervision of sex offenders in the community. With regard to treatment and supervision, McGrath, et al., (2007) reported that, for male adult sex offenders, over 50% of residential programmes, and just

fewer than 80% of community treatment programmes, employ the polygraph.

On the whole, the polygraph continues to be a much contested tool in the United Kingdom (UK). This reluctance is partially owed to a polygraph review by the British Psychological Society (BPS) in 2003, followed by a subsequent review that arrived at similar conclusions in 2004. These reports expressed apprehension about the utility of the polygraph in psychological settings, questioning the 'inherent ambiguity' behind the underpinning theory, and noting compromising factors such as the use of countermeasures, and the varying degree of skill that existed between examiners assessing clients. In 2007, the *UK Offender Management Act* mandated a time-limited period of mandatory polygraph trials across a few probation areas. These trials led to the approval of nationwide polygraph testing. Arrangements were imposed in August 2014 requiring high/very high risk adult male and female sentenced sexual offenders to undergo polygraph examinations, as part of their licence. These tests are funded by the National Offender Manager Service (NOMS), and are carried out by trained accredited

examiners. Offenders subject to the testing condition are within 8-16 weeks of release. For offenders whose tests yield a deceptive indicated outcome, a subsequent test will occur three months later. For those found to be truthful, tests will reoccur every 6 months. NOMS guidelines for polygraph testing specify the conditions under which administration of a test would not be appropriate, including being under the influence of drink or drugs, or running a fever/temperature as such factors may influence test results. In addition, offenders with diagnosed memory deficits, such as dementia, or serious mental illness (e.g. schizophrenia) have been deemed unsuitable for testing.

During tests, offenders are asked a number of direct, objective, closed-end questions relating to dynamic risk factors and/or aimed at enforcing licence conditions. Test results are then integrated into offender management and if imminent risk is highlighted, offender managers are expected take the appropriate level of action, such as informing the police if a previous victim is at risk, increasing supervision or instigating emergency recall. As the need for a more holistic assessment of offending

beyond detection and prosecution has become apparent, some research in the UK has explored the utility of the post-conviction polygraph, with trials conducted of mandatory polygraph testing within the UK National Probation Service (Gannon et al., 2014). Trial results indicate that overall, Probation staff found the polygraph a useful method of enhancing compliance and facilitating disclosure. However, extant research has certain limitations, such as the absence of certain subgroups of offenders (e.g. females, current inmates), and the perceived harm felt by some of the participants with regards to their sense of freedom and liberty (Gannon et al., 2014).

Courts in the United States have also been traditionally hostile to the admission of any evidence resulting from the administration a polygraph examination. Since *Frye v. United States* (the seminal polygraph case) most courts have argued that the absence of standardisation and the unreliability of the results meant the polygraph was inadmissible as evidence. However, the use of the polygraph by some major US federal organisations (e.g. Federal Bureau of Investigation (FBI), Homeland

Security, and Naval Criminal Investigative Service (NCIS), for screening and criminal investigations has encouraged a widespread perception that this is a method of truth detection that has been embraced by American law enforcement.

It is clear from the ongoing polygraph debate that there remains a need for more robust research investigating the theory behind the method, exploring variables associated with deception, and relating these to the physiological reactions that are observed during the polygraph examination.

1.3. Aims of the Current Thesis

The principal aim of this thesis is to investigate the utility of the post-conviction polygraph amongst sexual offenders. The thesis explores how and whether the polygraph could be a useful tool in the United Kingdom in the management and assessment of those who sexually offend. Shortfalls of current risk assessment tools in accurately predicting future risk will also be identified, and it will be noted that, like the polygraph, no current tool is infallible or flawless. Given that many professionals

remain apprehensive about welcoming the measure into practice, the question will be posed as to whether the weaknesses of the polygraph outweigh its benefits.

The current thesis comprises a systematic literature review of the existing available literature on the post-conviction polygraph and its influence on disclosure, an empirical research study investigating the bogus pipeline and its influence on disclosure of cheating behaviour, a critique of post-conviction polygraph methodology, and a single case study looking at the influence of group-based Psychosis Awareness Psycho-education and the appropriateness of a future polygraph for a convicted sex offender who is suffering from schizophrenia.

Chapter two takes the form of a systematic review of the post-conviction polygraph. The review begins with an introduction to the polygraph and its use in sex offender assessment. The literature investigating the relationship between the polygraph and its influence on disclosure and recidivism is then presented. The review proceeds to consider methodological limitations of current research, and the extent to which polygraphed clients are likely to

disclose offence- relevant information or reoffend. The review also further considers the content of disclosures, and how these can support professionals in the assessment of risk and victim protection.

A critique of the method behind the Post-Conviction Polygraph follows in Chapter three. The critique explores the general principles underpinning the polygraph. An evaluation of the tool is offered through a review of the empirical evidence on the validity of the polygraph with forensic populations. Consideration is given to the techniques strengths and limitations, and applicability to practice in clinical and forensic settings.

The empirical research study presented in Chapter four investigates the bogus pipeline effect amongst undergraduate students undertaking a staged deception-indicator test following exposure to group cheating behaviour. Rates of disclosure between the three conditions are reported, in addition to the influence of personality (as measured by the Big 5 traits) and levels of suggestibility on rates of disclosure.

A single case study is presented in Chapter five within the context of psychoeducation for psychosis in a group setting which included ten offenders within a NHS medium secure unit (MSU). The case study includes the formulation of, and the psychoeducational intervention of a young man with a history of paranoid schizophrenia detained in a MSU under section 47/49 of the Mental Health Act (2007). Reflections are made in response to case formulation, and a review of psychoeducational intervention with psychotic patients. Consideration will be given to techniques, which encourage patients to speak honestly and insightfully about their illness and offending. The exclusion from polygraph testing of clients with schizophrenia will be considered in relation to this case.

The thesis concludes in Chapter six with a discussion of the work presented, drawing together the main findings and considering implications for future research and practice.

Chapter Two

Systematic Review

2.1. Abstract

It is often difficult to ascertain the true extent and nature of deviant behaviour, as uncovering this often relies on self-reported or historic information. The polygraph has been proposed as a useful tool in the treatment and supervision of sex offenders. The current systematic review aims to provide a coherent, objective and recent synthesis of evaluation studies exploring the utility of the post-conviction polygraph (PCSOT) in the treatment and management of sexual offenders. Review outcomes included offence recidivism rates, rates of disclosure and self-reported utility. Nineteen studies were identified from the US, UK, and the Netherlands, with no randomised controlled trials of the measure identified. Overall, the review found that there was a significant increase in relevant disclosures associated with using the polygraph. The impact on reducing re-offending rates was significant for violent, but not sexual, offences. Methodological factors introduced the potential for bias in a significant number of studies included in this review.

2.2. Introduction: The extent and impact of sexual offending

The incidence of sexual offence convictions amongst males is estimated to be between 1-2% of the general population, although less than 2% of these cases result in a guilty verdict (Hohl, & Stanko, 2015). Such offences have a substantial negative impact at both a macro and micro level, with an emotionally devastating impact and substantial economic cost on victims and society more generally (McAlinden, 2008). In the UK, the number of convicted sex offenders in prison has reached record levels, with nearly a fifth of prisoners in England and Wales now serving time for a sexual offence (Howard & Barnett, 2015). The majority of these individuals will ultimately return to the community, and it is critical to public safety that their level of risk should be managed proportionately and effectively (Wilcox et al., 2013).

Official figures indicate that since the introduction of new court orders, such as the Suspended Sentence Order (SSO) in 2005 (under the Criminal Justice Act, 2003), there has been an increase in the number of offenders being supervised in the community, including those with sexual convictions. Although rates of re-offending are

inconsistent and tend to vary between samples and settings, a widely reported base-rate of sexual recidivism is 10% - 15% over a 5-6 year period (Hanson & Morton-Bourgon, 2005). These figures are likely to be an underestimate of true reoffending rates, due to factors such as underreporting and undetected offences (Meijer et al., 2008). Recidivism will also vary according to an offender's level of risk. For example, McGrath et al., (2007) found that the 3-year sexual recidivism rate for offenders in the low risk band was 1.2%, with 12.7% in the high-risk band (risk band allocations based on combined Static-99R and *Sex Offender Treatment Intervention and Progress Scale* [SOTIPS] scores).

2.3. The polygraph in sex offender assessment and management

There are a number of validated assessment tools used to assess and categorise the risks posed by convicted or suspected sexual offenders. Although these tools are useful in providing a standardised measure of risk, some appear preoccupied with the assessment of risk rather than its management (Beech et al., 2003). For those tools that categorise reoffending rates into discrete and separate categories, predictions of more 'serious'

reoffending have been found to be limited (Kemshall, 2003). It is proposed that the development of third and fourth generation risk assessment tools may be more powerful for considering 'what works' in interventions with offenders. This is because such tools are based on the recent accumulation of evidence used to inform case management and guide treatment supervision (Andrews, Bonta & Wormith, 2006).

The polygraph, a tool measuring physiological arousal responses to pre-defined questions (Greene & Heilbrum, 2014), has been advocated as a useful means of dealing with these shortfalls, as it can encourage offenders to reveal more information should evasion be identified (Owens et al., 2016). As a result, the polygraph test can potentially lead to the exposure of detailed and unknown information, which may trigger actions that improve an offender's risk management plan, and assist with more effective supervision and management. In addition, challenges to psychological treatment programmes, such as a lack of honesty, can reduce the benefit of such interventions (Jensen et al., 2015). The polygraph can help offenders overcome barriers to honesty, such as

denial, and feelings of guilt and shame, by encouraging disclosure earlier in the treatment process (Grubin et al., 2004).

The acceptance of the polygraph in sex offender management strategies differs between countries. In the United States, (for example), the polygraph has received wide acceptance for supervising and monitoring sexual offenders on parole or probation (English et al., 2000). In many US states, the polygraph is used to assess recidivism and adherence to community restrictions, with almost 80% of community treatment programmes using this method (McGrath et al., 2010). In the UK the polygraph has not been used as an investigative tool to assist in determining guilt or innocence (Gannon et al., 2011) and since 2014 the polygraph has been enforced as a mandatory licence condition for high risk adult sexual offenders. The polygraph is used in three main ways including with suspects, monitoring of sexual offenders and those coming off notification requirements. 6 police forces are currently using the polygraph: Hertfordshire, South Yorkshire, Essex, Kent, Northumberland and Manchester. These 6 forces currently utilise the polygraph amongst offenders who have already been convicted of

the crime, or with child indecent image internet offenders. However in addition, examiners have been trained in the London Metropolitan Police Service and this force in particular are looking at other applications for using the polygraph, for example in relation to terrorism offences, and further pilot testing of sex offenders pre-conviction.

Currently, the polygraph is given to offenders within 8 - 16 weeks post-release, with questions focusing on dynamic (changeable) risk factors and licence conditions. If, on the basis of these tests, an offender is found to be deceptive, further testing will occur on a more regular basis, and offender managers may increase levels of supervision and even recall the person to prison (Grubin, 2016). Currently, the polygraph is used in the UK in three ways; to monitor sexual offenders, for work with suspects, and when sexual offenders ask to come off their notification requirements. For example, courts can impose compliance with the polygraph as a condition of a Sexual Harm Prevention Order (SHPO) to improve the assessment of risk posed to the public. Several police forces are currently considering a trial to determine whether this should be extended, as it is currently only used in a small number of cases.

In the UK the polygraph cannot be used as part of criminal investigations, as Her Majesty's Court and Tribunal Service states that nothing aside from mandatory testing can be used in court as evidence. This restriction is the same as for any forensic risk assessment tool. However, the polygraph outcome report itself can be included in the 'unused material', as per any other intelligence information.

Currently, the situation remains unclear with regards to whether a defendant could seek to have a polygraph admitted as part of his or her defence. Another recent change regarding the use of the polygraph in forensic settings has occurred in 2017 under an initiative launched by Scotland Yard in 2017. This has involved counter-terrorism officers asking their informants to take lie detector examinations in a bid to improve the quality of intelligence. The introduction of the polygraph is, in part, a response to the said unreliability and poor quality of MI5 intelligence following an influx of terrorist attacks in the UK. The polygraph testing process is designed in this context to assist detectives in detecting misinformation

from informants whose integrity is questionable in light to their criminal associates and background.

Kent University is currently undertaking a National Research Project including 800 offenders, and introducing mandatory testing in the form of conditional cautions and Sexual Harm Prevention Orders (SHPOs). This will apply to Registered Sex Offenders (RSO's), Pre-conviction Internet Offenders (IIOC) released under investigation, and those RSO's who are due to have notification requirements removed (archived). The research project commenced in July 2017 and is due to be completed within 18-24 months. The study will compare disclosures (and police action taken in relation to these disclosures) between polygraphed and non-polygraphed controls.

In the absence of rigorous supportive research with certain subgroups, testing has been deemed unsuitable for use with offenders with various physical or psychological complexities (e.g. those with learning disabilities or an active psychotic disorder).

2.4. Post-conviction polygraph in monitoring sex offenders

The most common type of polygraph use in sex offender testing is the post-conviction polygraph examination (PCSOT; Kokish, 2004). The PCSOT measures reflect changes within the automatic nervous system in response to offence-relevant questions; these may indicate deceptive responding.

There are three types of PCSOTs; the specific issue denial test (SID, Grubin, 2008), the sexual history disclosure examination (SHDE; Wilcox et al., 2005) and the maintenance examination (Wilcox, 2000). The SID focuses specifically on an offender's alleged behaviour. The SHDE is a comprehensive psychosexual evaluation employed to reveal an offender's complete sexual history and obtain a more thorough understanding of their previously undisclosed sexual activities. The maintenance examination polygraph is periodically conducted in order to assess the offender's adherence to treatment and supervision restrictions (e.g. Community Rehabilitation Order and licence conditions). In seeking to decrease recidivism and obtain more accurate offence-relevant information, the PCSOT has been used in numerous

jurisdictions across the US, and is often implemented within a containment approach towards sex offender management.

The containment approach is holistic, as it utilises input from both supervisory and treatment services. It can be used with convicted sex offenders on probation, and with those who have recently been released into the community following a custodial sentence. Within the containment approach, the role of the polygraph examiner is deemed to be essential to the supervision of the offender, and the measure can provide verification of an offender's self-report when asked about their compliance to treatment and licence conditions (Heil, English & Veeder, 2016). Despite the tool's reported efficacy in facilitating disclosure and enhancing compliance, research exploring its utility is limited, critics are numerous, and high quality research is lacking (Rosky, 2012).

Given the potential magnitude of risk posed by offenders, it is essential that a rigorous monitoring process is in place, particularly for those operating in the community. Hanson and Wallace-Capretta (2000) recommended that

professionals should avoid relying on offenders' responses to post-treatment questionnaires, on the grounds that such questionnaires may not reflect true attitudes and behaviour. For this reason, amongst others, a PCSOT may be useful in evaluating to what extent an offender has been managing their dynamic risk factors and offending behaviour whilst subject to supervision.

2.5. Critique of the polygraph with sexual offenders

During the past decade there has been a resurgence in interest and an increase in studies exploring the utility of the polygraph in sex offender research, despite the topic remaining under-researched (Kraphol & Shaw, 2015). For proponents of the technique, the PCSOT contributes to the derivation of a more accurate and complete picture of an individual's offending, high-risk behaviours and sexual history, while also serving to enhance compliance with probation conditions (Holden, 2000). Proponents highlight three key benefits that result from the use of post-conviction polygraph testing. These are: an increase in self-reports of previous offences by offenders (DeLisi et al., 2016), a superior assessment of therapeutic engagement and progress following a sexual offence

conviction (Odum, Busby & Nelson, 2016), and a deterrent to reduce the likelihood of future offending (Marshall & Thomas, 2015).

Critics of the polygraph commonly focus upon the accuracy of the procedure itself and its underlying premise, claiming that it is difficult to determine the origins of physiological responses recorded by the polygraph (Ginton, 2015). Another common criticism is that the process itself is likely to elicit an emotional reaction, and therefore heightened arousal may be a consequence of the testing environment itself (Furedy 1996; Iacono, 2008). Being subjected to a polygraph assessment may lead the individual to feel anxious, and this may lead the tester to misclassify innocent individuals. False confessions may also result from 'false positive' outcomes (Rosky, 2013), whereby an innocent individual is accused of deceit and their susceptibility to suggestion results in them making a false confession (Gudjonsson et al., 2008). In response to such concerns, polygraph examiners usually attempt to control for individuals' anxiety levels by conducting a pre-polygraph interview that explores the offender's levels of anxiety related to the testing procedures prior to the official test

taking place (Grubin et al., 2014). The examiner may also formulate a number of control questions comprised of 'known' or 'probable' lies, which, while irrelevant to the focus of the polygraph examination, can assess the validity of the test through the observation of psychological changes to known lies (Bell, et al., 1999).

The debate continues with regards to the validity and reliability of polygraph techniques, including those undertaken in post-conviction settings. For example, the outcome of false positive (i.e., a guilty outcome for innocent individuals), and false negative, responses (i.e. a not-guilty outcome for guilty individuals) continues to be an issue raised by those challenging the validity of the tool in the court. However, for some, this argument is seen to be largely irrelevant, as the accuracy of the polygraph in distinguishing guilty from innocent individuals is not seen as the focus of the PCSOT. Whilst an error rate of 20% may be too high to warrant decisions regarding imprisonment, it is not too high to encourage changes in supervision, monitoring, treatment, or to signal a need for further investigation into potential transgressions. Alternatively, attention to the information

provided during the test can provide greater insight into risk and management considerations.

Whilst most critics recognise that the PCSOT increases disclosures (Rosky, 2013), it is argued that it potentially generates problematic information due to the poor scientific validity of the method (Cross & Saxe, 2001). For example, opponents of the polygraph contend that individual differences, such as body mannerisms of clients, the amount of examiner experience in testing special populations, the quality of examiner training, and various types of therapist/examiner partnership can all bias the polygraph results (Blackstone, 2008; Honts & Kircher, 1994). However, the majority of studies on any topic are biased by such variables should they not be adequately controlled (Almeyer, et al., 2000).

The issue of examinee 'countermeasures' has been a long-standing area of concern for those sceptical of the polygraph. Countermeasures are purposeful techniques used by the examinee to encourage a 'truthful' outcome from the polygraph test. The individual may be lying or being truthful when engaging in countermeasures. Innocent individuals may use countermeasures as an

additional 'safety tactic' to try and avoid any possibility of appearing to be offering a deceptive account. Repeated testing of the same individual may also threaten accuracy due to an examinee's habituation to the experience and increased opportunity to practise countermeasures (Honts, 2004).

Individual differences in responses during the PCSOT are another matter for potential concern. For example, psychopathic individuals may not have heightened physiological arousal when deceiving others, as they are less likely to feel anxiety to start with (Zuckerman & Driver, 1985). Therefore it may be that individuals with high levels of psychopathy are less susceptible to polygraph lie detection (Patrick, 2006). This is particularly relevant to forensic populations where psychopathic individuals are overrepresented (Shaffer et al., 2015). Studies have not yet considered the viability of use of the polygraph with specific populations, such as young children or those with active mental illnesses, as it is thought that tests with this population may also be compromised because of the nature of their idiosyncrasies (Blasingame, 1998). Mental illness is a common feature of

forensic populations (Fazel & Seewald, 2012) so this may result in a significant proportion of offenders being excluded from polygraph testing.

Ethical concerns have been expressed in relation to psychological treatment, as it is possible that the testing process may hinder the creation of a therapeutic alliance, and compromise subsequent treatment outcomes (Iacono, 2008). This invites the question of whether the use of the polygraph is sufficient to outweigh any potential barriers it may cause to treatment success and engagement.

Protection from self-incrimination during the polygraph is sometimes offered to offenders in an attempt to encourage disclosure. This presents another ethical and policy concern for decision-making in the field of criminal justice as individuals may not receive the 'punishment' they would otherwise receive. This highlights a paradox between delivering a programme of treatment routed in honesty, whilst simultaneously relying on a test that is based on detecting deception (Meijer et al., 2008).

A systematic review was needed to shed some light on the ongoing debate regarding the utility and efficacy of the PCSOT in forensic settings. The following review presents a coherent, critical and updated synthesis of all relevant studies identified. Its purpose was to explore the evidence, in light of ongoing criticisms, and offer an overall summary of key conclusions made in the existing academic literature. Systematic reviews are an integral part of scientific research, as they perform a number of different functions. This process has been described as '... the application of strategies that limit bias in the assembly, critical appraisal and synthesis of all relevant studies on a given topic' (Chalmers et al., 2002). Cooper and Hedges (1994) summarise the goals of a systematic review as, integrating and critically analysing past literature on a given topic, and identifying issues central to a field, such as queries relating to previous studies (e.g. methodological problems or problems in logic and conceptualization that have impeded progress within a topic area). There are a number of global organisations that conduct systematic reviews; the most relevant in terms of Forensic Psychology is the Campbell Collaboration (<https://campbellcollaboration.org/>). One

of the review groups within this organisation is dedicated to systematic reviews in the field of crime and justice.

The current review reported in this thesis aims to summarise the benefits and limitations of the existing evidence regarding the utility of the PCSOT in forensic settings, and to explore the hypothesis that the PCSOT significantly increases disclosures and reduces recidivism amongst sexual offenders. Employing a systematic review design also enables areas for future investigation to be highlighted, by identifying current gaps, and helps new hypotheses in polygraphy research to be generated. I have chosen to conduct a systematic review specifically, as the design minimises bias at each stage of the review and therefore increases confidence in the results. The key characteristics of systematic reviews include: a systematic search of the available research undertaken in accordance with a predefined search strategy, aiming to detect as much of the relevant literature as possible, quality appraisal of the included studies; and a synthesis (narrative with or without meta-analysis).

2.6. Design and Methods

I designed, conducted and reported a systematic review (SR) exploring the utility of PCSOT amongst sexual offenders following PRISMA (Preferred Reporting Items for Systematic Reviews) (Moher et al., 2009)) guidelines for structuring the review and evaluating study outcomes. This ensured, as far as possible, the robustness of the conduct of the review.

Searches for the relevant studies were conducted using a number of databases including Embase, Pubmed, PsycInfo, Medline, Cochrane library, and Web of Science. Searches were systematic and exhaustive and decisions on eligibility were made *a priori*, without looking at the results. Data extraction and quality appraisal of the studies were undertaken, again prior to looking at the results. Finally, a narrative synthesis was undertaken.

2.6.1. Eligibility

Completed studies evaluating the utility of the PCSOT amongst sexual offenders were considered. All studies had to include the administration of a polygraph, with questions focusing on sexual offending and related risk

factors. Polygraph studies in pre-conviction settings, without considerable evidence that the individual was guilty of the offence, were not considered for review, due to the different nature of some of the questions, and the higher likelihood that some individuals assessed in a pre-conviction setting were unlikely to be guilty of the allegations made against them.

Eligible studies could be either published or unpublished. There was no limit with regards to the date of appearance. Unpublished studies that were already accepted for publication were later coded as published studies. There were no restrictions to the country of origin or to reported language. Due to the relatively limited amount of research exploring the utility of the polygraph in a post-conviction setting, studies without a control group were also included for review, although reference to this methodological weakness was subsequently highlighted in the review.

2.6.2. The appropriateness of conducting a meta-analysis on this data-set

A meta-analysis was planned to be undertaken should the various study designs, statistical methods, methodological quality and outcomes have proven to be of sufficient homogeneity and quality. A meta-analysis focuses on the aggregation and comparison of the quantified findings of different research studies to summarise, integrate and interpret data (Smith & Glass, 1977).

Detailed assessment of the appropriateness of conducting a meta-analysis revealed that it would not be appropriate in this systematic review to combine study outcomes derived from a broad diversity of research designs. The current review includes both quasi-experimental and pre-post designs (of many variants) and also prospective, retrospective and longitudinal studies where the quantified outcomes are reported in a wide range of different statistical forms. For example, few of the included studies documented effect size, and these insufficiently reported the statistical data necessary for me to calculate an effect size (Lipsey and Wilson, 2001).

While some controlled clinical trials were of high quality, in the sense that they reported good baseline equivalence and quantified results sufficient to calculate an effect size (e.g. Gannon et al., 2014), other trials did not include sufficient statistical data for an effect size to be calculated (e.g. Buschman et al., 2009). Whilst all of the studies explored the relationship between the PCSOT and rate of disclosure or reoffending, an additional reason precluding a meta-analysis was because the designs of the studies are so different. In addition, heterogeneity in the quality of the included studies also resulted in a meta-analysis being inappropriate, as it would be difficult to construct a sensitivity analysis to account for the great deal of variance regarding the methodological quality of the included studies, where most of the pre- post-test studies would need to be excluded.

Table 2.1: Inclusion and exclusion criteria

Criterion Area	Inclusion Criteria	Exclusion Criteria
Topic	Must focus on the utility of the PCSOT in eliciting offence related disclosures or reducing recidivism amongst sexual offenders.	Any study not focused on the accuracy of the PCSOT generally or any other outcome associated with the test.
Study Design	Must be either a randomised controlled trial, controlled clinical trial, cohort analytic study, or a study employing Case-control or interrupted time series designs and single groups designs (with before and after measures) The review can include studies without a control group	Any design that is not a randomised controlled trial, controlled clinical trial, cohort analytic study, or a study employing case-control or interrupted time series designs. Single groups designs (with before and after measures)
Intervention	Must include the post-conviction polygraph, but can also include either a control or comparison measure	Any study that does not include a post-conviction polygraph
Outcome	Must include offence-relevant disclosures Rate of recidivism	Any study that does not include offence-relevant disclosure or offence recidivism as an outcome measure
Participants	Individuals charged with a sexual offence Adult and juvenile participants	Participants with no pending or previous charge for a sexual offence
Setting	Forensic setting	Any non-forensic setting

2.6.3. Methods: Information sources

The following databases were searched: Embase, Pubmed, PsycInfo, Medline, Cochrane library, and Web of Science. An internet search was also conducted to retrieve unpublished studies, reviews, and articles in progress. *Google* was the primary search engine used to reveal relevant unpublished materials. Specific sites and use links were accessed in an attempt to find sites that consider the post-conviction polygraph sexual offender management, monitoring and treatment. An additional focus was on institutional sites that promote correctional treatment (e.g. the Correctional Service of Canada, U.S. State Departments for Corrections, UK Home Office etc.), and sites that specifically deal with sexual offending (e.g. Centre for Sex Offender Management). Reference lists from all retrieved studies were examined for further studies.

2.6.4. Searching

Searches were performed between 2-21 November 2014 by EE, the author of the thesis. Agreement between the author (EE) and a co-reviewer (BV) who data extracted a sample was high. The following search terms were used: [(sex* or paraphil* or rape or rapist or molest* or exhibitionis* or

voyeur* or pedophil* or paedo* or incest* or fetish* or necrophil* or frotteur*) and (offen* or crim* or delinquen* or perpetrator* or prison*)] and (polygraph* or PCSOT*). For an example of the search strategy employed in one database, see Appendix 11. Including this strategy follows the gold standard in conducting a systematic review, as it enables the replication of search, if desired (see Higgins & Green (2011). *Cochrane Handbook for Systematic Reviews of Interventions*, Version 5.1.0 (see www.cochrane-handbook.org). Search strategies were developed from a few basic concepts; alternate spellings, to include, for example, American English and British English, were also considered. To reach a broader, more sensitive list of articles, words from titles or abstract, also called 'free text' or 'text word' were used.

2.6.5. Screening

Study titles and abstracts were screened electronically at the first stage according to the pre-specified inclusion and exclusion criteria. Following the screening process, those studies deemed eligible for inclusion were retrieved from the internet using *Google Scholar* or one of the academic databases accessible via the University of Nottingham online portal. In order to perform a suitably comprehensive search,

reference lists from relevant journals were also screened, and authors contacted when relevant studies were inaccessible or not yet published. The inclusion and exclusion criteria as outlined in detail in Table 2.1 were used for the screening. Initially, selection criteria were interpreted liberally, so that unless studies identified by the electronic and hand searches could be clearly excluded based on titles and abstracts, full copies were obtained. Full articles identified following the initial screening stage were then read in their entirety to confirm their suitability for inclusion. Those that were found *not* to meet the inclusion criteria were discarded from the review.

2.6.6. Data extraction

Studies were primarily coded by myself, although, to ensure a degree of reliability, one of my university supervisors (BV) reviewed a sample of my codings. On the whole, there was a significant degree of consistency between ratings, and any initial discrepancies were discussed in person and ultimately the rating decision was rationalised and agreed upon by both parties on the basis of critical analysis of the data included in the sampled studies. Although it was fully understood that such exercises are best served by two independent reviewers who each code all of the papers, this was an unfunded

doctoral study and there were insufficient resources to employ a Research Associate to undertake this highly time-consuming task. However, this is noted as a potential limitation of the study. A coding protocol was developed to record the important substantive and key quality and methodological features of each study (Tables 2.2; 2.3; 2.4) comprising: bibliographic details; number of included participants; setting i.e. prison or in the community; information regarding whether the participants were voluntarily recruited or mandated; and whether the outcome focused on recidivism rates or levels of disclosure; potential selection bias; study design; potential confounders; whether participants and/or researchers were blinded i.e. aware of the intervention status of participants; whether the data collection tools were valid and reliable; and rates of withdrawal and drop out throughout the study. The rates of disclosure were reported as percentages. Although selected studies focused on the PCSOT, some studies considered disclosure at different points in the polygraph process: e.g., on referral, after clinical interviews, and after polygraph testing.

