Polygraph Examiners: History, Modern Status, and Admissibility in Court

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I.  INTRODUCTION

Polygraph examination results have long been a topic of debate both inside and out of the American judicial system. They have been popularized in modern culture through crime-related television shows, such as CSI and Law & Order. However, their impact on the court system has real-world effects. This paper examines the history and current status and uses of polygraph examinations, the federal laws concerning expert witness testimony, and the admissibility of polygraph examiners’ opinion testimony in the federal court system.

II.  BACKGROUND

a. History of the Lie Detector

Polygraph examinations are believed to have been used for thousands of years by different peoples throughout the world. Ancient civilizations have been documented as using various methods to determine the veracity of an individual’s statements. Some used physiological responses as a means to determining veracity, while others used a combination of a person’s physiological responses and divine foundations.

Around 4,000 years ago, the Chinese used the first known lie detector testing by listening to an individual’s heartbeat to analyze whether that individual was telling the truth during a line of questioning.1 Moreover, Kenyans had used food to determine the veracity of a person’s statements by feeding them a minute amount of food and examining the impact of the feeding on the person’s saliva production.2 They believed that if the person’s amount of saliva decreased after being introduced to the food, then the person was not telling the truth.3 Ancient Hindu civilizations

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3 Id.
also used saliva production to determine veracity by compelling an individual to spit grains of rice onto sacred leaves.\(^4\) If the individual was unable to spit out the grains of rice, then the Hindus believed that the person was not telling the truth.\(^5\)

In recent modern history, the polygraph has been more deeply rooted in scientific reasoning than lie detectors of ancient times. In 1895, Cesare Lombroso, a famed criminologist, used blood monitoring experiments on criminals to determine whether they were telling the truth about their crimes.\(^6\) Specifically, Lombroso monitored changes in a criminals' blood volume in their hands when asking certain questions pertaining to aspects of their criminality.\(^7\) He inserted the accused criminal's hand through a rubber membrane and into a container of water, and used the changes in blood flow to determine veracity of statements.\(^8\) He believed that a drop in blood pressure to the hand meant the person was lying.\(^9\) On one occasion, his method resulted in Lombroso concluding that an accused thief was innocent of the crime, which was later confirmed by law enforcement officials.\(^10\)

Two decades later, in 1914, Italian psychologist Vittorio Benussi published his findings on the correlation between a person's respiratory system and the truth of their statements.\(^11\) He theorized that a person's ratio of inhalation to exhalation was larger after a lie, and subsequently, that it was smaller after an honest answer.\(^12\) In 1915, an American psychologist and lawyer,

\(^5\) Id.
\(^7\) Id.
\(^8\) Id.
\(^9\) Id.
\(^10\) Id.
\(^12\) Id.
William M. Marston, developed his own method of detecting lies. He used a “discontinuous systolic blood pressure test” to detect deception. His technique was to ask questions while recording a person’s blood pressure, and make conclusions about veracity based on any blood pressure results that were abnormal. His polygraph test would later become the test in question for the famous Frye decision, discussed at length below. The Court of Appeals for the District of Columbia ultimately ruled that his results were inadmissible because they had not gained general acceptance in the scientific community.

The most notable figures to study polygraph testing in the early 1900’s were John A. Larson and Leonard Keeler. Larson studied lie detection throughout the 1920’s, using his position as an employee of the Berkley, California, police department to study the veracity of statements in real cases. Both Larson and Keeler used the support of the Berkley Police Department to develop and modify their version of the polygraph. They were the first researchers to use galvanic skin responses (GSR) in polygraph testing. GSR refers to the changes that one experiences in sweat gland activity in relation to a line of questioning. In addition to GSR, their polygraph measured changes in blood pressure and heart rate.
The history of the polygraph from the late 1890's to the late 1920’s is not a comprehensive history of the polygraph in its totality; however, it gives great insight into how the polygraph started to come into use in modern times. The polygraphs of the past have shaped the way the polygraph is administered today. The modern polygraph certainly has used aspects from Larson and Keeler’s polygraph, as well as the many other polygraphs developed over this time period.

b. Current Status of Polygraph Testing

The administration of polygraph examinations has progressed significantly over the past century. The polygraph monitors and detects an individual’s body using more advanced technology than before. The measurements taken by polygraphs are significantly improved as well. In total, the modern-day polygraph is the most advanced form of the polygraph that we have seen.

