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SCIENTIFIC VALIDATION OF POLYGRAPH TECHNIQUES REVISITS ADMISSIBILITY IN COURT

By

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ABSTRACT

This article sets forth the current scientific status of psychophysiological veracity examinations also known as polygraph examinations and its potential use and impact on the judicial system. Historical arguments against its admissibility as evidence in court are presented and addressed with recommendations which will insure that only the results of those polygraph techniques that have met the scientific criterion accuracy required to be classified as *validated evidentiary polygraph techniques* are submitted to the courts.

KEY WORDS: Psychophysiological veracity examination, forensic psychophysiology, polygraph, lie detection, Quadri-Track Zone Comparison Technique, Integrated Zone Comparison Technique, Federal Zone Comparison Technique, Utah Zone Comparison Technique, Backster Zone Comparison Technique.

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The current scientific status of psychophysiological veracity examinations¹ herein referred to as polygraph examinations and its potential impact on the legal system can best be understood with a brief history of the latest research, development, publication and scientific evaluation.

In 2003, the National Research Council (NRC) of the National Academies [1] published a report on “The Polygraph and Lie Detection” which concluded that “in populations of examinees such as those represented in the polygraph research literature, untrained in countermeasures, specific-incident polygraph tests, can discriminate lying from truthful telling at rates well above chance, though well below perfection.” The report found that the scientifically acceptable laboratory and field studies of specific-incident polygraph tests ranged between 81% to 91%. Research in the last ten years has further demonstrated the accuracy of a polygraph examination which should have an impact on the criminal justice system.

APA Standards for Use of Validated Techniques

In 2007, the American Polygraph Association (APA), adopted a Standard of Practice effective 1 January 2012. This standard requires all members of the APA to use validated polygraph examination techniques that meet certain levels of criterion accuracy. This standard requires that event-specific diagnostic polygraph examinations used for evidentiary purpose “must be conducted with techniques that produce a mean criterion accuracy level of .90 or higher, with an inconclusive rate of .20 or lower.” Validation requires that a polygraph technique be scientifically tested and its results published in a peer-reviewed journal and replicated in a second independent research study also published in a peer-reviewed journal.

The Strengthening of Forensic Science in the United States

In 2009, the National Research Council of the National Academies of Science issued a report entitled *Strengthening Forensic Sciences in the United States: A Path Forward* [2] which stated that:

¹ Psychophysiological Veracity (PV) Examinations are also referred to as Psychophysiological Detection of Deception (PDD) Examinations.

It is clear that change and advancements, both systematic and scientific, are needed in a number of forensic science disciplines to ensure the reliability of work, establish enforceable standards, and promote best practices with consistent application.

Strengthening Forensic Science in the United States: A Path Forward provides a detailed plan for addressing these needs and suggests the creation of a new government entity, the National Institute of Forensic Science, to establish and enforce standards within the forensic science community. The benefits of improving and regulating the forensic science disciplines are clear: assisting law enforcement officials, enhancing homeland security, and reducing the risk of wrongful conviction and exoneration. *Strengthening Forensic Science in the United States* gives a full account of what is needed to advance the forensic science disciplines, including upgrading of systems and organizational structures, better training, widespread adoption of uniform and enforceable best practices, and mandatory certification and accreditation programs.

ASTM Controlling Standards

In 1996, the American Society for Testing and Materials (since 2001, known as ASTM International) established the controlling standards for *Forensic Psychophysiology*, a title which it enacted for the discipline of psychophysiological veracity examinations using the polygraph, after a full consensus ballot of the term and its definition had been approved by the ASTM committee on standards. The standards of ASTM are quite similar to APA standards inasmuch as the ASTM committees are composed primarily of APA members.

List of Validated Evidential Polygraph Techniques

The six polygraph techniques listed below met the scientific requirements of the American Polygraph Association to be classified as Evidentiary Polygraph Techniques which require a minimum criterion accuracy of 90% with an inconclusive rate not to exceed 20%.

EVIDENTIARY POLYGRAPH TECHNIQUES

QUADRI-TRACK ZONE COMPARISON TECHNIQUE

Overall Criterion (Decision) Accuracy: 98.8%. Inconclusives: 2.9%.

Matte & Reuss 1989 [3, 4]; Sample Nr. 122. Field Study.

Mangan, Armitage, Adams 2008 [5]; Sample Nr. 140. Field Study.

Shurany, Stein, Brand 2009 [6]; Sample Nr. 57. Field Study.

INTEGRATED ZONE COMPARISON TECHNIQUE - (Horizontal Scoring System)

Overall Criterion (Decision) Accuracy: 98.2%. **Inconclusives:** 5.4%.

Gordon, Mohamed, Faro, Platek, Ahmad, Williams 2005 [7]; Sample Nr. 11. Laboratory Study.

Shurany & Chaves 2010 [8]; Sample Nr. 84. Field Study.

Shurany 2011 [9]; Sample Nr. 84. Field Study.

Gordon, Fleisher 2012 [10]; Sample Nr. 16. Laboratory Study.

Gordon, Fleisher, Morsie, Habib & Salah 2000 [11]; Sample Nr. 309. Field Study.

UTAH ZONE COMPARISON TECHNIQUE - Canadian Police College, RCMP.

Overall Criterion (Decision) Accuracy: 93.9%. **Inconclusives:** 18.5%.

Honts, Hodes, Raskin, 1985 [12]; Sample Nr. 38. Laboratory Study.

Driscoll, Honts, Jones 1987 [13]; Sample Nr. 40. Laboratory Study.

Honts 1996 [14]; Sample Nr. 32. Field Study.

UTAH ZONE COMPARISON TECHNIQUE – Probable Lie Test

Overall Criterion (Decision) Accuracy: 93.1%. **Inconclusives:** 7.7%.

Kircher, Raskin, 1988 [15]; Sample Nr. 100. Laboratory Study.

Honts, Raskin, Kircher, 1987. [16]; Sample Nr. 20. Laboratory Study.

FEDERAL YOU-PHASE - (Empirical Scoring System)

Overall Criterion (Decision) Accuracy: 90.4%. **Inconclusives:** 19.2%.