Studies were quality appraised using the Quality Assessment Tool for Quantitative Studies (Effective Public Health Practice Project 2007; see Table 2.2) as advised in section 21.4 of the

Cochrane Handbook. The tool provides guidance on filtering each study against minimum criteria, involving the adequacy of reporting detail on the data sampling, collection and analysis, the technical rigour of the study elements indicating methodological soundness and the paradigmatic sufficiency, referring to researchers' responsiveness to data and theoretical consistency. This tool was chosen as an assessment option as it had been endorsed in the Cochrane Handbook (section 21.4) in light of its 'intervention integrity' and suitability for systematic reviews of effectiveness (Deeks, 2003).

Table 2.2: Quality assessment components and ratings for EPHPP instrument

COMPONENTS	STRONG	MODERATE	WEAK
Selection bias	Very likely to be representative of the target population and greater than 80% participation rate	Somewhat likely to be representative of the target population and 60–79% participation rate	All other responses or not stated
Design	RCT and CCT	Cohort analytic, case-control, cohort, or an interrupted time series	All other designs or design not stated
Confounders	Controlled for at least 80% of confounders	Controlled for 60–79% of confounders	Confounders not controlled for, or not stated
Blinding	Blinding of outcome assessor and study participants to intervention status and/or research question	Blinding of either outcome assessor or study participants	Outcome assessor and study participants are aware of intervention status and/or research question
Data collection methods	Tools are valid and reliable	Tools are valid but reliability not described	No evidence of validity or reliability
Withdrawals and dropouts	Follow-up rate of >80% of participants	Follow-up rate of 60–79% of participants	Follow-up rate of <60% of participants or withdrawals and dropouts not described

Following the data extraction and quality appraisal process, studies were then synthesised. The intention was to undertake, as a minimum, a thematically based narrative synthesis, and if appropriate, to also undertake a meta-analysis. As all of the studies were quantitative, the synthesis

was tabulated and focused on the characteristics and findings of the included studies. A meta-analysis was found not to be suitable for the current systematic review due to heterogeneity of: study designs; study quality; quantified outcomes (expressed in a diversity of statistical forms, Lipsey and Wilson, 2001) and participants. In addition, the quality of a significant number of the included studies was poor (Greenland, 1987; Torgerson, Hall & Light, 2003), which precluded the possibility of meaningful sensitivity analysis.

Table 2.3: Quality Appraisal and Methodological Considerations

Study	Selection bias	Design	Confounders	Blinding	Data collection methods	Withdrawal and drop-outs	Overall rating
Ahlmeyer, Heil, McKee, and English (2000)	MODERATE	MODERATE	WEAK	MODERATE	STRONG	STRONG	MODERATE
Bourke et al. (2014)	WEAK	WEAK	WEAK	MODERATE	STRONG	STRONG	WEAK
Buschman et al. (2009)	MODERATE	WEAK	WEAK	WEAK	STRONG	MODERATE	WEAK
Cook, Barkley, and Anderson (2014)	STRONG	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
English, Jones, Pasini-Hill, Patrick, and Cooley-Towell (2000)	STRONG	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
English, Jones, Patrick, and Pasini-Hill (2003)	STRONG	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
Gannon, Wood, Pina, Tyler, Barnoux, and Vasquez (2013)	STRONG	MODERATE	STRONG	WEAK	STRONG	STRONG	MODERATE
Grubin et al. (2004)	WEAK	WEAK	WEAK	MODERATE	STRONG	STRONG	WEAK
Grubin (2010)	WEAK	MODERATE	STRONG	NS	STRONG	MODERATE	MODERATE
Grubin and Madsen (2006)	MODERATE	WEAK	WEAK	WEAK	STRONG	STRONG	WEAK
Grubin et al. (2014)	MODERATE	MODERATE	WEAK	WEAK	STRONG	STRONG	WEAK
Heil, Ahlmeyer, and Simons (2003)	STRONG	WEAK	MODERATE	MODERATE	STRONG	STRONG	MODERATE

Kokish, Levenson, and Blasingame (2005)	WEAK	WEAK	WEAK	WEAK	STRONG	STRONG	WEAK
McGrath, Cumming, Hoke, and Bonn-Miller (2007)	STRONG	MODERATE	STRONG	MODERATE	STRONG	MODERATE	STRONG
Schenk, Cooper-Lehki, Keelan, and Fremouw (2014)	MODERATE	WEAK?	WEAK	WEAK	STRONG	STRONG	WEAK
Stovering, Nelson and Hart (2013)	MODERATE	WEAK	WEAK	WEAK	STRONG	STRONG	WEAK
Van Arsdale, Shaw, Miller, and Parent (2012)	STRONG	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK

Table 2.4: Key Characteristics of the Included Studies

Study Identification	Participants; number	Setting	Participants; voluntary or mandated	Outcomes; *disclosure/ and or recidivism as reported by authors
Ahlmeyer, Heil, McKee, and English (2000) United States	60	Community parolees Prison	Inmates voluntary Parolees mandated	*There was an increase in offence-related disclosures amongst inmates after the 1st polygraph (particularly if the test resulted in a deceptive outcome; DI). For number of victims (χ^2 (3, $n = 35$) = 91.98, $p < .01$) and the number of offences disclosed (χ^2 (3, $n = 35$) = 94.57, $p < .01$). Only 5% of DI inmates made no disclosures compared to 21% of parolees
Bourke et al. (2014) United States	127	Community	Voluntary	*Following the polygraph, 57% of total sample admitted contact sexual offence against a minor In all, 52.8% of these admissions were during the polygraph, 20.5% during pre-test interview, and 32.3% during post-test Pre-test yielded an additional 102 victims by 29 offender and post-test an additional 170 victims disclosed by 54 suspects Ten participants admitted to actively abusing a child post-polygraph 34% of those who disclosed contact offences also identified the victim by name
Buschman et al. (2009) Netherlands	25	Community	Voluntary	*The polygraph revealed a decrease in the mean age that offenders started to view IIOC from 41 to 18 years After the polygraph, all offenders admitted grooming children and engaging in contact sexual offences against minors

				<p>After the polygraph, offenders disclosed an interest in more extreme IIOC (COPINE scale categories 1-10)</p> <p>There was an increase in the number of individuals disclosing crossover between victims: boys and girls, gender combinations in IIOC, and IIOC featuring adults</p> <p>The polygraph revealed an increase in disclosures of offender interest pre-pubescent children</p> <p>Fifteen offenders disclosed engaging in high-risk behaviors following a polygraph</p> <p>There was no change in the reported preferred age for child in the IIOC following the polygraph</p>
<p>Cook, Barkley, and Anderson (2014)</p> <p>United States</p>	166	Community	Mandated	<p>Recidivism: Individuals having a polygraph were significantly less likely to reoffend (violently and sexually combined; ($\chi^2(1, N = 166) = 7.54, p = .006$)) or violently than those without a polygraph ($\chi^2(1, N = 166) = 5.769, p = .016$.)</p> <p>There were no significant differences in rates of sexual recidivism between those who had a polygraph and those who did not</p>
<p>English, Jones, Pasini-Hill, Patrick, and Cooley-Towell (2000)</p> <p>United States</p>	232	Community	Voluntary	<p>*Increase in number of disclosures of high-risk behaviors (e.g., deviant fantasies, use of child IIOC) after the polygraph. The number of victims and offences increased from 3% to 35%</p>
<p>English, Jones, Patrick, and Pasini-Hill (2003)</p> <p>United States</p>	180	Community	Mandated	<p>*Disclosure of assault against male victims (sexual) increased from 20% to 36% after exposure to combined treatment and polygraph</p> <p>Disclosure or crossover offences increased from 10%</p>

				<p>to 29% (both victim genders); from 10% to 33% (adult and children) following the polygraph/treatment</p> <p>Increased reporting of incestuous offences from 38% to 58% following the polygraph</p> <p>Increased report of deviant behavior in all offending categories (particularly bestiality that saw a nine-fold increase from 4.4% known to engage in bestiality to 36.1%) following the polygraph</p>
<p>Gannon, Wood, Pina, Tyler, Barnoux, and Vasquez (2013)</p> <p>United States</p>	658	Community	Voluntary	<p>*A higher proportion of polygraphed offenders made at least one disclosure than those in the comparison group (76.5% vs. 51.2% respectively) $\chi^2 (1, N = 635) = 44.41, p < .001.$</p> <p>There were no differences between polygraphed and non-polygraphed offenders regarding the seriousness of disclosures ($\chi^2 (3, N = 892) = 7.48, p = .06.$)</p> <p>The total number of disclosures was three times greater for those in the polygraph condition (2.60 vs. 1.25 respectively)</p>
<p>Grubin (2010)</p> <p>United Kingdom</p>	342	Community	Voluntary	<p>*Reported number of disclosures were 14 times greater among polygraphed offenders ($\chi^2 = 114.65 (df=1), p<.0001.$)</p> <p>No significant differences between polygraphed and non-polygraphed offenders regarding risk severity of disclosures made.</p>
<p>Grubin and Madsen (2006)</p> <p>United States</p>	114	Community	Voluntary	<p>*Overall perceived accuracy of the polygraph was 85%</p> <p>44% of offenders said the polygraph made them more honest with probation officer and treatment provider</p> <p>34% of offenders said the polygraph made them more honest with family and friends</p> <p>56% said the polygraph was moderately helpful in</p>

				<p>helping them avoid reoffending</p> <p>68% said the polygraph was moderately helpful in helping them avoid engagement with risky behaviors</p> <p>44% said receiving a polygraph in the future would increase the likelihood of disclosing to the police</p> <p>Those who had had polygraph disclosed that they were significantly less likely (at $p = .04$) to go to places to view children than those who were awaiting their first test</p>
Grubin et al. (2014) United Kingdom	31	Community	Voluntary	<p>*35% of participants made new disclosures following a DI outcome on the polygraph examination</p> <p>"Low risk" judgments made before the polygraph were confirmed to be placed in the correct risk category in only 26% of participants following the polygraph</p> <p>Offenders risk level was modified upward for 74% of individuals completing the polygraph</p>
Grubin et al. (2004) United Kingdom	34	Community	Voluntary	<p>*No significant differences were found between polygraph-aware and polygraph-unaware participants regarding the avoidance of high-risk behaviour</p> <p>At the first polygraph 97% disclosed on average 2.45 high-risk behaviours previously unknown during or following the polygraph</p> <p>At the second polygraph 71% disclosed an average of 1.57 high-risk behaviours</p> <p>Significantly fewer individuals failed the second polygraph test ($\chi^2=12.82$, $p<.001$.)</p> <p>In an offender feedback questionnaire 57% of offenders reported that knowledge of impending</p>

				<p>polygraph decreased their engagement in risky offence-relevant behaviors</p> <p>52% reported that the polygraph encouraged them to disclose more to their probation officer</p>
<p>Heil, Ahlmeyer, and Simons (2003)</p> <p>United States</p>	489	Community	Voluntary	<p>*Amongst inmates there was an increase in number of victims, number of offences, and offence category disclosures following the administration of the polygraph during treatment</p> <p>Amongst parolees the number of victims, offences, and offences category disclosures increased following the polygraph during treatment, but the increase was less dramatic than amongst inmates. There were more admissions of offences from numerous offence categories, against both children and adults, male and female victims, strangers and non-strangers, incestuous/non-incestuous as a result of the polygraph</p> <p>The most dramatic increase was the number of disclosure of child and adult victim crossover</p>
<p>Kokish, Levenson, and Blasingame (2005)</p> <p>United States</p>	95	Community	Voluntary	<p>*19% of respondents stated the polygraph resulted in a false positive outcome</p> <p>6% stated the polygraph resulted in false negative outcomes</p> <p>72% of participants stated the polygraph made them disclose more and become more honest with others and themselves</p>
<p>McGrath, Cumming, Hoke, and Bonn-Miller (2007)</p> <p>United States</p>	208	Community	Mandated	<p>Recidivism: The number of individuals charged with a new non-sexual violent offence was significantly lower for those who received a polygraph (2.9% vs. 11.5%) $\chi^2=5.82, p<0.05.$)</p> <p>There was no significant difference between groups regarding the number of individuals charged with</p>

				sexual offence.
McGrath et al. (2007) United States	76	Community	Voluntary	<p>*There were increases in disclosure of child victims and assaults following the polygraph examinations.</p> <p>There was an increase in disclosures regarding use of force during the offence, having male and female victims, and multiple victim relationships following the polygraph.</p> <p>The mean number of sexual offences increased from 27 noted in the file to 77 offences following the polygraph.</p>
O'Connell (1997) United States	127	Community	Mandated	<p>*A significantly greater number of reported incidents of deviancy (for all categories) were disclosed following the polygraph (Wilk's Lambda=.895, $F(2, 125)=7.316$, $p<.001$.)</p> <p>There was an increase in the number of disclosures of crossover offending across different areas of sexual deviancy (e.g., extra familial/interfamilial) ($t(126)=15.41$, $p<.000$.)</p>
Schenk, Cooper-Lehki, Keelan, and Fremouw (2014) United States	32	Secure treatment facility	Voluntary	<p>*A higher proportion of offenders disclosed acts of bestiality in the polygraph condition than on the self-report measure (81.25% vs 37.5% respectively)</p>
Stovering, Nelson and Hart (2013) United States	74	Community-residential non secure	Mandated	<p>*Juvenile sex offenders further disclosed, on average 2.39 additional victims, after being adjudicated to a residential treatment program.</p> <p>Additional victim reports occurred between the period of entering treatment program and undertaking a polygraph test (Time 1 a total of 87 victims were reported by all participants).</p> <p>The significant majority of disclosures were made once</p>

				<p>participants were aware of the upcoming polygraph (Time 2 a total of 57 victims were reported) $t(73) = 5.89, p = .001$</p> <p>Fewer victims were reported during the polygraph test itself (Time 3 when only one additional victim was reported) and following the polygraph (Time 4 when a total of 19 total victims were reported)</p> <p>96% of respondents rated the polygraph 'helpful'</p>
<p>Van Arsdale, Shaw, Miller, and Parent (2012)</p> <p>United States</p>	60	Community	Voluntary	<p>*The number of victims disclosed significantly increased post-polygraph ($t(59) = -4.89, p < .001$) and there was a significant increase in disclosure of male victims ($\chi^2 [1, N = 125] = 3.32, p = .07$)</p> <p>There were significantly more contact offence admissions following the polygraph ($\chi^2 (2, N = 130) = 15.00, p < .001$)</p> <p>15% of those polygraphed disclosed own sexual abuse victimisation, which may be considered useful for treatment interventions</p>

Note. Significance statistics were included where available.
IIOC = indecent image of children.

2.7. Results of searching and screening; results of data extraction and quality appraisal quality assurance procedures

Figure 1 shows the process of study selection and the search results. There were 35 initial hits, and, following screening, a total of 19 articles were identified for inclusion in the data synthesis. Four publications were rejected after realising the irrelevance of the content at title, and a further four removed after reading the abstract and noting that the research was not in the area of forensic psychology. All nineteen studies were then data extracted and quality appraised by me, with a sample data extracted by a second reviewer for quality assurance purposes. Agreement between the author (EE) and the reviewer (BV) who data extracted the sample was high, with no significant disagreements.

2.7.1. Results of searching screening, data extraction, quality appraisal, assessment of appropriateness of conducting meta-analysis, and synthesis.

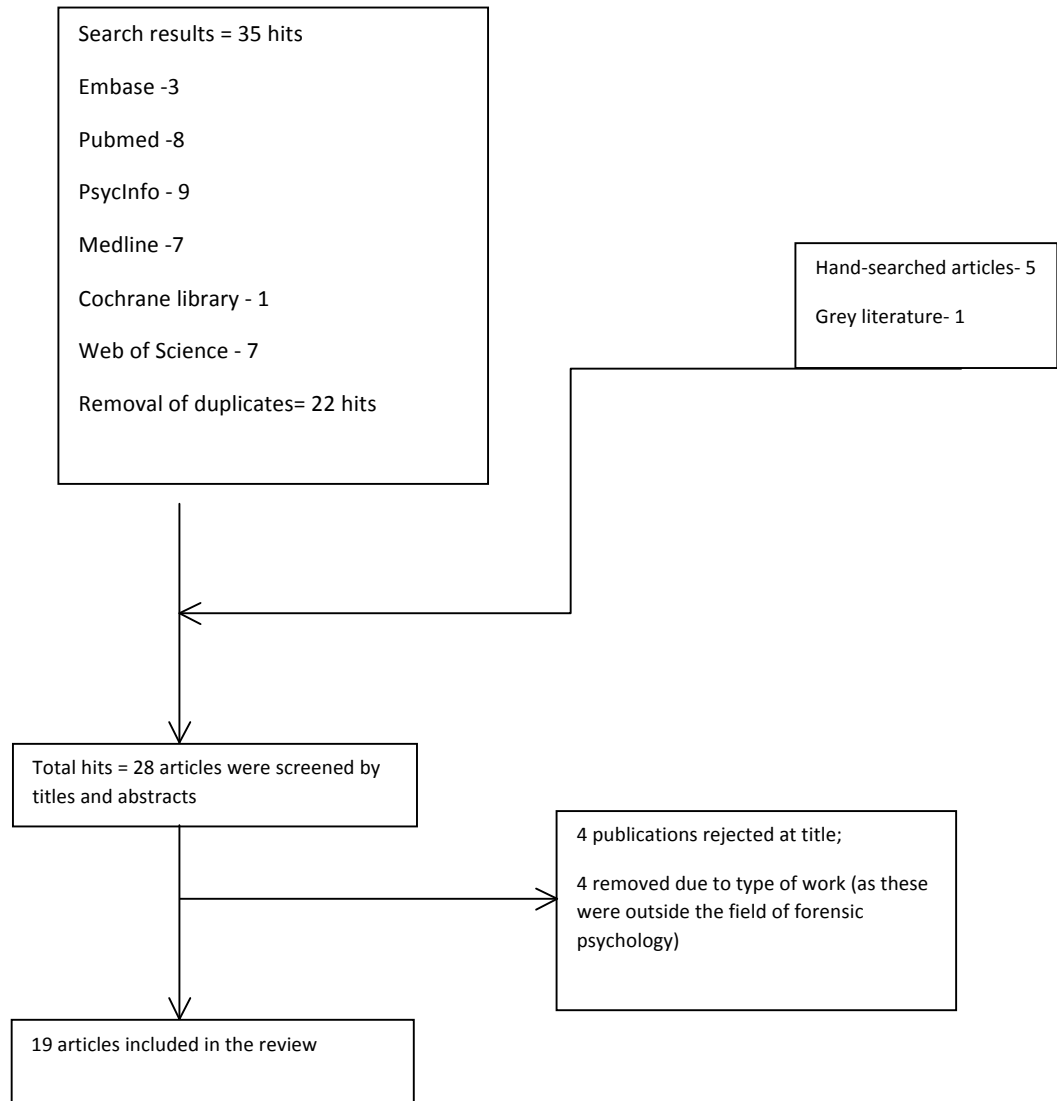


Figure 1 *The Process of Study Selection and Search Results*

2.7.2. Synthesis

In the light of the above, it was decided that a thematic narrative synthesis should be undertaken. I grouped the

studies thematically using both substantive and methodological groupings, for example, according to the disclosure and reoffending outcomes, or the number and type of offences disclosed. Thematic groupings were also applied to the methodological considerations, for example, the presence or absence of selection bias and rates of attrition. When synthesising the results, I took into account the overall rating from the quality appraisal judgements that was applied to each of the studies.

2.7.3 Results

The quality assessment tool (Armijo-Olivo et al., 2012) was used to guide the assessment (low, medium, high) of study quality in 6 components including selection bias, study design, confounding variables, study blindness, the quality of data collection methods, the proportion of withdrawal and drop-outs (attrition). If a study is rated as 'high' this is a positive indication regarding its methodological quality, i.e. it is of high methodological value. If a study is rated as 'moderate', it can be said to be of moderate or fair methodological quality, and a 'weak' rating indicates a component/study is of poor methodological quality according to this tool. The accumulation of component scores contributes to an overall score reflecting the methodological strength of each study

(weak, moderate, high). The overall score is determined by the number of weak ratings. For example if one component area is rated weak, then the study is scored moderate. If two or more components are rated weak, then the overall score of study quality will be weak. To assist with component scoring, the online quality assessment tool offers a dictionary with clear instructions that I used for each study. For example, with regards to attrition, the component is rated weak if there is a follow-up rate of less than 60%, or follow up/ participant retention is not described, moderate if there is 60-70% follow up or not applicable, and strong when the follow-up rate is 80% or greater.

Of the included studies, only one was rated as 'strong' on the basis of the quality assessment tool (Armijo-Olivo et al., 2012). Four were rated as being of 'moderate' quality (Ahlmeyer et al., 2000; Gannon et al., 2014; Grubin, 2010; Heil et al., 2003). The remaining fourteen of the included studies were rated as weak, according to the rating criteria. Use of this tool highlighted the variable quality of research exploring the influence of the polygraph upon disclosure and recidivism, and this signalled a need for more methodologically rigorous research to be undertaken (see Table 2.4).

2.7.4. Sample characteristics

Overall, the total sample size across studies ranged from 25 (Buschman et al., 2009) to 635 (Gannon et al., 2014), and the age of participants spanned from 13-76 years. In three of the studies, demographic data were unavailable (Bourke et al., 2014; Cook et al., 2014; Kokish et al., 2005)

The ethnicity of the offenders was predominantly white/Caucasian. All offenders were male with the exception of those in one study (English, Jones, Patrick, & Pasini-Hill, 2003) in which 4.3% ($n=7$) of the sample was female.

Twelve studies included offenders who offended against both adult and child victims. Six studies included solely offenders with convictions against children, some of which included juvenile offenders who had offended against peers or younger children (Bourke et al., 2014; Buschman et al., 2009; Grubin et al., 2014; Schneck et al., 2014; Stovering, Nelson & Hart, 2013; Van Arsdale et al., 2012).

All studies were carried out in the US, other than five conducted in the United Kingdom (Gannon et al., 2014; Grubin, 2010; Grubin & Madsen 2006; Grubin et al., 2004; Grubin et al., 2014), and one other conducted in the Netherlands (Buschman et al., 2009).

All but two studies included participants from community settings alone. The other two studies compared the usefulness of the polygraph for both prison and community samples (Ahlmeyer et al., 2000; Heil, Ahlmeyer, & Simons, 2003).

In thirteen studies it was reported that some, or all, of the participants were also receiving psychological therapy (Cook et al., 2014; English et al., 2003; English et al., 2000; Grubin et al., 2004; Grubin & Madsen, 2006; Heil, Ahlmeyer, & Simons, 2003; Kokish et al., 2005; McGrath et al., 2007; O'Connell, 1997; Schenk et al., 2014; Stovering, Nelson, & Hart. 2013; Van Arsdale et al., 2012). One study controlled for these treatment effects in the analysis by comparing a treatment-only with a combined polygraph treatment group (McGrath et al., 2007). Treatment programmes frequently targeted sexual offending and were implemented in a variety of settings including prisons and community treatment facilities.

The most common test/measure reported was the sexual history disclosure polygraph, which was employed in six of the included studies (Buschman et al., 2009; Emerick & Dutton, 1993; English et al., 2000; Heil, Ahlmeyer, & Simons, 2003; O'Connell, 1997; Van Arsdale et al., 2012). The maintenance polygraph test was used in three studies (Gannon et al., 2014; Grubin et al., 2004; McGrath et al., 2007) and the specific issue test in two (Bourke et al., 2014; Schenk et al., 2014). Combinations of test types were used in four of the reviewed studies (English et al., 2000; English et al., 2003; Grubin, 2010; Stovering, Nelson, & Hart, 2013).

2.7.5. Study design

Only four of the included studies reported the inclusion of a control group in their methodology, and only four studies were rated as having strong or moderately strong quality (Gannon et al., 2014; Grubin, 2010; Heil, Ahlmeyer, & Simons, 2003; McGrath et al., 2007). By definition, the effectiveness question for the SR means that the studies with a control group (and therefore able to establish causal inference) were likely to be judged as being of higher quality than those studies in the systematic review that did not

include a control group, as including a control group helps to rule out alternative possible explanations for findings.

Nine studies employed a single intervention group study design with no comparison group. These studies assessed participants before, and following, a polygraph, but did not follow-up afterwards (Bourke et al., 2014; Buschman et al., 2009; Emerick & Dutton, 1993; English et al., 2003; English et al., 2000; O'Connell, 1997; Schenk et al., 2014; Stovering, Nelson, & Hart., 2013; Van Arsdale et al., 2012). Two studies explored self-reported accuracy and utility from a single intervention design (Grubin & Madsen, 2006; Kokish et al., 2005).

Four studies followed a quasi-experimental design with a polygraph intervention and comparison group (Cook et al., 2014; Gannon et al., 2014; McGrath et al., 2007; Schenk et al., 2014). Others included a 'polygraph unaware' group (Grubin et al., 2004), a between samples comparison, i.e. parolee vs. prisoner (Heil et al., 2000; Heil, Ahlmeyer, & Simons, 2003), or a within individuals comparison between multiple polygraphs (Ahlmeyer et al., 2000). No randomized controlled trials were identified. This may be because it is

difficult to carry out randomised controlled trials in relation to studies of sex offender recidivism, partly due to low base rates of reoffending generally, and also due to reluctance amongst criminal justice agencies to permit experimentation amongst high-risk offenders (Laws & O'Donohue, 2008).

The polygraph test was conducted on a voluntary basis in all but six studies, where it was a mandatory part of treatment or supervision (Cook et al., 2014; English et al., 2003; McGrath et al., 2010; O'Connell, 1997; Schneck et al., 2014; Stovering, Nelson & Hart, 2013). Ahlmeyer et al. (2000) included both volunteer and mandated offenders as the study included both incarcerated and community samples.

2.7.6. Outcomes reported

The most frequent primary outcome from the included studies was offence-related disclosure of previously unknown information, with this being the focus in twelve of the studies. The timespan of these covered periods in waiting for, during or shortly following a polygraph examination. Topics of disclosure could be directly related to polygraph questions, but also occurred independently of these. All disclosures of interest included information of the individual's past, and of future

forensic risk, including their compliance with supervision or treatment.

Another reported outcome, which featured in two of the included studies, focused on the influence of the polygraph on rates of recidivism (Cook et al., 2014; McGrath et al., 2007). For both studies, reported recidivism was based on the occurrence of new convictions for criminal offences following the administration of the polygraph. Both studies measured reconvictions over a five-year period.

Two studies in the review explored the self-reported accuracy and utility of the polygraph with offenders (Grubin & Madsen, 2006; Kokish et al., 2005). Both studies implemented self-report measures in their methodology. One study used a 12-item survey with offenders (*Previous Experiences of the Polygraph Questionnaire*; PEPQ) to obtain this information (Grubin & Madsen, 2006). This survey explores the offender's perceptions of the usefulness of the polygraph in increasing self-reported disclosure and encouraging honesty with supervisory and treatment professionals. The other study (Kokish et al., 2005) utilised a questionnaire specifically constructed for the purpose of their research. The

questionnaire asked respondents whether mandatory polygraph examinations were helpful or/and harmful to their treatment and whether they considered the polygraph outcome to be accurate.

One of the included studies explored whether the expectation of an upcoming polygraph (in 3 months) was sufficient to decrease an individual's level of risk and help them avoid engaging in their identified high risk behaviours (Grubin et al., 2004). The numbers of disclosures were compared between two conditions, one in which individuals were informed of the upcoming polygraph and the other group in which individuals were only told that their behaviours would be reviewed, but with no mention of the polygraph. Both groups were matched with regards to demographic characteristics and level of presenting risk.

2.8. Results

In the analysis of the results, the quality of each study was taken into account. Those rated as strong or moderate would be deemed to have greater weight of evidence than those rated as weak, as weaker studies may have resulted in less valid results. The ratings used below in the analysis of results

are overall ratings from criteria assessment for each of the other categories, according to the algorithm prescribed by the quality assessment tool. Overall, only one study was rated as strong (McGrath et al., 2007), and four were rated moderately strong (Ahlmeier, Heil, McKee, and English., 2000; Gannon, Wood, Pina, Tyler, Barnoux, and Vasquez., 2013; Grubin, 2010 and Heil, Ahlmeier, and Simons, 2003). A potential explanation for a high number of 'weak' rated studies could be that blinding was assessed using the quality assessment tool, but in this area of research it is difficult, if not impossible, to blind participants who are undertaking a polygraph as the intervention of interest. Data collection tools were rated as strong as the polygraph is judged to be reliable and valid in researching the target domain.

2.8.1. Disclosure

Five studies (two rated as being of moderate quality and three of weak quality) reported an increase in the number of disclosed victims for those individuals who had been polygraphed (Ahlmeier et al., 2000; Bourke et al., 2014; Emerick & Dutton, 1993; Heil, Ahlmeier & Simons, 2003; Van Arsdale et al., 2012).

