Does the polygraph lead to better risk prediction for sexual offenders?

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Abstract

The polygraph is receiving increased attention surrounding its ability to facilitate more honest disclosures from sexual offenders concerning risk-related information (e.g., historical risk factors and acute-dynamic risk factors). In addition, the polygraph has become accepted as a standard containment tool in the US, although UK professionals appear to have taken a more cautionary approach. The aim of this review is to provide a basic overview of current risk assessment procedure in the absence of the polygraph, and then to investigate studies that use the polygraph to enhance sexual offenders’ risk assessments. Specifically, studies examining historical risk factors, stable-dynamic risk factors, and acute-dynamic risk factors are examined and evaluated. We conclude that there is reasonable evidence supporting polygraph use in some areas of risk assessment. However, the vast majority of studies suffers from serious confounds that should be taken into account by professionals who use the polygraph as a standard practice in sexual offender risk assessment and management. Finally, the future of the polygraph is discussed in light of the presented empirical evidence.

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Protecting the public from identified offenders who may reoffend is a challenging undertaking. Sexual offenders, in particular, are viewed by the public as inherently dangerous individuals who are untreatable, and highly likely to recidivate (Farkas & Stichman, 2002). Not surprisingly, then, professionals have become increasingly interested in the concept of polygraph-assisted risk assessment. In America, the polygraph has gained wide acceptance in the sexual offender treatment community where it is used for supervising, treating, and monitoring sex offenders on parole or probation (Consigli, 2002; English, Jones, Pasini-Hill, Patrick, & Cooley-Towell, 2000; Grubin, 2003; Van Aperen, 2006). In Britain, however, plans to adopt the polygraph as an adjunct to standard risk assessment have been more cautionary, and at the time of this article going to press, the Home Office has still not yet formally embraced the polygraph for the monitoring of sex offenders. Given the clearly contentious views that the polygraph evokes across differing individuals and continents, it is timely to examine the literature examining polygraph-assisted risk assessments with sexual offenders. To date, no published reviews have specifically examined the literature on sexual offender risk assessment and the polygraph. Our review provides an overview of current risk assessment knowledge, and examines current sexual offender polygraph research, examining whether the polygraph should be viewed as an indispensable asset for professionals involved in sexual offender management.

We will begin this review with a description of current methods of risk assessment used to apportion supervision resources, highlight treatment needs, and monitor risk in the community. Next, we examine the validity of current risk assessment approaches, and introduce the polygraph as a method for further improving current risk assessments. We then move on to review the range of polygraph-assisted risk assessment studies with sexual offenders, paying careful consideration to ethical concerns. Finally, we consider the future of polygraph-assisted risk assessments with sexual offenders, and propose some considerations for professionals who are interested in the relationship between sexual risk assessment and the polygraph. Throughout this review, the term risk is used to refer to a likelihood of further offending (either sexual or violent), and the term risk factor to refer to variables empirically associated with increases in the likelihood of further offending.

1. An overview of current methods of risk assessment

A comprehensive assessment of sexual offender risk needs to cover personal traits, historical variables, contextual antecedents, and also clinical factors (Beech, Fisher, & Thornton, 2003). There are three main assessments that, used together, cover all these individual variables: functional assessments, statistical or actuarial methods, and clinically informed methods.

1.1. Functional assessments

A functional assessment should form the underlying basis of any adequate risk assessment (Beech et al., 2003). Such an assessment is conducted through interviewing the offender about the events surrounding his offense; paying particular attention to elicit the thoughts, feelings, decisions, and behaviors that heightened the offender’s risk (i.e., acute-dynamic risk factors; see Ward, Louden, Hudson, & Marshall, 1995, for an example). The final assessment is typically used as an education tool for offenders, to teach them about the perils of acute-dynamic risk factors, and/or to
guide professionals as they monitor sexual offenders in the community. Of course, however, a functional assessment is only useful if the information elicited from the offender is truthful. It may be hard for sexual offenders to be completely truthful with their assessors since in doing so they may well divulge information that could setback their release, or bring about increased restrictions.

1.2. Actuarial assessments

Actuarial assessments measure the statistical relationship between an offender’s historic/static risk factors (e.g., past offenses and sentences, general criminality, victim crossover) and expected probability of recidivism. Using the data obtained from recidivism studies, actuarial instruments typically use a coding scheme in which professionals are required to indicate presence or absence of a range of factors that have been empirically associated with recidivism. The final calculation produces a statistical estimation of the offender’s risk which can be converted into categorical risk groups such as high, medium, or low for various follow up periods in the community. Effectiveness of actuarial instruments is typically assessed using Receiver Operating Characteristics Area Under the Curve Analysis (AUC). AUC analysis results in an estimation of instrument accuracy ranging from .5 (chance prediction) to 1 (perfect prediction). Popular instruments are the Rapid Risk Assessment for Sexual Offense Recidivism (RRASOR; Hanson, 1997; see Barbaree, Seto, Langton, & Peacock, 2001; Hanson & Thornton, 2000; Sjöstedt & Långström, 2002 for AUC results), Static-99 (Hanson & Thornton, 2000; see Hanson & Thornton, 1999, 2000 for AUC results), Risk Matrix 2000 (Thornton et al., 2003; see Craissati, 2004 for AUC results), the Minnesota Sex Offender Screening Tool-Revised (MnSOST-R; Epperson, Kaul, & Hesselton, 1998; see Langton, Barbaree, Harkins, Seto, & Peacock, 2002 or Epperson, Kaul, Huot, Goldman, & Alexander, 2003 for AUC results) and the Sex Offender Risk Appraisal Guide (SORAG; Quinsey, Harris, Rice, & Cormier, 1998; see Ducro & Pham, 2006; Harris & Rice, 2003 and Rice & Harris, 2002 for AUC results).

Actuarial instruments are deservedly popular since they are easily administered and scored from file information and are generally quite accurate when considering groups of sexual offenders. There are some problems with actuarial approaches, however. First, unusual offenders are unlikely to be present in the development samples used to construct the actuarial measures (Beech et al., 2003; Grubin, 1999). Second, actuarial instruments are likely to underestimate the true incidence of offending since official recidivism statistics underlie their development. Further, it is likely that offenders have a number of undetected offenses in their background that may alter their estimated risk to the community. Third, actuarial measures—on their own—have little utility for making predictions with individual sexual offenders since the statistical variation obtained from group models is too large to make precise individual predictions of risk (D. Cooke, personal communication, 23rd March, 2007). Finally, in addition to this, actuarial measures are of little use to professionals interested in managing and treating risk since these measures view risk factors as largely unchangeable, static, phenomena (Beech et al., 2003; Bonta, 2002; Craig, Browne, & Stringer, 2004; Hanson, 2006).