Nelson 2011 [17]; Sample Nr. 100. Field Study.

Nelson, Handler, Blalock, Cushman (in Press). [18]; Sample Nr. 22. Field Study.

UTAH ZONE COMPARISON TECHNIQUE – Directed Lie Test.²

Overall Criterion (Decision) Accuracy: 90.2%. **Inconclusives:** 7.3%.

Honts, Raskin 1988 [19]; Sample Nr. 25. Field Study.

Horowitz, Kircher, Honts, Raskin 1997 [20]; Sample Nr. 30. Laboratory Study.

The Backster Zone Comparison Technique from which all other Zone Comparison Techniques originate is undergoing further validation and is currently recognized by the International Society of Polygraph Examiners (ISOPE) as an evidentiary polygraph technique. The following studies reflect its current validation status.

BACKSTER ZONE COMPARISON TECHNIQUE

Overall Criterion (Decision) Accuracy: 87.6%. **Inconclusives:** 21.9%.

Nelson, Handler, Adams, Backster. (2012) [21]; Blind scoring of confirmed truthful and deceptive tests by 7 examiners. Published in *Polygraph*, Vol. 41, Nr. 2. Sample Nr. 22.

Accuracy: 82.5% without Inconclusives. 11.7% Inconclusives.

Nelson (2012). Monte Carlo Study published in *Polygraph*, Vol. 41, Nr. 1.

Sample Nr. 100. Accuracy: 92.7% without Inconclusives. 32.1% Inconclusives.

NOTE: The Nelson et al 2012 study used field cases from a government agency, some of which used formats that deviated from the Backster Zone Comparison Technique protocol which resulted in an accuracy rate below the expected minimum 90% criterion accuracy required for classification as an evidentiary technique from which all other zone comparison techniques originate. [21].

A recently published study entitled “Guiding Principles and Benchmarks for the Conduct of Validity Studies of Psychophysiological Veracity Examinations Using the Polygraph” [22] challenges the applicability and generalization of laboratory studies on control question techniques to field situations. It further challenges the Office of Technology Assessment [23] and the National Research Council’s [1] position that inconclusive results are errors. See also,

² The use of the Directed-Lie Comparison Question has been challenged in the following published studies and articles: Abrams 1991 [50]; Gordon 2015 [52]; Matte 1998 [46], 2013 [47], 2015 [49]; Matte, Reuss 1999 [48].

published article entitled “fMRI Lie Detection Validity and Admissibility as Evidence in Court and Applicability of the Court’s Ruling to Polygraph Testing” [45] in which the United States Court of Appeals for the Sixth Circuit, *U.S. v. Semrau*, 693 F3d 510 (6th Cir. 2012) concluded, after carefully reviewing the scientific and factual evidence, that the district court did not abuse its discretion in excluding the fMRI lie detection evidence under Federal Rule of Evidence 702 because the technology had not been fully examined in “real world” settings.

Legal Use Under Daubert

The above data provides the attorney with scientific evidence of the validity and reliability of the polygraph techniques cited above that qualify as *evidentiary techniques* that should meet the Daubert Standard enunciated by the United States Supreme Court in Daubert v. Merrell Dow Pharmaceuticals, 509 U.S.579 (1993) which superseded the Frye standard of “general acceptance” test (*Frye v. U.S.* 293 F. 1013 (D.C. Cir. 1923)). The court ruled that:

the trial judge, pursuant to Rule 104(a), must make a preliminary assessment of whether the testimony’s underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publications, its known or potential error rate, and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.

The court also stated:

Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof, rather than wholesale exclusion under an uncompromising “general acceptance” standard, is the appropriate means by which evidence based on valid principles may be challenged.

In describing the importance of peer reviewed published studies of new scientific techniques, the Court stated:

“Publication (which is but one element of peer review) is not a *sine qua non* of admissibility; it does not necessarily correlate with reliability,” “and in some instances, well-grounded but innovative theories will not have been published.” “But submission to the scrutiny of the scientific community is a component of *good science*, in part because it increases the likelihood that substantive flaws in methodology will be detected.” “The fact of publication (or lack thereof) in a peer-reviewed journal thus will be a relevant, *though not dispositive*, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.” (Daubert) (italics by author).

In reducing the Frye “general acceptance” test to but one factor for admissibility, the Court stated:

“general acceptance” is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence, but the Rules of Evidence – especially Rule 702 – do assign to the trial judge the task of ensuring that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands.

Thus under the Daubert standard, there are a number of factors that must be addressed when laying a validity foundation for potential admission of polygraph test results.

- (a) The specific polygraph examination technique used can be (and has been) scientifically tested
- (b) with demonstrated validity and reliability;
- (c) its potential error rate determined,
- (d) preferably subjected to peer review and publication.
- (e) The existence and maintenance of standards controlling its operation
- (f) attained acceptance within a relevant scientific community.
- (g) The polygraph examination was properly conducted
- (h) by a properly trained and competent polygraphist, and
- (i) the entire examination was video or at a minimum audio tape recorded.

To Whom Should the Courts Look?

In spite of the less stringent attitude towards admissibility of polygraph results under Daubert, the general acceptance in the “particular field” in which it belongs still looks to psychologists and physiologists for acceptance rather than the polygraph community composed of polygraphists and scientists involved in polygraph research. However, as Tarlow [24] noted:

in *Lindsey v. United States*³, the Ninth Circuit invoked *Frye*⁴ for the requirement of “general acceptance in the particular field in which it belongs,” and then proceeded to define the “particular field” (use of sodium pentothal) to consist of experts in “narcoanalysis.” There was no suggestion of any need for general acceptance by medical doctors, psychiatrists, or psychologists.