Five studies (two rated as moderate, and three of weak quality) reported an increase in disclosures regarding the number of offences (some reporting previously unknown contact offences) for polygraphed participants (Ahlmeyer et al., 2000; Bourke et al., 2014; Cook et al., 2014; Heil, Ahlmeyer & Simons, 2003; O'Connell, 1997) and six studies (two of moderate and four of weak quality) reported an increase in the disclosure of rule violating behaviours (e.g. licence violations) or engagement in risky behaviours indicative of a cause for concern with regards to the person's sexual risk (Ahlmeyer et al., 2000; Buschman et al., 2009; English et al., 2003; Gannon et al., 2014; Grubin & Madsen 2006; Grubin et al., 2004). Risk behaviours included admission to masturbation to deviant fantasies, violation of treatment or supervision arrangements, contact with potential victims, and engagement in substance misuse. Seven studies of variable quality reported an increase in admissions of crossover offences (Bourke et al., 2014; Emerick & Dutton, 1993; English et al., 2003; Heil, Ahlmeyer & Simons, 2003; Schenk et al., 2014; O'Connell, 1997; Van Arsdale et al., 2012). Cross-over included a higher proportion of offences against victims of multiple ages, across genders, offender-victim relationships and a wider variety of offences. Seven studies, also of variable quality, found an increase in

disclosure signalled a change in offenders' level/category/seriousness of risk (e.g. preference for a more explicit category of preferred indecent image/ higher scores on risk assessment tools such as the Static 99) as a result of a polygraph assessment (Buschman et al., 2009; Cook et al., 2014; Emerick & Dutton. 1993; Grubin 2010; Grubin et al., 2014; Grubin et al., 2004; Van Arsdale et al., 2012).

In a study (rated as moderate quality) comparing the impact of the polygraph on inmate and parole samples, offence-related disclosure was only significantly increased amongst inmates (Heil, Ahlmeyer, & Simons, 2003).

2.8.2. Recidivism

Two studies (one of strong methodological quality; the other rated weak) included in the review explored the influence of the polygraph on rates of recidivism (Cook et al., 2014; McGrath et al., 2007). McGrath et al. (2007) (the strongest study in terms of quality) found that after a fixed 5-year follow-up period, individuals in the polygraph group were significantly less likely to be charged with committing a new non-sexual violent offence (2.9% vs.11.5%). However, there were no significant differences between conditions for sexual

reoffences (5.8% vs. 6.7%). Cook et al. (2014) also found that polygraphed individuals were significantly less likely to receive a conviction for violent-only offences or when violent and sexual recidivism rates were combined. Similarly to McGrath's findings, there was no significant impact of the polygraph on sexual-only recidivism. Cook et al. also found that reoffending participants were on supervision significantly longer prior to partaking in the polygraph examination. The authors suggested that offenders who fear being detected, having committed another offence, are more likely to try to avoid the polygraph. However, the reasons for avoidance were not explicitly explored in the study, and it is possible that the need for a polygraph was simply overlooked, or the offender was in treatment and not at a stage where the polygraph was felt appropriate.

2.8.3. Self-reported accuracy and utility

Results from Grubin and Madsen (2006) (a weak quality study relying on questionnaire responses) revealed low levels of self-reported inaccuracy regarding the polygraph outcomes, with 30% ($n=27$) stating the polygraph resulted in a false positive outcome, and 17% ($n=6$) that it resulted in false negative findings. Overall, participants' perceived accuracy of the

polygraph was 85%. With regard to self-reported increases in disclosure, 44% of participants stated that the polygraph made them more honest in their accounts to professionals. Amongst participants expecting to be subject to the polygraph, 44% ($n=50$) reported an increase in the likelihood of their disclosing offence-relevant information to supervisory and treatment agents. With regards to the polygraph assessment as a deterrent for future risk, 56% ($n=71$) reported that the test encouraged them to avoid reoffending, and 64% ($n=81$) stated that it helped them avoid engagement with risk behaviours. Results from Kokish et al. (2005) also suggest a propensity for high levels of self-reported disclosure amongst polygraphed offenders, with 72% ($n=68$) stating that the test made them more honest with themselves and their therapists. Levels of accuracy were reported by Grubin and Madsen (2006), with regard to false positive outcomes ($n=27$); however, fewer incidents of false negatives were reported ($n=6$).

2.8.4. Timing of disclosure

Differences between the two groups concerning the number of disclosed 'high risk' behaviours in the three months leading up to the polygraph test were examined. Findings indicated that

there were no significant differences between the polygraph 'aware' (in which individuals were told they would receive a polygraph examination in three months regarding their high-risk behaviours) and 'unaware' individuals (who were told their behaviour would be reviewed in three months with no mention of an impending polygraph test). This outcome suggests that the expectation of an upcoming polygraph test failed to deter individuals from engaging in risk behaviours.

Bourke et al. (2014) found that offenders were 52.8% more likely to make offence-relevant disclosures during the polygraph than beforehand during the pre-test interview (20.5%), or afterwards during the post-test debrief (32.3%). However this study was rated as weak by the quality appraisal. Pre-test disclosures yielded information from 29 offenders highlighting an additional 102 victims. During the post-test interview, an additional 170 victims were disclosed by 54 individuals. A study rated as moderate in the quality assessment, Ahlmeyer et al. (2000), also found offence-related disclosures during the polygraph test, or shortly afterwards, during the post-test interview, particularly if the test yielded a deception-indicated result. In contrast, Grubin et al. (2004) found that individuals were most likely to report high-risk behaviours to the examiner during the pre-test

interview (84%). However, following a failed test, 80% of participants reported additional and unknown information about their high-risk behaviours during the post-test interview. Grubin et al.'s study, however, was rated as methodologically weak, and did not pre-specify 'during the test' so it is difficult to identify exactly when disclosures were made with respect to the questioning process.

In Gannon's (2012) trial of mandatory polygraphs, the majority of disclosures reported for polygraph offenders occurred in the pre-polygraph interview before the polygraph test was undertaken. The mean number of disclosures per offender in the pre-polygraph interview was 0.96, compared with 0.21 in the actual polygraph test, and 0.31 in the post-polygraph meeting. This suggests that knowledge of an impending polygraph test was sufficient to facilitate disclosures amongst these participants. In addition, offenders were most likely to make a disclosure during a first test when the outcome indicated deception, and the number of disclosures decreased over the following five tests. This finding suggested that the first testing experience may be the most important for encouraging offenders to comply with and/or understand their licence conditions.

Stovering et al. (2013) studied the number of unique disclosures made over a wider time period, taking into account the number of unique victims disclosed at each of four time periods over the course of a mandated sex offender treatment programme [adjudication, assessment/education, at the polygraph examination, and during continued treatment (from after the polygraph until discharge)]. Results indicated that the largest numbers of victims were disclosed during the assessment/education phase (from the first day of treatment until taking the polygraph). Although additional victims were also disclosed during the polygraph examination itself, and during continued treatment following the polygraph, this represented a small number of additional victims. Indeed, only one additional victim was disclosed during the polygraph, and 19 in continued treatment, compared to 87 and 157 during the adjudication and assessment/education phases retrospectively. The Stovering et al. (2013) study was also rated as weak using the quality appraisal tool, suggesting potential for bias in its results.

2.9. Discussion

The main finding of this systematic review is that the polygraph is an effective technique in eliciting a greater

number of offence-related disclosures amongst sexual offenders. All of the included 19 studies found the polygraph effective either with regards to facilitating disclosure or reducing some types of reoffending. Although these were of variable methodological quality, the fact that all studies (including four strong and moderately strong studies) had a similar finding strengthens the confidence of this conclusion. The polygraph also appears to encourage an increase in risk-related disclosures, including the number and variety of offences and victims, risk behaviours, and violations of licence and treatment conditions. Such factors influence how an individual's presenting level of risk is decided, and this can assist us to judge how we manage and treat this risk in the future (Hanson et al., 2007). An increase in the reported levels of disclosure regarding crossover offending in seven of the included studies (six studies of weak and one of moderate quality) suggests an opportunistic and malleable nature to sexual offending, which challenges the notion that sex offenders can be categorised according to rigid typologies (Wolak, Finkelhor & Mitchell, 2005)

A higher degree of crossover is indicative of higher risk associated with sexual recidivism as it indicates deficits in impulsivity and self-regulation (Hanson & Morton-Bourgon,

2004). Information on crossover offending is useful for providing a supervision/treatment focus based on each individual's relevant offending patterns (Heil et al., 2003). Therefore, the polygraph may help in generating more accurate information to allocate resources, evaluate risk, or devise individualised interventions. Despite these increases in disclosure rates, offenders may continue to conceal information and disclose only the minimum they feel necessary to stop further enquiries. Or alternatively, offenders may fabricate confessions after being found deceptive to prevent the examiner from revealing the truth, or to satisfy what they believe the examiner wants to hear. Thus, it is difficult to ascertain to what extent the newly disclosed information can be trusted as wholly accurate and complete (Grubin & Madsen, 2006; Kokish, Levenson, & Blasingame, 2005). This is why it is crucial to continue with thorough investigative procedures following an admission. It should be noted that, immunity from criminal prosecution was a feature of many of the included studies, which may also have increased disclosure.

Studies reported different findings with regard to the timing of disclosures made in relation to the polygraph test. Therefore,

it is likely that additional factors, such as the impact of treatment or good therapeutic relationships, play a role in the timing of disclosures (Wood et al., 2010). In studies that showed a decrease in recidivism rates following a polygraph examination, this effect was significant only for violent reoffending, perhaps due to lower base rates for sexual offences, which may preclude determination of statistically significant outcomes (Falshaw et al., 2004).

Although the polygraph increased information about offenders' risk behaviours, this was not associated with specific sexual reoffending rates. This confirms previous research demonstrating that (threat of) sanctions have little impact on sexual recidivism (Andrews & Bonta, 2007). It appears, however, that the polygraph can separate frequent from non-frequent offenders, perhaps because of a fear of detection, or over-confidence that they have their urges under control. Cook, Barkley, and Anderson (2014) argued that although the use of the polygraph in a jurisdiction does not necessarily result in less recidivism, from a broader perspective it appears to separate high from low risk reoffenders, as those who seek to avoid the test are less motivated to not reoffend (Grubin et al., 2004) and are more likely to be concealing previous

offences and avoiding treatment programmes (Lösel & Schmucker, 2005). Therefore, in the future it might be beneficial to focus on increasing supervision for those individuals who appear to be actively avoiding the polygraph.

There was a large degree of variance between studies with regards to the type of polygraph test administered, which was dictated by the content of the questions and the purpose of the test. It is unknown whether the type of polygraph test administered impacts upon the validity of the outcomes; however, some researchers have suggested that the method of questioning employed may have an influence on the outcomes (Saxe et al., 1985). The type of polygraph test delivered was not specified in four of the included studies (Ahlmeyer et al., 2000; Grubin et al., 2014; Grubin & Madsen, 2006; Kokish et al., 2005).

2.9.1 Missing studies and data

It is possible that some studies have escaped identification due to limited accessibility of their data, or because of ongoing execution. However, with these caveats in mind, given the comprehensive search strategy, it is likely that the studies

reported here adequately represent the present state of polygraph research with sex offender populations.

The main limitations of the data set of included studies lie within the variable quality of the available evidence as demonstrated through the application of the quality assessment tool. In the included recidivism studies, assignment to treatment conditions was not random (e.g. Ahlmeyer, 2000) and polygraphed offenders may have undergone lengthier periods of treatment and supervision, arguably reducing their risk to reoffend. In the absence of random allocation to condition, it is possible that other factors, aside from the polygraph, contributed to the likelihood of reoffending. A small proportion of the included studies rely to some extent on case file data, therefore the information used may have been initially gathered for clinical and treatment purposes rather than for research, and missing or unreported data may weaken the accuracy of the conclusions made.

2.9.2. Previous experiences with the Polygraph

It was not always possible to ascertain whether offenders had undergone polygraph testing previously, and if so, with what frequency and during what time frame. It is possible that some studies included participants who had previous exposure

to the polygraph, and this could have impacted upon study findings. Previous research suggests that experience of the polygraph may increase the number of false negative results due to practice effects, and therefore could also influence the content and rates of disclosures (Rovner et al., 1979). However, Ben-Shakhar & Dolev (1996) showed that practice is not necessary for a successful implementation of polygraph countermeasures, and therefore previous exposure to polygraphy may not necessarily impact on disclosures.

2.9.3. Study Design

Small sample sizes without comparison groups weaken the generalisability of findings. A substantial number of studies incorporated multiple case or single intervention group designs. In a number of studies, individuals undergoing a polygraph were also concurrently receiving treatment for their sexual offending. Retrospective methodologies and the absence of an appropriate control group make it difficult to disentangle the impact of therapy/supervision from the effect of the polygraph examination, and research indicates that engagement in sexual offender treatment reduces recidivism and disclosure (Hanson et al., 2002). Therefore, it is possible that an increase in disclosure for the polygraph was due to the

fact that these individuals were also receiving psychological treatment encouraging openness and responsibility.

Only two studies (of variable quality) have considered the impact of the polygraph on recidivism, with the length of the follow-up being a maximum of five years. Given the slow rate to reoffending and generally low base rates of sexual offending, such time frames may not be sufficient to gain an accurate picture of recidivism. Longitudinal research shows that sexual recidivism increases with extended follow-up (Loucks, 2002). After twenty years, it is estimated that rates of recidivism in the general sex offending population will approach 30% - 40% (Hanson et al., 2003).

A major confounding variable amongst the included studies is sampling bias. Many studies included voluntary participants who represent a particular subgroup of offenders (indicated by the discrepancy between the number approached and those agreeing to participate). Volunteers are perhaps more compliant and eager to please, making them more likely to disclose or adhere to experimenter effects during the polygraph. In one of the included studies (Ahlmeyer et al., 2000) volunteer inmates were significantly more likely to

disclose victims during the polygraph than mandated parolees. Therefore, results from voluntary participants cannot be generalised to all sexual offenders. Whilst results using non-voluntary samples have also found promising results in favour of the polygraph, they have not been so extreme. This may be due to the biases resulting from the use of voluntary samples that probably represent a subgroup of highly motivated (and quicker to disclose) offenders, compared to those who are mandated as part of licence supervision or treatment. For example, in Gannon's 2012 mandatory pilot, the mean number of disclosures for individuals in the polygraph compared with the non-polygraph condition was 2.60 versus 1.25 respectively. This can be compared with voluntary samples reported by Grubin (2006; 2010) in which the number of disclosures from polygraphed offenders were fourteen times greater than comparison offenders.

2.9.4. Sample characteristics

Participants included in the reviewed studies represent a homogenous group of individuals, and it is therefore difficult to generalise these findings to other groups. Participants were predominantly white, middle-aged males from the US or UK, and demographic data were missing in a substantial number of

the studies, making it difficult to explore whether such characteristics influenced disclosure or reoffending rates. Also, to date, there is no known research exploring gender differences in admissions made during or following a polygraph. It is possible that female offenders will be affected differently by the test, for example, depending on the perceived repercussions of acting deceptively (Dreber & Johannesson, 2008).

2.9.5. Issues with self-reported utility

For those studies including self-reported rates of polygraph utility, it is likely that social desirability impacted upon participant responses, particularly where self-report was obtained during face-to-face interviews, or whilst a therapist was present in the room. Offenders are likely to want to make a good impression on those with whom they are working and therefore are more likely to be compliant and report that such influences are useful. Conversely, it is possible to argue that some offenders may be more likely to state that the polygraph is not useful in order to undermine professional confidence in the test.

2.9.6. Drop out

There were substantial drop-out rates amongst the included studies. High rates of drop-out are notorious amongst forensic populations, and these have been found to increase rates of recidivism, even compared with those who receive no intervention whatsoever (McMurran & Theodosi, 2007). It was not possible to determine systematically why offenders dropped out at various times during certain studies, but it is possible that participants completing the studies represent a different subgroup to those who drop out, the latter are potentially more resistant to making disclosures during the polygraph. Also, because no detailed information was offered in studies with regards to the characteristics of those who dropped out, it is possible that those offenders confronted with a deceptive outcome result may have simply withdrawn their willingness to participate.

2.9.7. Strengths of this systematic review

The current review sought to minimise bias through the rigorous locating, quality appraisal and synthesis of relevant studies. The systematic review design, by its nature, seeks to minimise bias, and the present study has been conducted in accordance with the PRISMA (2009) guidelines, including use

of the PRISMA (2009) checklist which highlights high quality items included in the conduct of this review (see Appendix 12 for a completed checklist). The completed checklist includes a section number next to each item, to demonstrate the extent to which that quality item has been adhered to in the design and conduct of this review.

2.9.8. Limitations of this review

There are a number of limitations of the current systematic review. Firstly, the outcome criteria were not as restricted as I would have been preferred. Thus, I included both disclosure and recidivism as outcome variables, which may have compromised the tightness of the review and expanded parameters, thus reducing focus. Although a sample of the studies was reviewed by a second researcher, double data extraction of all 19 studies was not possible due to this being completed as doctoral research that lacked the facility of a second co-researcher. In addition, the quality assessment forms were not completed by two individuals, again due to a lack of resources to fund a second researcher. Due to the variable quality of research availability, I have included studies (e.g. those using pre and post-test measures) that do not necessarily meet the rigorous criteria that one would typically

include in a systematic review looking at the effectiveness of an intervention. This kind of research question ideally uses an experimental, or quasi-experimental, design. This means the weight of evidence is not as high as it would have been had it been possible to include more quasi experiments. If there had been a wider body of research to retrieve, I would have discarded some of the methodologically weaker studies included in this review. In Appendix 12 the completed PRISMA (2009) checklist does highlight some limitations of this systematic review. For example, there was no double data extraction, and it was not registered with a systematic review organisation, although it was registered locally with the University of Nottingham ethics committee.

2.10. Conclusion

The studies included in this systematic review provide a foundation for understanding the utility of the PCSOT amongst forensic samples. The review has a particular focus on disclosure. Current studies suggest the polygraph may be useful in increasing offence-related admissions, which promotes more realistic risk assessments. However, any conclusions should be tempered by the seeming lack of methodological rigour of the studies reviewed (only four good

quality quasi-experiments have been undertaken), and the significant issues surrounding the quality of included studies using a pre-post-test design. Despite these concerns, the initial results provided by these studies, particularly the increased disclosure across a wide range of risk relevant information, justify the introduction of larger, integrated, and more rigorous PCSOT evaluations in the future. Such studies should note the methodological variability identified in the current literature and employ more rigorous methods in order to expand and improve upon the evidence base for the use of the polygraph in sex offender management and treatment.

In particular, studies should attempt to follow an experimental design. The parameters of polygraph testing that need to be investigated include, its basis in theory, the frequency of polygraphs for optimal disclosure, how and when the polygraph is most effectively administered (pre or post-conviction), and what types of offenders may be eligible for testing. Only then will we know what sort of test format, if any, is most effective, with whom, and for what.

Rationale for Chapter 3

Chapter 2 has illustrated that the polygraph can be a useful tool in the assessment and management of sex offenders, particularly for increasing disclosure of risk relevant information, which can assist relevant professionals with current investigation and future understanding of risk. Due to the heterogeneity of methodologies employed and lack of control samples comparison between studies is difficult, and a meta-analysis was deemed to be inappropriate. In light of such difficulties, focus should be given to the methodology of polygraphy and its associated limitations in both research (such as the absence of control or comparison groups) and practice (such as internationally conflicting laws and the inherent shortfalls of the instrument itself). Chapter 3 addresses some of these issues by way of a critique of the Post-Conviction Polygraph in forensic research.

Chapter Three

Critique of Methodology

3.1. Introduction

The polygraph was originally developed in the early 20th century and, perhaps infelicitously became commonly referred to as a 'lie detector' (Morawski & Donahue, 2016). The method has been most widely utilised in the USA, and assists criminal investigations, employee screening of army personnel, and a number of other occupations related to national security (Mark, 2014). The polygraph functions by measuring fluctuations in our evolutionary 'fight or flight' reactions associated with threat and physiological arousal (Ginton, 2017). The autonomic nervous system (ANS) is responsible for monitoring conditions in the internal environment (e.g. threat) and bringing about appropriate changes in response (Slavkovic, 2004). There are two major components; the sympathetic and the parasympathetic systems, which control electrodermal activity (EDA) including breathing and blood pressure (Bhutta et al., 2015). The sympathetic system also controls the skin (e.g. perspiration levels). Science dictates that the ANS is particularly active during the experience of emotion and prepares the body for the so-called 'fight or flight' phenomenon (Lewis & Cuppari, 2009)

Research has found that the ANS is also activated when individuals act deceptively, due to the short-term psychological stress associated with lying (Grubin & Madsen, 2005; Pavlidis, Eberhardt, & Levine, 2002). The underlying premise of the polygraph, therefore, is to measure these specific, universal, and reproducible physiological responses manifested by the ANS as an indicator of deception (Saxe, 1991). Critics argue that associated elevation in the ANS may indeed be caused by deception, but, alternatively, it could be caused by myriad potentially confounding factors, ranging from stress, fear and anxiety to anger and embarrassment (Steinbrook, 1992).

The polygraph does not offer a direct measure of falsehood *per se*, but works under the premise that when an individual is seeking to be deceptive, they will become increasingly stressed and physiologically aroused because of the fear of being 'caught out' (Grubin, 2016). This fear is revealed somatically by heightened respiratory and cardiovascular responses along with an increase in perspiration (Gamer et al., 2009). According to advocates of the approach (English, 1998; Grubin, 2016) operator skills are essential, as in all forms of

scientific testing, Following well-constructed quality and control assurance programmes will enable well trained administrators to detect whether patterns of arousal activated during responses offer an 'inconclusive', a 'deception indicated' or a 'no deception indicated' interpretation of the examinee's responses. However, it has been suggested that changes in blood pressure after baseline may be established by factors independent of the fear response. For example, changes in blood glucose levels, which could spike or dip during the test (Rebello, Hodges, & Smith, 1983).

This review will critically discuss the evidence in favour and against the use of the Post- Conviction Sex Offender Test in the monitoring, assessment, and supervision of convicted sex offenders.

The polygraph has received significant attention over the past decade in relation to the supervision and management of convicted sexual offenders in the community. This is largely due to the repeated nature and seriousness of such crimes, and the secrecy offenders deploy in their offending behaviour (Seto, 2004). The most common type of polygraph use in sex offender testing is the post-conviction polygraph examination

(PCSOT), of which there are four main types; the specific issue denial test, the sexual history disclosure examination, the maintenance examination, and the monitoring examination (Grubin & Madsen, 2006).

The specific issue denial test examines the level of deception for a specific issue under investigation. In contrast, the sexual history disclosure examination explores more thoroughly an offender's previous sexual functioning, sexual preferences, and previously undisclosed sexual activities. Maintenance polygraph examinations focus on adherence to treatment and licence/probation conditions. Finally, the monitoring polygraph examination explores new convictions or licence breaches that have occurred since the original conviction (Day, 2013). This final test is concerned with probation requirements, and treatment concerns are not usually assessed.

PCSOTs often employ a method of questioning known as the comparison question technique (CQT; Abrams & Abrams, 1993). The CQT includes both relevant and comparison questions. Relevant questions relate specifically to the issue/offence under investigation (Elaad, 2015), which may be easily denied (e.g. 'Have you seen any pornographic images

involving children in the past X months?'). Comparison questions are more general (Ginton, 2017), and are designed to induce an emotional reaction following a priming statement from the examiner (e.g. the examiner may state 'You don't seem like the type of person who would lie to someone you love...'). Subsequently, using this method during a later polygraph, the interviewee may be asked, 'Have you ever been dishonest to someone who trusted you?' (Beguin et al., 2014). The theory behind this line of questioning is that an innocent individual would be more preoccupied with comparison questions, and therefore would emit a larger physiological reaction to these questions during the polygraph (BPS, 2004). Laboratory based research has identified positive findings for the validity of the CQT in PCSOT (Vrij, 2000), but the approach has been criticised for a lack of ecological validity (BPS, 2004). Results from field research have led to estimated accuracy rates of between 83%-89% for guilty examinees, but a wider range of 53%-78% for the identification of innocent examinees (Raskin & Honts, 2002).

The CQT has been criticised for a number of reasons. A common complaint is that it lacks a standardised approach and the formulation of good comparison questions depends

upon the skills of those constructing them (Cross & Saxe, 2001). There is a paucity of research exploring the test with children and adolescents, whose cognitive development and functioning may lead to patterns of physiological arousal during the PCSOT different to that of adults (Craig & Molder, 2003). Similarly, individuals with learning disabilities may also not be appropriate for a PCSOT because the impairments associated with this condition may influence their understanding of questions and compromise the validity of the test (Blasingame, 1998).

Advocates argue that the PCSOT can assist professionals in gaining a more comprehensive picture of factors that relate to an offender's background and recent behaviour (Wilcox, 2005). It is considered that the approach also offers a cost-effective alternative to the resource-exhaustive surveillance strategies of offenders in the community (La Fond & Winick, 2003). The International Association for the Treatment of Sexual Abusers (ATSA, 1997) has supported its role in validating an offender's self-report. Relying solely on what an offender says is obviously problematic for a number of reasons. It may be that the offender is deliberately deceptive in order to avoid consequences of their offending. Alternatively

the offender might make subconscious attempts to minimise, or even fail to acknowledge, their wrongdoing in order to retain a positive self-image or to avoid experiencing negative emotions related to their offending (Emerick & Dutton, 1993).

Although the PCSOT appears to have face validity, the empirical research base exploring the claims for this approach is sparse and, as a result, the PCSOT remains exposed to a substantial amount of public and scientific scrutiny without much evidence to defend it. Although proponents argue that the polygraph is a highly accurate device (reporting that the most accurate estimate of polygraph accuracy falls between 81-91% in lie detection investigations (National Research Council, 2002), others question the value of the method on the grounds of the unsatisfactory evidence of its scientific validity, and potentially inaccurate results (Cross & Saxe, 2001). For example, when considering the application of the Daubert criteria for assessing whether polygraph test results should stand as admissible evidence in criminal proceedings, it would appear that the technique's reliance on physiological measures does not sufficiently indicate deception. This is because deception is not uniquely related to physiological reactions and so it is impossible to predict the conditions

under which polygraph test results will be accurate or inaccurate. And so, the common interpretation of Daubert, that scientific demonstration of validity is required for admissibility of expert testimony, does not hold true when it comes to the polygraph (Saxe & Ben-Shakhar, 1999).

In reality, the research evidence behind claims made by both proponents and critics of the polygraph is mostly inadequate, leaving the debate to consist of a vitriolic and theoretical exchange, rather than empirically-informed, exchanges. For some, the absence of evidence appears to have been confused with substantive evidence against polygraphy (Honts & Perry 1992). Criticisms of its ethical basis are also widespread, as some argue that the polygraph imposes an unnecessarily intrusive and stressful situation upon those being tested (Furedy, 1993), and requires examiners to induce anxiety and fear in examinees (Vess, 2011). There are objections that PCSOT disclosures are gained through 'psychological manipulation' (Cross & Saxe, 2001). Grubin (2016) argues that the PCSOT should not incorporate interrogation techniques, but, rather, it should explicitly discourage deception throughout the interview. Ethical concerns may be particularly prominent when it comes to the issue of polygraphy with juvenile offenders and children (Chaffin,

2011) as they are considered vulnerable populations more suggestible and susceptible to external influence during interrogative procedures (Scott & Steinberg, 2008). In addition, there are differences between adults and young people with regard to psychosocial development and neurological maturity that may differentially influence the way polygraphy works. Despite these distinctions, a recent study including 62 Colorado youths who had committed sexual crimes (mean age= 14.74 years) found that the polygraph significantly resulted in more disclosures, and a greater number of disclosures were associated with the frequency of testing (Yoder et al., 2017). However, as with the majority of adult research studies in the area of polygraph testing, findings from Yoder et al. should be interpreted with caution due to the absence of a control group or multivariate tests

Further scrutiny has come from the polygraph's application to employee screening, security vetting and criminal investigations. Holden (2000) argues that the debate surrounding the polygraph's application in these settings should be considered separately from that looking at the utility of the polygraph with sexual offenders in a post-conviction setting (English et al., 2000). This distinction is crucial, as unlike most other forms of polygraphy, the importance of

accuracy in relation to sex offending research is not as heavily weighted on the PCSOT. Rather, the primary objective of the test is to encourage disclosure from the examinee and to provide an additional treatment tool, rather than providing grounds for prosecution (Grubin, 2008). From this perspective, the benefit of the PCSOT rests with its ability to encourage more truthful self-reports of risk-related factors from offenders. Indeed a study by Wilcox & Sosnowski (2005) found this to be the case, with polygraphed offenders reporting a higher number of acute-dynamic risk factor disclosures (e.g. stalking, paying for sex etc.) compared to non-polygraphed offenders on probation.

3.2. Disclosure

As noted above, a key argument for the utility of the polygraph is its ability to elicit disclosures from convicted sexual offenders. These disclosures often occur during the test itself, but can also occur following the procedure, or even before the test had begun, particularly when the individual is aware of an impending polygraph (Blasingame, 1998). Disclosures can assist professionals working with offenders by bringing attention to unknown information relevant to an offender's offending or risk. For example, a UK pilot study by Wilcox et al. (2005) found that, following a polygraph

examination of convicted sex offenders, the mean number of contact sexual offences reported increased substantially from 37.2 to 81.9. For non-contact offences (e.g. indecent image possession), the mean increase was even greater (from 26.2 to 80.8).