1.3. Dynamic risk assessment

Because of the limitations inherent in actuarial measures, researchers have developed risk instruments that include changeable factors (i.e., clinically informed measures). Examples are Beech’s deviancy concept (Beech, 1998), Thornton’s (2000, 2002) Initial Deviance Assessment, the Sex Offender Need Assessment Rating (SONAR, Hanson & Harris, 2001), the Sexual Violence Risk-20 (Boer, Hart, Kropp, & Webster, 1997), and the Risk for Sexual Violence Protocol (RSVP; Hart et al., 2003).

1.3.1. Beech’s deviancy concept (Beech, 1998)

Beech’s work on the concept of deviancy has stemmed from evaluation work carried out with the Sex Offender Treatment Project team in the United Kingdom (see Beech, Fisher, & Beckett, 1999). In brief, Beech conceptualizes deviancy as being directly related to the presence of stable-dynamic risk factors (i.e., factors of risk that are relatively stable, but may be influenced by treatment. Such factors include deviant sexual interests, socio-affective functioning, and offense-supportive attitudes). Using a battery of psychometric tests that tapped each of these domains (and relevant non-offender norms), Beech used statistical cluster analysis techniques and found that he was able to divide child molesters into two main groups: high deviancy and low deviancy. High deviancy individuals were men who displayed
high levels of offense-supportive attitudes, were highly obsessed about sex, and showed sexually deviant interests (Beech, 1998). They also displayed a range of socio-affective deficits such as being unable to form effective emotional relationships with appropriate age-mates (Beech, 1998). On the other hand, low deviancy men did not tend to be characterized by stable-dynamic risk factors. For example, they showed relatively low levels of offense-supportive attitudes, and did not display the high levels of socio-affective deficits characteristic of high deviancy men (although they did have much higher levels than non-offenders). Perhaps most interestingly, a good proportion of situational offenders typically hypothesized to be low risk (just under one third) fell into the high deviancy category outlined by Beech (1998). Beech, Friendship, Erikson, and Hanson (2002) have reported that the pre-treatment identification of deviancy increased Static-99’s predictive power by up to 86% (Craissati, 2004).

1.3.2. Initial deviance assessment (IDA; Thornton, 2000, 2002)

This assessment concentrates on four main stable-dynamic variables: deviant sexual interests, offense-supportive attitudes, socio-affective functioning, and self-regulation issues. Offender deviancy is postulated to be the extent to which psychological functioning is affected by each of these stable-dynamic variables. An offender deemed to be of high deviance represents an offender experiencing psychological problems related to at least three stable-dynamic factors. An offender experiencing psychological issues with one or two stable-dynamic factors is an offender of moderate deviance, and finally; an offender exhibiting no identifiable issues in any domain is a low deviance offender. Like Beech’s deviancy concept, the IDA has been found to independently predict sexual recidivism in addition to Static-99’s predictive accuracy (see Beech et al., 2002; Thornton, 2002; Thornton & Beech, 2002), although a combined IDI-Static-99 approach seems to yield most accurate results (Thornton, 2002).

1.3.3. Sex offender need assessment rating (SONAR, Hanson & Harris, 2001)

Hanson and Harris (2001) have provided risk assessors with an innovative risk instrument interview that includes both stable-dynamic and acute-dynamic assessments of risk. Acute-dynamic risk factors refer to highly changeable risk factors that are proximal signals of imminent reoffending. Using empirical research (Hanson & Bussière, 1998; Hanson & Harris, 2000a), the SONAR was developed to encompass: (a) stable-dynamic factors, including intimacy deficits, social influences, supervision cooperation, offense-supportive attitudes, and both general and sexual self-regulation; and (b) additional acute-dynamic risk factors, including substance abuse, victim access, hostility, negative affect, social support, sexual preoccupations, and supervision rejection. A novel aspect of the instrument is the addition of unique acute risk factors. These factors are those that are personal to the offender and may function to elevate risk (e.g., ongoing health problems, victim contact). Subsections are scored to produce dynamic and acute risk ratings. This instrument represents a significant achievement since it is able to assess change in risk profiles over time and the authors report an acceptable ability of the instrument to discriminate between recidivists and non-recidivists (ROC .74). The SONAR has now been further advanced by Hanson and Harris and is packaged as two separate scales: Stable 2000 and Acute 2000 (see Hanson & Harris, 2000b, 2000c). The results of a three and a half year study investigating these measures are expected to be announced soon.

1.3.4. Sexual violence risk—20 (SVR-20; Boer et al., 1997)

This instrument contains 20 items (static and dynamic) empirically related to sexual recidivism that span three main areas: psychosocial adjustment, sexual offenses, and future plans. The SVR-20 allows the assessor to take into account person-specific variables of risk and any recent change in an item’s salience. Items from the SVR-20 may be summed for research purposes, but for practical risk assessments clinical formulation is advised, resulting in structured clinical judgments of low, moderate and high risk. Research shows that the final SVR-20 risk judgment is highly predictive of sexual recidivism in Dutch sexual offenders (AUC = .83, de Vogel, de Ruiter, van Beck, & Mead, 2004). Hanson and Morton-Bourgon’s (2004) meta analysis also found that the SVR-20 had a mean effect size of .77 for prediction of sexual recidivism across six studies.

1.3.5. Risk for sexual violence protocol (RSVP; Hart et al., 2003)

The RSVP is the latest structured clinical judgment tool available for assessing risk of future sexual offending and updates the SVR-20. Improvements include clearer information regarding assessment procedures, further consideration of risk factors relating to risk management, and use of scenario-based methods of risk assessment (Logan, 2005). Like the SVR-20, the RSVP contains a number of static and dynamic factors empirically related to sexual offense recidivism.
that are clinically formulated into an individual risk assessment and management package for the individual. To date, however, there is very little evidence on the validity of the RSVP.