Furthermore in *Huntingdon v. Crowley*,⁵ⁱ a similarly narrow view of the *particular field* was held in evaluating the admissibility of a new blood grouping technique. As Tarlow further noted:

The California Supreme Court did not inquire into the technique’s acceptance within the “particular field” of medical practitioners, nor even medical blood specialists. Rather, the court looked to the experts who might aid its determination; those in the highly specialized field of “disputed paternity testing.” The court further stressed that the question of whether a scientific technique has, at any given point in time, gained general acceptance in its particular field is primarily a question of fact to be determined by the trial court. Under this increasing restriction by courts of “particular field” to knowledgeable specialists, the proper inquiry is not whether polygraphy (much less its underlying theory) has gained general acceptance among physiologists and psychologists, as suggested in *Frye*, rather, it is whether there is general acceptance of the technique by experts in polygraphy.

As stated by Gordon L. Vaughn, Esquire, General Counsel for the American Polygraph Association, [25] “In the federal circuits, the admissibility of polygraph evidence is largely controlled by trial judge discretion under FED R. EVID. 702 and the decision in *Daubert*, though

³ *Rolland Lindsey v. United States*, 237 F.2d 893 (9th Cir. 1956).

⁴ *James A. Frye v. United States*, 54 App. D.C. 46, 47, 293 F.1013, 1014 (1923).

⁵ *Terry Huntingdon v. Arthur Crowley*, 64 Cal. 2d. 647, 656 [L.A. No 27702. In Bank. May 25 1966]

some circuits continue to adhere to a per se exclusion of polygraph evidence, some courts, both federal and state, cite *United States v. Scheffer*, 523 U.S. 363, 118 S. Ct. 1261, 140L. Ed. 2d 413 (1998) for support of judicially imposed per se ban on polygraph evidence. A close reading of *Scheffer*, however, does not support such reading. Additionally, the federal courts are in conflict as to whether polygraph evidence should be admissible in post-trial settings such as sentencing proceedings. Compare *Rupe v. Wood*, 93 F.3d 1434 (9th Cir. 1996) with *Goins v. Angelone*, 226 F.3d 312 (4th Cir. 2000).” In an article published in the *Law Review*, University of California at Davis [51], the author C. Domin, argued for the admissibility of polygraph results in the penalty phase of a capital trial, stating “There is an injustice in a system that fails to allow criminal defendants every opportunity to proffer evidence that may save their lives. Polygraph evidence should be admissible during the penalty phase of a capital trial. If this issue comes before the United States Supreme Court, the Court should follow the Ninth Circuit’s holding in *Rupe* and allow polygraph evidence.”

While the case of *U.S. v. Edward Scheffer* upheld the presidential ban on the admissibility of polygraph examination results in military courts, its position can be successfully challenged in that it permitted States to ban polygraph by statute due to the uncertainty of polygraph validity which has since been rectified with significant scientific validation studies published in peer-reviewed journals. Furthermore, the results of polygraph tests can still be admitted as character evidence as was permitted in *U. S. v. Crumby* (895 F. Supp. 1354 DC AR. 1995) wherein the mental state of the defendant was avoided (*U.S. v. Campos*, 217 F.3d 707 (9th Cir. 2000)).

In *U. S. v. Williams Galbreth*, 908 F. Supp. 877, 64 USLW 2260, 43 Fed. R. Evid. Serv 585, 4 Oct 1995, the court cited Daubert’s mandate that “proposed testimony be supported by appropriate validation.” Furthermore, the Court held that in addition to establishing the scientific validity of the polygraph technique in the abstract, the proponent of the proposed testimony must also prove that the specific examination was conducted properly by a competent examiner.

In *Kumbo Tire Company, Ltd, et al. v. Patrick Carmichael*, 526 U.S. 137 (1999). The court held that a federal judge’s “gatekeeping” role under Rule 702 extends to all expert testimony, not just that deemed scientific. Thus, in federal court, soft-science (experience based)

experts are subject to pre-trial Daubert challenges just like data based hard science. The Court further cited Rule 702 which holds that “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.” The Court pointed out that “This language makes no relevant distinction between “scientific” knowledge and “technical” or “other specialized” knowledge. It makes clear that any such knowledge might become the subject of expert testimony. In Daubert, the Court specified that it is the Rule’s word “knowledge,” not the words (like “scientific”) that modify that word, which “establishes a standard of evidentiary reliability.” 509 U.S., at 589-590. Hence, as a matter of language, the Rule applies its reliability standard to all “scientific,” “technical,” or “other specialized” matter within its scope.

In a West Virginia Supreme Court of Appeals decision, *Clinton and Jessie San Francisco v. Wendy’s International, Inc.*, 656 S.E.2d 485, the plaintiff sought to introduce expert evidence from Dr. Peter Gregor, an internal medicine and cardiac specialist and Ewan Todd, an expert in food preparation and safety from Michigan State University. The Defense objected to their testimony on the basis that Dr. Gregor was not a gastroenterologist and Todd’s opinion was speculative and based on assumptions. The plaintiff argued that Dr. Gregor’s extensive experience in treating such cases in a hospital environment was sufficient to qualify him as an expert, while Todd’s opinion was based on scientific studies. The County Circuit Court found for the Defense, but the verdict was reversed on appeal by the West Virginia Supreme Court of Appeals which held that the function of the judge as ‘gatekeeper’ is not to decide the truthfulness of the proposed testimony, but simply to determine whether its method and reasoning is valid. The County Circuit Court had exceeded that role in this case, and the testimony should have been allowed.

Elements That Can Adversely Affect Test Results

The court should be further provided with evidence that the specific test(s) results were not adversely affected by:

- (1) drugs,

- (2) physical or mental impairment,
- (3) physical or mental countermeasures, nor by
- (4) the often cited but scientifically refuted '*friendly polygraphist*' concept.
- (5) the Othello Error.

Drugs

It should be noted in regards to (1) above, that the use of drugs by an examinee will not prevent valid and reliable polygraph examination results when a control question technique is used, unless the dosage is so great that the examinee is unable to participate in the pretest interview, in which case the examination would be aborted. The use of drugs will have an equal effect on both the control and relevant test questions hence should not be a cause for false positive/negative results. (For a full discussion on the effects of drugs in polygraph examinations, see Chapter 20 in *Forensic Psychophysiology Using the Polygraph*. [26].