A key motivation in all sexual risk assessment is victim awareness and detection. Using retrospective data from sexual offender case files, a 5-6-fold increase in victim disclosures was identified following a therapy-related PCSOT (Hindman & Peters, 2000). Interestingly, the opposite effect was found for the number of disclosures for their own childhood victimisation, suggesting that in non-polygraphed assessments, offenders may exaggerate their own victimisation and downplay their offending behaviour. The PCSOT has also resulted in an increase of disclosures for crossover offences (e.g. an offender abusing both female and male victims; Heil et al., 2003; Wilcox et al., 2005), both adult and child victims (English et al., 2000), and familial/ non-familial victims (Emerick & Dutton, 1993). A comprehensive picture of offence crossovers is a valuable component of risk assessment, as it indicates a degree of indiscriminate

offending characterised by impulsivity and poor self-regulation which increases an offender's risk (Craissati, 2004).

3.3. The post-conviction polygraph in the UK

The PCSOT is used in some US states as an official test of lie detection, and as an investigative tool to assist in determining guilt or innocence (Gannon et al., 2014). Faigman et al. (2003) reported that polygraph testing is employed in more than 30 states to monitor offenders. The polygraph is also employed in the US to assess reoffences and adherence to community restrictions, with almost 80% of community treatment programmes using this method (McGrath et al., 2010). In contrast, the polygraph has only quite recently been used officially in such fashion in the UK, perhaps due to being placed under considerable critical scrutiny during the mid-1980's (British Psychological Society, 1986).

In April 2009, the NOMS Offender Management and Public Protection Group (OMPPG) began piloting mandatory polygraph testing for sexual offenders (over 18 years of age) in eight NPS trusts in the East and West Midlands. The findings from this initiative suggested that the polygraph increased the chances that a sexual offender under supervision in the

community would reveal information relevant for their management, supervision, treatment or risk assessment; over half of these disclosures occurred in the context of the polygraph session itself (Gannon et al., 2014).

These pilots were largely a response to the Government's Review of the Protection of Children from Sexual Offenders (2007), which involved a number of high profile sexual offences against children. Pilots were restricted to East and West Probation regions, and incorporated a mandatory polygraph into licensing conditions for convicted sexual offenders (albeit polygraph results could not be utilised as a basis for recall, or more widely in criminal courts). The results of the pilot, in addition to independent research, demonstrated that mandatory polygraph testing was a beneficial supplementary risk management tool for Offender Managers. As a result, Parliament approved a Statutory Instrument in January 2014 to permit the national implementation of mandatory polygraph testing as part of licence conditions for high-risk sexual offenders.

Polygraph trials had been previously rejected because of procedural problems. Subsequent evaluation was marked by

progressive increases in participant numbers and design complexity allowing for more rigorous testing of the paradigm (Ramsey & Farmer, 2008). The first trial supported by the Home Office in 2004 was conducted by Grubin et al. and reported preliminary findings from a pilot of voluntary polygraph testing with a small group of sexual offenders in three UK probation areas. This study found a significant decrease in risk behaviours for those subjected to the polygraph compared to those who were not (Grubin et al., 2004). These findings encouraged further research with UK samples supported by the National Offender Management Service (NOMS) which commissioned a more extensive voluntary pilot across ten English NPS areas (Grubin, 2006; 2010).

Findings from the pilot study by Grubin et al. (2004) led to the conclusion that the polygraph acted as a deterrent for high-risk behaviour. Of those who failed the polygraph, 71% disclosed risk behaviours. However, high attrition rates limited the value of the findings, with only 21 of the offenders (42%) completing the study (Beech et al., 2001). Further to the introduction of initial polygraph trials (Grubin et al., 2004; Wilcox et al., 1999; Wilcox et al., 2005), the polygraph was

reviewed once again by the British Psychological Society (BPS, 2004), with similar conclusions to those in their earlier report. The BPS report argued that a number of methodological issues remained which still needed to be addressed, in particular, the need to increase the number of methodologically rigorous field-based studies, and to ensure that research is not carried out by those who have a 'vested interest' in methods for detecting deception.

Grubin's (2010) UK voluntary pilot comparing disclosures made by 350 polygraphed offenders, compared to 180 non-polygraphed offenders, found that the odds of offenders disclosing information relevant to their treatment, supervision, and risk assessment were fourteen times greater for polygraphed offenders than was the case for offenders receiving standard supervision without polygraph testing. Furthermore, these disclosures were rated medium-high severity in over 40% of cases. Despite these promising results, Grubin (2016) outlined a number of caveats. Firstly, voluntary participant recruitment meant that those who participated were likely to be more motivated to undertake the polygraph, with only 40% of those eligible agreeing to be tested, and therefore volunteers represented a biased sample

likely to include more compliant individuals. Secondly, offenders in the comparison group were insufficiently matched to the polygraph offenders on exposure to treatment, race, index offence, or previous sex offences (Gannon et al., 2012).

Due to the methodological shortfalls reported in Grubin (2010), Gannon et al. (2014) conducted mandatory trials involving over 600 high risk offenders (serving a minimum of 1 year in prison), few of whom were receiving community sex offender treatment. Gannon et al. found that those in the polygraph group were significantly more likely to disclose offence relevant information than those who did not undergo such tests; however, the odds of a disclosure being made was markedly lower than those reported in Grubin (2010) at 3:1 as opposed to 14:1. Currently although the use of PCSOT is forbidden in UK criminal proceedings, there is currently no law prohibiting its use as court evidence (Stockdale & Grubin, 2012). Elton (2017) argues that it is irrational to overlook the possibility of using the polygraph in English courts, as a more reliable form of evidence in favour of the less reliable, for example relying on the ability of a jury to assess the truthfulness of a defendant, which is often little better than chance (Blumenthal, 1993). Currently in the UK the polygraph is used in three key ways; to monitor sex offenders, with

those under investigation for suspected sexual offences, and with offenders who request to come off notification procedures.

3.3.1. The PCSOT as a therapeutic tool

At present, most sex offender treatment programmes are psychosocial. This applies to the sex offender treatment programme (SOTP), which is the standard therapy approach for use in England and Wales. However, there is a paucity of adequate research about the impact of sex offender treatment on reoffending, which prevents conclusions about its usefulness (Langstrom et al., 2013). Of the research that does exist, evidence for the efficacy of such treatment programmes in reducing recidivism is lacking (Ho et al., 2013). One suggested explanation for this involves reluctance amongst participants in opening up about their secret deviant thoughts and behaviours. This would likely make their participation in therapy less meaningful, particularly if such treatment has been imposed by external agencies. The implementation of the polygraph may assist in revealing hidden information, thus guiding the treatment to target specific behaviours or beliefs.

According to clinicians utilising the PCSOT, benefits can arise even prior to the operation of the testing procedure itself. This is evident in studies, which reported an increase in the disclosure of unknown offences, victims, or risk behaviours committed during the preparation process of the polygraph (Janes, 1993). Proponents of the method have recommended that offenders should be offered sufficient opportunities to report relevant details prior to undergoing the actual examination (Blasingame, 1998). Assurance of immunity from further prosecution following a disclosure has also been identified as a significant factor in facilitating disclosure, as individuals will feel less threatened by the outcome of further potentially self-incriminating information (Schwartz & Cellini, 1995). Another way in which the polygraph can aid treatment, is that once a significant disclosure is made, the individual may believe that there is 'nothing more to lose', encouraging them to continue with therapy in a more truthful manner (Ho et al., 2013).

Within a treatment programme, the PCSOT can potentially increase the accountability of an offender living in the community, particularly if used in conjunction with other monitoring methods (ATSA, 1993). Offenders are usually explicitly informed of an upcoming PCSOT, and are made

aware that this will involve questions about their therapeutic engagement and compliance. The PCSOT may also include relevant questions relating to therapeutic concerns rather than direct offending. For example, the PCSOT can be used to explore mediating factors for offending behaviours, such as the misuse of substances (Gannon et al., 2008). An awareness of the impending PCSOT has been shown to provide a substantial deterrent for engaging in future offending (Rosky, 2013).

3.4. False positives and false negatives

There are two key measures for consideration when examining the accuracy of the PCSOT; specificity and sensitivity. Specificity occurs when the polygraph outcome indicates 'No Deception Indicated' (NDI) when the examinee is being honest. Sensitivity relates to the polygraph correctly indicating deceptive responding. When polygraph results measure the reverse conditional relationships seen in sensitivity and specificity, these result in 'false negative' and 'false positive' outcomes. A false positive is when the polygraph gives an inaccurate 'Deception Indicated' (DI) as when the offender was responding honestly. A false negative would be when the polygraph gives a NDI result when the offender is actually

being deceptive (see, Figure 1). The limited amount of research into the occurrence of false positives and false negatives that exists suggests that whilst these occur in polygraph outcomes, they are not common.

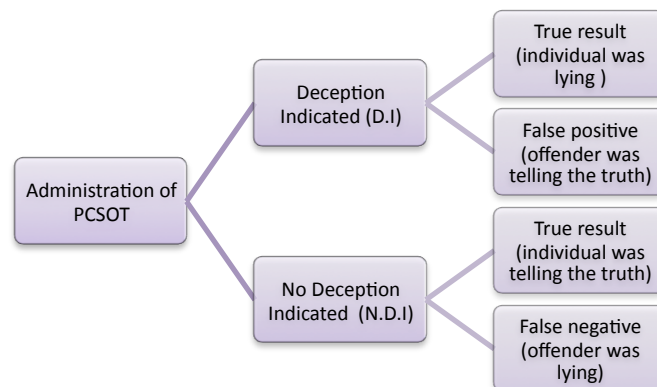


Figure 1: *Process of False Negative and False Positive Outcomes*

The majority of research examining false positive and negative rates amongst sex offender polygraph tests suggests that the problem is not substantial, with low inaccuracy percentages being reported. The two, studies addressing this issue (Grubin & Madsen, 2006; Kokish et al., 2005) reveal that less than 10% of offenders reported making false disclosures. However, these figures are based on self-report from anonymous US surveys a method which, in itself, is inherently flawed.

With regards to public protection concerns, the false negative outcomes from PCSOT undoubtedly pose a significant threat, as they may mean that guilty offenders are not prosecuted,

and remain a significant threat to others. False positives may cause an increase in the amount of offenders needlessly kept in custody, incurring higher and needless costs and breaching human rights due to some being punished for offences and violations that they did not commit. Errors may also lead to financial and policing/monitoring and budgetary constraints.

One difficulty with the interpretation of polygraph results is arriving at accurate base-rates. It is theorised that the outcome of the polygraph is largely dependent on the base rate of deception – that is, how common deception is in the population being tested (Rosky, 2012). Due to the fact that sex offenders are notoriously evasive in their offending behaviour, and are often ashamed of their offending (Seto, 2004), it is highly probable that the majority of these offenders are (at least, sometimes) deceptive in their responses. This means that the base rate of deception within the post-conviction context will be high (as base rates are dictated by the frequency of deception within the population being examined.) In turn, this will compromise the sensitivity and specificity of the PCOT, factors which depend largely on these base rates. If these conclusions are extended to the sex offender polygraph, it suggests that high base rate of

deception notoriously found amongst sex offenders threatens polygraph efficacy, and thus potentially significantly compromises public safety.

Due to the unknown base rate of deception for PCSOT's, it is extremely difficult to measure with confidence the impact or rates of false positive and negatives amongst sex offenders.

3.5. Influencing variables

A number of variables may influence the outcome of the polygraph. For example, it has been suggested that the very manner and tone of the questioning can affect polygraph outcomes (Horvath et al., 2013). Comparison of different questioning approaches reveal substantial variation that may affect examination outcomes (Abrams, 1989). For this reason, guidelines for polygraph testing have encouraged standardization of method among examiners (Kokish, 2004). The varying expertise and competencies between examiners (both with regard to polygraph testing and the assessment of sexual offenders) may also influence the validity of the test (Matte, 2012) with accuracy rates varying between 50% and 95% (Rosky, 2012).

A number of within-individual client variables can influence the outcome of polygraph examinations. These include factors both beyond the offender's control (e.g. learning difficulties, mental illness, medical conditions) and those deliberately induced (e.g. refusal to comply with the examiner's instruction/ not complying with instructions to answer quickly, or asking that a question be repeated, and intoxication; Lundell & Holmes, 1993). For example, Tanner (2007) noted that patients with dementia may be more prone to confabulation, and perhaps believing in the reality they have constructed, would be unlikely to exhibit physiological signs indicative of deception, rendering polygraph results amongst this population questionable. The mandatory polygraph from Gannon et al.'s (2014) pilot study attempted to match the comparison and the polygraph groups as closely as possible according to the rural/urban constitution of the health trust and client demographics such as age and ethnicity. However, it was shown that the polygraph's impact on the number of disclosures did not vary by offender demographics (risk as measured RM2000 and index offence type) or experience of sexual offender treatment. One should be mindful that this study was not piloted on under-represented demographic groups, such as female sex offenders.

Polygraph examinees may use countermeasures to purposefully mislead a polygraph test, potentially resulting in false negative results. Innocent individuals may also use countermeasures as an additional safety tactic to try and avoid any possibility of arriving at a deceptive outcome. In studies that have trained offenders in the deliberate use of countermeasures, guilty examinees have been successful in faking honesty (Honts et al., 1996). Polygraph countermeasures can be both physical and mental, the former commonly including muscle control (e.g. pressing toes to the floor; clenching buttocks), and pain infliction (e.g. tongue biting). Mental countermeasures involve examinees deliberately attempting to conceal deceptive responses through mental distraction techniques (e.g. creating exciting memories to create enhanced responding to control questions). It is often assumed that mental countermeasures are more detrimental to polygraph validity because these are more difficult to detect; however some research has found no significant differences between the effectiveness of these techniques (Ben-Shakhar 2008; London Daily Telegraph, 2012). Polygraph advocates accept that although the approach should not be used in isolation, as some offenders may be able to fool the test, it is likely that a larger proportion are often successful in fooling their therapists and supervisors. This can

be noted by the higher number of risk assessments employed by probation officers when polygraphy is also used (Grubin, 2010).

PCSOTs can be administered at regular intervals to monitor ongoing compliance amongst offenders. As a result, concern has been expressed that repeated testing may result in 'practice effects' which facilitate the rehearsal of a lie, and act as a load-reduction strategy to alleviate physiological arousal associated with anxiety - a primary indicator of deception during the test (Walczyk et al., 2013). Continued exposure to this procedure may also serve to habituate offenders to stressful situations (Branaman & Gallagher, 2005). To alleviate these risks, proponents of the PCSOT suggest that using different polygraph examiners to conduct the tests could reduce habituation effects, though, of course, this will not reduce habituation to the testing procedure itself (Branaman & Gallagher, 2005). Given a standardised form of administration, it is unclear whether using different examiners would have any significant impact on the validity of test outcomes, or whether continued exposure to questioning and discussing one's crimes serves to desensitize the individual's emotional connection to their offence.

If polygraph examiners suspect or detect the use of countermeasures during their investigation they will often confront the examinee, and make note of these potential attempts to sabotage the polygraph in their records. It is crucial to fair and accurate testing that examiners should be careful not to draw firm conclusions from a test where countermeasures may have disturbed the validity of the polygraph reading (particularly when these suspicions are confirmed by a second examiner in a quality assurance review). It has been suggested that skilled examiners can detect the use of countermeasures by observing the examinee's movement (using movement sensors), and identifying distinct physiological profiles indicative of specific countermeasures (Barland, 2003). This can enable them to discount particular polygraph readings, and have greater confidence in the validity of their conclusions. However, according to Heil and English (2009) a proportion of administrators, particularly supervisory officers and treatment providers, lack the necessary skills and proficiency to accurately conduct the PCSOT.

Grubin (2008) accepts that while it is possible for guilty offenders to be familiar with techniques that can assist them to pass the polygraph, in order to use countermeasures effectively, offenders require feedback from their polygraph examiner. The examiner's competence is dictated by their level of training, skill, and ability to ensure that physiological reactions are produced because of deception rather than by other potential causes of autonomic arousal. This requires well-constructed quality assurance and control programmes (Grubin, 2016). However, with continuous advances in technology it is now possible for members of the public to simply download one of a number of polygraph apps for free onto an electronic device upon which they can practise countermeasures at their leisure. Software applications such as this could arguably jeopardise the integrity of the practice and provide a platform for individuals to discuss the most effective strategies to evade deception detection.

3.6. Recidivism

To date, there is only one published randomised control trial of PCSOT including 208 offenders, all of whom receive sex offender treatment, and 50% of whom undergo a PCSOT. After five years, there were no significant differences in rates of sexual recidivism between offenders who received the PCSOT

and those who didn't. However, rates of non-sexual violent offences were significantly higher amongst those who did not undergo polygraph testing. Although the study was on the whole considered methodologically sound, offenders were tested only once every 22 months, a relatively lengthy period that should have reduced the likelihood that the polygraph would have influenced offending.

It is generally established that effective sex offender treatment programmes should follow the 'risk-needs-responsivity principle' (RNR; Andrews and Bonta, 2010) which states that treatment is most effective in reducing reoffending when it is tailored to the individual. Because the PCSOT has the potential to provide additional information about the individual's true beliefs, understandings, and potential risk, it may assist in the delivery of individualised treatment. Thus it would appear that the use of this tool is consistent with RNR principles, and could assist in the reduction of recidivism.

3.7. Methodological challenges and limitation in PCSOT research

A substantial number of studies exploring the PCSOT rely on comparison between what is known about an offender prior,

and subsequent to, polygraph testing. In many cases, there are no contemporaneous control or comparison group in which participants did not undergo polygraph testing. This design inherently weakens any conclusions drawn from such studies, as it prevents efforts to quantify the influence of extraneous and secondary variables. For example, without an appropriately matched control group, it is difficult to conclude with confidence whether individuals would have made such disclosures even in the absence of the PCSOT for example because of changes in supervision or treatment impact (Hindman & Peters, 2001). Similarly, without a comparison or control group, conclusions regarding rates of recidivism must also be interpreted with caution, as offences and breaches may occur without detection. Furthermore, the probability of a serious sexual offender being reconvicted for a sexual or violent crime is relatively low (Grubin, 1998). In some studies, recidivism was limited to a short time period e.g. 5 years (McGrath et al., 2007), which may not cover a sufficient time period to monitor reconvictions (Mann et al., 2010).

In some studies, polygraphed offenders were concurrently receiving treatment for their sexual offending (e.g. Wilcox et al., 2005). In such cases, it is difficult to ascertain whether a

decrease in reoffending/ risk engagement or disclosure is due to the positive impact of therapeutic engagement, or to the polygraph examination, especially given that research indicates that successful engagement in sexual offender treatment alone reduces recidivism and disclosure (Hanson et al., 2002). An integral part of a number of sexual offender treatments involves encouraging attendees to speak openly and honestly about their offences and eradicate the influence of cognitive distortions, such as denial and minimisation (Perkins, 2014). Such therapeutic aims are likely to encourage disclosure.

Another limitation of PCSOT research is that sample sizes are often relatively small (e.g. Wilcox et al., 2005) and rely on voluntary participation (Rosky, 2012). Research in the area is therefore inevitably underpowered. Moreover, for this reason, group differences may be strongly affected by the presence of outliers (Gannon et al., 2008). Studies are also characterised by substantial drop out rates (e.g. Grubin et al., 2004), which further limit the generalisability of the findings. For example, it is possible that voluntary participants who see a study through to completion represent a more compliant subgroup of offenders, who are more likely to disclose information. Such

respondents may be more suggestible to experimenter influences, or demonstrate a desire to please their treatment supervisor and polygraph examiner, or generally include less serious offenders. For example, Gudjonsson and Sigurdsson (2000) found offenders who molested children demonstrated higher levels of social desirability. With regards to the 'Big Five' personality traits, Egan et al. (2005) found sexual offenders against children scored higher on measures of Agreeableness and Conscientiousness compared to generic mentally disordered offenders or control groups. Some studies have also shown evidence of selection bias; for example, a study in support of the PCSOT (Kokish et al., 2005) eliminated from the sample any offender who had an outcome of 'deception indicated' on a prior polygraph test.

A further research limitation is the use of self-report to measure the accuracy and utility of the PCSOT (e.g. Grubin & Madsen, 2006; Kokish et al., 2005;). Self-report data are characterised by a number of weaknesses including social desirability, self-serving biases, and barriers to recall (Maxfield & Babbie, 2014). These biases may be particularly strong for sexual offenders who have a significant vested interest in presenting themselves favourably (Huizinga & Elliot, 1986).

Relying on self-report fails to acknowledge the absence of an incentive for an offender to admit dishonesty.

In an attempt to encourage disclosure, polygraphed offenders can be granted immunity for their self-reported offences (e.g. Hindman & Peters, 2001). This immunity alone may account for the increase in risk-related disclosures, both because they are protected from consequential punishment and the fact that this provides more freedom to tell the interviewer what they think they want to hear (Gannon et al., 2008). Unfortunately, no previous PCSOT study has included a condition to control for the effects of immunity.

3.8. Conclusion

The PCSOT has demonstrated its usefulness in encouraging disclosures amongst sexual offenders under investigation or in the community. Such disclosure provides fuller histories of deviant sexual behaviour, admissions of previously unknown offences and victims, and increased disclosure of other high-risk behaviours (Madsen et al., 2004). This can assist professionals in gaining a more accurate understanding of the offender, and the risk they pose to others. It appears that a range of emotional and cognitive processes interact to produce

changes in arousal recorded by the polygraph, including autobiographical memory, differential salience (altering threat responses depending on the extent of the perceived threat), attentional processing, and the cognitive effort associated with lying (Grubin, 2016) However, there are a number of concerns with the PCSOT which warrant further attention including its poor theoretical basis, and vulnerability to false-positive and false-negative errors. In addition, as is noted in the earlier systematic review (Chapter 2), a substantial number of studies researching this tool are of poor methodological quality. This suggests that in its current state, the PCSOT should be used as an information facilitator as opposed to a source of hard evidence for influencing sentencing decisions.

Rationale for Chapter 4

Chapter 3 highlighted the benefits and challenges associated with using the polygraph in clinical practice and legal proceedings. Chapter 4 goes beyond this descriptive piece to investigate a paradigm known in social psychology as 'the bogus pipeline.' The study explores the bogus pipeline effect experimentally, assessing the rates of disclosure of socially undesirable behaviour amongst individuals attached to a deception indicator machine. Chapter 3 discusses a number of limitations of the polygraph, and the bogus pipeline effect has been cited as one of these, as critics state that the machine's ability to achieve the truth is grounded in subjects' believability of its infallibility. Chapter 4 goes on to explore the veracity of the bogus pipeline effect in polygraphy, and under which (if any) circumstances it operates.

Chapter Four

**The Bogus Pipeline Effect on the Disclosure of Cheating
Behaviour**

4.1. Introduction

The polygraph (also referred to as a lie detector or deception indicator test) has become a popular cultural icon in modern society, frequently gaining coverage in the media and providing a topic of debate both amongst a range of professionals and members of the general public. The debate around this topic and the validity of the paradigm can be considerable (Iacono, 2008).

Polygraph examinations utilise devices, which record autonomic arousal, which is believed to indicate deceptive behaviour. Over time the machine has evolved from an analogue to a more efficient digital instrument (Kanable, 2010). A typical polygraph examination will include a pre-test phase during which the polygraph procedure is explained to the examinee, and each question collaboratively reviewed. The pre-test interview ensures that examinees have a sound understanding of the upcoming questions, and the negative implications of acting deceptively. A practice test is sometimes utilised in order to increase a participant's familiarity with the procedure, and demonstrate its accuracy (Raskin & Honts, 2002).

The American Polygraph Association (APA) claims that the polygraph tests performed by their members are accurate more than 90 percent of the time (American Polygraph Association, 2011). However, there are inconsistencies in the literature regarding such figures. Unfortunately, a substantial number of existing studies exploring the measure's accuracy have been criticised for their methodological flaws (Cross & Saxe, 2001).

4.2. The polygraph in forensic contexts

The history of the polygraph in the detection of deception has been controversial since its origins in the late nineteenth and early twentieth centuries (Iacono & Patrick, 1999). Whilst its utility in the assessment of forensic cases has remained a topic of debate amongst experts in the field, the polygraph has become accepted once more as an apparently objective tool for assessment by some national agencies and other professional bodies directing standards of practice for sex offender treatment providers. Across the United States, the Association for the Treatment of Sexual Abusers (ATSA) has advocated the polygraph as a method of deception detection to be used in conjunction with other treatment techniques. In addition, almost half of juvenile corrections in the United

States use the polygraph as a clinical tool (Jensen et al., 2016).

The past decade has seen an increase in the number of studies exploring the utility of the polygraph in sex offender research. Advocates contend that the procedure is evidence-based and effective in aiding the supervision of sex offenders, as it contributes to the derivation of a more truthful and holistic representation of an individual's offending, high-risk behaviours, and sexual history, while also enhancing their compliance with probation conditions (Levenson, 2009). With regards to the utility of post-conviction sex offender measures, polygraph advocates claim that this tool is an essential component in the 'containment approach' for managing adult sex offenders in the community. A number of key benefits derive from the use of post-conviction polygraph testing (PCSOT). For example, an increase in the number of self-reported historic offences disclosed by offenders following a polygraph has been documented (Emmerick & Dutton, 1993). Some have judged the method as a superior assessment of therapeutic engagement and progress following a sexual offence conviction (Abrams, 1991) compared to more traditional paper and pen assessment self-report methods.

Some advocates of the polygraph also claim that it serves as a deterrent by preventing future offences and can assist in encouraging interviewees to be more honest with professionals (Edson et al., 2007).

4.3. The current use of the polygraph in the United Kingdom

Polygraph examinations have been used extensively in some countries (most notably in Japan, North America, and Israel) for both employee selection, and criminal investigations. Previously, the polygraph has not been used in the UK as an investigative tool to determine guilt or innocence amongst individuals under suspicion for criminal offences, in part due to the premise that the polygraph tests should rely on the 'deterrent effect' [that is, the fear of being caught lying (Gannon et al., 2014)]. However, the polygraph is now being used by police with suspects of sexual offences. Only relatively recently has the method received serious consideration as a potential means of facilitating the assessment and treatment of sex offenders.

A number of pilot studies have been conducted to examine the potential use of the polygraph in the UK. Grubin et al. (2004) reported preliminary, yet encouraging, findings from a pilot study with a small volunteer group of sexual offenders in three probation areas. This study found a significant decrease in risk behaviours for those subjected to the polygraph compared to those who did not undergo the examination (Grubin et al., 2004). These findings encouraged further research using UK samples funded by the National Offender Management Service (NOMS), which commissioned an extensive voluntary pilot across ten English probation areas (Grubin, 2006; 2010). The more recent UK pilot studies produced results suggesting that the odds of polygraphed offenders disclosing offence-related information assessment were fourteen times greater than for offenders receiving standard supervision with no polygraph testing.

In Grubin et al.'s (2004) study of offenders, participants were allocated to one of two conditions; the 'polygraph aware' in which participants knew that they would later be subjected to a polygraph, and the 'polygraph unaware' in which participants were unaware that they would undergo the polygraph. Of the entire sample, 67% failed the polygraph when denying their engagement in risk behaviours, and 97%

of offenders made subsequent disclosures. There were no significant differences found between the 'polygraph aware' and 'polygraph unaware' conditions with respect to either information disclosed, or polygraph outcome. The authors concluded that knowledge of the upcoming polygraph had not in itself deterred individuals from risky behaviours relative to their offending. In the second part of the study, all of the original participants were 'polygraph aware', and 28% failed the polygraph with a 'deception indicated' result. Of those who failed, 71% subsequently disclosed risk behaviours. Despite these encouraging results, high sample attrition rates limited the value of the findings, with only 21 of the offenders (42%) completing the study (Beech et al., 2001).

Despite these apparently promising results, a number of limitations prevail. Firstly, voluntary recruitment means that those who participated were probably more motivated to take the polygraph than offenders who declined to take part, and therefore represented a slightly biased sample of more compliant, therapy-seeking (as compared to therapy-avoiding) individuals. Secondly, offenders in the control group were insufficiently matched to those in the polygraph condition on a number of variables including their race, index offence and previous sexual offences (Gannon et al., 2014).

In April 2009, mandatory polygraph testing for adult (over 18 years of age) sexual offenders was piloted by the NOMS Offender Management and Public Protection Group in eight probation trusts in the East and West Midlands of the UK. Piloted results suggested that using the polygraph could increase the chances that a sexual offender under supervision in the community will reveal information relevant for their management, supervision, treatment or risk assessment, with over 50% of these disclosures occurring in the context of the polygraph session itself (Gannon et al., 2012).

4.4. The Bogus Pipeline Effect (BPL)

It is important to differentiate between the use of the polygraph as a means of determining whether a respondent is telling the truth or not, and its possible use as a means to encourage great honesty in the first place. Clearly, its potential in clinical work with sex offenders may involve both functions: as a lie detector, and as a means to encourage truthfulness. In respect of the latter function, what may be most important is not the true accuracy of the polygraph in detecting honest responses but, rather, the extent to which the respondent believes that the tool is able to detect false

responses. The bogus pipeline effect refers to a situation where an individual is influenced to respond honestly because they falsely believe that the machine to which they are attached is capable of indicating the truth about their responses.