In summary, the range of methods available for assessing sexual offenders’ risk is impressive, and shows good face validity. On the whole, actuarial methods are typically deemed to be most effective at predicting generic group risk (Bonta, 2002; Craissati, 2004; Grove & Meehl, 1996; Hanson, Morton, & Harris, 2003), while clinically guided assessments provide a comprehensive overview of individual risk for treatment and community surveillance (D. Cooke, personal communication, 23rd March, 2007). Every single method so far outlined, however, is reliant upon self-report information provided from the offender either directly (through interviewing) or indirectly (though file review). Even best case scenario (i.e., a combination of methods), leaves professionals wholly reliant on offenders’ willingness to fully disclose pertinent information. This is a problem voiced by many researchers interested in measuring historical/static risk factors (e.g., English et al., 2000), and stable-dynamic risk factors such as offense-supportive beliefs or deviant sexual arousal (see Conte, 1985; Gannon, Keown, & Polaschek, 2007; Kolton, Boer, & Boer, 2001; Langevin, 1991). Much concern is also voiced over honest disclosures of acute-dynamic risk indicators (English et al., 2000; Wilcox, Sosnowski, Warberg, & Beech, 2005). Sexual offenders being supervised in the community are extremely unlikely to notify supervising bodies if they feel they are engaging in high risk behaviors that may jeopardize their freedom. One way of improving self-reported risk factors is to provide clinicians and assessment professionals with a theoretical framework to guide their interviews with clients, enabling them to sensitively probe for fuller disclosure in areas believed to be particularly pertinent (see Ward & Beech’s Etiological Model of Risk, 2004). However, even with the use of such a guiding framework, many clinicians are prepared for the reality that sexual offenders will give only incomplete accounts of their past offending behaviors and of the problems that they experience in abstaining from offending. The question is, can we do better? Can we use external apparatus in the form of the polygraph to gain a more coherent account of sexual offenders’ risk?

2. Polygraph-assisted risk assessments

The literal translation of the Greek term polygraph is “many writings” (British Psychological Society; BPS, 2004; Centre for Forensic Psychophysiology, 2006) and the underlying premise of the polygraph is that lying is associated with various physiological changes of the autonomic nervous system. The polygraph is not a lie detector, but measures physiological arousal that may be the product of lying. More specifically, continuous changes in respiration, cardiovascular, and electrodermal functions are typically recorded and the results then used to diagnose probable truthfulness for an individual (USA Employee Polygraph Protection Act of 1988; Grubin, 2005; Madsen, Parsons, & Grubin, 2004). There are four main techniques used for polygraph-assisted questioning: the relevant/irrelevant technique, the control or comparisons question test, the directed lie test, and the guilty knowledge test (BPS, 2004). Post-conviction polygraph testing with sexual offenders relies almost exclusively on the comparison question test (Abrams & Abrams, 1993) and so in the interests of space, we shall describe only this technique here.

In the comparison question test (CQT) an individual’s truthfulness may be ascertained through examining their physiological responses to two main question types: relevant questions and comparison questions. Relevant questions are very specific questions that tap into the issue of interest such as “Did you engage in sexual contact with your daughter?” Comparison questions, on the other hand, are designed to be rather vague and general in nature and refer to long time periods (BPS, 2004). An example would be the question “Have you ever had any thoughts that might concern your probation officer?” Here, it is important to note that the polygraphist places great emphasis on the incriminating nature of comparison questions and because of this, the innocent respondent feels they have almost no choice but to lie. In sum, the aim of the comparison question is to encourage innocent individuals to lie and experience physiological discomfort. It is hypothesized that innocent individuals produce more physiological arousal to the comparison questions relative to the relevant question since they know that they are directly lying to the comparison question. Guilty individuals, however, who are lying to both comparison and relevant questions, are hypothesized to show less arousal to the comparison questions relative to innocent individuals since the relevant question is most threatening to their well being if lying is detected (BPS, 2004).

So, how accurate are the data obtained from CQT polygraph examinations? It is worth pointing out here that a number of writers have argued that the CQT test lacks standardization since the construction of good comparison questions is very much dependent on the skills of the examiner (see BPS, 2004 or Cross & Saxe, 2001). In the US, the
National Research Council (2003) commissioned a review of the scientific evidence supporting the validity of the polygraph—including CQT techniques—specifically for Government security purposes. The final report describes the lack of polygraph research investment as “striking” and argues that use of the polygraph in such settings allows too many honest employees to be falsely identified as deceptive (i.e., false positives) and many threats to Government security going undetected (i.e., false negatives). Further, a review of relevant field study reviews conducted by the BPS (2004) has highlighted accuracy figures of between 83% and 89% for correctly identifying guilt, and between 53% and 78% for correctly identifying innocence (see Ben-Shakhar & Furedy, 1990; Carroll, 1991; Honts & Perry, 1992; Iacono & Patrick, 1997; Lykken, 1998; Saxe, Dougherty, & Cross, 1985; Raskin & Honts, 2002). Laboratory studies do show more positive findings (see Vrij, 2000), but are less ecologically valid (BPS, 2004).

Also of importance here is the level of cognitive sophistication required by individuals who are the recipient of relatively complex CQT techniques. Some researchers have voiced doubts, for example, about the validity of polygraph testing with adolescents whose cognitive understanding may not be sufficiently well developed to elicit valid physiological reactions to the polygraph (see Craig & Molder, 2003). Relatively few studies have been designed to adequately test polygraph examination of young children and adolescents. The best known study appears to be that conducted by Abrams (1975), who reported generally poor validity with younger children aged below 11 years. Persons with lower IQs, active mental illness, and anxiety disorders should also be excluded from polygraph testing, since the very nature of these impairments may well affect the usual validity of polygraph testing (Blasingame, 1998).

While the polygraph’s level of accuracy is far from perfect, polygraph proponents argue that much of the research and practice utilizing post-conviction polygraph testing is not dependent upon accuracy per se since the polygraph is viewed primarily as a truth facilitator (Grubin, 2005; Grubin & Madsen, 2006). It is from this stance that we review the relevant literature since the polygraph’s potential benefit in relation to sexual offenders’ risk centers on its ability to motivate more honest self-reports of risk-related factors.