Physical or Mental Impairment

Regarding (2) above, the Standards of Practice of the American Polygraph Association require that the polygraphist make reasonable efforts to determine that the examinee is a fit subject for testing, where allowed by law. Basic inquiries into the medical and psychological condition of the examinee as well as any recent drug use should be made where allowed by law. Mental, physical or medical conditions of the examinee that should be observable, or that should be reasonably known by the polygraphist, should also be evaluated prior to testing. No test should be conducted where valid results could not be reasonably foreseen. If a polygraphist has a reasonable doubt concerning the ability of an examinee to safely undergo a polygraph examination, a release from the examinee and his/her physician shall be obtained.

Countermeasures

It should further be noted in regards to (3) above, that several works have been published about the use of countermeasures to defeat the polygraph examination process, most notably by David T. Lykken, [27] but publication of anti-countermeasures and counter-countermeasures developed by polygraphists has been limited to professional journals dealing with that subject. In

addition to the use of motion or activity sensing polygraph chairs to detect physical countermeasures, anti-countermeasures have been incorporated into the examination's methodology, the psychological structure of the test and the analysis of the physiological data in modern polygraph techniques such as the Quadri-Track Zone Comparison Technique and the Integrated Zone Comparison Technique. Because the issue of countermeasures is certain to be part of the attack on the admissibility of polygraph evidence, counsel must be aware of the arguments and the data available to refute the arguments. [5, 26, 28, 29, 36].

The Friendly Polygrapher Hypothesis

It should also be noted in regards to (4) above that at least two major studies have been published refuting Dr. Martin Orne's "Friendly Polygrapher" hypothesis [30] which hold that defense attorney clients who are guilty are less likely to be detected in polygraph examinations due to their lack of fear of detection as a result of the protection afforded them under the umbrella of privileged communication. Professor Orne hypothesized that if a defense attorney instructed his client to take a polygraph examination confident that a failure indicating deception would be kept secret under the attorney-client privilege, that the validity of the results would be undermined by the removal of the subject's fear of detection of deception.

The Utah study [31] used three separate samples to test Orne's hypothesis. The first sample showed that defense cases produced 78% truthful, 20% deceptive, and 2% inconclusive outcomes. The law enforcement cases produced 76% truthful, 20% deceptive, and 5% inconclusive outcomes. Contrary to the "friendly polygrapher" hypothesis, there was no difference in frequency of truthful outcomes for defense and law enforcement examinations conducted by the same examiner. The second sample produced mean numerical scores of -4.7 for defense cases and -2.0 for law enforcement/employer cases. Although the difference between those means was not significant, it was in the opposite direction from that predicted by the "friendly polygrapher" hypothesis. The third sample produced mean numerical scores of -10.4 for defense cases and -7.0 for law enforcement cases. The difference between those means was statistically significant and in the opposite direction from that predicted by the "friendly polygrapher" hypothesis. Thus the three samples of data obtained to test the predictions from the "friendly polygrapher" hypothesis not only

failed to produce any evidence to support that hypothesis, but some of the results indicated effects which were totally contrary to Orne's speculations.

The second study [32] examined the raw data scores indicating the degree of arousal of the control versus relevant test questions of verified real-life cases from a police department and a private polygraph firm, both using the Quadri-Track Zone Comparison Technique which revealed that from a total number of cases examined in this study (122), 39 were conducted for defense attorneys under attorney-client privilege and 34 of those were scored deceptive, and subsequently confirmed. Furthermore, defense attorney cases showed a mean chart score of -9.38 compared with police cases which showed a mean chart score of -9.10, which suggest similar states of autonomic arousal. Another group, commercial cases which were not tested under privilege, showed a mean chart score of -9.90, thus there was no statistical difference in the scores obtained from police versus private polygraph examinations.

The reason that the Friendly Polygrapher Theory is not a factor is that the subject never loses his fear of detection. In fact, it may be heightened by the attorney's discussion about all the favorable uses that could follow from a truthful result.

The Othello Error Hypothesis:

The 2003 report by the National Research Council of the National Academies of Science indicated that the scientifically acceptable laboratory and field studies of specific-incident polygraph tests ranged between 81% to 91%, but that these figures most likely overstates true polygraph accuracy due to the potential use of countermeasures and the 'Othello Error' "in which examinees who fear being falsely accused have strong emotional responses that mimic those of the truly deceptive. Under this hypothesis, field conditions might have more false-positive errors than are observed in the laboratory and less accuracy." In fact, in 1985, Dr. Paul Ekman [33], a member of the NRC committee authored a book "Telling Lies" devoted primarily to verbal and non-verbal behavior in which he discusses the element of 'fear' in his chapter on the polygraph and states "The severity of the punishment will influence the truthful person's fear of being misjudged just as much as the lying person's fear of being spotted – both suffer the same consequences." Dr. Ekman believed that the polygraph examination, like behavioral clues to deceit, is vulnerable to what he termed the "Othello Error" because the Shakespearean

character Othello failed to recognize that his wife Desdemona's fear might not be a guilty adulterer's anguish about being caught but could be a faithful wife's fear of a husband who would not believe her.

Interestingly, the "fear of error" issue had been addressed in 1977 in the development of the Quadri-Track Zone Comparison Technique (QTZCT) [4, 5, 26, 29, 34, 35] a uni-faceted single-issue polygraph examination which quantifies the degree of response to the fear of error question by an innocent examinee during the administration of the polygraph test and applies those positive scores to the overall tally thus preventing false positives and significantly reducing inconclusives. The NRC committee had possession of the field validation study on the aforesaid technique and cited it, yet failed to acknowledge the existence of this remedial component that addresses that critical issue. The Integrated Zone Comparison Technique version-2 has recently incorporated the QTZCT's "Fear of Error" component into its technique. Furthermore, field research studies comprise actual polygraph examinations which include criminal suspects who can and do employ physical and mental countermeasures.