The origins of the bogus pipeline concept lay in laboratory research undertaken by social psychologists in the 1970s. Social researchers have long sought to measure people's attitudes, thoughts and beliefs in an accurate and reliable manner. There are a number of challenges in the ability of psychological research to do this. An important consideration is that unlike the physical sciences, psychological research typically involves participants who are conscious of, and potentially reactive to, the social situation of the testing context. This increases the likelihood of a number of biases, reducing the validity of the research. These biases have been long recognised and include social desirability biases (Crowne & Marlowe, 1964), thoughtless responding (Langer, 1989), acquiescence biases (Bentler et al., 1971), experimental demand (Orne, 1962), and positivity biases in interpersonal evaluations (Jones et al., 1972).

The bogus pipeline (BPL) attempts to overcome some of these biases and increase the motivation amongst participants to offer more truthful self-reports (Jones and Sigall, 1971). This notion stemmed from work undertaken by Sigall in 1967 who was interested as to whether an apparent reduction in white prejudice against black people, as reported in surveys, truly reflected attitudinal change or whether respondents had become less willing to report their true feelings. In their pioneering article, Jones and Sigall (1971) convinced individuals that the physiological measurement apparatus to which they were attached could accurately detect their true thoughts and attitudes. Participants were asked to predict the machine's output whilst being reminded that the machine could detect when they were being deceptive. Therefore their bogus machine acted as an 'interactive prop', and neither the participants nor the experimenters depended on falsified, fixed feedback.

The underlying assumption of the BPL is that respondents are driven to provide more honest responses to avoid appearing 'out of touch' with himself or herself, or as being perceived as a liar. Three elements comprise the original procedure. Firstly, the participants are introduced to the physiological monitoring

machine, which they are told can measure their attitudes towards a certain topic. In reality this machine, despite its convincing appearance, is not measuring anything. Next, participants are attached to the apparatus via electrodes and a few rigged demonstrations occur to convince them that the machine operates accurately, encouraging a belief in the BPL's accuracy. The final stage of the original BPL method involved assessing the participant's attitudes after being instructed to answer as honestly as possible, whilst the participant remained attached to the machine. In some studies, the final stage also required participants to guess the machine's readings to their responses, under the assumption that participants would respond honestly to present as being 'in tune' with themselves.

Two key criteria are proposed for studies exploring the validity of the BPL. The first is that the BPL should produce reliable, measurable and consistent differences between responses offered from the control and BPL groups. The second criterion is that the impact of the BPL should affect the outcome of the polygraph 'test' (or whatever other tool is employed for this) in an appropriate direction. The appropriate direction can only be indirectly inferred, as questions are asking about mainly

subjective experiences. Typically, the 'appropriate direction' of the BPL is considered as an assumed shift towards examinees giving answers that present them in a more negative light. This assumption is due to the finding that social desirability biases usually guide participants towards offering a more favourable self-report (Alexander & Fisher, 2003).

A review of thirty-eight published social psychology reports found evidence for a measurable (albeit moderate) BPL effect (Roese & Jamieson, 1993) with 65% of studies reporting a significant BPL effect, and 43% reporting interactions between the BPL condition and another experimental variable. A meta-analysis conducted by the same authors reported a reliable and moderate mean BPL effect size of $d=.41$. There was no significant impact of gender or the topic of exploration (e.g. whether questions related to prejudice, attraction etc.). Confirmation of these null hypotheses implies a degree of generality in the BPL procedure and its application to research. Moreover, the BPL was just as influential regardless of whether or not participants had been previously convinced of the BPL's advanced detection mechanisms. Roese and Jamieson (1993) concluded that the most prominent disadvantage to the BPL was its impracticality over other design strategies (e.g. the

randomised response technique) in reducing social desirability and inducing the believability of the procedures. Overall, Roese and Jamieson (1993) concluded that individuals under a BPL effect are more likely to disclose negative information than those in pen-and-paper conditions alone.

4.5. The bogus pipeline in forensic research and practice

With regards to the operation of the polygraph, the bogus pipeline effect is a consequence of the belief that the machine can accurately distinguish truth from lies and, as a result, the likelihood of disclosures is increased. One suggested explanation for this observed effect is that individuals are more likely to disclose because they believe they could be, “caught out” by the polygraph. This is consistent with research demonstrating that one of the best predictors of criminal confession is the belief that there is sound evidence against them (Gudjonsson et al., 2004). Alternative suggestions are that a polygraph exam provides an opportunity to alter their account in a ‘face-saving’ way, or that there is something different about the polygraph interview which encourages disclosure, compared with the regular supervision interview, (Grubin, 2016).

Critics of the polygraph often use the BPL effect as an argument against the technique's utility. They state that because disclosure is dependent upon the examinee believing in the machine's accuracy, if they did not hold this belief, disclosures would not occur. However, it can be argued that the extent of the BPL effect has not previously been explored, and therefore, if the effect does exist, we do not know its strength, or what level of accuracy is necessary to trigger it.

Some sceptics of the polygraph's utility in forensic work suggest that the polygraph acts solely as a bogus pipeline (Crosse & Saxe, 2001), and that its success in differentiating between guilty and innocent individuals is wholly due to the fear it instils in those guilty individuals being tested and is the product of a belief that the polygraph 'works.' The premise is that without these beliefs, polygraph associated disclosures would cease (London Daily Telegraph, 2012).

An early study from Saxe et al. (1987) explored the hypothesis that participants' belief in the efficacy of the test is essential for the 'power of a polygraph' to prevail. The studies found false positives ranged from 0%-75%, and false negatives from 0%- 29%. A high rate of deception detection could be achieved even in the absence of polygraph testing.

When participants did not believe in the efficacy of the test, however, none of the guilty participants were detected, and innocent participants were misidentified as guilty. These results are consistent with classic social psychological research involving BPL methodology, which have been conducted to assess the degree of social desirability in attitudinal research (Jones & Sigall, 1971).

In a BPL study by Gannon et al. (2006), child molesters attached to a bogus lie detector did not report significantly more offence-supportive beliefs (cognitive distortions) compared with their own previous scores or those disclosed by controls. In fact, the bogus pipeline appeared to reduce cognitive distortion endorsements. These findings challenged the popular notion that the majority of child molesters possess distorted beliefs. However, a later and methodologically improved study from the same researcher a year later (Gannon et al., 2007) found the opposite effect, that when the participants were attached to a bogus polygraph, they reported a higher number of cognitive distortions. This study differed from the original in a number of respects. Firstly, the researchers increased the time interval between readministration of the questionnaire measuring cognitive distortions. Secondly, they indicated that they used a more

'psychometrically sound' measure of cognitive distortions (i.e., Bumby's MOLEST, 1996). Participants were also restricted to only high-risk offenders and were shown the bogus polygraph "working" from a manipulated screen output.

On the basis of this finding, the authors concluded that simply believing in the polygraph's ability to detect deception can facilitate the disclosure of offence-supporting cognitions amongst some child abusers. Furthermore, participants attached to the BPL demonstrated reduced impression management during the second time of questioning. Molesters in the BPL condition were also less likely to impression manage than participants in the control group not attached to a fake polygraph. This is a useful finding as impression management (a person's conscious or subconscious attempt to influence others' perceptions of them) has been found to reduce the validity of other forensic assessment techniques (Hines et al., 2010).

4.6. Criticism of the BPL

As noted above, some critics of the polygraph have argued that while it is unable to indicate whether someone is being truthful, it nevertheless, can influence behaviour in ways that

induce more honest reporting. Such critiques are not dismissive of the BPL effect in of itself, therefore.

However, others are less persuaded of the BPL effect, claiming that the methodology employed in many of the paradigm's supporting studies is flawed. Most notably, more than forty years ago, critics claimed that the use of such machines lacked empirical support, and that such an approach was both methodologically defective and unethical (e.g., Cherry, Mitchell & Byrne, 1976). Ostrom (1973) expressed concerns that the methodology was another failed attempt at creating the perfect attitude measurement tool. In response to Ostrom's comments, Jones and Sigall (1973) argued that,

"The 'bogus pipeline' is not an all-purpose substitute for conventional rating scales, but a procedure useful in certain settings to inhibit social desirability influences or to explore the affective components of attitudes" p. 260).

Other critics have queried the extent of a participant's motivation to avoid being second-guessed by a machine. Brigham et al. (1974) concluded from their research that the machine does not resolve systemic bias issues caused by response (felt pressure to report in a socially desirable manner) and accuracy-constraint (felt pressure to appear

accurate and truthful). This is supported in findings by Cherry et al. (1976), who found that the BPL was vulnerable to demand characteristics, particularly amongst individuals scoring highly in measures of social desirability. However, there is question as to whether the concept of a demand characteristic in itself even exists as a test-specific error variance (McCambridge, 2012).

The main purpose of the current study is to revisit and gain a better understanding of the bogus pipeline effect. Previous BPL studies have involved participants being told that the lie detector is 100% accurate, but it is not clear whether there is a threshold below which participants will no longer 'respond' to the bogus pipeline. This is relevant to polygraph testing, as its effect in increasing disclosures is often attributed to participants' belief that the polygraph can detect deception with 100% accuracy, and as a result, they are more inclined to disclose socially proscribed behaviours. Thus it could be argued that should examinees realise that it is not 100% accurate, disclosures will cease. Certainly, polygraphs are not claimed to be 100% accurate (the accuracy rate is believed to be in the region of 80-90%; National Research Council, 2003). Whether participants will cease to be subject to a BPL effect

when they believe it to be less than 100% effective is the key question that is asked in the present study. To achieve further understanding of this issue, the current study employs two different 'accuracy' levels to examine potential changes in disclosure rates.

There is currently a lack of research exploring whether there is a mediating impact from particular personality traits on the bogus pipeline effect. This warrants further attention, as it may be that individuals with differing levels of certain personality traits may be more or less likely to disclose based on the presence of a bogus pipeline effect. It was considered that two personality traits from the 'Big Five' Emotional Stability and Conscientiousness, together with suggestibility, should be examined in relation to their sensitivity to the BPL effect.

There is also a paucity of research investigating whether there is a mediating impact of suggestibility on the bogus pipeline effect. The notion of suggestibility is of particular interest with forensic populations, in consideration of criminal interrogations and false confessions. Although the current study does not include 'forensic' participants, this research remains applicable

when considering the utility of the polygraph with forensic populations, and could be used to justify future similar studies, with offender participants.

The selection of Conscientiousness for the study is based on findings from social psychological research that have found a negative correlation between Conscientiousness and personal disclosure on social networking sites. Here, participants scoring highly on Conscientiousness were less likely to disclose information about themselves (Hollenbaugh & Ferris, 2014). A study from the field of health psychology also found this trend. Here, HIV patients with lower levels of conscientiousness were more likely to disclose their HIV status to others (Adejumo, 2011). Although this study is also not in the field of forensic psychology, it concerns the disclosure of socially undesirable information such as is the case in the current study.

The choice of Emotional Stability (ES) reflects findings in the literature that those with lower levels will be more likely to disclose because they are more prone to anxiety (Judge et al., 2004) and negative emotions (Selby et al., 2013) that may arise during the stress of a polygraph examination. In such circumstances, it seems likely that those with lower levels of

ES will be affected by the polygraph in ways that may render them more likely to disclose.

The current study involved volunteer university students in what they believed was a study of group influence on cognitive tasks. Those receiving the bogus lie detector were informed that the 'deception indicator machine' was either 75% or 100% accurate in determining the truth. This design enables the influence of different levels of informed machine accuracy on the rates of disclosure to be explored.

The main dependent variable in the study was the disclosure rate for cheating in the three groups. It was hypothesised that:

(1) Individuals assigned to the 100% accuracy condition will disclose more often than those assigned to the 75% accuracy condition. Given that it is possible that the effect will only operate when the machine is believed to be infallible, it was also hypothesised that there will be no significant differences in disclosure between the 75% accuracy condition and the control group.

The reasoning behind this hypothesis, is based on the assumption that if participants are told that the machine correctly distinguishes truths from lies 75% of the time, some may choose to 'take the risk' of responding deceptively on the grounds that, even if the figures presented are accurate, there is still a 25% chance that the machine will not correctly identify whether they are being truthful or not. The reason for the 100% hypothesis is grounded in the assumption that because participants in this condition are told that the machine is infallible, they will be less inclined to respond deceptively as it is more likely that they will be revealed to be a liar.

(2) Individuals scoring highly on measures of suggestibility will be more inclined to make disclosures in both the 100% and 75% accuracy conditions than those in the control group. However, it is also hypothesised that this effect will be greater for those in the 100% condition.

The reasoning behind this hypothesis is that those individuals who are more suggestible will yield more to questioning at all accuracy levels of the polygraph, and therefore will be more likely to disclose. In addition, it is hypothesised that highly suggestible participants will be more likely to believe the

researcher's claims regarding machine accuracy, and therefore those in the 100% condition will still demonstrate the highest likelihood of disclosing.

(3) Individuals with lower levels of Emotional Stability and lower levels of Conscientiousness measured by the International Personality Item Pool (IPIP-50) (Goldberg, 1992) will be more likely to make disclosures in both the 100% and 75% accuracy conditions than those in the control group.

4.7. Research protocol and methods

4.7.1. Participants

The number of participants was determined following a Power calculation based on an expected effect size of $d=.41$. This effect size was derived from a meta-analysis of the BPL (Roese & Jamieson, 1993). With an effect size of 0.41, an expected significance of $p<.05$, and power of 80%, G Power (G*Power: Erdfelder, Faul, & Buchner, 1996) estimated that this study would need 155 participants.

Participants were recruited from students attending The University of Durham, UK (see recruitment poster Appendix

1). A sum of £20 was offered to each individual for their participation. Students across academic disciplines were asked to take part in the study, as I was actively seeking participants without specialist knowledge of psychological principles.

In full, 180 participants signed up to take part in the study, of whom 145 attended part 1 and 141 part 2 (82 females, 59 males). The high rates of attendance in part 2 may be attributed to the fact that participants only received payment if they attended both parts. Three participants were missing data for part 1, as they did not write their names at the top of the sheets and therefore could not be identified.

To optimise confidentiality, the exact age of participants was not taken; however all students were enrolled on undergraduate courses and there were no obviously mature students participating. For this reason, the estimated age range lies between 18-22 years old.

Because participants were all undergraduate students, it was assumed that they were of roughly similar intellectual ability, had experienced a similar length of time in education, and

were of broadly comparable socioeconomic status. Randomisation to condition minimised any systematic biases associated with these factors.

4.7.2. Design

The study was a 1 by 3 independent subject design. The dependent variable (DV) was disclosure of the cheating behaviour acted out by the confederate. The independent variable was the reported BPL accuracy (control vs. 75% vs. 100%). Individuals were randomly allocated to experimental or control conditions. A cheating confederate was present in all groups.

4.7.3. Ethics

Ethical approval was granted by the University of Nottingham, Faculty of Medicine & Health Sciences Research Ethics Committee, and the University of Durham.

4.7.4. Procedure

Prior to the study, participants were briefed in large groups using a standard study description, and subsequently gave written consent (see consent form Appendix 2). Participants

were informed that they were assisting with research exploring how and whether group performance impacts upon an individual's processing speed on subsequent tasks, ostensibly along the lines of, 'do group interactions prime cognitive processing?' Participants were informed of their right to withdraw at any time, and provided with a participant information sheet (Appendix 3). Participants were allocated into groups of 5-10 students including a confederate. All participants individually completed the self-report psychometric scales below.

4.7.5. Personality

The NEO International Personality Item Pool (short version) (IPIP-50) is a questionnaire comprised of 50 items registering five dimensions based on the Big Five perspective (Goldberg 1999) of personality: Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Intellect. Each domain comprises ten statements (scored 1–5). The average alpha values are stated to be approximately 0.80 for the IPIP-50 subscales. Valid IPIP-50 profiles were obtained for 141 participants attending part 1 of the study.

This study will focus on the personality traits of Emotional Stability and Conscientiousness, as research in other academic areas led to the conclusion that these two variables were most likely to have a significant impact on disclosure.

4.7.6. Suggestibility

The Short Suggestibility Scale (SSS) from the Multidimensional Iowa Suggestibility Scale (MISS; Kotov, Bellman, & Watson, 2007) was used. This consists of 21 items assessing differences in suggestibility. Each item is scored 1-5 indicating the extent of agreement with each statement (from 'not at all' to 'a lot'). Higher scores are indicative of high levels of suggestibility. The scale is reported to have good internal consistency ($\alpha=.92$) (Chan, 2014).

These particular scales were chosen as they are short and can be completed relatively quickly. An additional benefit of administering the psychometric tests was that they served to distract participants from the true research question explored (disclosure).

In total, 133 participants completed this measure. Scale data were not included for eight participants, as some scales were returned without names, precluding determination of ownership.

Following the administration of the brief psychometric test battery, participants were told that they were going to be asked to complete three tasks, two individual and one group. They were informed that a £500 prize donation to the charity of their choice would be awarded to the group with the highest overall score in both the group and final tasks (which provided an additional incentive to resist disclosure).

For the first exercise each participant completed an old version of the Wechsler Adult (WAIS) digit symbol task in 120 seconds. Following this, participants completed a 5-minute group task, which took the form of a multiple-choice quiz. In the final stage, participants were asked to complete an anagram task individually, while remaining seated in their group. The anagram task is an objective assessment of cheating, referred to in the literature as the 'Words Task' (Wiltermuth, 2011). Anagrams must be completed in order, but the third anagram is impossible to solve, which means that

no one should be able to proceed beyond it, enabling a clear discrimination between honest and dishonest individuals, the latter of whom would disclose three or more correctly solved anagrams.

At the completion of the tasks, the researcher asked one member of the group to add up the individual scores to obtain a group total. The researcher left the room after this instruction, making an excuse for doing so. When the researcher was out of the room, participants submitted their scores to the group member responsible for compiling the overall score. When it was their turn, the confederate stated to the other group members that they skipped number three, and asked the others to be complicit in the cheating by adding a higher score to the group total. Confederates stated this explicitly so that all members of the group were aware that an individual in their group had cheated/ attempted to cheat.

The confederate was a fellow university student, who had been asked previously by the researcher to act in this way.

4.7.7. Stage 2

All participants were emailed to return for the second part of the experiment in order to answer a number of questions about the testing experience. The same experimenter interviewed all participants to reduce experimenter effects. Individuals were randomly allocated to one of three conditions using a random number generator: one in which they were questioned with the assistance of a 100% accurate 'deception indicator', one with a 75% accurate 'deception indicator', and a control condition in which they were questioned without any external apparatus. There were 42 participants allocated to the control condition, 50 to the 100% condition and 49 to the 75% condition.

4.7.8. Procedure

Individuals were asked whether they, or anyone in their group, had cheated (as a combined single question). In order to offer an explanation as to why they would be asked about cheating behaviour within their group, participants were informed that some groups had reported abnormally high scores, which would indicate dishonesty amongst some of the competing individuals. The experimenter proceeded to explain

that it was important to determine which group was dishonest, as the winning group would be awarded a sizeable charity donation and this money should be awarded fairly. In the two experimental groups the 'lie detector' was introduced as a means of seeking out which group result should be discounted (for machine details see Appendix 4).

In the experimental conditions, each participant was informed of the machine's accuracy in detecting deception, depending on the group they were in (75% or 100%). Attachments from a genuine polygraph instrument were fastened to participants in the experimental conditions. Unknown to the participants, the 'deception indicator' was not turned on. While the experimenter secured the blood pressure cuff, respiratory gauges, and placed electrodes between the participants' fingers, forearms, and neck, participants were informed that the 'deception indicator' could assess truthfulness by measuring vital signs such as heart rate and galvanic skin response.

To enhance the believability of the bogus pipeline, the experimenter instructed participants to reply 'yes' to two questions, one which evoked a lie response (*'Is today*

Saturday?'), and one a true response (*'Are we in Durham, United Kingdom?'*). Shortly after asking these 'test' questions, participants were shown a bogus screenshot, which purported to differentiate the false from the truthful response.

Following this participants were instructed to sit still (in part to increase the believability of the test) and answer the following question:

'Did you yourself or anyone in your group attempt to cheat at any point of the experiment?'

Participants giving deceptive responses were then informed that the polygraph had detected deception for that question. The question was then repeated with the experimenter reminding the participant to be as truthful as possible.

Following questioning each participant was debriefed (Appendix 5) and informed of the true nature of the study. They were provided with the researcher's email address should they request further details of the study. (All participants were asked to keep the manipulation secret until the study was completed). During the debrief all participants allocated to the experimental BPL conditions were asked whether they

believed that the deception indicator machine was switched on.

4.8. Results

4.8.1. Gender

A chi-square test of independence was performed to examine the relation between gender and disclosure. The concept of gender was explored as some research has suggested that women were more likely to disclose to a female researcher (as was the case for the present study) (Prosser, 2013). The relation between these variables was non-significant $\chi^2(1) = .26, p = .61$. A separate chi-square test was conducted to explore whether there was any gender differences in rates of disclosure for those in the experimental groups only ($N = 99$). The relation between these variables was also non-significant $\chi^2(1) = .47, p = .49$.

4.8.2. The bogus pipeline effect

Table 4.1 provides the rates of disclosure for each condition.

Table 4.1: *Rates of Disclosure by Condition*

Disclosure	No	Yes
Group		
Control	27 (64%)	15 (36%)
75%	12 (24%)	37 (76%)
100%	7 (14%)	43 (86%)

To test the main effect of condition (i.e., perceived exposure to a 'lie detector' with various levels of accuracy) on disclosure, a logistic regression was performed to ascertain the effects of condition on the likelihood that participants will disclose cheating behaviour. The logistic regression model was statistically significant, $\chi^2(2) = 26.15, p < .0001$. The model explained 23.7% (Nagelkerke R^2) of the variance in disclosure, and correctly classified 75.7% of cases.

In a next step, the effect of the different levels of perceived accuracy of the 'lie detector' (i.e., 75% and 100%, respectively) on disclosure was tested by means of a logistic regression with dummy coded contrasts. With the control

condition used as reference, two planned contrasts were calculated; contrast 1 reflected the effect of being exposed to a 'lie detector' with 75% accuracy, contrast 2 reflected the effect of being exposed to a 'lie detector' with 100% accuracy. Both of these contrasts were statistically significant (Wald statistics for the respective b-coefficients were 13.24 and 21.40). The results suggest that participants exposed to the 75% accuracy condition (i.e., having been told that they were attached to a lie detector with 75% accuracy whilst responding to the disclosure question) are 5.41 times more likely to disclose than those who are not. In comparison, participants exposed to the 100% accuracy condition (i.e., having been told that they were attached to a 100% accurate 'lie detector') are 11.11 times more likely to disclose in comparison to those who are not attached to a 'lie detector'.

4.8.3. Suggestibility

To test whether the effect of an increased likelihood of disclosure under 'lie detector' conditions was moderated by the level of suggestibility of the respondent, a stepwise logistic regression analysis was conducted. In this analysis, disclosure was regressed on Suggestibility, condition and, in a subsequent step, the interaction term of both.

Results indicate that Suggestibility did not contribute over and above condition to the explanation of variance in the dependent variable (Wald for $b_S = 0.850$, $p = .356$). The inclusion of the interaction between Suggestibility and condition in the equation led to an increase of a mere 1% in the explanation of variance in the dependent variable (Nagelkerke $R^2_{\text{step1}} = .257$, Nagelkerke $R^2_{\text{step2}} = .267$, respectively); neither did the interaction term reach statistical significance (Wald for $b_{S \times \text{Cond}} = 1.165$, $p = .280$).

4.8.4. Personality (Emotional Stability and Conscientiousness)

In total, 136 participants completed both the IPIP-50 (Goldberg, 1992) and part two of the experiment. Table 4.2 provides Validity scale alpha coefficients, means, and standard deviations for IPIP scales in the current sample.

Table 4.2: *Validity scale alpha coefficients, means, and standard deviations for IPIP scales in the current sample*

Scale	Alpha	Scale M	Scale SD
Agreeableness	.76	38.28	5.55
Conscientiousness	.84	33.21	7.09
Emotional Stability	.87	31.55	7.99
Intellect	.73	35.49	5.31
Extraversion	.84	33.47	6.68

An analogous approach to that used for Suggestibility was chosen to test the hypotheses regarding Emotional Stability and Conscientiousness, respectively.

The results in relation to Emotional Stability indicate that this did not contribute over and above condition to the explanation of variance in the dependent variable (Wald for $b_{ES} = 0.039$, $p = .843$). The inclusion of the interaction between Emotional Stability and condition in the equation did not increase the extent to which variability in the dependent variable was explained (Nagelkerke $R^2_{\text{step1}} = .261$, Nagelkerke $R^2_{\text{step2}} = .264$, respectively), and the interaction term did not reach statistical significance (Wald for $b_{ES \times \text{Cond}} = 0.299$, $p = .585$).

Similarly, Conscientiousness did not contribute over and above condition to the explanation of variance in the dependent variable (Wald for $b_C = 0.196$, $p = .658$). The inclusion of the interaction between Conscientiousness and condition - reflecting a potential moderation- in the equation led to no increase in the explanation of variance in the dependent variable (Nagelkerke $R^2_{\text{step1}} = .262$, Nagelkerke $R^2_{\text{step2}} = .265$, respectively), and the interaction term did not

reach statistical significance (Wald for $b_{\text{CxCond}} = 0.279$, $p = .597$).

In sum, the analyses suggest that response behaviour in relation to a disclosure question is strongly affected by the circumstances under which responses are given. Whilst the effect seems slightly lower for a situation where the respondent is led to believe that they have been attached to a 'lie detector' with 75% accuracy, in comparison to a 'lie detector' with 100%, it is still substantive. Analyses also indicate that this effect is independent of the gender, suggestibility, Emotional Stability, and Conscientiousness of the respondent.

4.9 Discussion

These results indicate that participants in either experimental condition (i.e. attached to a bogus lie detector) were significantly more likely to disclose cheating behaviour than those in the control group who were not connected to such a device. Being attached to a 'deception indicator' increased the likelihood that participants would tell the examiner that an individual in their group had attempted to cheat during the anagram task.

Participants who were instructed that the machine was able, with 75% accuracy, to determine whether or not they were being deceptive in their responses were as likely to disclose cheating behaviour, as those who believed the machine had 100% accuracy. Thus, although it is widely assumed that the BPL effect requires a belief that the lie-detecting machine is virtually infallible, the present study did not find this to be the case. It was found that using a 100% 'lie detector' was not, in fact, necessary for the BPL effect to operate, as enhanced disclosure was elicited at both 75% and 100% levels of perceived accuracy. This finding challenges claims that procedures such as polygraph testing derive their efficacy in eliciting disclosures by making false claims about their accuracy (provided, of course, that their actual accuracy estimates are greater than that required to elicit the BPL effect).

Proponents of PCSOT argue that regardless of the explanations for increased disclosure amongst polygraphed offenders, the effect is real and useful. They query whether it is ethically viable to ignore risk relevant information due to concerns about the evidence base for the mechanisms that generate it (Grubin, 2016).

The current findings do not support the suggestion that two personality traits emotional stability and conscientiousness may be influential in predicting differences in disclosure. Unlike the findings in other areas of psychology, participants' levels of Conscientiousness did not seem to impact upon disclosure. Neither does it appear that any greater anxiety that might be expected to be experienced by those scoring low on Emotional Stability affects subsequent disclosure.

Research has indicated that individuals scoring highly on measures of suggestibility are more likely to make false confessions (Horselenberg et al., 2003). Although there is no basis in the current study to measure false confessions (every individual was exposed to confederate cheating), the findings contradict the position presented in some earlier studies, which have suggested that differences in suggestibility influence the likelihood of disclosure associated with the polygraph (Branaman, 2005). There was no association between scoring on the suggestibility measure and rate of disclosure, meaning that students who were more suggestible were no more likely to disclose in the current study.

Findings indicate that gender was not a confounding variable in the study. Previous research exploring the influence of gender on disclosure during criminal interrogations is limited. However, the present results would appear to contradict some earlier research findings stating that females are more likely to report offending than males during hypothetical interrogation scenarios (Mesiarik, 2008)

An ethical issue associated with the study was that participants were provided with misinformation about the 'lie detector.' However, the questions asked in the mock polygraph condition were unobtrusive, and referred to the cheating behaviour of another individual. A small number of participants admitted that they felt somewhat embarrassed that they had believed the machine was turned on and recording their physiology. Once the underlying premise of the 'bogus pipeline' methodology was described, all participants appeared less uncomfortable.

These findings are consistent with research suggesting that the polygraph can assist in revealing previously undisclosed socially undesirable or immoral information (e.g., Ahlmeyer et

al., 2000; Emerick & Dutton, 1993; English, et al., 2003; Gannon et al., 2012; Grubin, 2014), and that it achieves this effect at least partly through the examinee's belief in its efficacy. Thus, the findings support arguments that the polygraph may serve both as a lie detector and as a means to increase truthful responding.

In studying the behaviour of university students at a leading research- intensive university, the present research shows that the BPL effect operated with a highly educated, and, most likely, sophisticated population that one might anticipate would not be easily taken in by such a procedure. Thus, the BPL effect would seem not to be limited to those who might be considered to be those who are perhaps more gullible.

The research findings show that respondents do not need to be convinced that the machine is 100% accurate for its effect on behaviour to be apparent. However, they do demonstrate that the effect of the BPL is greater when respondents are led to believe that it has a 100% capacity to identify untruthful responses. Given that only 100% and 75% accuracy rates were suggested to respondents in the present study, further research could profitably explore whether there is a critical

threshold where the effect ceases to have a meaningful impact.