Polygraphs are measured using a variety of equipment placed throughout an individual’s body. The equipment detects similar physiological channels to those that Keeler monitored in the 1920’s. Polygraphs today, monitor cardiovascular and respiratory activity, as well as GSR. Some polygraphs go beyond these measurements; some use equipment that monitors movement, voice pitch, and other physiological information. The measurements themselves are now produced onto computers with polygraph software.

There are mainly two ways for one to administer a polygraph examination today. The most widely used test is the Control Question Test (CQT). The other prominent test is the Concealed Information Test (CIT). Both tests usually use the same monitoring equipment and measuring

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23 Synnott, supra, at 59-83 (internal citation omitted).
24 Id.
27 Synnott, supra, at 59-83 (internal citation omitted).
software but are administered in different ways.28 There has been a recent movement away from administering the CIT on a polygraph machine; however, it is still the norm among examiners to give both the CQT and CIT on a polygraph machine.29

The CQT has been the most commonly administered polygraph examination since the 1940's.30 Stated in its most simple terms, the CQT compares a person's body responses when giving answers to relevant questions to the person's body responses when giving answers to control questions.31 Relevant questions are questions directly addressing the issue in question, while control questions concern "misdeeds that are similar to those being investigated, but refer to the person's past and are usually broad in scope."32 An example of a relevant question is "did you shoot your wife?" while an example of a control question is "have you ever betrayed anyone who trusted you?".33 The physiological measures for each question are taken and compared.34

An innovative advancement in CQT testing has come about in the last few years.35 Polygraph examiners conducting CQT testing have begun to move away from traditional polygraph technology, which examines sweating, heart rate, and breathing, among other things, towards the use of fMRI technology.36 The fMRI measures brain functions instead of bodily

28 Id.
30 Synnott, supra, at 59-83 (internal citation omitted).
31 See Meixner, supra, 106 NW. U.L. Rev. at 1455.
33 Id.
35 See, e.g., Kozel, supra, at 605; Langleban, supra, at 262-63.
36 Id.
functions by recording "changes in blood flow that correspond to changes in local brain activity." Stated simply, examiners look to and compare brain activity when asking control questions and relevant questions to determine whether an individual is being deceptive in their answers. If there is a physiological response to the relevant question greater than that of the control question, there is usually a finding of deception. Traditional CQT testing assesses deception using the same method, but instead comparing the physiological measurements taken by the polygraph machine.

The CQT, therefore, has been described as a deception test. Conversely, the CIT is known as an "information" test. The test does not seek to detect deception by the individual being monitored; instead, the test seeks to understand whether the individual has knowledge of certain details of an event – details that are not disclosed to the public. The CIT is administered by introducing the person to certain items that are either relevant or irrelevant to the crime. The examiner then assesses whether the person’s physiological response is different based on being subjected to the relevant item compared to the irrelevant item. The distinction between relevant and irrelevant items can be small yet significant. Thus,

38 Rutbeck-Goldman, supra, at 724.
39 Id.
41 Id.
42 Meixner, supra, at 1458; see also Raskin, supra, at 31-32.
43 Id.
44 Id.
45 Id. For example, the person being examined in relation to a shooting may be introduced to two different firearms. The relevant firearm would be the firearm used in the shooting, while the irrelevant firearm will be one that was not used in the shooting. If the person has a more significant physiological response to the relevant firearm compared to the irrelevant firearm, it shows, in theory, that the person has knowledge of the shooting beyond that which is known to the public.
the examiner seeks to gain information about what the person knows rather than when the person is being deceptive.