Post-conviction polygraph proponents (e.g., English, Jones, Patrick, & Pasini-Hill, 2003; Grubin, Madsen, Parsons, Sosnowski, & Warberg, 2004) argue that the polygraph promotes more realistic risk assessments that may be used to inform treatment and monitor sexual offenders’ compliance with supervision conditions (i.e., their immediate risk in the community). The main benefits of the polygraph are seen to be the elicitation of: (i) more honest historical/static risk information (e.g., information about the frequency of previous offenses and the range of victims [offense crossovers]; Ahlmeyer, Heil, McKee, & English, 2000, Wilcox et al., 2005); (ii) more honest revelations of stable-dynamic risk factors or psychological traits (Gannon, 2006; Gannon et al., 2007); and (iii) more honest disclosures concerning high risk behaviors within the community (i.e., acute-dynamic risk factors; Emerick & Dutton, 1993; Grubin & Madsen, 2006; Grubin et al., 2004).

3. Empirical evidence on polygraph-assisted risk assessment

We will now review the relevant research examining the effect of post-conviction polygraph testing on assessments of sexual offenders’ risk. We will structure this review in a way that is consistent with the risk assessment literature summarized earlier. First, we will examine the literature pertaining to historical/static risk factors; the most prolific aspect of the risk-related polygraph literature. Then, we will examine the literature examining stable-dynamic risk, and acute-dynamic risk. Within this review, we use the term treatment-related polygraph to refer to polygraph examinations that are associated with, or given as part of an offender’s treatment program.

3.1. Historical/static risk factors

Historical/static risk factors are features from an offender’s past that have been found to statistically predict future recidivism. They form the underlying basis of many successful actuarial risk instruments (e.g., Static-99, RRASOR, SORAG) and may indicate the presence of core treatment needs (e.g., being single could be a potential indicator of empathy deficits; Beech & Ward, 2004). Over the past 15 years, researchers have compared polygraph-assisted examinations with other standard information gathering techniques such as investigative summary reports or clinical interviews (Ahlmeyer et al., 2000; Emerick & Dutton, 1993; Heil, Ahlmeyer, & English, 1998; Wilcox & Sosnowski, 2005; Wilcox et al., 2005) to assess the relative benefits of using the polygraph. The general purpose of such studies has been to examine any increases in the numbers of previous offenses and victims admitted by the offender during polygraph-assisted examinations.
In a US study, Ahlmeyer et al. (2000) examined 35 inmate and 25 parolee sexual offenders’ victim and offense disclosures across three main sources: pre sentence file summaries (available on record), responses to a sexual history disclosure form (administered up to 90 days following admission to treatment), and polygraph examination (administered consecutively—4 to 6 months apart—following completion of the sexual history disclosure form). More exact information concerning the timing of these tests in relation to treatment is not given, although it seems that the initial polygraph test was timetabled directly after standard responses to the sexual history disclosure form. Results showed that both inmates and parolees showed considerable increases in the numbers of offenses and victims admitted across differing sources. Statistical differences between these means were not analyzed, but differences were obviously large. For example, mean number of admitted victims was just two on the pre sentence file summary, 50 on the sexual disclosure form, 99 on the 1st polygraph, and a massive 110 on the 2nd polygraph! Interestingly, when the same data were examined separately for inmates and parolees, mean numbers of admitted offenses and victims did not appear to increase as dramatically across each data source for the parolees. Ahlmeyer et al., suggest that this may be the product of fearing parole violation repercussions, or a treatment confound, since parolees received less intensive treatment than inmates.

In a larger US study Heil, Ahlmeyer, and Simons (2003) collected pre sentence file summaries, responses to a sexual history disclosure form, and polygraph examination information administered during treatment for 223 inmates and 266 parolees. Overall, they found that more offenses and victims were disclosed by the inmates during polygraph examinations compared with the pre sentence file information (for example, mean number of offenses increased from 12 in the file information condition to 137 in the polygraph examination condition). As we shall discuss later, however, one potential problem with the mean as a measure of central tendency is that the number of offenses may be strongly affected by outliers. Heil et al. also provide median figures which show that median number of offenses increased from 2 in the file information condition to 24 in the polygraph examination condition. Thus, a measure of central tendency such as the median may represent a more realistic and accurate representation of number of offenses and any shifts in reporting of such offenses in the context of polygraph assessment. Further, while Heil et al.’s pattern of results could reflect the effects of the polygraph, it is of concern that inmates had undertaken a considerable part of their treatment program upon polygraph examination. Once again, parolees showed a much smaller change compared with inmates (mean number of offenses increased from 3 in the file information condition to 14 in the polygraph examination condition; note however, that using median number of offenses this increase is from only 1 in the file information condition to 2 in the polygraph examination). Again, these figures could reflect the fact that parolees received less intensive treatment compared with inmates.

In one of the first British pilot studies investigating a small number of treated sexual offenders’ sexual history disclosures (n=14), Wilcox et al. (2005) found that medium to high risk men (measured using the Risk Matrix 2000; Thornton et al., 2003) made significantly more disclosures during polygraph examination compared to information held on file (i.e., pre sentence reports, previous sexual history disclosures, psychometrics etc.). For example, mean disclosures of “hands on” sexual offenses increased from 37.2 to 81.9 and mean disclosures of non-contact sexual offenses increased from 26.2 to 80.8. It is unclear, however, how much the polygraph per se facilitated offense disclosures since, on average, sexual offenders had received 13 months of treatment prior to the polygraph procedure. In addition to this problem, Wilcox et al. also provide more reliable estimates of disclosures of sexual offenses in the form of the median. Using the median as a measure of central tendency, it appears that disclosures of “hands on” sexual offenses actually increased from 3 to 4 and median disclosures of non-contact sexual offenses increased from 3 to 5. Thus, using more realistic measures of offense disclosures the polygraph’s ability to lead to further disclosures of risk appears rather less dramatic. Recall that this was also the case in Heil et al.’s study.

In a retrospective study, Hindman and Peters (2001) found substantial five to six fold increases in the amount of victim disclosures made by US sexual offenders during treatment-related polygraph examination (in which offenders were granted immunity from further prosecutions) compared with offenders who self-reported their history pre sentence or dropped out of treatment prior to polygraph assessment. A four-fold increase was also reported within sexual offenders who gave self-reported histories prior to treatment, and then again in relation to treatment-related polygraph examination. Perhaps the most striking aspect of Hindman and Peter’s study is what they refer to as the Magical X. In brief, this is the term that Hindman and Peters use to refer to the substantial turnaround of historical risk factors that occurs during polygraph examination. From their analysis, Hindman and Peters found that under polygraph examination, sexual offenders’ prior victim disclosures significantly increased yet disclosures about their own childhood victimization experiences significantly decreased. From this, Hindman and Peters argued that sexual
offenders are apt to minimize their offense histories and exaggerate their own victimization when self-reporting historical risk factors under standard conditions. In this study, however, polygraphed offenders tended to be granted offense immunity, which by itself could have elicited increased risk-related disclosures. Further, this study relies specifically upon mean number of victim disclosures; a measure which may be strongly affected by the presence of outliers.