Issues in Polygraph Examination Admissibility Under Daubert

Finally, the court should be provided with valid arguments supported by credible evidence that (a) neither judges nor juries have been overwhelmed by the results of polygraph examinations, thus polygraph examinations will not replace the jury system; (b) forensic psychophysiology is not the only discipline that may decide the ultimate issue in a trial; (c) forensic psychophysiology does not consume more time or collateral litigation than other admissible disciplines; (d) there is no particular degree of reliability required for admissibility; (e) Polygraph examination testimony does not qualify as hearsay evidence; and (f) polygraph evidence is direct evidence of defendant's or witness's truthfulness, which may be offered by either side, regardless of whether defendant testifies or puts his/her character in issue. Each of these issues is discussed in detail in textbook "Examination and Cross-Examination of Experts in Forensic Psychophysiology Using the Polygraph" [36].

Reference (c) above, in the State of New Mexico, polygraph evidence has been admissible over objection of opposing party for the past three decades, provided the court has

evidence of the qualifications of the polygraphist, there is testimony that the procedure was approved by authorities, and the validity of the test made on the subject has been established: *State v. Dorsey*, 87 N.M. 323, 532 P.2d 912, remanded 88 N.M. 184, 539 P.2d 204 (N.M. 1975). In 2004, an attempt was made to have Rule 11-707 that allowed polygraph examination results to be admitted in the courts of New Mexico repealed in *Kevin Lee, et al. v. Hon. Lourdes Martinez, et al.* Supreme Court of New Mexico 96 P.3d 291 (2004) Minsner, Justice. No. 29915, Filed 14 July 2004. The Supreme Court of New Mexico declined to repeal Rule 11-707. Instead the Supreme Court held that polygraph examination results are sufficiently reliable to be admitted under Rule 11-702 provided the expert is qualified and the examination was conducted in accordance with Rule 11-707.

Admissibility of Polygraph Results in New York State Courts

New York Courts are aligned with other jurisdictions regarding admissibility of polygraph evidence. Such evidence is generally excluded. In *People v. Leone*, (25 NY 2d 511 [1969]), the New York Court of Appeals traced its history on the topic after acknowledging that instruments have been used with increasing frequency in industry to detect deception but that “their reliability has not yet been sufficiently established to give them an evidentiary standing” in criminal law cases. It added that only New Mexico seems willing to utilize polygraph evidence on a regular basis in criminal cases.

By 1986, a few other jurisdictions had opened the door. “Idaho, along with Rhode Island and Vermont, appear to be the only jurisdictions with no appellate decision on the issue of admissibility of polygraph evidence. In 22 states polygraph evidence is admissible upon stipulation, and in another 21 states polygraph evidence is not admissible in any circumstance. Four states, Louisiana, Massachusetts, Michigan, and New Mexico, may admit polygraph evidence without stipulation.” *Matter of X*, (714 P. 2d 13 [Idaho Supreme Court] 1986).

Few cases in New York have attempted to lay a scientific and technical foundation for the reliability of polygraph evidence. Most situations have involved use of the polygraph as an investigatory tool with results favoring an accused who then wants to offer the test results as evidence of innocence. Without expert testimony addressing the reliability issue, such offers are summarily denied. As stated in *Leone*:

This refusal to accept the results of a polygraph instrument test as probative evidence of truth or deception has been followed in most jurisdictions.[1] An exception to this general rule has been made in several States where the parties may stipulate on the record to such admission for any purpose, [2] or for a limited purpose to corroborate other evidence or to impeach or corroborate the defendant's testimony. [3] However, some of these latter States permit the Trial Judge to exclude the test results if he is not satisfied with the examiner's competence. 25 NY 2d 511 at 514.

The court went on to review the contrasting opinions of proponents and opponents of the polygraph, and noted the “The alleged statistical accuracy of the machine has also been challenged. Several critics have contended that the 95% accuracy rate claimed by the proponents of the machine has been arrived at on the basis of improper statistical method. (Skolnick, *supra*; Sternbach, Gustafson & Colier, Don't Trust the Lie Detector, *Harv. Bus. Rev.*, Nov.-Dec. 1962, p. 127.)” In addition, it is noted that even if statistically proper, the 95% figure is meaningless because undetected guilty individuals are not likely to report that fact to the examiner. (Burkey, *The Case Against the Polygraph*, 51 A. B. A. J. 855.) *Id at 515*.

The court concluded:

Although perfection in test results is not a prerequisite to the admissibility of evidence obtainable by the use of scientific instruments, the rule has been to grant judicial recognition only after the instrument has been sufficiently established to have gained general acceptance in the particular field to which it belongs. (Wigmore, *Evidence* [3d ed.], § 990.)

Applying this standard, it is clear that the record before us does not adequately establish the reliability of the tests to be admissible in evidence. As previously indicated, the criterion for interpretation of the test chart has not as yet become sufficiently definite to be generally reliable so as to warrant judicial acceptance; nor can it be said that the examiner's opinion demonstrates reasonable certainty as to the accuracy of the polygraph test in most instances. *Id at 517*.

The phrase “not yet become” left the door open, if only a crack, to allow future litigators

to offer polygraph evidence upon proof of its reliability.

The court of Appeal in *Pereira v. Pereira*, (35 NY 2d 301 [1974]) dealt with a polygraph examination taken by stipulation. The results were admitted as proof of a father's contemptuous concealment of his child. In overturning the contempt, the court held that the stipulation to submit to the polygraph test did not include a stipulation to admit the results in court. It also noted that the examiner was not sufficiently trained, and the qualified expert who testified to the reliability of polygraph had no part in the examination.

In *People v. Tarsia*, (50 NY 2d 1 [1980]), the Court of Appeals reviewed a case in which a defendant claimed his confession was coerced by misuse of results of a voice stress test. In commenting on the scientific basis for voice stress evaluations, the court stated:

Unlike the polygraph, whose reliability as a determinant of truth or falsity has been the object of scientific testing during its much longer history, the voice stress evaluator has only come on the market in the last decade, during which it has had not only far less time but also far fewer occasions in which to prove itself. Yet, attempts to demonstrate that the polygraph is possessed of scientific certainty have been held too indecisive to warrant judicial acceptance. * * * In any event, . . . unlike the degree of equivocation that exists regarding the reliability of the polygraph (see *People v. Leone*, supra, pp 514-516), authorities on voice stress analysis tend to agree that test is not reliable (see Moenssens and Inbau, *Scientific Evidence in Criminal Cases* [2d ed], § 15.14; Link, *Detection 8*8 Through Voice-Analysis*, 3 *Military Police Law Enforcement J*, pp 38, 40). *Id at 7*.