The CQT and CIT have varying levels of reliability. The CQT has been documented as having a reliability rate of anywhere from 78% to 90% for detecting deception, including CQT testing using fMRI technology.\textsuperscript{46} The CIT, on the other hand, statistically, is slightly more reliable, as it has an 80% to 90% accuracy rate for determining whether an individual has knowledge of certain aspects of an event.\textsuperscript{47} However, it is notable that there are outlying studies who have found extremely different levels of accuracy.\textsuperscript{48,49}

The CQT and the CIT, as the most prominent polygraph examinations today, are used throughout the world. The reliability of each is not definitively known through studies, but each seems to be at least somewhat accurate. However, it is certain that they are significantly more advanced than polygraphs of the past, and that the technology and equipment that is used when administering these examinations is more complicated than ever.

c. Governmental Uses of Polygraph Testing

In 1965, the United States Congress boldly declared, "[t]here is no lie detector, neither man nor machine. People have been deceived by a myth that a metal box in the hands of an investigator can detect truth or falsehood."\textsuperscript{50} This statement was a condemnation on the belief that one could

\textsuperscript{46} Id. at 1457 (citing Kozel, supra, at 60; Langleben, supra, at 267).
\textsuperscript{47} Id. at 1485; see, e.g., Allen, et al., The Identification of Concealed Memories Using the Event-Related Potential and Implicit Behavioral Measures: A Methodology for Prediction in the Face of Individual Differences, 29 Psychophysiology 504 (1992).
\textsuperscript{48} Id. at 1485 n.215 (citing Mertens & Allen, The Role of Psychophysiology in Forensic Assessments: Deception Detection, ERPs, and Virtual Realit Mock Crime Scenarios, 45 Psychophysiology 286, 293 tbl.3 (2008)).
\textsuperscript{49} For an in-depth analysis of rate of error for the CQT and CIT, see infra IV(b)(ii).
detect the veracity of another’s statement based purely on what a machine was detecting. However, over forty years later, the United States government now uses polygraph testing more than ever.

The United States Department of Justice has embraced the use of polygraph examinations for a number of important practices. The FBI, DEA, ATF, and OIG have acknowledged the use of polygraphs for criminal and administrative investigations, foreign counterintelligence and counterterrorism, pre-employment screening, personnel security and counterintelligence screening, foreign vetting, among other uses.51 Individuals applying for positions in the FBI, DEA, and ATF are required to take a polygraph examination as a part of pre-employment screening and administrative investigations.52 Refusal to take a polygraph has a variety of consequences, most notably dismissal from employment.53 Between 2002 and 2005, these agencies have conducted more than 49,000 polygraph examinations.54

The skill level and ability of polygraph examiners in the federal government are gauged in a variety of ways.55 The government uses an examiner’s capability to follow the professional standards of conduct as the best way to judge each examiner’s abilities.56 However, they do judge performance based on examiners’ rates of conclusive opinions, which are described as “the percentage of Deception Indicated or No Deception Indicated opinions.”57 The government has

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51 United States Department of Justice, Office of the Inspector General, Use of Polygraph Examinations in the Department of Justice, iii-v (2006).
52 Id. at v-vi.
53 Id. at 42.
54 Id. at xi.
55 Id. at 64-66.
56 Id. at 65.
57 Id.
found that their examiners come to conclusive opinions at a higher rate than the industry standard. They also assess performance based on an examiner’s confession rate, which is found by “dividing the number of times examinees with a final opinion of Deception Indicated ended up making an admission or confession that confirmed the polygraph results.” The FBI has stated that the total confession rate for their examiners is “considered high within the polygraph community.” Thus, when compared to polygraph examinations given outside of the government, the federal government has stated that their polygraph examiners are more consistent and more qualified.

Governmental usage of the polygraph examination is important to acknowledge and understand when assessing the present-day validity of the examination. When courts analyze the nature of polygraph examinations and the validity of both the examinations and the conclusions that are made from the examinations, they should recognize the use of the examination and conclusions by non-judiciary government branches, and the government’s reported rates of success.