Of particular relevance here is the pioneering study conducted by Abel et al. (1987), which did not involve any polygraph procedures. In this study, sexual offenders were guaranteed specific immunity from prosecution for the purpose of the project which examined self-reported offending history. A large number of victims were reported under conditions of immunity. For example, male-target pedophiles reported a mean of 150.2 victims (median = 4.4) and rapists reported a mean of 7 victims (median = 1.4). Thus, it appears that immunity—sometimes used in polygraph studies—produced victim disclosures far in excess of those typically reported by offenders not granted immunity. In addition, this study like that of Heil et al. (2003) and Wilcox et al. (2005) illustrates that median values—often not highlighted in polygraph studies—provide a more representative and realistic measure of victim disclosure than the mean. Thus, Abel et al.’s study raises an interesting methodological issue in relation to the study described by Hindman and Peters. Here, participants were granted immunity as well as being polygraphed, introducing a confound that could only be further tested through introducing a condition in which the effect of immunity alone is tested. In fact, none of the polygraph studies that we review have incorporated a condition to test the effects of immunity alone. This is an unfortunate flaw that needs to be rectified before valid conclusions may be drawn regarding polygraph testing.

Wilcox, Foss, and Donathy (2005) have recently described the case study of a high risk sexual offender (measured using the Risk Matrix, 2000; Thornton et al., 2003) who professionals suspected was covering up the extent of his offending behavior during initial therapy. A polygraph examination was conducted and the offender admitted a plethora of sexual offenses during adulthood and childhood which he had never been apprehended for. These included approximately 700 further victims of indecent assault, 20–50 indecent exposure victims, and 300 frottage victims during his adult years. A further 50–80 indecent exposure victims, 10 victims of public masturbation, and 2 victims of obscene telephone calls were reported during his childhood years. Additionally, this offender admitted to having stalked individuals on around 400 separate occasions as an adult, and as having publicly masturbated more than 20 times as an adult. Similar sexual history disclosures associated with the polygraph have been reported in single case studies presented by Hagler (1995). Single case studies, however, are unlikely to substantially increase knowledge concerning the validity and reliability of the post-conviction polygraph.

The descriptions of offender denial by Wilcox et al. (2005) will resonate with many who work in the risk assessment field. Accurate self-reporting of offense and victim frequency is a problem that risk professionals have to deal with on a daily basis. This problem becomes more meaningful when offense reports are examined for offense crossovers; a frighteningly common occurrence amongst sexual offenders (English et al., 2000; Weinrott & Saylor, 1991). Offense crossover refers to sexual offense disclosures showing that victims vary on significant characteristics such as sex, age, and relationship to the perpetrator. Typically, when offense crossover is disclosed, assigned risk level increases (see the actuarial and clinically informed measures described earlier). Next, we examine the empirical work with the polygraph which taps into the offense crossover characteristics of victim sex, victim age, and relationship to perpetrator.

3.1.1. Victim sex

A particularly important risk-related variable is the sex of the offender’s victims. Child molesters who offend against boys are deemed to be particularly high risk individuals (see Beech, 1998; Hanson & Bussière, 1998; Hanson & Thornton, 1999; Quinsey et al., 1998). Since entrenched victim preferences are hypothesized to indicate pervasive deviant sexual interest (Beech & Ward, 2004), it is thus important to obtain accurate and full disclosures from offenders about the sex of their victims so that accurate risk assessments may be conducted for treatment and risk surveillance reasons.

Heil et al. (2003) have reported that 35.9% of their 223 US inmate sexual offenders disclosed abusing both males and females during treatment-related polygraph examination; a substantial increase on the 8.5% figure available from the same inmates’ pre sentence reports. Increases were also noted in the parolee group, but these were less substantial (3.5 pre sentence compared with 9.7 associated with treatment-related polygraph examination). Similarly, English et al. (2000) found that treatment-related polygraph assessment prompted one in three US sexual offenders to admit having

1 Blasingame (1998) argues that such immunity agreements are particularly likely to elicit increased disclosures.
male victims compared to only one in five recorded on the same offenders’ file information (containing such information as pre sentence, police and supervising officer reports). From this, English et al. conclude that reliance on file information could lead to serious underestimates of sexual offenders’ risk to the community. Recall, however, that polygraph implementation was paired with the treatment process. In Hindman and Peters’ (2001) retrospective US study, non-polygraphed sexual offenders tended to report predominantly female victims, but polygraphed offenders revealed fairly equal numbers of male and female victims. On the surface, such results appear to indicate that the polygraph leads to a more accurate picture of the sex of offenders’ victims. However, as we have noted earlier, it is typically not possible to totally rule out other confounds such as treatment or disclosure immunity.

3.1.2. Victim age

Those who offend against both children and adults are held to be particularly risky since their indiscriminate offending is indicative of impulsivity and regulation deficits (Beech & Ward, 2004; Craissati, 2004). Thus, honest reports of victim age crossover are of paramount importance for adequate risk assessment. Several studies appear to indicate that relying on readily hand file information (which often contains a vast array of evidence from several different sources) leads to vast underestimates of sexual offenders’ age crossover. English et al. (2000) reported that treatment-related polygraph assessment prompted 33% of US sexual offenders to admit having offended against both adults and juveniles compared to only 10% recorded on the same offenders’ file information. English et al. argue that this result speaks for itself: polygraph examinations help to identify previously unidentified risk characteristics that can radically change how professionals deal with both the treatment and risk monitoring of a particular case. Similarly, using pre sentence investigation reports, Heil et al. (2003) found that only a small percentage of US inmate sexual offenders (7.2%) appeared to have both child and adult victims. Upon treatment-related polygraph examinations, however, this percentage rose to 70%. In the British pilot work described earlier, Wilcox et al. (2005) found that polygraph examination increased adult-child crossover disclosures. However, numbers were extremely small due to the exploratory nature of the work (two offenders with adult victims disclosed unknown child victims).