Several limitations in the study should be considered. First, during post- polygraph disclosure, 100% of the participants in the experimental conditions reported during pre-test interview that they believed the machine was switched on, and recording their physiological response to the questions. It is possible that participants claimed to believe the accuracy of the bogus pipeline merely because they had no apparent reason to openly refute it, or in response to demand characteristics. Three participants stated that they found either the behaviour of the confederate, or the momentary leaving of the researcher suspicious, during part 1. However, one would anticipate that any doubts about the role of the experimental procedure would, if anything, be more likely to reduce, than increase, the potency of the BPL effect. This suggests that, if some participants were not persuaded about the veracity of the cheating incident, the results of the study would potentially represent an underestimate of what would have otherwise have been obtained. Two individuals in the 100% condition stated that they struggled to believe the machine was infallible, although this figure is very low.

However, such suspicions may challenge the validity of the present findings, as some participants' responses during the bogus polygraph may have been potentially influenced these.

Four participants were adamant that they had not witnessed anyone in their group attempting to cheat. It is possible that these participants genuinely did not observe or actively process the confederates cheating. Ignorance resulting from a desire not to witness something, or 'plausible deniability', is a different deception strategy to making a continued effort to appear innocent, motivated by a fear of being caught lying, and may indicate possible deception detection evasion strategies in operation. Again, however, the number of any such individuals would appear to have been very small. Another limitation is that participants wrote their names at the top of sheets used in part 1, and therefore as researcher, I was able to identify those who were being untruthful during the experiment.

Second, participants were asked to keep the true nature of the study a secret following debriefing. It is possible that some participants shared this information with other participants who had not yet undertaken the second part of the experiment

(the BPL manipulation), which, if this were the case, could significantly harm the validity of the findings. To have overcome this possibility, it is possible that participants could have been given the debriefing at a later stage, for example after all participants had completed stage two. However this would have raised a number ethical dilemmas, regarding some of the participants leaving the experiment under the impression that they had a) been attached to a functioning lie detector and b) found to be deceptive, and the associated negative emotional responses this may have elicited.

Third, the current study was conducted with university students, and these findings may not generalise to other populations. University students at Durham University represent a relatively homogeneous sample and participants were highly similar with regard to their demographics. For example, the majority of participants were white British, in their early twenties, comparatively intelligent, and from middle class backgrounds. It is interesting to discover that the BPL effect operated with a group of highly educated, group of participants unlikely to readily accept the claims of a psychology researcher in a study undertaken in a university setting. However, one must be careful of generalising from this group to offender populations. Future research would

benefit from using a more diverse range of participants and exploring the potential influences of these variables on disclosure rates. The sample size here was substantial, conditions randomly controlled, with a strong power, and a strong test of cheating, which, taken together, provided the researcher with a degree of confidence in the results. However, it should be noted, nevertheless, that the study involved a mock scenario with feigned cheating on a competitive task, and the repercussions of disclosure were significantly less threatening than for persons undergoing offence-related polygraphs. As a result, participants in this study may have been less motivated to deceive the examiner than those under investigation for criminal offences. For example, a study by Strang and Peterson (2016) found that the BPL effect differs depending on the seriousness of the violation. For example, men in the BPL and control conditions were just as likely to report the use of verbal coercion in their sexually aggressive behaviour, but those in the BPL were statistically 6.5 times more likely to disclose the use of illegal sexual assault strategies. The authors suggest that these differences are due to the implications of the disclosures in light of their seriousness, for example verbal coercion strategies are not illegal and therefore are likely judged less punitively (Muehlenhard, & Peterson, 2004).

The weight of accumulated evidence indicates that the polygraph can influence disclosure in ways that render it useful for increasing participant honesty. This study has provided evidence that suggests that this effect is powerful even when the participant believes its accuracy to be less than perfect (indeed close to what are considered to be the true accuracy rates).

However, researchers will need to continue to explore how the polygraph can most effectively assist practitioners. Rosky (2013, 2016), a critic of the use of the polygraph in forensic settings, has argued that it is not increased disclosure that needs to be shown (he does not dispute this effect), but improved treatment outcomes in the form of reduced reoffending rates. In response, Jensen et al., (2016) criticises the concerns raised by Rosky (2013), highlighting that there are numerous methods of exploring treatment efficacy, not solely recidivism. They mention, for example, that some sex offender risk assessments (e.g. Static 99) are responsive to past historical offences and the use of the polygraph can assist in verifying these reported sexual histories. However, some might consider this to be a rather disingenuous response.

Ultimately, what is surely crucial is that increasingly sophisticated assessment informs more powerful treatment, and this ultimately leads to a reduction in offending and reoffending.

Rationale for Chapter 5

Chapter 4 demonstrates that a bogus pipeline effect appeared to operate in a study of university students when they were told that the procedure was either 100% or 75% effective. Chapter 5 goes on to present a single case study, involving the assessment and impact of psychoeducational group treatment of a man convicted of serious sexual offences and diagnosed with paranoid schizophrenia. It explores how professionals might encourage him to open up and disclose his sexual history and offending, while recognising the potential for deleterious consequences should self-protective cognitions to be challenged. Despite current guidelines ruling out the use of the polygraph with clients with severe mental illness, this chapter considers whether the use of a polygraph might sometimes be helpful in cases such as the one presented. The possible implications of the issues raised for broader clinical practice are also explored.

Chapter Five

**Psychoeducation with a Man in Medium Security with
Paranoid Schizophrenia: A Single Case Study**

5.1. Introduction

Given that the use of the polygraph in forensic settings is designed to encourage respondents to report their true feelings and beliefs, it is unsurprising that this tool is widely considered to be inappropriate for use with those suffering from psychotic conditions. However, should this always be the case for offenders who have a diagnosis of schizophrenia? Are there times when such an approach could be helpfully employed? The following case study examines a psychoeducational intervention with a client who denied personal responsibility for his offending on the grounds of his schizophrenia. In the light of the outcome of the intervention, the possible additional value, and challenges, of employing a polygraph test are considered. Finally, the value of seeking 'objective truth' as a means to foster clinical progress in the present case is considered.

For the purpose of anonymity the client will be referred to as Client A throughout this report. The study follows a single case design.

5.1.2. Referral details and offending history

Client A was a 37 year old male, referred to forensic medium secure care in 2014 under Section 37/41 (Hospital Order with Restrictions) following an initial period of 5 months in prison and 3 months in private psychiatric care. He was initially convicted of rape.

5.1.3. Family history

Client A is the second child in a sibship of three. He has two sisters, his eldest sister, sister1, and younger sister, sister2. He reported a positive yet occasionally volatile relationship with sister1, and claimed to have taken on a parental role towards her during their childhood, despite her being older. Sister1 has a diagnosis of paranoid schizophrenia and is currently treated in a psychiatric hospital relatively near to the family home. Client A stated that his sister's schizophrenia was apparent from a young age, when she would frequently regress into 'her own little world.' Client A does not appear to share a close relationship with his younger sister, sister2, who he has not had contact with since 2007 due to what he described as a 'dangerous dynamic,' characterised by jealousy and resentment.

Client A's parents were in their 60's at the time of this intervention. They separated when he was six years old. His father worked in a care home, and his mother was a supply teacher. He recalled his parents often arguing, and described his father as having mental health problems. Client A reported that his father had disclosed this to him at a time when he was on anti-psychotic medication in the 1980's due to suffering from a mental illness. Whilst growing up, Client A's father was largely absent, although they spoke from time to time on the telephone. He reports a mediocre relationship with his father with whom he remains in contact. Client A's reporting of a history of mental illness within the family fits with genetic and biological theories of schizophrenia (Ripke et al., 2014).

Client A stated that his mother rarely spoke to him from the age of seven, and described her as "mentally cruel" and "psychologically sadistic". He alleged that his mother subjected him to emotional abuse throughout his childhood and adolescence until the age of 18, when he began to confront and challenge her. Such experience is consistent with findings from a meta-analytic review that reported a medium to large effect of childhood adversity in people with schizophrenia (Matheson et al., 2012). It is quite possible that

maltreatment in Client A's early life was a factor in the development of his schizophrenic illness. Client A maintained that his family struggled financially and that, as a result, his mother did not meet his basic physical needs while he was growing up. Client A's mother remarried when he was 12 years old to husband2. Client A stated that husband2 showed evidence of delusional thinking, and added that the two of them did not get on. Client A denied experiencing any acts of physical or sexual abuse during his childhood, however the environment he describes indicates neglect.

5.1.4. Educational history

Client A attended mainstream education. He stated that he had a number of friends, but none that he was especially close to. He described himself as a 'loner' at school, feeling socially excluded for reasons that he was unable to describe. This self-reported rejection ties in to the 'social defeat hypothesis' of schizophrenia (Selten et al., 2013), which states that ongoing social isolation may lead to sensitisation of the mesolimbic dopamine system and thereby increase the risk for schizophrenia. He stated that whilst at school, other pupils would mock or tease him for appearing socially awkward and shying away from extracurricular activities. Client A reported

that he was able to complete academic work without much difficulty, but added that his academic performance would waiver when he was experiencing significant stress in the family home. He completed GCSE exams gaining A-C grades, and A Levels in maths, chemistry, biology and electronics. He then progressed to University to study electronic engineering, and was awarded his degree in 1999. He lived in halls of residence during his first year, but found this an unpleasant experience due to what he describes as 'loud and boisterous behaviour' of peers on his corridor. As a result, he spent the final two years living in a squat to avoid having to interact with other students. He recognises that he became increasingly psychologically unstable during this time period. Again, research has confirmed that increased social isolation can be both a consequence and aggravating factor of schizophrenia (Howes & Murray, 2014). After finishing his degree, Client A returned to his hometown where he found himself largely without purpose and his life lacked daily structure or routine.

5.1.5. Relationship history

Client A describes himself as a heterosexual and attracted to female adults. He has experienced two relationships with

women significantly older than him. Both relationships were relatively short-lived, with a maximum duration of three months. Studies have shown that an absence of adult intimate sexual relationships can impact on sexual recidivism (Hanson et al., 2007). According to Client A, all relationships terminated because of his delusional thinking and increasing struggle managing his psychosis. He noted that romantic partners would often become 'scared' of his odd (or seemingly odd) and eccentric behaviour, and end the relationship soon after. Client A reported first having sexual intercourse at age 21, but admitted that he did not feel confident sexually. He stated that he learnt about sex through watching online pornography and stated that he would watch this for hours at a time, past reaching orgasm. This excessive preoccupation with pornography is a phenomenon that has been reported for individuals with high levels of sexual aggression and aggressive attitudes (Hald et al., 2010; Johnson, 2015; Nøttestad et al., 2010; Vega & Malamuth, 2007). Client A first paid for the services of a prostitute in 2003 when in Amsterdam on a visit alone that had been made exclusively for this reason. He admitted to sleeping with prostitutes on average twice a year as he felt less threatened when engaging in sexual activity with them, because they were paid to

'provide a service' and therefore the potential for rejection was not an issue.

5.1.6. Schizophrenia

Client A has a diagnosis of paranoid schizophrenia, which he received following a referral to private forensic psychiatric care in 2006. Studies demonstrate that it is not uncommon for individuals to receive their first diagnosis following detention or involvement with the criminal justice system (Way et al., 2015). During the acute phases of his illness (prior to hospitalisation and the prescription of antipsychotic medication) Client A experienced significant delusional ideation. His belief system was characterised by delusions of grandeur, referential delusions of communication, and referential delusions of observation. Client A has also experienced auditory hallucinations that, he states, instructed him to commit the offence on the grounds that the victim was an evil force that needed to be eradicated. This is consistent with evidence that voices commanding acts of violence toward others are likely to be influential in the commission of violent behaviour (Bjorkly, 2002), and that patients are more inclined to comply with hallucinations that are consistent with their delusions (Junginger, 1995).

In relation to Client A 's delusions of grandeur, whilst unwell, he repeatedly stated that he encompassed an element of 'higher being' and therefore had the responsibility of 'saving the planet' from evil forces. Client A commented that he thought there were witches everywhere that intended to kill him. He advised that on the particular day of his offence he had gone out looking for evidence to support this belief, i.e., 'witch symbols', to prove they were real, believing that he possessed 'special sight' to see these. He described himself as being in 'an extreme state of combat' at that time and stated that he had armed himself with a corkscrew and a piece of wood with screws protruding from it. He added that about a year later he began carrying a knife to 'protect himself from lynch mobs': these were also part of his delusional belief system. Research has indicated that it is not uncommon for individuals with paranoid delusions to carry weapons for self-protection (Coid et al., 2013) because of the powerful nature of such threatening beliefs. Client A stated that, at this time, he was experiencing daily paranoid thoughts that increased feelings of distress. These reinforced and propagated his delusions of persecution. Because of his lack of trust in others, he dealt with these fears alone and without any challenge from others, such beliefs became increasingly powerful.

5.1.7. Forensic history and index offence

Client A has three convictions for a total of five offences. These consisted of two offences against property, one offence relating to police/courts/prisons, and two miscellaneous offences. Of course there may have been additional crimes, which went undetected; however Client A did not disclose any additional offences.

The index offence (I.O) occurred in 2012, and involved Client A booking a female escort. When he went to kiss her, she refused. He stated that at that point he became increasingly paranoid about her being part of a conspiracy against him. When she stated that she wished to leave, he proceeded to rape her multiple times over a nine-hour period.

Client A was sentenced on the basis of the following:

- False Imprisonment (of a female)
- 2 offences of assault by penetration (including 1 count of anal digital penetration, and 1 count with sex toy)
- 5 offences of Rape (including 3 counts of anal, 1 count vaginal, 1 count oral)

5.1.8. Substance misuse and addictive behaviours

Client A denied any significant current or historic substance misuse. He did, however, confirm that he was intoxicated with alcohol at the time of the index offence, and added that if sober he may not have been as likely to have offended. This claim is supported by findings from research with sexual offenders demonstrating that alcohol consumption can increase the likelihood of sexual assault due to its disinhibiting effect (Abbey et al., 2014).

Client A informed me that, prior to committing the offence, he had experienced periods of 'pornography addiction' where he would spend hours viewing pornography online. He stated that he felt that this served as a self-soothing strategy during times of acute stress and social isolation.

5.2. Sex Offending and psychosis

Persons with psychotic disorders have been largely neglected from the literature on sex offending (Alden et al., 2007). Some studies have found an elevated incidence of violent sexual offences in males with such disorders, and it is generally accepted that patients with psychosis are less able to inhibit

inappropriate behaviours, and more readily act upon deviant thoughts (Craig & Giotakos, 2011). Smith and Taylor (1999) found that almost all the schizophrenic sex offenders in their study reported hallucinations or/and delusions at the time of the index offence, with 33-43% of these symptoms being directly or indirectly related to the offence. Individuals with psychosis have also been associated with a higher risk of sexual reoffending (Fazel & Yu, 2011) and may show features of bizarre and exceptionally violent behaviour (Takeuchi & Remington, 2013). However this association may be confounded by sociodemographic, criminal history, and other clinical factors. Because of Client A's reluctance to disclose information about his thoughts or feelings at the time of the index offence, it proved difficult for his clinicians to gauge the content of his cognitions and any difficulty he may have had with inhibition. One alternative way clinicians may have been able to gather this information is collaterally, from speaking with family members and peer informants.

A number of negative psychotic symptoms, including problems with motivation and social interaction, are detrimental to patients' abilities to meet their sexual desires in a socially viable way and when untreated, these may increase the risk of

sexual reoffending. Treatment of the mental illness, in part by teaching patients how to detect negative symptoms through psychoeducation (such as the current PAG intervention), may assist to reduce the likelihood of offending through earlier intervention (Garrett & Thomas-Peter, 2009).

5.3. The nature of denial and deception

It is important to recognise that the polygraph is principally designed to identify deception rather than denial. Denial has been considered in the literature as both a binary construct (i.e. one is either denying something or they are not) and as representing a continuum of behaviours ranging from complete denial ("I didn't do it") up to the point of total acceptance of guilt and responsibility (Craissati, 2015). In addition to the degree to which the individual admits undertaking the act in question, the impact of, and responsibility for, their position along this continuum can also reflect varying degrees of minimisation (playing down the significance of the event, often when outright denial is impossible) and justification.

Craissati (2015) notes that denial can also be perceived as varying on a consciousness dimension. Thus, one may consciously engage in denial in order to effect a more desirable outcome (e.g., a less severe sanction), while, in contrast, attempts to minimise the impact of the act in order to reduce emotional discomfort, and reduce threat to one's core vision of oneself (Yates, 2009), may operate at a more unconscious level. Craissati further states that denial may be based upon distorted ideas that are truly believed, for example, as a result of self-deception or delusion (Bortolotti & Mameli, 2012). Delusional beliefs represent false convictions marked by inadaptability on the basis of logic or evidence. As such, an individual's account may be both subjectively true and objectively false (Langleben, Dattilio, & Guthei, 2006).

Deception represents a deliberate attempt to fabricate conceal and/or manipulate factual and/or emotional information (Masip, Garrido, & Herrero, 2004). The objective of deception is usually to create or maintain in others a belief that the communicator considers false.

It is possible that Client A's cognitions and responses are underpinned by elements of delusion, denial and deception, Although he admitted the criminal act of rape from the outset, he continued to underplay the seriousness of the offence, including denying any act of anal penetration with a sex toy. He minimised the impact of the offence on his victim, claiming that she appeared to take some pleasure in the incident, on the grounds that he had heard her moaning and eventually no longer asked him to stop. What was uncertain was whether Client A really believed that the victim found the offence pleasurable and therefore, in his opinion, the offence was less serious. If this were truly the case, the educative component of the treatment programme might need to focus more intensively upon such issues. Given the potential clinical value of achieving greater understanding of the client's cognitions, would a polygraph test have been able to have made a meaningful contribution? Here, however, the client's psychosis, and uncertainties surrounding the nature of his denial of personal responsibility, contributes significantly greater complexity to the resolution of this issue.

Client A did not deny committing the offence (perhaps because he was arrested at the scene of the crime with indisputable evidence against him). However, he continually circumvented

the need to take personal responsibility for his actions, stating that he was unaware of his intention to rape the female due to his schizophrenic illness and therefore should not be punished for this, nor have to spend time in prison or hospital.

In planning Client A's treatment programme, the clinical team considered that his reluctance to accept ownership of the problem could be therapeutically damaging on the grounds that such behaviour may prevent full participation in treatment, and has been shown to lead to higher rates of attrition (Beyko & Wong, 2005; Levenson et al., 2009; Levenson and Macgowan, 2004). For this reason, it was considered that engagement in a psychoeducation group had the potential to increase his awareness of psychotic illness and also encourage him to no longer hide behind the illness and, instead, accept responsibility for his actions. However, as is discussed below, such a strategy may not necessarily prove helpful in work with sex offenders (Craissati, 2015).

5.3.1. Appropriateness for the Psychosis Awareness Group (PAG)

Client A had been struggling with untreated schizophrenia for a number of years, and it is possible that this had a role to

play in his index offence, as reported delusions at this time were directly related to his criminal actions. Client A was considered too mentally unwell for prison, due to the nature and extent of his illness, and he was therefore sectioned under 48/49 (transfer of a prisoner on remand to hospital) of the Mental Health Act (2007), and detained in hospital for treatment. He is currently receiving a depot anti-psychotic (haloperidol 20mg). Haloperidol has been proven to be effective in the pharmacological treatment of schizophrenia (Nakamura et al., 2013) and ward staff were in agreement that depot would be more suitable than orally administered anti-psychotic medication, due to previous covert non-concordance and relapse prevention (Patel & David, 2005). In conjunction with his medication, Client A was engaging in individual psychology sessions, which predominantly followed a cognitive behavioural therapy (CBT) framework. CBT is widely thought to be the most effective psychotherapy for encouraging a reduction in delusional symptoms (Ryan et al., 2014).

Client A undertook a psychoeducation intervention to help him to understand his mental illness whilst at a previous psychiatric hospital, but this was not completed due to his

transfer to the current unit. It was felt that he would benefit from recommencing this type of intervention, as research indicates that such programmes can assist patients in identifying signs of relapse, including potential stressors, and develop adaptive strategies to help manage symptoms, with the aim of reducing the frequency and intensity of relapse (Pasadas & Manso, 2015).

Client A successfully completed the preparatory group programme, '*Groups Are Great (GAG)*', an intervention designed to introduce patients to group based therapy, and increase their ability and confidence when participating as part of a group. Reports suggest that Client A actively became involved during group sessions, attending regularly and working well with others. This indicated that he was an appropriate participant for this level of group therapy, as motivation and engagement are predictors of successful treatment completion (Kukla et al., 2014).

Client A spoke openly about the nature and content of his previous delusional beliefs and thoughts to certain staff members, particularly during psychological work. However, he continued to appear resistant to discussing these symptoms in

relation to the index offence. Therapists within the team considered that Client A's avoidance of offence-related discussions and focus on the schizophrenic illness may have been manifestations of deeper underlying offence-tolerant attitudes which could serve to justify his offending behaviour (Mann, Webster, Wakeling, & Marshall, 2007). Ideally, the subsequent group work would enable such a possibility to be probed and responded to as necessary.

5.3.2. Empirical evidence on psychoeducation for psychosis

Psychoeducation is the delivery of systematic, structured, didactic information on an illness and its treatment, which also integrates emotional aspects of the individual's experience, in order to enable patients to cope with the illness. Psychoeducation is often delivered within a complex family therapy intervention but can also be delivered as an independent therapeutic programme with individual or groups of patients (Bäumel et al., 2006).

The primary objective of the psychosis awareness group (PAG) was to provide patients with education from which they can gain knowledge and understanding through a process of

learning involving changes in behaviour, skill or attitude (Falvo, 1994; Rummel-Kluge, 2008). In the current case, it was hypothesised that learning about psychosis would encourage the patients to manage and recognise their psychotic symptoms, and thus reduce the risk of relapse (Xia et al., 2011) and encourage early detection, leading to quicker intervention and help-seeking behaviour (Reid, 2005). NICE (2002) guidelines recommend education on schizophrenia as part of treatment, with positive findings from a relatively recent research review (Xia et al., 2011) demonstrating that psychoeducation promotes better social and global functioning.

As a focus for treatment, a higher number of early maladaptive schemas have been identified amongst schizophrenic patients including; mistrust/abuse, emotional deprivation, social isolation, defectiveness, enmeshment, failure and subjugation (Bortolon, 2015) which can further increase the risk of offending (Richardson, 2005). Through the provision of factual information, it was hoped that the delivery of psychoeducation session would assist in challenging these schemas, and encourage Client A to share more.

5.4. Formulation

The formulation for Client A followed Weerasekera's "Five P's" framework (1996). This model was chosen due to its holistic approach in terms of thinking about all aspects of an offender's functioning, including biological, psychological and social factors which can link a clinical and forensic problem to its origins, development and maintenance.

5.4.1. Predisposing factors

Attachment: Client A has experienced a pattern of dysfunctional attachments stemming from early childhood, which are likely to have impacted upon his ability to form healthy adult relationships (Fonagy et al., 2013). Client A described an insecure/disorganised pattern of attachment and a toxic relationship with his mother, who he claims subjected him to emotional abuse and neglect from his earliest years. Client A has continuously reported feeling very unwanted as a child, and felt that he would often be used as an outlet for his mother's frustration and untreated mental health problems. Anger and hostility towards his mother remains a central topic, almost a preoccupation, in ongoing individual psychology sessions. Client A's mother has seemingly provided him with

an unhelpful template for understanding females and his isolated upbringing and avoidance of closeness with women has limited his ability to challenge these faulty preconceptions (Maguire et al., 2015). In individual psychology sessions Client A has described most women as 'threatening' and 'manipulative. Such hostility towards women is frequently expressed amongst sexual offenders (Gannon et al., 2008) and supports sexual aggression by interfering with empathy and increasing anger levels (Wakeling & Barnett, 2011).

According to Client A, his father presented with signs of mental illness during his upbringing, which further contributed, to a chaotic early family environment. He felt his parents were more preoccupied with their own needs at the expense of their children's. It remained evident that Client A continued to harbour a sense of bitterness towards both parents, for leaving him to feel emotionally deprived and without comfort when he was growing up. Such exposure to perceived rejection and absent parenting has been linked to the development of psychosis (Morgan & Fisher, 2007)

Environmental factors: Client A referred to himself as a lonely child who spent much of his spare time reading factual books

and avoiding people, as he did not enjoy the company of others. It appears that this was an early self-protection mechanism; he had learnt to manage a fear of rejection. Client A's focus on difficult academic material, mostly mathematical, shifted the basis of his self-worth to matters largely within his own control, without requiring approval from others. As mentioned previously, Client A's early environment was chaotic and unsettling. He discussed periods of financial difficulty when his mother and father were unable to provide for his and his sister's basic needs, and felt this led him to be singled-out from other children who would bully him for his lack of material wealth.

Social factors: Client A stated that he did not enjoy the social aspects of school, and experienced difficulty making new friends. He reported spending most of his time alone and took pleasure in learning new things from mathematical books. Client A recalled feeling 'different' from a young age, and reported symptoms synonymous with social anxiety, a condition that is a frequent, but often unrecognized, feature of schizophrenia (Kingsep et al., 2003). He described an increase in social withdrawal during his first year in university when the initial signs of schizophrenia emerged.

Precipitating factors: Client A experienced difficulty in managing negative emotional experiences, for example as a result of rejection or belittling, but does not appear to be consciously aware of these feelings. Poor emotion management is often reported amongst sex offender populations, and is often a focus of sex offender therapy programmes (Ward & Mann, 2004). Increasing social isolation and a lack of opportunity to interact with others encouraged a deterioration in Client A's psychological wellbeing, evidenced by active withdrawal from the company of others, and spending long periods of time studying alone. The acquisition of knowledge seems to have provided a sense of purpose and mastery for Client A that served to alleviate some feelings of inferiority in other areas of functioning. Periods of acute stress have been identified as a trigger for the worsening of Client A's schizophrenia, as for many individuals suffering from the illness (Belvederi et al., 2012) and this appears to coincide with increasing self-isolation and an absent support network (Oliveira, Esteves & Carvalho, 2015).

Presenting factors: Client A continues to experience difficulties in accessing, recognising and managing his emotions, a

frequent clinical deficit, and one not specific to schizophrenic illness (Cedro et al., 2001). He also demonstrates problems communicating in groups, which is why short-based group therapy may provide a useful platform for practising group skills in a non-threatening and structured setting. Indeed ameliorating social impairment has become one of the most important challenges when treating patients with schizophrenia due to their difficulties with understanding and attending to social cues (McGurk et al., 2004).

It was decided that Client A continues to present at high risk for future offending due to his perceived lack of insight into his offending behaviour, and the seriousness of his offence (Boer & Hart, 2009). He continued to offer his schizophrenic symptoms as a justification for his offence, minimising responsibility for his actions. In contrast to child sexual offenders, sex offenders who offend against adults are more likely to use blame attributions associated with the particular offence, including pre-existing symptoms of mental illness (Blumenthal et al., 1999). In the upcoming months Client A is scheduled to complete a programme of intensive 1-2-1 therapy which will explore the events leading up to the index offence and the actual offence itself. The PAG will help prepare

Client A for this intense and challenging therapy by dispelling myths about mental illness and introducing some of the key therapeutic concepts characteristic of treatment.

Perpetuating factors: Client A continues to minimise responsibility for the index offence, incessantly blaming his actions on the psychotic delusions he experienced at the time. Such distortions were perceived by the clinical team as potential barriers to successful future treatment on the grounds that they, could reduce Client A's sense of accountability and prevent him from accessing and managing feelings of guilt. Such feelings were considered to be important motivators for change and indicative of empathic understanding (Prentky & Righthand, 2003). Client A's avoidance of responsibility appears to be reinforced by distorted beliefs and self-deceptive thinking processes. The PAG will help Client A understand the true nature of psychosis and sessions may also challenge some of the faulty beliefs he has about the disorder's all-encompassing influence on behaviour.

Client A has poor strategies for coping with stress and perceived social rejection. He lacks crucial emotional

recognition skills and cannot manage negative feelings. At present, he struggles to maintain an association between thoughts, emotions and behaviours, and therefore cannot self-regulate or manage negative emotions before they build and catastrophise. The PAG will teach patients how to recognise early warning signs for relapse into psychosis, and how to seek the necessary help or, if possible, self-manage to avoid a deterioration of mental health. The concept of early recognition is important because it allows for early intervention that teaches patients how to control their own behaviour and therefore seeks to instil a sense of mastery (Fluttert, et al., 2008).

According to reports from staff, and by his own admission, Client A continues to remain isolated on the ward. This facilitates the continuation of faulty beliefs concerning his self-worth and inability to bond with others. The PAG is attended by a number of other patients across the hospital wards, and sessions include group and pair tasks which will encourage Client A to work within a team and share experiences and thoughts with others. It has been suggested that Client A can, at times, adopt a grandiose demeanour, particularly with reference to academic credibility and knowledge. It was

unclear whether this was genuine or a self-protective strategy representing an attempt to mask feelings of inadequacy and low self-esteem. Individuals with highly grandiose delusions often have higher self-esteem and hold less negative evaluations about themselves than psychotic individuals without such delusions (Smith et al., 2006). Such presentation has previously encouraged peers to avoid Client A as mutual exchange leads to feelings of inferiority and can make the recipient of his conversations feel badly about themselves.