III. FEDERAL LAW REGARDING EXPERT WITNESSES


Persons giving testimony who are considered experts are subject to different rules than persons considered lay witnesses. Under the Federal Rules of Evidence (“F.R.E.”), lay witnesses can only give testimony in the form of an opinion when it is “(a) rationally based on the witness’s perception; (b) helpful to clearly understanding the witness’s testimony or to determining a fact in

58 Id. (“FBI examiners issued conclusive opinions . . . in 92.2 percent . . . of all examinations . . . which is well above the industry standard of 80 percent.”).
59 Id.
60 Id. (“rate of 61 percent of individuals with final opinions of Deception Indicated made an admission or confession.”).
issue; and (c) not based on scientific, technical, or other specialized knowledge . . . "61 Conversely, expert witnesses are subject to different set of standards. Under the F.R.E.,

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

(b) the testimony is based on sufficient facts or data;

(c) the testimony is the product of reliable principles and methods; and

(d) the expert has reliably applied the principles and methods to the facts of the case.62

F.R.E. 702 was amended in 2000 to codify the factors considered in Daubert, discussed in Part III(b) below.63 The revisions state that experts can only testify if “(1) the testimony is based upon sufficient facts or data; (2) the testimony is the product of reliable principles and methods; and (3) the witness has applied the principles and methods to the facts of the case.”64 Courts will analyze an expert’s potential testimony under F.R.E. 702 at a Daubert evidentiary hearing.65

All evidence offered, including expert testimony, must have its probative value weighed in relation to dangers of unfair prejudice.66 If the court determines that relevant evidence’s probative value is “substantially outweighed” by unfair prejudice or misleading the jury, among other concerns, the court must exclude the evidence.67 Courts have noted that “[e]xpert evidence can be

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61 Fed. R. Evid. 701
62 Fed. R. Evid. 702
64 Fed. R. Evid. 702
65 Weinstein & Berger, supra, at § 13.02(4)(c)(ii).
66 Fed. R. Evid. 403.
67 Id.
both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under Rule 403 of the present rules . . . exercises more control over experts than over lay witnesses.68 However, courts have generally been reluctant to exclude evidence under F.R.E. 403, as contested evidence almost always has substantial probative value.69 Instead, judges can instruct jurors to only focus on testimony offered by an expert that the expert was qualified to give.70

b. Federal Court Rulings Regarding Expert Witnesses

For many decades, federal courts relied on the D.C. Circuit Court opinion in Frye to dictate the admission of expert testimony.71 Under Frye, expert witness testimony would be admitted if court determines that the skill or expertise that the witness will testify about is “sufficiently established to have gained general acceptance in the particular field in which it belongs.”72 This was commonly referred to as the “general acceptance” test.73

In 1975, decades after the Frye decision, the Federal Rules of Evidence were put into place.74 In 1993, the United States Supreme Court addressed the Frye standard in the Daubert case, stating that it was not supported by the now-adopted Federal Rules of Evidence, and thus was no longer controlling.75 Daubert, now used as the standard for admitting expert testimony,

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70 United States v. Williams, 717 F.3d 35, 41 (1st Cir. 2013).
71 Daubert, supra, at 585 (Frye has been the “dominant standard for determining the admissibility of novel scientific evidence at trial.”).
72 Frye, supra, at 1014.
73 Daubert, supra, at 585.
75 Daubert, supra, at 587.
emphasized reliability for admission of expert testimony, while rejecting the idea that because certain testimony was generally accepted, it should be admitted.\textsuperscript{76}

Additionally, The \textit{Daubert} opinion emphasized the "gatekeeping" role of a judge.\textsuperscript{77} Under this duty, the judge is tasked with determining whether expert testimony should be admitted or not.\textsuperscript{78} The judge, as the "gatekeeper," must determine that the expert witness' testimony will be both reliable and relevant before it can be admitted.\textsuperscript{79} In totality, the judge must compare the potential expert witness testimony to F.R.E. 702, and thus, determine whether the expert qualified, whether the testimony aids the trier of fact, whether the testimony is based on sufficient facts, whether the principles and methods underlying the testimony are reliable, and whether the expert will apply the principles and methods reliably to the facts of the case.\textsuperscript{80} Therefore, \textit{Daubert} shows that the judge must play an active role in analyzing potential expert witness testimony before it is introduced to the court.