In 1996, the Court of Appeals in *People v. Angelo* (88 N.Y.2d 217) rejected the defendant's claim that a *Frye* hearing should have been held to determine the admissibility of polygraph evidence because the hearing had not been clearly requested and the issue unpreserved.

Trial courts and intermediate appellate courts in New York typically reject polygraph evidence out of hand with such statements as: "The law in New York is well settled on the question of admissibility of polygraph results; such results are clearly inadmissible." *People v. Shedrick*, (104 AD 2d 263, 275 [4th Dept. 1984]). *Shedrick* was appealed to the New York Court of Appeals and affirmed, but its decision was more carefully couched: "The reliability of

the polygraph has not been demonstrated with sufficient certainty to be admissible in this State.” *People v. Shedrick*, 66 NY 2d 1015 (1985).

The foregoing subtle language difference may give comfort to the proponents of polygraph evidence, showing that the New York Court of Appeals has not been as dismissive of polygraph evidence as the lower courts have been, but it may be small comfort since that court has not taken a close look at the scientific basis of polygraph examinations in 45 years.

Significantly more research has been conducted in the last four decades, however, including numerous field tests that confirm deception on the part of examinees in actual cases. The court in *Leone* noted “that 80% of the persons calling themselves polygraph examiners are not qualified to interpret test results,” and “that there are no definite set of standards for polygraph examiners” (25 NY 2d 511, 516), but in 1969 there were no ASTM standards for polygraph exams or examiners, and standardized methods for chart interpretation had not been fully developed. What has been lacking is a case for the Court of Appeals that presents the offering of evidence derived from a properly executed polygraph examination conducted by a well trained qualified examiner along with expert testimony showing current standards, recent research and published studies demonstrating significant reliability.

In 1979, one case did provide a careful analysis in which scientific evidence supporting the polygraph was admitted. In *People v. Daniels*, (102 Misc.2d 540 [Supreme Court Westchester Cty, 1979]) the defendant who was charged with robbery, petit larceny, and criminal possession of a weapon in the fourth degree, sought to offer evidence at trial of the favorable results of his privately obtained polygraph test. Prior to trial, defense counsel, moved for a hearing to determine whether the polygraph results should be admitted into evidence as probative and scientific. The court granted the hearing, and defendant called expert witnesses to establish the reliability of the polygraph, its technique, and its wide acceptance.

The court’s decision describes the general underlying principles and the procedures involved in administering a test. It traced the history of the polygraph’s inadmissibility and noted that *Leone* “gave considerable weight to the qualifications of the polygrapher as being the central issue therein. The court relied primarily on the inexperience of the examiner in upholding the exclusion of polygraph evidence.” It then pointed to more recent New York courts that have admitted “polygraph evidence upon stipulation and in other specific cases where the issue to be

decided was of primary importance and the aid of the polygraph highly probative.” *Id at 545*.

With regard to relevance, the court pointed out that although “some have argued that general scientific acceptance is a proper avenue for the court to take judicial notice of a scientific fact” it is not the appropriate criterion for testing and admitting scientific evidence, and more specifically polygraph evidence. (McCormick, Evidence (2d ed), § 207.) If the evidence has substantial probative value and is relevant to the issue and does not endanger defendant's rights, or prejudice the jury, nor mislead the proper administration of justice, that it should be admitted as any other evidence. (55 BU L Rev, 302, 304; McCormick, Evidence (2d ed), § 202.)” *Id at 546*.

The court said that polygraph evidence is particularly useful in identification case, especially when a conviction may stand or fall on a single eyewitness’s testimony, which was the case before it. The court then addressed the common objections to polygraph evidence and pointed out that advances in the field including research studies, better trained examiners, and more sensitive equipment have changed the entire field a great deal from 1923 when Frye was decided.

The *Daniels* court granted the defendant’s request to offer evidence by polygraph experts limited by the following safeguards and conditions:

1. The court will admit the result of a polygraph test administered to the defendant by the polygrapher of his own choosing. The court will permit the District Attorney's office to conduct their own examination of the defendant with a polygrapher chosen by their office. The defendant agreed that the examination should be admitted, after knowingly and voluntarily waiving his Fifth Amendment protections, but only waived to the extent that those rights relate to the issues in the case.

2. The examination shall be conducted by a competent, experienced and qualified examiner upon a mutually agreed time.

3. The court in the first instance shall determine at a hearing whether the two experts have sufficiently met the standard set by the court so that their opinion is reliable.

4. Among the qualifications the court will consider but not necessarily limit itself to are that the examiner: (a) Must have a college degree from an accredited university or college or in the alternative a high school diploma and a number of years of experience; (b) The examiner

must be licensed in the State in which he practices; if none is required, licensed by other States; (c) Graduate from an accredited professional school with a six-month training period; (d) Polygrapher should be a member of national and State professional associations; (e) Must have extensive experience in polygraph tests and more specifically within the criminal area; (f) The examination should be conducted with controlled questions without undue deviation from the chart results; (g) The polygrapher should score the chart on a numerical basis.

5. The court may refuse the evidence if it finds that the examiner does not meet the qualifications, or the test was not conducted under the proper conditions and guidelines as set forth herein.

6. If it meets the standard as outlined, both tests shall be introduced at trial.

7. The results, charts and all other pertinent data must be maintained and exchanged before trial in order for a party to familiarize oneself with it for possible cross-examination.

8. The polygrapher may be cross-examined as any other expert witness, that is: (a) The examiner's experience, qualifications and expertise may be subject to scrutiny; as well as; (b) the test conditions; (c) the chance for error; (d) and any other pertinent matter relating to the issue in question, subject of course, to the court's discretion.

9. The opinion of a polygraph examiner is direct evidence and may be introduced by either party on their direct case regardless of whether the defendant takes the stand or stands mute.