3.1.3. Relationship to victim

Sexual offenders who hold a more distant relationship to their victim(s) are believed to pose a higher level of risk to the community. For example, men with stranger victims are deemed to be higher risk individuals (Craissati, 2004; Hanson & Harris, 2000a; Hanson & Thornton, 1999, 2000), as are child molesters who target victims outside of their family (Hanson & Thornton, 1999). Fewer studies focus on offense crossovers addressing this issue. However, Heil et al. (2003) found that 57% of inmate sexual offenders polygraphed during treatment admitted offending against stranger as well as known victims compared with only 7% of disclosures available on the same offenders’ pre sentence investigation reports. A similar increase was reported for disclosures of offenses against both relatives and non-relatives (pre sentence investigation reports showed a disclosure rate of only 12% whereas treatment-related polygraph elicited 70% disclosures of this type). Focusing more specifically on only the infantile child molesters \( (n=141) \), Heil et al. report disclosures of molesting both child relatives and non-relatives of 65.2% during treatment-related polygraph compared with only 15.6% from pre sentence investigation reports. In one of the only studies that appears robust from treatment confounds, Emerick and Dutton (1993) examined the historical offense information for 76 US juvenile sexual offenders using file information, clinical self-report, and interviewing coupled with the polygraph. Overall, the polygraph appeared to prompt offenders to disclose having offended against a variety of victims of differing relationship categories; 46.7% admitted having victims that crossed over differing social relationships compared with file information and the clinical interview (22.2% and 28.9% respectively). This study was novel since polygraph testing occurred pre-treatment. However, the authors did take special precautions to ensure adolescents’ disclosures would not incriminate them further, thus confounding the study with offense immunity.

On the face of it, studies that examine the polygraph’s capability of eliciting more honest disclosures of historical risk factors show very positive findings. Using the polygraph, researchers and treatment professionals have reported vast increases in the amounts of offenses and victims admitted (Ahlmeyer et al., 2000; Heil et al., 2003; Wilcox et al., 2005). The polygraph also appears to elicit a more comprehensive picture of offense crossovers (English et al., 2000; Heil et al., 2003; Hindman & Peters, 2001; Wilcox et al., 2005), and of offender specific variables such as history of victimization (Hindman & Peters, 2001). However, the usefulness of the small cohort of studies on this topic is severely compromised by a lack of rigorous experimental control and small participant numbers. Typically, for example, in the studies we have described, polygraph use is confounded with treatment provision (e.g., Ahlmeyer et al., 2000; English
et al., 2000; Heil et al., 2003), or offense immunity (Emerick & Dutton, 1993; Hindman & Peters, 2001) and when between groups comparisons are made, the groups are not adequately matched on factors of critical relevance to the dependent variable (e.g., Hindman & Peters, 2001).

3.2. Stable-dynamic risk

Stable-dynamic risk factors are stable psychological features that form the underlying basis of many successful risk evaluation schedules (e.g., Hanson & Harris’ SONAR, 2001; Beech’s deviancy concept, 1998; Thornton’s IDA, 2002) and are amenable to treatment change (Beech et al., 2003). Much of the risk-related polygraph work with sexual offenders has concentrated upon eliciting more honest disclosures of historical risk factors (Ahlmeyer et al., 2000; English et al., 2000; Hindman & Peters, 2001; Wilcox et al., 2005; Wilcox & Sosnowski, 2005), and acute-dynamic risk factors (see our later descriptions; English et al., 2000; Grubin et al., 2004). However, educated estimates about the pervasiveness of stable-dynamic risk factors may be made from historical disclosure obtained during polygraph examinations (e.g., higher offense crossovers may indicate a pervasive sexual regulation problem; Ward & Beech, 2004). Nevertheless, a much more accurate picture of sexual offenders’ treatment need could perhaps be gained from utilizing the polygraph to highlight more honest pictures of stable-dynamic risk. Surprisingly, however, we found very little polygraph research directly focused on the examination of stable-dynamic risk factors. We were, however, able to draw upon some of our own studies to give some insight into this arena.

Thus far, researchers using the polygraph have advocated its ability to elicit more honest disclosures rather than provide a fully accurate indicator of lying per se (Grubin, 2005). In other words, the real power of the polygraph paradigm is deemed to be its ability to facilitate disclosures or confessions since the participant is convinced of the polygraph’s lie detecting capabilities (Madsen et al., 2004). Because of this, we predict that—if the polygraph is a useful adjunct to risk assessment—similar effects should be elicited using a bogus polygraph, as long as the participant is convinced that the polygraph is real. To our knowledge, only two such studies have been conducted with sexual offenders (see Gannon, 2006 and Gannon et al., 2007), and these studies focus exclusively on eliciting accurate portrayals of offense-supportive beliefs.

In the first study, Gannon (2006) asked 32 relatively low risk child molesters to complete an offense-supportive beliefs scale at two time points separated by only a few days (Time 1 and Time 2). At Time 1, the questions were completed under standard conditions (i.e., child molesters were free to impression manage). At Time 2, however, when molesters were revisited, half of the molesters were placed in the fake polygraph condition (in which they completed the questionnaire again attached to what they were led to believe was a type of polygraph), and the other half completed the questions again under standard transparent conditions (i.e., they acted as a control group). The bogus polygraph was made up of a skin conductance monitor with electrodes that was attached to a lap top computer showing skin conductance output. Participants in the fake polygraph condition were simply told that dishonesty was related to skin conductance and so they should refrain from lying once connected to the electrodes. Results were rather disappointing since molesters in the fake polygraph condition did not show increased disclosures of offense-supportive beliefs relative to their own previous reports or that of the control group. It seemed, then, that the molesters in Gannon’s study had either not consciously hidden their real beliefs when they first answered the items at Time 1 (see Gannon & Polaschek, 2006), or not fully believed in the veracity of the machine.

In a bid to further investigate this finding, Gannon et al. (2007) strengthened the methodology from Gannon’s (2006) study by (a) lengthening the time interval between re administration of the questionnaire, (b) using a more psychometrically sound measure of offense-supportive beliefs (i.e., Bumby’s MOLEST, 1996), and (c) showing fake polygraph participants a rigged demonstration of the polygraph “working” in which the experimenter manipulated screen output using a hidden foot pedal while participants tried to “lie” to the machine. Gannon et al. also limited recruitment intake so that only relatively high-risk offenders were recruited (measured using Static-99). This time, as hypothesized, molesters in the fake polygraph condition significantly increased offense-related belief endorsements relative to their own previous responses, and the control group’s responses. In other words, this result suggested that these relatively high risk child molesters had consciously covered up the extent of their offense-supportive beliefs when asked to self-report them via standard questionnaire conditions. It is hard to pinpoint exactly why the latter fake-polygraph study found more positive findings since a number of variables were strengthened. It is possible, however,

2 It was designed especially for her study.
that it were the high risk sample utilized since high risk offenders are most likely to hold offense-supportive beliefs that they feel should be minimized under standard self-report conditions. However, it is important to point out that the clinical significance of Gannon et al.’s findings were dubious since the size of the statistical effect was small, amounting to an average increase in agreement with the items of .09.