The \textit{Daubert} opinion also gave insight into how to analyze potential expert witness testimony using F.R.E. 702. The trier of fact must determine whether the expert will testify to "(1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue."\textsuperscript{81} To understand whether the testimony will be "scientific knowledge," the court must determine whether it can be or has been tested.\textsuperscript{82} The court must also look at whether the "theory or technique has been subjected to peer review and publication."\textsuperscript{83} Furthermore, the court should "consider the

\textsuperscript{76} Id. at 589.
\textsuperscript{77} Id.
\textsuperscript{78} Id.
\textsuperscript{80} See Fed. R. Evid. 702.
\textsuperscript{81} \textit{Daubert}, supra, at 592.
\textsuperscript{82} Id. at 593.
\textsuperscript{83} Id.
known or potential rate of error.”

Also considered is “the existence and maintenance of standards controlling the technique’s operation.”

Last, the court will analyze the theory’s general acceptance in the relevant community, also known as the Frye test.

In totality, a Daubert inquiry analyses “the scientific validity – and thus the evidentiary relevance and reliability – of the principles that underlie a proposed submission.”

Once validity of the expert’s testimony has been determined, it must also be determined to “assist the trier of fact.” This inquiry has been related to a relevance inquiry under F.R.E. 402 and is somewhat easily satisfied.

Daubert emphasized that the F.R.E. 702 inquiry is “flexible,” and that “its overarching subject is the scientific validity – and thus evidentiary relevance and reliability – of the principles that underlie a proposed submission.” The focus of the these inquiries “must be solely on the principles and methodology, not the conclusions they generate.”

However, the judge must also consider the other rules that may apply to the testimony.

Over the next few years, federal courts began to clarify the Daubert ruling. Daubert’s ruling initially applied to scientific evidence only, as the expert witness testimony in question was presented as being scientific.

However, in 1999, the Supreme Court stated that Daubert’s ruling

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84 Id. at 594.
85 Id.
87 Id. at 594-95.
88 Id. at 591 (quoting Fed. R. Evid. 702).
89 United States v. Posado, 57 F.3d 428, 432 (5th Cir. 1995).
90 Id. at 433 (“if polygraph technique is a valid (even if not certain) measure of truthfulness, then there is no issue of relevance.”).
91 Daubert, supra, at 594-95.
92 Daubert, supra, at 595.
93 Id.
94 Id. at 597 (“To summarize, “General acceptance” is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence . . .” (emphasis added)).
applied to all expert testimony, whether categorized as scientific, technical, or other specialized knowledge. Moreover, the Supreme Court ruled that *Daubert* rulings are reviewed under an abuse of discretion standard by appellate courts.

**IV. ADMISSIBILITY OF POLYGRAPH RESULTS**


Courts must first analyze whether polygraph examiner testimony should be considered lay witness testimony or expert testimony. This analysis is simple under the Federal Rules of Evidence. F.R.E. 701, as described above, clearly states that lay witnesses cannot give opinion testimony if that opinion is “based on scientific, technical, or other specialized knowledge.” Polygraph examiners introduced to the court to give testimony seek to give an opinion based on the administration of the polygraph examination are offered to give their opinion because they consider themselves to be qualified under F.R.E. 702. Polygraph examiners are not considered lay witnesses because they seek to give an opinion based on their training in the administration of the polygraph examination. Thus, the admissibility of their testimony must be analyzed under F.R.E. 702.

b. *Polygraph Examiner Testimony Under F.R.E. 702 & Daubert*

i. *Standards for Polygraph Examiners: Threshold Requirement*

The Federal Rules of Evidence have a threshold requirement for witnesses to be admitted as experts to give opinion testimony. As stated above, the witness must be “qualified as an

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95 *Kumho Tire Co.*, *supra*, at 151.
97 Fed. R. Evid. 701(c).
98 *See* Fed. R. Evid. 702
99 *Id.*
expert by knowledge, skill, experience, training, or education.” Therefore, polygraph examiners whose testimony is sought in court must pass this threshold requirement before being admitted to give their opinion testimony.

To analyze polygraph examiners under this threshold requirement, the court must analyze the training that polygraph examiners receive before they can be considered as a certified examiner. The American Polygraph Association lists the requirements for becoming a certified APA polygraph examiner. The requirements include:

[a] minimum of 400 hours that will be completed in not fewer than 10 nor more than 17 weeks and must be conducted at a qualified education and training facility; a week shall consist of at least four but not more than six consecutive days; a day is defined as at least six but not more than nine hours . . . at least 95% of the instruction hours shall be provided each week shall be done in the presence of a faculty member qualified to provide such instruction.