10. Upon admission, the evidence may be considered as any other opinion evidence. The examiner may not testify as to guilt or innocence, but rather may testify and assess the veracity of defendant's responses to the questions asked during the test. The jury shall give it whatever weight or significance it may wish in their function as the trier of the facts.

11. The court in its charge will instruct the jury that polygraph evidence is only expert opinion and may be erroneous. Finally, the court ruled that the jury has the duty to evaluate the opinion and may, if it wishes, reach a conclusion contrary to that of the expert. The evidence does not prove or disprove any element of the crime charged but is only an indication of whether the defendant was deceptive or not at the time of his responses. Guilt or non-guilt remains their task alone. *Id at 553-556.*

No appeal followed the *Daniels* case, so its thoroughness of analysis and careful

procedural directions have never been reviewed by a higher court. The case has been cited, albeit not with explicit approval, but the case has earned a place in litigation jargon: a “Daniels hearing” is referred to in *People v. Shedrick*, 104 AD2d 263; *Matter of Dona D*, 141 Misc.2d 46; and *Matter of Meyer*, 132 Misc.2d 415. It may well be a model for future hearings in which admission of polygraph evidence in a criminal case is sought.

Matter of Meyer, (132 Misc.2d 415 [Family Ct, Kings Cty, 1986]) was a Family Court neglect proceeding in which the court clearly distinguished itself from criminal cases:

The exclusory rule in this State evolved in criminal cases. Those cases differ from child protective proceedings in two significant ways. The first is that a case against a criminal defendant must be proved beyond a reasonable doubt by evidence stringently tested by a strict application of the rules of evidence. The case against a respondent in a child protective proceeding need only be proved by a preponderance of the evidence presented (Family Ct Act § 1046 [b] [i]), and the traditional rules of evidence are significantly relaxed. (See, Family Ct Act § 1046).

Indeed, in many child protective proceedings, including this one, the most damaging evidence a respondent must face is hearsay or unsworn testimony of the subject child admitted under Family Court Act § 1046 (a) (vi). Although the child's testimony must be corroborated by other evidence (Family Ct Act § 1046 [a] [vi]), the quantum of corroboration is relatively low and substantially lower than required in the criminal courts. (See, Family Ct Act § 1012 [e] [iii]; § 1046 [a] [vi]; and compare, *Matter of Cindy JJ.*, 105 AD2d 189; *Matter of Michael G.*, 129 Misc 2d 186; *Dutchess County Dept. of Social Servs. v Bertha C.*, 130 Misc. 2d 1043, with *People v Watson*, 45 N.Y.2d 867; *People v Ahlers*, 98 AD2d 821.) The second difference is that the criminal cases are jury trials while child protective proceedings are tried without a jury. The Court of Appeals in *Leone*, the leading case on polygraph evidence, in excluding the evidence, emphasized the danger that evidence of a polygraph test, commonly known as a "lie detector", will be given undue weight by a jury. There is considerably less danger of undue weight during a bench trial. (132 Misc.2d 415, 418).

The court found no prohibition to the admission of polygraph evidence in a child protective proceeding, noting that the *Leone* court specifically applied its ruling to "criminal law." The parties stipulated to the polygraph examinations and to their admissibility. After reading the factual material submitted pursuant to stipulation, affidavits of the two polygraphers, a professor, a current article, the discussion of the science of polygraphy in *People v Daniels* (102 Misc 2d 540, supra) and *People v Vinson* (104 Misc 2d 664), the court ruled that the polygraph experts could testify with a considerable degree of accuracy as to the results of the polygraph examinations the current literature on the reliability of polygraph evidence, the evidence in support of (*Id at 418–420*).

There are skeptics. Justice Hans Linde of the Oregon Supreme Court wrote, "I doubt that the uneasiness about electrical lie detectors would disappear even if they were refined to place their accuracy beyond question. Indeed, I would not be surprised if such a development would only heighten the sense of unease and the search for plausible legal." *State v. Lyon*, (744 P.2d 231, 234-35 [Or. 1987]). Meanwhile the proponents of polygraph remain hopeful of eventual full recognition and admissibility of evidence. If cases follow such models as *Daniels* and *Meyer* and reach the appellate courts, the polygraph may be a useful tool in both criminal and civil litigation.

Comparison of Polygraph with Other Diagnostic Tools

Professor Edward J. Imwinkelried, [37] in his National Association of Criminal Defense Lawyers' (NACDL) review of this author's textbook '*Forensic Psychophysiology Using The Polygraph*' stated that "the most powerful argument for admitting polygraph testimony - - the comparative lack of empirical studies validating the assumptions underlying many types of expert analysis which prosecutors routinely rely on in (some) recent cases. Courts have gone to the length of holding that these species of analysis do not qualify as '*scientific knowledge*' under Federal Rule of Evidence 702. The extent of research validating polygraphy dwarfs the amount of empirical data supporting those forms of expert testimony. By comparing the two bodies of empirical research, a defense attorney can make it very difficult for any intellectually honest judge to simultaneously admit the prosecution evidence while excluding defense polygraph

testimony.” Since 1998 when the above review was published, there has been enormous additional research studies on polygraphy published in peer-reviewed journals.

A comparative analysis of polygraph with other screening and diagnostic tools was conducted by Philip E. Crewson for the Department of Defense Polygraph Institute in 2003 [38]. The purpose of the study was to conduct a limited review of the literature concerning the accuracy and reliability of screening and diagnostic tests in polygraph, medicine, and psychology involving 198 studies. Evidentiary polygraph techniques which are of interest to attorneys are considered diagnostic tests. There were 37 field polygraph, 94 medical, and 51 psychology diagnostic studies used in this analysis. *Sensitivity* reflects the proportion of diseased cases correctly identified by an assessment tool. In polygraph, disease is analogous to deception. *Specificity* reflects the proportion of non-diseased (Truthful) cases correctly identified by an assessment tool. Hence for field diagnostic assessments, the sensitivity of polygraph (Deceptive), medical and psychological tools was 92%, 83% and 72% respectively. Specificity of polygraph (truthful), medical and psychological diagnostic testing was 83%, 88% and 67% respectively. Overall, the mean combined diagnostic accuracy of polygraph 88% and medical 86% studies are very similar; however the mean diagnostic accuracy of psychological studies 67% is significantly lower than polygraph. It should be noted that this study conducted in 2003 did not include subsequent rigorous studies published in peer-reviewed journals on polygraph cited in Figure 1 containing accuracies from 90 to 100 percent.