Protective factors: Client A does not deny the index offence, a factor which increases his likely responsiveness to treatment (Cooper, 2005), but continues to blame some of these actions exclusively on his psychosis. Overall, he is polite, well mannered and expressed an initial interest to join the group, which suggests a desire to engage and learn more about his mental health condition. Evidence of motivation has been identified as a predictor of therapeutic engagement (Hiller et al., 2002). Client A reported that he enjoys helping others and is likely to benefit from helping and supporting other group members, some of whom will perhaps struggle to understand some of the material.

5.5. Intervention

Pre-course and Post-course psychometric measures:

📄 Thoughts and Feelings about Medicines Questionnaire
(Appendix 6)

📄 Schizophrenia Questionnaire (Appendix 7)

The PAG consists of an individual pre-group assessment, ten group sessions, and an individual post-group review. The ten group sessions are tabulated in Appendix A and described in detail in Appendix B. Each session has a defined closing section, in which group members are thanked for their contributions and asked for their reflections on the session. Reflection included commentary on particular learning points, views on what went well, and what could be done to improve the session for future cohorts. The beginning of each session also included a recap of the previous session to refresh key learning points.

1. Client A was one of the more vocal group members. From Session 1, he demonstrated enthusiasm for the subject area and displayed a keen interest in learning more about psychosis. Client A also assisted the team by completing a weekly session review form, administered by myself and another member of the psychology team. This form required Client A to reflect upon the previous PAG and to offer ideas for

improvement for future attendees with respect to delivery style, content and organisation. The participation of patients in the planning, delivery, and evaluation of services is increasingly recognised as essential to a recovery-oriented system of care for patients with a psychotic illness (Dixon et al., 2010).

2. Client A was helpful in assisting another group member who struggled with grasping the stress-vulnerability model (Zubin & Spring, 1977) and generally demonstrated good communication skills with others in his group. He demonstrated a particular strength during Session 2 in his ability to identify differences between physical and mental health difficulties, discussing the variation in time between different patients recovery. He also offered a dictionary definition of 'illnesses' in an attempt to formally explain the concept.

3. During the first session Client A appeared enthusiastic and thoughtful during Session 3. He actively contributed to group discussions; however at times he became slightly domineering. When asked to give a positive point from the previous week he stated that he had enjoyed cooking sessions

with the occupational therapist. This indicates that Client A is able to enjoy the benefits of social engagement and involvement in prosocial activities with staff on the ward. Client A was able to interpret psychosis as an illness and easily grasped the difference between positive and negative symptoms, whilst other patients struggled more in making this distinction. Client A repeatedly tried to explain the classification of these symptoms to others in his group. Although this could at times have been interpreted as somewhat arrogant or pretentious, it was recognised that Client A does present with above average intelligence. Overall it was agreed between facilitators that Client A did have a genuine interest in supporting others and that performing this function would most likely help to increase his self-esteem.

4. During Session 4, Client A continued to present as reflective and engaged, making a number of relevant (and somewhat revelatory) comments about the factors he felt contributed to his experience of psychosis, including reference to the difficult relationship with his mother during his childhood and adolescence. Client A appeared to have a particular interest in the stress vulnerability model as a theory of psychosis. He stated that stress factors had had a significant influence upon his own development of the illness,

commenting specifically upon his lack of stable accommodation at this time, which contributed to his chaotic lifestyle. His readiness to share information encouraged other group members to share their experiences with greater confidence and listen in a non-judgemental manner.

5. Client A engaged well in Session 5, making useful distinctions between symptoms experienced in the early, active and recovery phases of psychosis. He made reference to 'acute factors,' which as he explained occur most commonly during the active phase of psychosis and was a leading member when performing a card sort group task.

6. Again, Client A was one of few participants who made reference to their own experience of psychosis. In Session 6 Client A shared some of the early signs of psychosis that he experienced when he first became unwell. He was able to listen to others reflections but at times appeared rather preoccupied with thoughts as to what his next contribution would be.

7. During Session 7, Client A was the least vocal he had been throughout the programme. This is most likely due to the fact that the session looked at the association between substances and psychosis. Despite acknowledging that alcohol was likely to have played a role in the sexual assault, Client A stated that he has no history engaging in of illicit drug use or heavy alcohol consumption. For this reason, he may have felt less able to contribute. Although this could be interpreted as a reduction in engagement, it also enabled Client A to follow the lead of other group members and learn more about the negative impact of taking such substances from the first-hand experiences of his peers.

8. Session 8 explored different types of stigma related to psychosis, and participants were encouraged to participate in an end of programme quiz (Appendix 8). Client A did not appear to enjoy this session as much as those previously delivered. He stated that he did not feel that the video material used to illustrate stigma in mental health was relevant to those with a forensic background. Client A can at times appear somewhat dismissive in acknowledging the aims of presented material, particularly when he feels that this does

not target his specific needs. The content of each session can be seen in Appendix 9 and Appendix 10.

5.6. Post- psychometric results

- *Schizophrenia Questionnaire*

The *Schizophrenia Questionnaire* is a 23-item self-report inventory that measures factual knowledge about schizophrenia and was administered both before and after the PAG. A higher score indicates a greater factual knowledge about schizophrenia. Client A obtained a pre-course score of 19 out of 23, and a post-course score of 21 out of 23, indicating that he has had a good knowledge of schizophrenia throughout the course with some improvement demonstrated at the programme.

- *Thoughts and Feelings about Medicines*

Thoughts and Feelings about Medicines is a 26-item self-report inventory that measures beliefs about medication and was administered both before and after the course. A higher score indicates a more positive attitude towards taking antipsychotic medication. Client A obtained a pre-course score of 22 positives, 1 negative and 3 'Don't know' out of 26. He gained

a post-course score of 22 positives, 0 negative and 4 'Don't know'. This indicates that he has an overall positive attitude towards taking antipsychotic medication and his positivity remained throughout the course.

5.7. Has the polygraph the potential to contribute to Client A's treatment programme?

While, in theory, it is possible that the use of a polygraph might have helped the therapist to gain a clearer picture of Client A's thoughts and feelings, and also to have encouraged him to engage in open and frank discussion, a client with his psychological profile would not on both regulatory and scientific grounds, be deemed appropriate for this approach.

Current regulatory guidelines do not support the use of the polygraph with someone with a diagnosis of schizophrenia (see page 8 of the 2014 Polygraph Examinations: Instructions for Imposing Licence Conditions for the Polygraph on Sexual Offenders by The National Offender Management Service; <https://www.justice.gov.uk/downloads/offenders/psipso/psi-2014/psi-36-2014-polygraph-examinations.pdf>). This is, in

part, is because little research has been conducted of its use with those suffering from acute mental illness.

In the legal setting, delusions pose a particular challenge for deception devices, because they seek to identify a deviation from objective truth with a device sensitive only to the correlates of individuals' internal (subjective) states. This poses questions about exactly the nature of truth and denial with such clients. Furthermore, there are also likely to be measurement difficulties as schizophrenic patients, can present with an abnormal autonomic system (Schell et al., 2005) and a reduced physiological and emotional response to various stimuli (Kring, 2008). For such reasons, some researchers have argued that the polygraph cannot be expected to be accurate with individuals who have chronic mental health diagnoses within the psychotic spectrum of disorders (Abrams, 1974). Furthermore, systematic research has not been undertaken to investigate the impact of anti-psychotic medication on polygraph measurement, and it is not known to what extent Client A's compliance with Haloperidol would affect the validity or reliability of such a test (Vempati & Telles, 2000).

As Client A had pleaded guilty to the charges and had already been convicted of his sexual crime, a polygraph employed to help determine his guilt would have served no meaningful purpose. However, might its use have yielded additional insights that could inform the content of clinical intervention?

If one accepts the claims of Hirschmann, Guzner and Lev-Ari (2014) that the polygraph can have relevance for psychotic patients, it is possible that the tool might have some value in examining Client A's beliefs about his offending. Hirschmann and colleagues examined the reported delusions of 23 psychotic patients. Their findings suggested that the polygraph was able to accurately indicate that respondents truly believed the content of their reported delusions and, as a result the tool can, "...be used to confirm or refute expert testimony concerning the content of illness-related delusions" (p. 4). Importantly, the authors claimed that beyond the boundaries of clients' psychotic content, the polygraph might have a role in differentiating between truths and non-truths.

While the findings of this research team offer tentative support to the notion that polygraphy may contribute to forensic work with those who present with delusional beliefs, one must be aware of a number of caveats. Firstly, 6 of the 23 patients

were deemed unsuitable for this small-scale study on the basis that they did not understand the questions or presented as extremely agitated. Secondly, the published paper is lacking in methodological and substantive detail and appears not to have been subjected to peer review. Finally, I have been unable to find evidence of follow up studies on this theme by this team, or any subsequent citations or commentary by other scholars. Not only are there scientific grounds for caution here, there is also no meaningful indication about how information obtained, assuming it were valid, could be meaningfully employed for therapeutic purposes.

If it were determined that Client A is now thinking lucidly, could a 'maintenance polygraph' assist in monitoring his progress and adherence to therapy? As noted earlier in this thesis, there is some support for this approach with studies, albeit of non-psychotic clients, having indicated that polygraphy can further treatment engagement by promoting honest relationships within and outside the therapy setting (Kokish et al., 2005). Because Client A disclosed consuming alcohol prior to the offence, issues concerning mediating factors in his offending, such as the misuse of substances, could also potentially be explored as part of the polygraph test (Gannon et al., 2008).

5.8. Recommendations and reflections

Client A appeared to engage well within the group setting, and his understanding and perception of the illness benefited from the psychoeducation group, as previous research would suggest (Falvo, 1994; Rummel-Kluge 2008). In future psychological work, staff should remain aware of Client A's occasional grandiose style of interaction, and his tendency to challenge some of the more academic elements of the material, and seemingly, to dominate the session. It was noted by the group facilitators that such behaviour had the potential to foster defensiveness amongst the staff team, and if this proved to be the case, the session could have been diverted from its main aims, becoming instead an irrelevant intellectual debate of little value to all patients attending the programme.

Client A should continue to benefit from psychological group work, particularly from sessions addressing his ability to cope with stress, a relevant factor to his offending behaviour which seemingly triggered a psychotic breakdown. Group work is potentially advantageous for Client A in a number of respects (Janicki, 2015). It provides a safe space outside from the usual ward environment for him to practise social

communication and interaction skills, and offers a more intense level of engagement with peers on topics that may be more meaningful or sensitive than the day-to-day talk around the hospital. Another advantage of group-based therapies is that these allow Client A to listen and learn from other peers as well as from staff facilitating the sessions. This is likely to be particularly beneficial to Client A as, at times, he presents as somewhat rigid in his own views and opinions. Hearing the perspectives of other patients may encourage gentle consideration of alternative interpretations and understandings.

Alongside group therapies, Client A should receive intense individual intervention, which targets his offending behaviour and explores the underlying motivations and events leading up to the index offence. Client A continues to present as emotionally detached from this offence and frequently blames his illness for the crime he committed, without accepting any form of responsibility for his actions, and discarding any other influences which may have motivated the offence. Getting an optimal balance may be challenging for clinicians, as is noted elsewhere in this chapter, it is possible that pressing him on his denial of personal responsibility may have a deleterious effect on his sense of self, with negative consequences for his

future behaviour (Craissati, 2015). On the other hand, his desire to attribute all responsibility for his actions to his schizophrenia may undermine his sense of agency in respect of his future behaviour. For this reason, intervention will need to focus sensitively upon recognising and addressing attitudes, feelings and behaviours that will place him at risk for future offending (Marshall & Ware, 2008). Thus, some work around emotional recognition and labelling should assist Client A in understanding how emotions such as anger and frustration played a role in his offending. Help with the early identification of such emotional experiences will be useful in enabling Client A to recognise these risk indicators, and to seek assistance as necessary to reduce his risk of reoffending.

The introduction to this chapter poses the question as to whether there are times when the polygraph might be useful in work with offenders who have a diagnosis of schizophrenia. As is noted in Section 5.7, it is possible that the polygraph could have potential value for therapeutic work with Client A, perhaps by encouraging him to speak more frankly about his sense of personal responsibility for his crimes, and about his current thoughts and feelings. It is important to accept that while it is possible to hypothesise about the potential value of this tool for work with Client A, such deliberation can only take

the form of conjecture as the scientific basis for the use of the polygraph with delusional patients is severely under-researched and far from understood. Any conclusions, therefore, that might be derived from its use in this case would be highly tentative, and ultimately, could prove unhelpful. Prior to any adoption of the polygraph with offenders diagnosed as psychotic, future research would need to demonstrate that claims as to its value, such as those of Hirschmann et al., (2014), have substance. Furthermore, given that the polygraph, equipped with its various monitors and cables, could be perceived by patients as a form of psychological manipulation (Cross & Saxe, 2001), future research would need to show that there is limited potential for unintended iatrogenic effects that might weigh upon those who suffer from paranoid delusions.

Despite these challenges, the potential of the polygraph in therapeutic work is worthy of serious consideration and should be the subject of systematic research. In so doing, it is likely to be helpful to examine what benefits, if any, the polygraph (or, indeed, any form of lie-detection technology) could have in reducing the likelihood of reoffending. If the deployment of this tool is not found to meaningfully reduce the individual's propensity, or means, to offend, one can question its

therapeutic value. Thus it would be helpful to ascertain the value of the polygraph in ensuring truthful responses, identify how relevant this might be for patients who experience delusional thinking, and determine those situations where overcoming denial is, or is not, clinically valuable. For example, ascertaining the reality of whether or not client A truly believed that his victim enjoyed the offence does not resolve the issue as to whether his beliefs should be vigorously interrogated. As is discussed below, such actions may have the negative effect of challenging some of client A's self-protective cognitions that help to preserve a positive self-image and, as a result, increase, rather than reduce his risk of reoffending (Craissati, 2015; Janicki, 2015).

Denial, except, of course, in cases where they are innocent of the charges against them (Ross, Tredoux, & Malpass, 2014), has typically been viewed as an obstacle to treatment that needs to be targeted (Blagden, Winder, Gregson, & Thorne, 2011; Freeman, Palk, & Davey, 2010). However, challenges to this position have been offered on the grounds that the preoccupation with offenders taking personal responsibility is rooted in 'common sense' rather than being based upon scientific evidence. Research to date has not convincingly demonstrated that sex offenders who categorically deny

responsibility for their offences, differ on significant criminogenic features from those who admit to their offences (Mann, Hanson & Thornton, 2010). It would seem that individuals who categorically deny their offence present no higher risk of sexually reoffending than those who admit (Hanson & Morton-Bourgon, 2005; Harkins et al., 2015; Langton et al., 2008). In Hanson & Morton-Bourgon's (2005) meta-analysis, denial of sex crime, lack of victim empathy, minimisation, and lack of motivation for treatment were each found to be unrelated to sexual recidivism. Indeed, Harkins, Beech, and Goodwill (2010) found that denial was associated with a reduced risk of recidivism amongst high-risk sex offenders.

Paradoxically, denial may have a positive function as it may indicate that the offender is cognisant of the social and cultural disapproval of their actions, and understands that their offence was wrong. Some suggest that denial can function primarily as a post-hoc defence rather than a precursor to offending (Craissati, 2015). However, it is possible that the relationship of denial to recidivism is moderated and mediated by other variables for example the type of sex offender (Thornton & Knight, 2007) and/or the level of risk they pose (Kingston, 2010). Thornton (2013), for example, suggests that denial

may be an important treatment target for incest offenders but not for higher risk child molesters who have a more generalized pattern of offending. Prior to impacting upon therapeutic work, such claims will require further research to establish their validity for both psychotic, and other, offender groups.

It is important that the initial treatment formulation for Client A, in which the need for him to accept responsibility for his actions was held to be a key component, does not result in a perceived requirement to “smash through” (Janicki, 2015, p. 409) his denial. In considering practitioner beliefs, it has been suggested that therapeutic work with offenders can be undermined by a system-wide, emotionally driven, unwillingness on the part of forensic psychologists (Craisatti, 2015) and probation officers (Janicki, 2015), to accept the tenuous relationship between denial and sexual recidivism. Perhaps, attrition amongst deniers may result from the therapist’s negative reactions and lowered expectations, rather than the denial itself (Ware & Mann, 2012)?

In Client A’s case, it is possible that his interest and understanding of schizophrenia may have had a self-

preservative function that might need to be carefully probed. Rather than focusing upon his denial of responsibility, Client A's future therapeutic direction should be upon addressing areas that have been found through research to be problematic for sexual recidivism: sexual preoccupations and deviancy, anti-social traits and inadequate self-management, and intimacy deficits. However, focusing on the modification of risk factors is unlikely to be sufficient means to encourage desistance (Ward, 2017) and, "...while still in its infancy" (de Vries Robbé & Willis, 2017, p.59), the field is increasingly recognising the importance of assessing, highlighting and fostering such protective factors as autonomy, life goals, parental supervision, emotional competence, and social supports (de Vries Robbé, 2015; Ward, 2017). Rather than drawing upon the polygraph, or indeed, other new lie-detector technologies such as the fMRI (Masip, 2017; Rusconi & Mitchener-Nissen, 2013) in relation to past demeanours, perhaps the operation of the 'maintenance polygraph', encouraging respondents to state what they truly believe about various areas of their lives, may have some utility for such work?

As is often the case, consideration of an individual case study throws up many intriguing questions that impact upon what

can appear to be somewhat sweeping claims in the literature. Reflection upon recent work with Client A has highlighted a number of complexities in relation to the role of the polygraph in clinical practice. While this tool is not recommended with patients deemed to be psychotic, it has been noted that this all or nothing conclusion may be insufficiently nuanced. Perhaps, this tool has the potential to contribute in those areas of thinking that are not delusional (cf. Hirschmann et al., 2014)? Perhaps, it may have value for patients who have been successfully treated and who now demonstrate lucid thinking? Putting the issue of psychosis to one side, this case study has also highlighted the complexities of seeking patient truthfulness in regards to previous behaviour and future action. In Client A's risk assessment and treatment plan it was deemed important that barriers to the acknowledgement of his actions should be overcome. However, where the denial of personal responsibility has adaptive value in helping the client to build and preserve a positive sense of self, and to maintain membership of important social networks, therapists may be better advised to encourage offenders to focus upon strengths (Marshall & Ware, 2008) and to accept responsibility for their future actions rather than concentrate upon their previous offending (Ware & Mann, 2012). Perhaps the polygraph may have value in helping clients, such as Client A, to reflect upon

and discuss openly their beliefs about themselves, their challenges, and their future behaviour?

Chapter Six

Discussion

6.1. Discussion

The use of the polygraph in the UK has historically been treated more cautiously than in the United States, where it is widely used for the supervision of sex offenders (McGrath et al., 2007), and by various security services (e.g., the CIA and the FBI) for employee screening. Nevertheless, as noted in Chapter One, while in the UK it is not employed as an investigative tool to assist in the determination of guilt or innocence (Gannon et al., 2011), there is a slow but growing interest in its potential value for work with offenders.

In relation to work with sex offenders, the polygraph's current use is primarily to support ongoing work with those who have already been identified as offenders. In part, this trend follows from a series of studies that have been conducted in several probation services across the country which have led to changes to UK Government legislation. This now enables offender managers to impose licence conditions for high/very high-risk sexual offenders, sentenced to a term of imprisonment of 12 months or more, to undergo mandatory polygraph examinations.

As has been noted in the thesis, the polygraph has the potential to be used as a lie detector, either in formal proceedings (e.g. in police investigations or in Court) or more informally, for example, in identifying potential offenders, or in ongoing work with convicted offenders. In this latter respect, the polygraph may have a role in monitoring, supervision and in clinical treatment, particularly by encouraging honest disclosure.

The investigation into the impact of the post-conviction sex offender test upon rates of disclosure began with a systematic review of studies reported in the relevant literature. The review sought to examine if the use of the polygraph examination with individuals committed of sexual offences is associated with an increase in the disclosure of risk-relevant information. Risk relevant disclosures included unknown offences, rule violations and engagement in risk behaviours (e.g., masturbation to deviant fantasies). Perceived accuracy, utility (from polygraph examinees), and rates of recidivism were also considered.

On the basis of the nineteen studies that were included in the systematic review, it was found that the administration of a post-conviction polygraph tended to be associated with a

greater likelihood of disclosure in a number of risk relevant areas. Studies reported an increase in disclosures regarding the number of offences (some reporting previously unknown contact offences), an increase in the disclosure of rule violating behaviours (e.g. licence violations), and an increase in disclosure of risky behaviours (e.g. treatment violation). All of these areas present a particular cause for concern, as they are indicative of a recidivism rates.

The increased disclosure for 'cross-over' sexual offences was an interesting outcome. Here, the polygraph appeared to facilitate offence confessions in which victims were from multiple age, gender, and relationship categories. The disclosure of crossover offences contradicts widely held beliefs that offending patterns of sexual offenders tend to be predictable and unvarying (Abel & Rouleau, 1990), and supports the utility of this technique in providing additional information in future risk assessment of sexual offenders (Cann et al., 2007).

It was also found that, with regard to recidivism, the polygraph's influence differed between violent sexual offences, and non-sexual violent offences. Individuals who underwent polygraph testing were significantly less likely to commit

further crimes involving non-sexual violence, but there was no significant difference for sexually violent recidivism. There does not currently appear to be an adequate explanation as to why the use of the polygraph might be related to the likelihood of reoffending for certain crimes but not for others. This provides a seemingly important topic for future research. A difficulty in offering guidance for practice based on the systematic review lies with the poor quality of the evidence available. In the recidivism studies that were included, assignment to treatment conditions were not randomised, and it did not prove possible to ascertain whether treatment engagement/length was differentially weighted between conditions. Therefore, it may have been that those in the polygraph group were already more likely to engage with treatment, and this contributed to disclosure. In addition, because allocation to conditions was not random, extraneous variables such as age and offence type may have influenced disclosure rates. Furthermore, for some studies, reliance upon case file data may have weakened the accuracy of the conclusions, in part because of the likelihood of missing or unrecorded data.

The review highlighted the fact that there were few studies that could be included at the given criterion of quality.

Although significant results were found in some studies, the heterogeneity between samples meant that meta-analytic statistical comparison between groups was not considered to be feasible or appropriate and, for this reason, a qualitative approach was employed. How findings from the review might apply to a wider forensic population is therefore a debatable question. Despite these shortfalls, the review laid the foundation for explaining the potential influence of the polygraph on sex offender management, and highlighted the significant complexity of examining the association between polygraph testing and offence-relevant disclosure.

Chapter Three contained a critique of the Post-Conviction Sex Offender Test (PCSOT). This chapter provided an overview of this investigative method and examined the available literature concerning the tool's validity and reliability, and its utility for research and practice. It noted that the tool is in the early stages of application in UK forensic settings, and commented that the evidence base for its use is still rudimentary. Despite these caveats, the chapter concluded that the PCSOT appears to be a useful tool in eliciting disclosures amongst sexual offenders. Furthermore, it was noted that some studies have found that the inclusion of the PCSOT within a therapeutic environment has provided a

substantial deterrent for engaging in future offending (Rosky, 2013).

A number of disadvantages were also outlined. The problem of 'false negative' and 'false positive' outcomes was discussed. This issue relates to inaccuracies of testing outcomes, both with respect to finding an innocent person guilty, or a guilty person innocent. Although research studies generally suggest that rates of inaccuracy are low, these have typically relied on self-report measures, which are likely to be particularly unreliable in offender populations.

Despite the weaknesses identified in many of the studies that were included, and the questions posed in the literature review in Chapter Three, the accumulated evidence offers tentative support for the use of the polygraph with sex offenders. It appears that the advantages of the polygraph may outweigh the disadvantages when this is used as an additional and complementary tool to facilitate investigation, rather than as an investigative tool principally used to determine innocence or guilt, as is popularly imagined. Due to improvements in the challenges associated with the assessment of sexual offenders, the polygraph may yet prove an inherently useful additional method of soliciting offence-relevant information for a more

accurate overall understanding of risk. As a consequence, the polygraph may be able to assist in reducing the number of offenders that are considered to require incarceration. It may help us to target finite resources more appropriately by helping to identify those offenders who present a 'real risk', and who require more detailed and comprehensive forms of supervision and monitoring.

If the polygraph is to prove effective, its capacity as a lie detector needs to be believed by those who take the test. However, this may not operate in simple binary fashion – i.e., it either works 100% or it doesn't work at all. It is more likely that belief in the effectiveness of the polygraph will range along a scale from a total to a zero acceptance of its ability to detect falsehood. Assuming that this is the case, it is unclear whether to be effective, participants need to be convinced of its infallibility, or merely believe that its accuracy rate is relatively high.

The primary empirical investigation sought to examine this issue, and was presented in Chapter Four. The study explored the bogus pipeline effect (BPL) upon disclosure in lie-detector tests undertaken with university students. The study also considered the impact of personality traits and suggestibility

upon rates of disclosure in each of several conditions. The overarching aim of the study was to examine whether the informed accuracy of a 'deception indicator' test impacted upon the likelihood of each individual's disclosure of group cheating on an earlier occasion.

This study sought to extend the existing scientific knowledge base about the bogus pipeline effect, as, prior to this, there has been little research exploring this topic. It was found that participants who underwent a bogus 'deception indicator' test, supposedly using a polygraph, were significantly more likely to disclose that a member of their group had cheated during a collaborative exercise than those who were asked the question without the presence of such a device. No significant difference in rates of disclosure was found between the two bogus pipeline conditions (75% and 100%). This finding provided evidence to support the notion that the polygraph can have an influence upon interviewees' responses even if they do not believe that the device is completely foolproof. Despite the study being undertaken with university students, and thus operating as a low-stakes exercise (there was nothing seriously at stake for these participants) which is unlikely to be the case for alleged offenders, this finding would still appear to have important implications for practice, and

warrant further related research with offender groups. The fact that the behaviour of highly intelligent students, who, one might anticipate, would not be easily fooled by a postgraduate researcher, was seemingly influenced by the use of the bogus polygraph, suggests that the machine's ability to influence behaviour has potential value in encouraging offenders to be truthful in their responses. This finding is consistent with other research outcomes discussed in this thesis that support suggestions that the polygraph has the potential to gather information regarding socially undesirable behaviour that might otherwise remain undisclosed.

The case study in Chapter Five offered a rather different perspective on the use of the polygraph. While it was not possible to use a polygraph with the client featured here, given regulatory and ethical constraints, the case study highlighted the everyday practical and complexities of individual work with clients with severe mental health problems. While fully acknowledging that the polygraph is proscribed for use with those with psychotic conditions, partly because of potential difficulties with regard to physiological measurement (King, 2008; Schell et al., 2005), it was noted that this ruling appears to be operating largely within, and as a consequence of, a research vacuum. As a recent review

(Masip, 2017) notes, there has been surprisingly little research on lie-detection conducted with those who have psychiatric conditions.

Some (Hirschmann et al., 2014) have suggested that the polygraph can be relevant for differentiating between truths and non-truths in work with those psychotic patients, although their research presents some methodological concerns. A second, equally important area for research and reflection concerns the potential of the maintenance polygraph for therapeutic work (cf. Kokish et al., 2005) with those who have been successfully treated with medication and who now appear to be operating lucidly (as, seemingly, was the case for the client in the thesis case study).

The case study examination also highlighted another significant issue that, hitherto, has not been adequately considered in the polygraph literature. It has been suggested that the polygraph may be able to assist with psychological treatment by breaking down the initial barriers to disclosure and encouraging a more open platform for honest discourse. Typically, proponents have assumed that any tool that can serve to strip away a client's motivation to offer untruthful responses must surely be an important contributor to

therapeutic work and risk prevention. In this respect, the perceived effectiveness of the polygraph is tied closely to its ability to overcome falsehood. However, this understanding was queried in the thesis on the grounds that denial of offending does not seem to be associated with a greater risk of reoffending (Harkins, Beech & Goodwill, 2010).

Clinical work is often complex and multi-layered, and it is possible that challenging denial in the search for truthfulness is more important in some aspects of client disclosure and reflection than in others (Craissati, 2015; Janicki, 2015). In reflecting upon the potentially protective elements of denial of responsibility, Chapter Five concludes by suggesting that, rather than focusing upon the veracity of statements relating to past actions and attributions, the polygraph's primary contribution may be to help clients reflect upon, and discuss openly, their beliefs about themselves, their challenges, their future behaviour, and how these may place them at risk for future offending (Marshall & Ware, 2008).

In discussing the challenges and complexity of casework with those who may present a risk to others, Moore and Drennan (2013) emphasise the importance of understanding not only a person's behaviour, but also those factors that might assist or

hinder their recovery to, "...a position of greater safety, security and personal agency" (p. 230). This process involves the creation, or re-establishment, of a post-offending notion of self that can provide them with hope, control, and opportunity, while placing them at the centre of their future pathway. In seeking to achieve such ends, therefore, we need to be careful that the use of a lie detector, whether it is a polygraph or some such other technological procedure, does not undermine such a process.

Despite existing research exploring the impact of polygraph testing on the assessment and management of sexual offenders, the actual evidence base examining the polygraph and its relationship to disclosure is sparse, sometimes inconsistent, and often undermined by poor methodology. Future research should aim to employ a higher methodological standard by utilising larger forensic samples and including control and comparison samples where potentially confounding variables such as treatment engagement are considered. Longitudinal studies would appear to be important for the examination of recidivism over lengthy periods.