Potential examiners study test formats, question format, and the background and underpinnings of polygraph examinations. Moreover, the APA offers continuing education for credentialed examiners through yearly weeklong seminars, as well as many other educational and research benefits. The APA does require their credentialed

100 Id.
102 Id.
103 Id.
members to adhere to continuing education hours, but the requirements are not currently available.\(^{106}\)

The many federal government agencies who administer polygraph examinations have more stringent requirements.\(^{107}\) The FBI, DEA, ATF, and OIG all select their examiners from a specific area of their personnel.\(^{108}\) Most agencies require examiner candidates to be trained at the Department of Defense Polygraph Institute.\(^{109}\) Moreover, “all examiner candidates must also complete an internship, during which they work under the supervision of an experienced polygraph examiner.”\(^{110}\) After certification, federal polygraph examiners must meet continuing education standards.\(^{111}\) To remain certified, each agency requires examiners to administer a minimum number of test annually.\(^{112}\)

Polygraph examiners play an integral role in the administration of polygraph examinations.\(^{113}\) Clearly, the training and education they receive applies directly to the threshold requirement of F.R.E. 702. Additionally, the continuing education and federal minimum annual polygraph administration requirements show that these polygraph examiners have minimum levels of experience. Thus, APA-certified and federal polygraph

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\(^{107}\) See United States Department of Justice, Office of the Inspector General, supra, at x-xi.

\(^{108}\) Id. at x.

\(^{109}\) Id. FBI examiners can be trained at the DoDPI or a school approved by the FBI or the APA. Id.

\(^{110}\) Id.

\(^{111}\) Id. (“[S]tandards require that examiners receive 80 hours of polygraph-related training every 2 years.”).

\(^{112}\) Id. (OIG requires annual minimum of 12; DEA, 25; ATF, 36 (minimum of 18 every six months); FBI, 48).

\(^{113}\) Giannelli & Imwinkelried, Scientific Evidence, § 8-2(A), at 218 (2d ed. 1993) (stating that “the examiner, not the machine, is the crucial factor in arriving at reliable results.”).
examiners’ training, education, and experience will likely be sufficient to fulfill the threshold requirement of F.R.E. 702.

Although continued APA certification may be enough to pass the threshold requirement, many states do not require that polygraph examiners be APA certified.114 Subsequently, many polygraph examiners who lack certification are administering examinations, thus leading to a lack of faith and trust in the polygraph community.115 Thus, polygraph examiners seeking to give opinion testimony in court who lack certification may not pass the threshold requirement of F.R.E. 702. Non-certified polygraph examiners therefore should be evaluated on a case-by-case basis; judges should assess an examiner’s knowledge, skill, experience, training, and education before analyzing their potential testimony under the other requirements of F.R.E. 702.

ii. Reliability

The reliability of the polygraph examination has been analyzed both in and out of court for decades. Federal court opinions throughout the country display the numerous rulings regarding polygraph admission, especially in circuit courts. There is currently no comprehensive admissibility rule for federal courts in regards to polygraph examinations. Thus, it is important to analyze the different methods of administering a polygraph examination under F.R.E. 702.


The United States Supreme Court has only examined reliability of polygraph examinations once since Daubert; thus, it is important to look at circuit court rulings throughout the country to get a complete understanding of how federal courts currently view the examination. In 1998, the Supreme Court, in the Scheffer case, ruled that a per se rule excluding polygraph examination admission does not violate an individual's right to present a defense. However, the Court also ruled that "individual jurisdictions . . . may reasonably reach differing conclusions as to whether polygraph evidence should be admitted." Therefore, the United States Supreme Court has not definitively stated whether polygraphs should or should not be admitted under F.R.E. 702.

Circuit courts throughout the nation have mostly uniform rulings on the per se exclusion of polygraph evidence. Some courts had ruled that they did not have a per se exclusion of polygraph evidence before the Daubert decision. However, in the wake of Daubert, most circuit courts have subsequently ruled that per se exclusions of polygraph examinations under F.R.E. 702 are no longer valid. Circuit courts seem to be in agreement that there should not be a per se exclusion of polygraph examiners as expert witnesses, and thus, the admissibility of their opinion testimony must be evaluated under F.R.E. 702.