Although the fake polygraph procedure described above may be criticized since, by definition, the machine used was not authentic, fake polygraph studies do have some benefits. Most importantly, they differ from the majority of real polygraph studies described earlier since they are experimentally controlled. For example, they utilize control groups, and are not administered as part of treatment (see Gannon et al., 2007). On a practical level, however, such a paradigm could not generally be used with sexual offenders in treatment since word would quickly spread about the bogus nature of the equipment.

In summary, fake polygraph procedures appear to be the only studies focusing upon sexual offenders’ stable-dynamic risk. Other stable-dynamic risk factors other than offense-supportive beliefs need to be assessed using either a real or fake polygraph to gain a clear picture of how polygraph-assisted assessments may further enhance risk assessment. Until this time, we believe the information is far too sparse to conclude that the polygraph can elicit reliable information in the stable-dynamic domain.

3.3. Acute-dynamic risk

Acute-dynamic risk factors are those thoughts, feelings, decisions, and behaviors indicating that a sexual offense is imminent; they indicate when an offense may occur and are of paramount importance to professionals planning relapse prevention during treatment or supervising sexual offenders in the community (Craissati, 2004). The polygraph is of obvious appeal in the context of sexual offender supervision since even amenable sexual offenders are likely to withhold self-reported risky thoughts, feelings, and behaviors from their supervising officers for fear of reprisals (e.g., receiving additional supervision restrictions, prison recall, or even additional convictions). Because of this, professionals have used the polygraph to examine whether offenders under community supervision: (a) disclose imminent acute-dynamic risk factors when polygraphed (English et al., 2000), and (b) are deterred from high risk behaviors through knowledge of impending polygraph examinations (Abrams, 1991; Abrams & Simmons, 2000). At present, the research conducted examining both of these areas look promising, at least at surface level (Abrams & Ogard, 1986; English et al., 2000; Grubin et al., 2004; Harrison & Kirkpatrick, 2000; Wilcox, Sosnowski, & Middleton, 1999). For example, in relation to acute-dynamic risk disclosures, the British pilot study by Wilcox et al. (2005) found that polygraph examinations elicited a number of acute-dynamic risk factor disclosures from probationed sexual offenders. The behaviors reported included pornography and substance use, and visiting prostitutes and nude bars. Perhaps most worrying, however, was the finding that 57% of men disclosed stalking behavior that was unknown to supervising officials and many men disclosed acute-dynamic risk factors from many categories. Recall however, that a mere 14 offenders were used in this study, and so these results are very preliminary.

In a British prospective study, Grubin et al. (2004) investigated community treatment sexual offenders’ ability to adhere to their relapse prevention plan, through avoiding thoughts, feelings and behaviors associated with relapse. During the first phase of the research, 50 sexual offenders participated in acute-dynamic risk interviews and were told that they would be visited again in 3 months. Offenders assigned to the polygraph aware condition were informed that they would receive a polygraph examination during their next visit, while polygraph unaware offenders were merely told that they would receive a behavior “review.” In reality, during phase two, when offenders were revisited, all were given a polygraph examination since the authors hypothesized that polygraph aware individuals would disclose significantly lower levels of acute-dynamic risk than polygraph unaware individuals. At this stage in the study, a number of offenders dropped out leaving just 32 for polygraph examination. Surprisingly, however, polygraph aware and unaware individuals did not show significantly different disclosures of high-risk behaviors upon polygraph examination. Instead, it appeared that both groups disclosed equally high levels of engagement in highly risky behaviors with 97% of offenders confessing engagement in at least one behavior of high risk. Upon closer inspection, this figure equated to an average of 2.45 (SD = 1.7) risky behaviors for each offender, and some disclosures indicated some very serious threats to the community (e.g., cruising public toilets for potential victims, making contact with a previous child victim, and frottage on public transport). Because of this high disclosure rate, all group allocations were subsequently discarded and all participants were warned that they would receive another polygraph examination six months later (phase three). By phase three, another 11 individuals dropped out of the study, leaving just 21 offenders to

be examined. At this stage, however, a large number of offenders passed the polygraph examinations (71%), and offenders who disclosed risky behavior (n=15) had already talked about these difficulties with their community supervisors. On an offender feedback questionnaire, all offenders bar one reported that knowledge of the imminent polygraph examination had enabled them to abstain from reoffending. However, although this study appears to conclude on some positive results, Grubin et al.’s study has some limitations that require discussion. Why, for example, during the second phase of the research did both the polygraph aware and unaware groups display equally high levels of risky behavior? At face value, this null result suggests that knowledge of the impending polygraph had very little effect on offenders’ behaviors. In other words, giving sexual offenders information of an impending polygraph examination does not persuade them to decline from more risky behavior. Unfortunately, because of this null result, Grubin et al. combine groups during the third phase, weakening their study design and eradicating any possibility of drawing scientific conclusions regarding the effectiveness of the polygraph in monitoring risk.

Madsen et al. (2004) examined the same data from the study of Grubin et al. (2004) to see whether polygraph examinations also helped to reduce the severity of acute-dynamic risk disclosures as well as their frequency. Less severe behaviors were classified as being relatively “passive” activities that could threaten abstinence such as associating with sexual offenders. Behaviors of medium seriousness were more serious transgressions such as giving children alcohol, and behaviors deemed to be of a highly serious nature were behaviors thought to be serious offending precursors such as having unsupervised contact with potential victims. Madsen et al. reported that, at phase three, there was a significant decrease in the seriousness of reported behaviors as well as the decreased frequency of high risk behaviors originally reported by Grubin et al. (2004). Similarly to Grubin, however, Madsen et al. found that polygraph effectiveness was unique to phase three, and did not occur during the polygraph examinations given at phase two. They suggest that the polygraph needs to be experienced by sexual offenders before it enhances optimal disclosure (Madsen et al., 2004). However, like so many of the polygraph results we have reviewed here, significant confounds make firm conclusions impossible. As noted in the original study, there is no comparison group of polygraph unaware offenders and treatment progression may have confounded these results since men were steadily progressing through community treatment at each successive study phase.