CONCLUSION:

The criterion accuracy of polygraph examinations that qualified as evidentiary techniques described above reflect accuracy rates from 98.8% to 90.2% with inconclusive rates from 2.9% to 19.2%. Furthermore, the issue raised in the National Research Council’s 2003 report concerning the innocent examinee’s “Fear of Error” as a potential for false positives has been scientifically addressed with the development of the Quadri-Track Zone Comparison Technique which significantly diminishes the successful use of countermeasures which are usually hidden in the inconclusives. This data offers a most compelling argument for the admissibility of the results of a polygraph examination result based on a scientifically validated evidentiary polygraph technique. The holding by Justice Thomas in *United States v. Edward G. Scheffer*, 41

MJ 683 (AF Ct. Crim App 1995) and 523 U.S. 303 (1998), that “a fundamental premise of our criminal trial system is that the jury is the lie detector, and that determining the weight and credibility of witness testimony has long been held to be the part of every case that belongs to the jury who are presumed to be fitted for it by their natural intelligence and their practical knowledge of men and the ways of men” is not in consonance with its history [36, 39]. The United States Constitution and its common law heritage repose that responsibility in the hands of the jury, but the law does not turn its back on evidence that helps jurors make their decision. A review of existing research reveals that even persons trained in behavior analysis do not fare much better than chance at credibility assessment. Predictions of truth or deception by trained polygraphist/interrogators on the basis of verbal and nonverbal behavior were accurate only 56% and 69% of the time respectively [31], and only about 52% of the time in another study [40] using nonverbal behavior, with an overall accuracy in the low seventieth percentile when verbal and nonverbal behavior were evaluated by trained interrogators. A third study [41] using trained evaluators in distinguishing truthful from deceptive suspects undergoing behavior analysis interviews, concluded that 78% of the judgments on actually truthful suspects were truthful decisions, 8% were erroneously found deceptive and 14% were inconclusive. On deceptive suspects, the evaluators averaged 66% deceptive decisions, 17% were erroneously found truthful and 17% were inconclusive. When trained behavior analysts can do no better than the above, we should not realistically expect a jury pool to do much better than chance in evaluating the credibility of witnesses. Finally, a study [42] by a team of psychologists led by Nancy L. Etcoff, published in the journal *Nature*, involved brain-injury patients with aphasia who displayed an uncanny ability to detect deception. The study showed that non-aphasics detected deception about 50% of the time while aphasics detected the liar 73% of the time. Etcoff said, “People have told me ‘These patients should be on juries or in customs lines at the airport.’ The fact is that some people are really good at this who are not aphasics, but for the rest of us, it’s just chance. We’re just not very good at it.”

Furthermore, the impact of polygraph evidence on a jury has been shown in several surveys of jurors to have had minimal influence on their verdict [36]. The other concerns about the ultimate issue in a trial and collateral litigation are tired arguments which deserve repose as a categorical rule of exclusion according to Supreme Court Justices Kennedy, J., concurring in part

and concurring in the judgment, in which O'Connor, SA., Ginsburg, RB., and Breyer, JJ., joined Stevens, J., filed the lone dissenting opinion in the *United States v. Scheffer* case.

Dick Wheelan, member of The Champion Advisory Board of the NACDL, in his book review of this author (Matte)'s textbook *Examination and Cross-Examination of Experts in Forensic Psychophysiology Using The Polygraph* stated that "Of course, buried deep in the subconscious regions of our defense attorney minds is the not-so-subtle realization that a 100 percent effective polygraph would render our profession obsolete." Dick Wheelan's honesty is to be admired, but this author (Matte) believes that his fears are quite unfounded when we look at the State of New Mexico which has been admitting polygraph results as evidence in their courts for the past three decades without incidents that would reflect a negative impact on its judicial system or the legal profession.

John Henry Wigmore's famous quote "If there is ever devised a psychological test for the evaluation of witnesses, the law will run to meet it" has unfortunately traveled at a snail's pace since 1923 (Frye) in embracing polygraph which stems from the overinflated fear that polygraph will adversely impact the justice system. This has been proven wrong and validation studies continue to prove polygraph results are accurate when scientifically validated polygraph techniques are used.

Historically, the courts have had serious doubts about the ability of juries to accurately evaluate the credibility of witnesses, hence the enactment of witness competency rules [24, 36]. However, in the last decades of the twentieth century, the courts relinquished to the jury the responsibility of assessing the credibility of witnesses. The results were microscopically seen by the public on the nightly ABC television show "Nightline" [43], when 30 persons, convicted and placed on death row, but subsequently found innocent and released from prison, testified about their faith in the justice system that freed them, but condemned the jury that convicted them. This represents only known wrongful convictions in capital crimes and it is expected that the judicial processing of capital crimes is more thorough than crimes carrying lesser penalties. The number of other wrongfully convicted innocent defendants will never be known, but it is not unreasonable to believe that lesser offenses suffer a greater potential for wrongful convictions and exonerations.

Sharon Cohen of Associated Press reported in the Buffalo News [44] that “Since 1973, eighty-one men and one woman sentenced to death have been freed, nearly half of them since 1990, according to Richard Dieter, director of the Death Penalty Information Center in Washington. He believes more investigations by lawyers and journalists and increased use of DNA testing are partly responsible.” The authors firmly believes that the admissibility of the results of a scientifically validated polygraph examination as evidence in the courts of the United States would significantly reduce wrongful convictions and be of great assistance to the Innocence Project⁶, hence should receive the full support of judges and lawyers in revisiting this critical issue. The innocent will be eternally grateful.

NOTE: Studies listed in the following references are available for review at:

www.mattepolygraph.com under the heading of Research and Publications by James Allan Matte: 3, 4, 22, 29, 34, 45, 46, 47, 48, 49.

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