In summary, it appears that the polygraph is a potentially useful post-conviction device for monitoring, therapeutic and

clinical purposes. However, it should be employed only on those occasions when it clearly has something to offer, for example, with high-risk clients who have consistently demonstrated an inability to work with professionals in reducing their risk and progressing with therapy.

Those with clinical roles need to ensure that if the use of the polygraph proliferates, this is not at the expense of efforts to build rapport and trust with the client, or that this results in unintended iatrogenic effects, such as stripping away helpful, self-protective cognitions. We should also keep in mind the fact that therapeutic intervention is not solely about 'getting information' but, rather, may be conceived of as a journey that the therapist takes alongside the client to assist them with processing, reflecting upon, and managing their previous offences, acknowledging these in their own way, and taking responsibility for desistance in the future. The power of human interaction, the development of trust, and collaborative exploration and decision-making cannot, and should surely not be replaced by a machine.

6.2. Final observations

It is hoped that, by providing a systematic review and evaluation of the current literature, highlighting current

methodological weaknesses in the literature, utilising an experimental study to answer a fundamental question about the necessity of believing in the tool's infallibility, and using a clinical case study to tease out a number of previously under-considered complexities, this thesis will contribute to the current evidence base regarding the utility of the polygraph and provide a greater understanding of risks and reoffending.

In the eyes of the general public, the polygraph is often perceived as a magical machine that can peer into the respondent's mind and identify whether he or she is telling the truth. This notion has been influenced by Hollywood, by high profile public scandals ranging from US spies to the ongoing travails of the Clinton family, and by regular media grabbing enterprises such as the recent PR stunt of a British MP (The truth about politics: MP takes lie-detector test (2011, August 27; Retrieved from <http://www.bbc.co.uk/news/uk-politics-14669084>).

To much media interest, Hillary Clinton has recently been challenged to a lie detector test, to prove or disprove her stated behaviour in relation to a death of a Navy SEAL in the Middle East. Echoing widespread beliefs about the power of lie

detection machines, one blogger commenting upon the challenge to Clinton has recently written:

"Everyone knows that lie detector tests are not admissible in court. But everyone also knows that they are in fact highly accurate, and probative. Police use them all the time to eliminate suspects. Multiple federal agencies use them to confirm the veracity of employees. As for corporations, The Employee Polygraph Protection Act allows polygraph tests to be used in connection with jobs in security and handling drugs or in investigating a specific theft or other suspected crime. Polygraphs do work."

Source:

<http://www.redstate.com/diary/gawken/2016/01/09/open-letter-charles-woods-go-ahead-sir-lie-detector-test-live-air-without-hillary/> Retrieved 11.01.16.

As this thesis has indicated, scientific evidence concerning the efficacy of the polygraph is rather less persuasive than this blogger has claimed, although the polygraph does appear to be more accurate in identifying untruthfulness than human judgement alone (Elton, 2017). Despite this, many researchers and professionals believe that the polygraph has no scientific credibility, and its 'magic' is no less powerful than that typically featuring in a Hollywood technological fantasy.

However, the conclusions of the present thesis indicate that, while one should remain cautious about media hype, there does appear to be some potential for polygraph testing with sex offenders.

Interestingly, the potential of the polygraph as a lie detector is now being challenged by new technological approaches, for example, functional magnetic resonance imaging (fMRI), which measures central nervous system activity. Whether this, or other devices, will supplant the polygraph as the lie detector technology of choice is unclear, but, clearly, very similar methodological issues will first need to be overcome (Wagner et al., 2016).

Scientific progress can often be hindered by absolutist beliefs about what can, and what cannot, impact upon human behaviour, and claims may be prematurely rejected because of insufficient availability of evidence for or against a proposed approach. Together, in combination, it is hoped that the various sections of this thesis offer a rather more nuanced picture in which the polygraph, while not a magical means of revealing the truth of a person's statements, may offer valuable information and insights that not only can contribute to legal proceedings, but also help us to understand, engage

with, and ultimately, support and influence the choices and actions of those offenders who present a serious risk to others.

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Appendix 1: Recruitment Poster

Attention students!

You are invited to take part in a study exploring how and whether group interactions prime cognitive processing.

Are two heads better than one? Are seven heads better than two?!

The study will take place on Collingwood Campus, Durham University.

If you are interested in taking part please email Elizabeth at lwxiemel@nottingham.ac.uk for more information.

Appendix 2: Consent Form

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet the above study and have had the opportunity to ask questions.

☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. I understand that should I withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis.

☐

3. I understand that relevant sections of my data collected in the study may be looked at by the research group and by other responsible individuals for monitoring and audit purposes. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained

☐

from my participation in this study. I understand that my personal details will be kept confidential.

4.I understand that all data will be anonymous and confidential

☐

5.I understand that information about me recorded during the study will be kept in a secure database. If the data is transferred it will be made anonymous. Data will be kept for 7 years after the study has ended and then securely destroyed.

☐

6.I agree to take part in the above study.

☐

Name of Participant

Date

Signature

Miss E M Elliott

16.02.14

E M Elliott

Appendix 3: Participant Information Sheet

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

1. What is the purpose of the study?

The study will explore how and whether group performance impacts an individual's processing speed on subsequent tasks, ostensibly- 'do group interactions prime cognitive processing?'

2. Why have I been invited?

You are being invited to take part because you are students from a local University. We are inviting approximately 120 participants like you to take part.

3. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. This would not affect your legal rights.

4. What will happen to me if I take part?

The research study will take only 3-5 hours to complete in total. There are three main parts to the study. You may need to attend on 2 separate days in order to fully complete the procedure. The study will be conducted at Collingwood College, The University of Durham, United Kingdom. Your information will be kept confidential and you will be given an ID number to ensure your anonymity.

You are expected to attend all parts of the study and fill in the questionnaires as fully as possible.

5. Expenses and inconvenience allowance

Participants will not be paid to participate in the study.
However, a financial incentive of £10 will be offered.

6. What are the possible disadvantages and risks of taking part?

There are no known risks associated with participation in the study.

List inclusion and exclusion criteria including the following:

Inclusion criteria	Exclusion criteria
Students from The University of Durham	Below 18 years/ over 50 years
Aged 18-50 years	

7. What are the possible benefits of taking part?

The information we get from your participation in this study may help us understand the psychological and cognitive mechanisms associated with group processes

8. What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. The researchers contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you should then contact the Research Ethics Committee Administrator, c/o The University of Nottingham, School of Medicine Education Centre, B Floor, Medical School, Queen's Medical Centre Campus, Nottingham University Hospitals, Nottingham, NG7 2UH. E-mail: louise.sabir@nottingham.ac.uk.

9. Will my taking part in the study be kept confidential?

Information regarding all participants will be kept confidential. You will be allocated a number, which will be your reference code throughout the study. Data will be collected independently. The data may be retained for use in future

studies but further ethical approval will be sought prior to its use. Data will not be kept for longer than is necessary.

We will follow ethical and legal practice and all information about you will be handled in confidence.

If you join the study, authorised persons will look at some parts of the data collected for the study from the University of Nottingham who are organising the research. They may also be looked at by authorised people to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

All information that is collected about you during the course of the research will be kept strictly confidential, stored in a secure and locked office, and on a password-protected database. Any information about you, which leaves the institution, will have your name and address removed (anonymised) and a unique code will be used so that you cannot be recognised from it.

Your personal data (address, telephone number) will be kept for one year after the end of the study so that we are able to

contact you about the findings of the study *and possible follow-up studies* (unless you advise us that you do not wish to be contacted). All other data (research data) will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to your personal data.

10. What will happen if I don't want to carry on with the study?

As a voluntary participant, you have the right to withdraw at any time. Please notify the researcher if you wish to withdraw. If you withdraw before the study has been completed, your data will be extracted and destroyed.

Your participation is voluntary and you are free to withdraw at any time, without giving any reason.

11. What will happen to the results of the research study?

The results of the research project will be analysed in the final stages, and used as part of the researcher's doctoral thesis. It is possible that the study will be published at a later stage, and you will be able to obtain a copy of the published results from the publishing journal. You will not be identified in any report/publication.

12. Who is organising and funding the research?

This research is being organised by the University of Nottingham.

Who has reviewed the study?

All research in the University of Nottingham is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by The University of Nottingham Research Ethics Committee.

Further information and contact details: Email Miss Elizabeth Elliott at

lwxiemel@nottingham.ac.uk

Appendix 4: Polygraph Machine Information

Make and model: Lafayette Polygraph LX5000.

The machine will be turned on to increase its believability, but the machine will not actually be recording anything as it is the bogus pipeline effect we are interested in.



Image taken from <http://www.lafayettepolygraph.com/>

Appendix 5: Study Debrief

Thank you for taking part in the study. The study was actually examining whether or not being told different rates of the polygraphs accuracy influences participants likelihood of disclosing cheating behaviour. This is also known as 'The bogus pipeline effect.'

If you have any more questions about the experiment please do not hesitate to contact the lead researcher at the email address lwxiemel@nottingham.ac.uk

Appendix 6: Thoughts and Feelings about Medicines

1. Side effects occur with every medication and cannot be controlled
2. Once I am on a medication it cannot be changed
3. Medication will definitely make me gain weight as all antipsychotics cause the same amount of weight gain.
4. Medication will make me lose control over my thoughts
5. Medication will cause insomnia
6. Medication will make me drowsy and zombie-like
7. I have no say with regards to my medication
8. The psychiatrist may change the dose of my medication without informing me first
9. All antipsychotic medication comes as an injection
10. Medication will help reduce some of the frightening experiences I have
11. Medication will reduce the likelihood of relapse
12. I may not have to take medication for the rest of my life, depending on what my doctor advises

13. Medication will ruin my sex life
14. Medication will make me less sociable
15. Medication might help improve my mood
16. Taking medicine is a sign of weakness
17. Medication will affect my senses (e.g. sight, taste, hearing...)
18. I have no say in deciding which medications I try
19. I will never be able to drink caffeine with medication
20. Medication will cause memory loss
21. Medication can help reduce the intensity and frequency of hallucinations
22. I cannot become pregnant/ my partner cannot become pregnant whilst taking antipsychotics
23. Taking medication will help me think clearer and may help improve my concentration
24. Taking medication will make it difficult for me to engage in conversation
25. Taking medication will make me helpless
26. Medication can be part of a relapse prevention plan that suits me

Appendix 7: Schizophrenia Questionnaire

1. Schizophrenia is a brain illness resulting from a combination of genetic and environmental factors.
☐ True ☐ False
2. Schizophrenia is treatable.
☐ True ☐ False
3. Schizophrenia results in more hospital stays and consumes more hospital beds than any other illness.
☐ True ☐ False
4. Schizophrenia usually begins sometime in adolescence or early adulthood.
☐ True ☐ False
5. Approximately 40% of all people with schizophrenia will attempt suicide.
☐ True ☐ False
6. Medical and psychosocial-rehabilitation interventions are primary in the treatment of schizophrenia.
☐ True ☐ False

7. A person can have schizophrenia-like symptoms and not have schizophrenia.
- ☐ True ☐ False
8. Psychoeducational information and support for family members is part of relapse prevention for the consumer.
- ☐ True ☐ False
9. Approximately 25% of people who are homeless may be living with schizophrenia or psychosis.
- ☐ True ☐ False
10. The chances of an identical twin developing schizophrenia if the other twin has schizophrenia are about 40%.
- ☐ True ☐ False
11. The main theories of what causes schizophrenia are: genetic predisposition, viral infection, faulty nerve development in the unborn child's brain, or birth trauma.
- ☐ True ☐ False
12. Schizophrenia was once thought to be caused by bad parenting, dysfunctional families, demon-possession or a split personality.
- ☐ True ☐ False

13. The main brain chemicals (neurotransmitters) involved in schizophrenia are dopamine and serotonin.
- ☐ True ☐ False
14. The stigma of mental illness is based upon lack of understanding, plus lack of educational contact with a person living with mental illness, multiplied by fear of the unknown (myths).
- ☐ True ☐ False
15. People with schizophrenia can live lives of recovery and empowerment if given the chance and access to proper community supports and services.
- ☐ True ☐ False
16. A person with schizophrenia may not take medication because of lack of insight called anosognosia, side effects of medication, or may have stabilized and feel he or she no longer needs the medication.
- ☐ True ☐ False
17. Medication is all that is needed to recover from schizophrenia.
- ☐ True ☐ False
18. Families are crucial in the recovery process.
- ☐ True ☐ False

19. Recovery is a process of regaining lost skills, dreams, and hope as well as renewed purpose and meaning so as to live beyond the limitations of the mental illness.
- ☐ True ☐ False
20. Up to 70% of all people with schizophrenia tend to get better whether they receive treatment or not.
- ☐ True ☐ False
21. The best mental health system is one which is recovery-oriented.
- ☐ True ☐ False
22. Schizophrenia is the same as split personality or a psychopath.
- ☐ True ☐ False
23. Up to 70% of those with an enduring mental illness have experience some form of trauma.
- ☐ True ☐ False

Appendix 8: End of Programme Quiz

- a. Name the three ways in which mental and physical illnesses are similar
- b. Name three symptoms of psychosis
- c. How many people out of 100 have schizophrenia?
- d. Name one theory for the cause of psychosis
- e. Name the three phases of schizophrenia
- f. Name three early warning signs
- g. What percentage of people who have experienced psychosis will relapse at some point?
- h. In what ways might illicit drugs or alcohol affect psychosis?
- i. Name two benefits of antipsychotic medication
- j. Name two ways in which mental illness is stigmatised

Appendix 9: Session Summaries

Session 1: Group Introduction

The aim of the first session was to introduce group members to one another and to the facilitators/observers. Formal introductions was essential in order to ensure that roles were established early on and that those involved in the group were comfortable with knowing who other people were, and therefore felt more relaxed in contributing to group discussions. Knowing others also meant that members was referred to one another by name, facilitating uniqueness, relatability, and encouraging individual members to be perceived as individuals with their own value and contribution.

The first session also prepared individuals for the contents of the programme by highlighting the key aims of the course, which were: ·

- ✓ To provide information about psychosis
- ✓ To help group members recognise symptoms and prevent relapse
- ✓ To help develop coping strategies
- ✓ To help reduce anxieties and concerns about psychosis

- ✓ To develop group work skills

By facilitators providing an overview early on, participants had clear expectations about the programme and areas of focus.

Group rules were collaboratively made with input from both group facilitators and attending participants. These ideas were collated into an overall list and written upon a flipchart sheet so that they were viewable during all sessions. It was important that rules could be seen as this meant that they feature in the room as a physical reminder to participants and encouraged individuals to remember them. Prior to the programme, facilitators considered some of the group rules that they feel are necessary for safe and effective running of the group (e.g. confidentiality, appropriate/acceptable behaviour within the group), and these were added to the overall list if group members had not referred to these previously during the exercise.

To promote group cohesion and establish the importance of interaction, engagement and contributions some group activities/exercises were introduced to increase familiarity amongst group members and help to set precedence for future sessions. Group activities and exercises included each person saying their name, and something inoffensive about

themselves (e.g. my favourite colour is...). After everyone had introduced themselves, each member had to choose someone else in the group to introduce based on what they had heard (e.g. this is Frank and he likes Chinese food).

Session 2: What is Illness?

The primary aim of this session was to introduce the concept of illness as a continuum, using examples of physical and mental illness to facilitate understanding. Participants were also encouraged to consider the process of recovery and how symptoms of illnesses are manageable.

To begin the process of viewing illness of a continuum, members were asked to mark on a continuum ('very well' → 'very unwell') where they would have placed themselves in relation to their mental health at a number of stages including:

- a) When they first experienced mental health symptoms
- b) The point of hospital admission admitted to hospital
- c) Currently

The group was then asked to reflect with other group members on any differences between ratings, and consider the things that might have promoted change between the two time points. Consideration as to the sources of change helped

members to identify protective factors, or strategies that have enabled them to feel better (e.g. talking therapies/medication). The exercise was conducted using a large A3 flipchart, which was positioned so that all members could see what was written.

After this group exercise group members were divided into smaller groups of 3 and asked focus either on mental illness (e.g. anxiety) or physical illness (e.g. flu) in terms of early signs, coping strategies, treatment, and possible relapse.

The smaller groups then fed back their ideas to a group with the opposite illness (e.g. mental paired with physical) and collaboratively discussed the similarities between the development, treatment and management of physical health and mental health problems. Group facilitators concluded this session by also acknowledging the differences between mental illness and physical illness (stigma of mental illness, physical illness may be observable to others).

Session 3: What is Psychosis?

This session began with a group discussion about what psychosis involves and some 'psychosis myths'. Doing so provided an opportunity to dispel some of the negative societal

perceptions of psychosis. Responses from the group discuss were written on a flipchart sheet.

Diagnostic terms reflecting psychotic illnesses (e.g. schizophrenia, schizoaffective disorder, drug-induced psychosis etc.) were also discussed and the following definitions were debated upon,

"Psychosis involves disturbances of mental processes, specifically thoughts and perceptions"

"Psychosis is a mental disorder that is characterized by impairment of an individual's ability to think clearly, respond emotionally, communicate effectively, understand reality, and behave appropriately"

Facilitators introduced the idea of positive and negative symptoms of psychosis and discussed how the term 'positive' in this context referred to symptoms/experiences additional to how a person would usually think, feel and behave (as oppose to positive as in good) e.g. hallucinations, delusions. Facilitators also stated that negative symptoms reflect a reduction or loss of normal functioning e.g. reduced motivation, blunted affect, as oppose to 'negative' in the more commonly known interpretation. To encourage active participation and consolidation of learning, the group was split in half and given cards with symptoms of psychosis written on

them. Members were asked to stick the cards to flipchart paper headed with either 'Positive Symptoms' or 'Negative Symptoms' according to what was written. Once group members allocated symptoms to either positive or negative flipcharts the group discussed whether allocations were correct and discussed the symptoms in greater detail.

The diagnostic process was summarised to the group by facilitators, including life history taking, mental state assessments, behavioural observations, collateral information sourcing and DSM and ICD diagnostic manuals. Facilitators took a lead on this part of the session due to their advanced knowledge on diagnosis, which was not likely to be known to participants. However, there was a substantial amount of time offered to group members to ask questions and reflect upon what had been taught.

Session 4: What Causes Psychosis?

Session 4 introduced different developmental theories for psychosis, with focus on the Stress-Vulnerability Model, using the 'bucket analogy' to illustrate, as stress was emphasised as a key trigger for psychosis throughout the sessions, and could be altered/managed by patients (as oppose to more stable factors such as genetics etc.). Group members were invited to

consider the role stress may have played in the development, and maintenance, of their own illness. Worksheet 4.1 'Who Gets Psychosis?' was distributed to group members for completion in the session. True or false responses were discussed in the group and members were provided with the correct information regarding the prevalence of psychosis amongst certain populations.

The next worksheet was entitled 'Worksheet 4.3 Stress and Vulnerability to Psychosis' and required group members to consider stressors that they experienced prior to becoming unwell. Again the group was divided into two to consider different ways of reducing and managing stress (linking back to the Stress-Vulnerability Bucket analogy with facilitators explaining that reducing stress is like trying to reduce the amount of water that goes into the bucket, and that people can create holes in the bucket to stop the bucket from overflowing). Again, each group were asked to feedback their ideas to the rest of the group and these were written onto a flipchart sheet.

Session 5: What are the Phases of Psychosis?

Session 5 introduced the three different phases of psychosis (early signs, active phase and recovery phase) and addressed

the different symptoms experienced in these phases. The session followed with a 'Symptoms of Psychosis card sort' exercise – performed in pairs. A selection of different symptoms of psychosis was offered to group members on pieces of coloured card. Group members then discussed the phase of psychosis each of the symptoms might occur in, prior to this, facilitators stated that not all symptoms discretely fit into the three categories and there may be some overlap, with certain symptoms occurring in each phase. The possible outcomes/prognosis for people who have experienced psychosis were discussed using Worksheet 5.1 'Outlook for Recovery'.

Session 6: Early Signs

The session began with a recap from the previous session on the 'Early Signs' phase of psychosis and symptoms that might occur during this phase. 'Worksheet 6.1 Early Warning Signs' was completed early in the session. Group members were invited to share their experiences of early warning signs if they felt comfortable. Discuss with group members why it might be important to be aware of

The benefits of detecting the early signs of psychosis were discussed and how to respond to these if they occur. The benefits discussed included:

- ✓ Help to prevent development of active symptoms or relapse
- ✓ Minimise severity and duration of active phase or relapse
- ✓ Reduce the need for hospitalisation
- ✓ Help to identify stressors and coping strategies
- ✓ Seek support/intervention from others

Reference was made back to the previous week's discussion regarding the outlook for recovery and the reported relapse rate for psychosis, which is 60% (Insel, 2013). The stress vulnerability model was also revisited and group members were requested to consider what events or circumstances might have triggered the emergence of early signs and write their ideas down on the group's flipchart.

After warning signs had been identified and discussed at length, group participants considered how they would respond to the emergence of early signs by completing hand out Worksheet 6.2 'Managing Early Warning Signs' and discussing the relative advantages and disadvantages of the different strategies outlined in the sheet (exploring the difference between helpful and unhelpful coping strategies). Group members offered other coping strategies they could think of

that did not feature on the worksheet, or those that had worked for them personally.

Session 7: Substance Use and Psychosis

Session 7 began with a discussion of the different ways in which substance use can impact upon people's lives (physically, mentally and socially), and the short term and long term advantages and disadvantages of using substances.

The focus then became narrower and participants considered the ways in which substance use might affect psychosis specifically. The term 'substance use' was debated and in turn, members were asked to generate a list of different substances they knew of. The reported substances were then collaboratively placed under one of four categories including: Depressants, Stimulants, Hallucinogens or Opiates. Following this, the group discussed how substances in general impact on the three main areas of physical, social and psychological functioning. Using cannabis as an illustration, group members gave examples of how cannabis might affect all types of functioning, both in the short and the long term.

The second half of the session concentrated on how substances may affect psychosis and reduce a person's ability to manage symptoms (substance use as a trigger for relapse was also discussed).

Session 8: The Stigma of Mental illness

Session 8 began with a brief definition of 'stigma' to ensure all participants understood the concept. On the flipchart the outline of a person was drawn with speech bubbles protruding from the sides of the page. Group members were asked to fill the speech bubbles with stigmatic thoughts or comments that they had either experienced from others, thought themselves or had heard from the media/ friends etc. The impact of these types of stigma was discussed along with the reasons behind why stigma might exist (e.g. lack of knowledge, fear, scapegoating etc.). The impact of stigma on those suffering with a mental illness was discussed within the group, with some members drawing on their own feelings and reaction whilst others gave more generic feedback. To introduce some variety to the session, the 'Challenging Mental Health Discrimination DVD' was to the group (approximately 15 minutes long) with a conversation about its contents following this.

To end the session in a positive/ hopeful manner, ideas for challenging stigmatised views about mental illness were discussed as a group with emphasis on the fact that mental illness does not define the whole person but is a condition which someone has/has had. A pie chart was drawn to

demonstrate the various roles and interests individuals can have (e.g. father, son, football supporter, darts player, music lover) to show that a 'self' is multifaceted and complex. Members completed their own 'self' pie chart using Worksheet 8.1 'What Makes Me Who I Am' and were invited to show these to the group at the end of the session before close.

Session 9: Treatments

The main aims of session 9 were to introduce the different treatments available to manage symptoms of psychosis, and consider the advantages and disadvantages of these options. The first treatment option discussed was antipsychotics. Hand-outs were distributed (Worksheet 9.1: What are Antipsychotics?) and the content of the hand-out was discussed with the group, inviting any questions arising from the discussion. Facilitators explained that while antipsychotic medication could be used to treat acute psychotic episodes, it is also used to reduce the risk of further episodes of psychosis once people are well. Although emphasis was on the benefits arising from medication, side effects were also considered using Worksheet 9.2 'Side Effects of Antipsychotics.' Strategies for managing side effects were shown on a PowerPoint presentation (e.g. healthy eating, attending doctor appointments.). A cost- benefit analysis of the short and long

term impact of medication was tabulated on the flip chart using group feedback. Because some patients had very negative experiences of medication, facilitators validated these experiences, but weighed them up against the potential benefits of continued compliance with medication.

After the topic of medication, the roles of mental health professionals were discussed in the group, with focus on how professionals could assist and support patients in getting and staying better. Group members were given different types of support, therapeutic input and treatments written on pieces of card and were asked to consider which mental health professionals (e.g. nurses) would be likely to offer each type of support or intervention (e.g. plan a patient's care in hospital). Pieces of flipchart paper were put up on the group room walls with the different professions written on (Psychiatrist, Psychologist, Nurse, Occupational Therapist, Social Worker) and group members attached the written role to who they thought would be the mental health professional most likely to undertake that responsibility.

Session 10: Staying Well

The final session focused on patients developing their relapse prevention plan. Plans were constructed focusing on having an

awareness of potential stressors, monitoring and recognising early signs, and using of appropriate coping strategies. To test learning, a fun 'Raise Your Psychosis Awareness Quiz' was undertaken in pairs by group members (see Appendix 8 for questions). A prize was offered to the pair who achieved the highest score as an incentive for greater effort and sustained concentration.

At the end of session 10 participants were awarded named certificates for their completion of and participation in the group.

Post Group Review Sessions

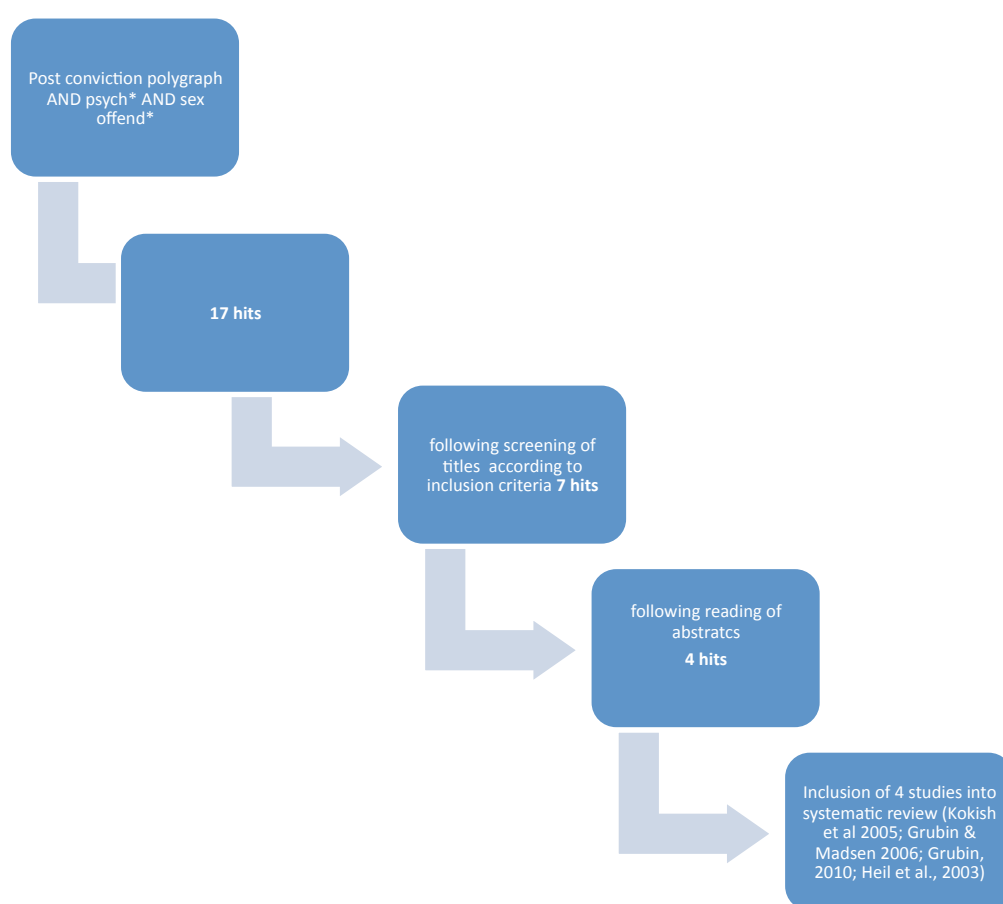
After the final session, facilitators met group members individually to review their progress through the course and spend time discussing the Staying Well - Relapse Prevention Plan that group members completed as homework in the final session. Facilitators informed all group members that elements of this plan may be incorporated into the Post Group Report. The post group psychometrics (Thoughts and Feelings about Medicines Questionnaire and Schizophrenia Questionnaire) were also completed in this session.

Appendix 10: Group session topics

Session number	Topic
1	Group introduction
2	What is illness
3	What is psychosis
4	What causes psychosis
5	What are the phases of psychosis
6	Early signs
7	Substance use and psychosis
8	The stigma of mental illness
9	Treatments
10	Staying well

Appendix 11: Example Search strategy for systematic review

This search was performed using the PsycINFO database



Appendix 12: PRISMA 2009

Section/topic	#	Checklist item	Reported in Section #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	2.6
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Not in abstract but in sections 2.6-2.8
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	2.5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	2.6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available,	Yes- but only registered with UoN ethics committee, not

		provide registration information including registration number.	registered with an independent systematic review organisation
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	2.6.1
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	2.6.3
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Yes Appendix 11
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	2.6.5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Yes in section 2.6.5 but methods for quality assurance below gold standard of double data extraction
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Yes in Table 2.3.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how	Table 2.2.1

		this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Table 2.3
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	2.7.3