In the US, examination of case files by English et al. (2000) highlighted some preliminary findings associated with acute-dynamic risk surveillance. They found that treatment-related polygraph examinations lead to 21 offenders (n=147) admitting sexually abusive behavior in the community (i.e., frottage, intercourse, voyeurism, and exhibitionism). Additionally, of sexual offenders who received maintenance polygraph examinations (n=122), just over a third (36%) confessed to engagement in high-risk behaviors such as inappropriate use of the internet, use of pornography, masturbation to deviant sexual fantasies, and indecent phone calls whilst under community supervision. However, this study did not use a comparison group making any conclusions drawn largely speculative.

Emerick and Dutton (1993) have also found that acute-dynamic risk disclosures increase for adolescent sexual offenders who receive polygraph examinations (n=76). In their study of offenders’ file information, clinical self-reports, and polygraph-interviews, they found that offenders were significantly more likely to disclose use of abusive pornography and masturbation to abusive images when polygraphed compared with their own standard clinical self-report. However, although comparisons could be usefully made within participants in this study, there was no comparison group and so performance of the polygraph as a risk surveillance measure was not adequately tested.

Taken together, the small number of studies we have reviewed indicates an urgent need to further resource studies investigating the polygraph’s ability to elicit increased risk-related disclosures in a variety of risk domains. We have uncovered some key methodological problems with many of these studies, which are frequently conducted in naturalistic treatment settings. Interestingly, while more research appears to have been undertaken in the historical and acute-dynamic risk factor domains, it is extremely difficult to draw any conclusions in the stable-dynamic domain due to a distinct lack of polygraph studies. Thus rigorous polygraph research is vital for this domain; especially for professionals interested in the polygraph’s ability to lead to better treatment planning.

4. Future research and conclusions

The research presented in this review shows some tantalizing findings in relation to polygraph-assisted risk assessments. On the face of it, the polygraph appears to substantially increase disclosures of both historical risk factors and acute-dynamic risk factors (English et al., 2000; Heil et al., 2003; Wilcox et al., 2005). There are,
however, various other possible alternatives for these findings such as offense immunity and treatment provision. We have noted throughout that the dominant research design used to assess the polygraph’s capabilities relies upon the naturalistic treatment setting. Such studies usually introduce the polygraph examination as part of treatment and then compare offenders’ polygraph disclosures to either their own disclosures prior to treatment, or to another group of offenders receiving less intensive treatment (Ahlmeyer et al., 2000; Heil et al., 2003). Clearly, although the use of this design is understandable in applied settings—especially when only retrospective data is available—such data can only really serve as a useful starting point and should not be interpreted as giving a fully integrated picture. In short, it is impossible—experimentally—to demonstrate a clear effect of the polygraph on increased disclosures of risk when other factors have also been introduced which are likely to increase self-disclosures also. With some consternation then, we suggest that further use of retrospective, treatment-confounded research is not likely to substantially increase scientific knowledge concerning the post-conviction polygraph. Designs that are prospective, however, and that include an adequately matched comparison treatment group who do not receive polygraph examinations and who are granted immunity from further prosecution may be adequate to control for the confounds so often noted in risk-related polygraph research. This would help to further disentangle the mechanisms driving the strong disclosure effect. Additionally, within-subjects designs could also be further carefully designed so that they are more valuable. Because much of the existing research is confounded by treatment or offense immunity, we suggest that pre-treatment offenders should be tested using standard self-report measures and the polygraph with a small time interval between tests, test order counterbalanced, and offense immunity either granted across both tests or neither.

In addition to these amendments, it may also prove valuable for researchers to design studies that not only better test the effectiveness of the polygraph at eliciting further disclosure of risk, but also test the long term effectiveness of polygraph-assisted treatment on offender recidivism. In other words, do offenders who have been polygraphed throughout treatment reoffend less than offenders provided with standard treatment only? Such information is valuable for professionals interested in adopting the polygraph as part of standard treatment programmes, but may take some time to come to fruition.

Our examinations of polygraph research in relation to stable-dynamic risk factors have highlighted a major gap in the research knowledge. At the time of this article is going to press we could find no risk-related authentic polygraph work directly tapping stable-dynamic risk factors. This could be the result of other existing methods (e.g., use of the penile plethysmograph or the implicit association test to measure deviant sexual interests; Gray, Brown, MacCulloch, Smith, & Snowden, 2005). Existence of other seemingly successful methods does not, however, preclude the possibility of researchers widening their scope somewhat, to use the polygraph for testing stable-dynamic domains. Such work—if rigorously controlled—may provide a broader measure of the usefulness of the polygraph in facilitating more honest risk disclosures.

Presently, we are concerned that continuing to conduct naturalistic polygraph studies—in which treatment confounds are clearly present—may seriously jeopardize the value of the resulting data. Thus, if the value of the resulting data is of poor empirical quality, can researchers really justify engaging in a general violation of offenders’ rights, or perhaps irretrievably damaging the bond of trust between therapist and clients? Using the polygraph within treatment sounds appealing, and is indeed current practice in many US states. Yet carefully designed studies should be at the forefront of this decision to use the polygraph within treatment, since other more damaging results could be lying in wait. It is of paramount important, then, that if the polygraph is to be used at all, it should be used in conjunction with a range of other methods before reaching a risk-related conclusion concerning sexual offenders.

In summary, the sexual offender risk literature has shown that researchers have created an exciting area of research in which interviews and structured risk assessments may be used to predict future risk and behaviors. Our review has focused upon the question of whether—by introducing the polygraph into such research—we can further improve what is already an extremely impressive achievement. The risk-related polygraph data we have examined certainly shows an avenue of intuitively pleasing research which requires further substantiation. Abel et al.’s study—which is over two decade’s old—showed us some time ago that it is possible to get sexual offenders to cooperate and disclose previously unknown victims and crimes if they are granted offense immunity. In other words, it may not be necessary for professionals to use the polygraph to gain more accurate risk descriptors. Thus, in the interests of best practice, we believe that researchers should turn their focus upon developing a more water-tight research program involving the polygraph. Only then should we make decisions about the overall value of the polygraph in assessing and managing sexual offenders’ risk.
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