As stated in § II(b), infra, the polygraph examination is generally administered using one of two methods, the CQT and CIT. Each method must be examined independently of one another under F.R.E. 702 to determine whether either or both should be admissible in federal court.

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117 Id.
118 Id. at 313.
119 See, e.g., United States v. Piccinonna, 885 F.2d 1529, 1535 (11th Cir. 1989).
120 See, e.g., Posado, supra, at 429; United States v. Cordoba, 104 F.3d 225, 228 (9th Cir. 1997); United States v. Call 129, F.3d 1402, 1404 (10th Cir. 1997); United States v. Thomas, 167 F.3d 299, 308 (6th Cir. 1999); United States v. Prince-Oyibo, 320 F.3d 494, 501 (4th Cir. 2003).
Moreover, the CQT must be differentiated by the use of traditional polygraph equipment and the use of the fMRI. Thus, an examination of each method is crucial to determine admissibility.

The traditional CQT test, when examined under F.R.E. 702, has a few concerns. First, the traditional testing method has a significant potential rate of error. Traditional CQT testing has been found to be "biased against innocent individuals." This bias comes from the assumption that one who is being deceptive will be more anxious, thus leading to greater physiological arousal than one who is being truthful. This assumption is incorrect, however, because individuals are likely to have similar responses when being confronted with a false accusation and being truthful as those who are confronted with a true accusation and are being deceptive. Additionally, it has been documented that individuals can be trained to "beat" traditional CQT testing. Persons being questioned during a polygraph examination can artificially augment their responses to control questions by "curing the toes, lightly biting the tongue, or performing mental arithmetic when control questions are being asked." Most concerning is that these countermeasures are incredibly difficult to perceive, and thus can be used effectively by one being deceptive without being detected. One study has shown that more than 50% of individuals that are taught countermeasures can subsequently "beat" the traditional CQT polygraph examination. The bias and potential error rate of traditional CQT testing may independently be enough to be ruled inadmissible under F.R.E. 702.

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122 Id.
123 Id.
124 Id. at 78.
125 Id. (citing Honts, Raskin, & Kircher Mental and Physical Countermeasures Reduce the Accuracy of Polygraph Tests, Journal of Applied Psychology, 79, 252-59 (1994)).
126 Id. (citing Honts, et al., at 252-59).
127 Honts, et al., supra, at 252-59).
Furthermore, it seems unlikely that the traditional CQT test is generally accepted by the scientific community. Members of the Society for Psychophysiological Research and the Fellows of the American Psychological Association’s Division of General Psychology were surveyed in regard to their acceptance of traditional CQT polygraph testing.\textsuperscript{128} One third of respondents found CQT testing to be scientifically sound, and only one fourth of respondents believed CQT testing should be admissible in courts.\textsuperscript{129} The biggest concern with CQT testing was the ability for a questioned individual to learn countermeasures and avoid detection when being deceptive.\textsuperscript{130} Thus, traditional CQT testing likely would not be found as being generally accepted by the appropriate field. When coupled with the concerns regarding traditional CQT testing’s potential rate of error, it appears that traditional CQT testing should inadmissible under F.R.E. 702.

The administration of CQT testing using fMRI measurements also has some issues when analyzed under F.R.E. 702. Most notably, the fMRI likely has not been generally accepted in the field.\textsuperscript{131} Since the use of fMRI technology during CQT testing is a relatively new advancement, many have argued that it cannot yet be generally accepted due to the lack of scientific studies regarding its reliability.\textsuperscript{132} The use of fMRI technology for neuroscientific purposes is generally accepted in its field; however, this does not translate to a general acceptance when using it for polygraph examinations.\textsuperscript{133}

\textsuperscript{128} Id. at 83.
\textsuperscript{129} Id.
\textsuperscript{130} Id.
\textsuperscript{131} See Meixner, supra, at 1478-1480.
\textsuperscript{133} Id.
Additionally, the lack of scientific studies concerning fMRI testing and its use during polygraph examinations leaves unanswered questions relating to its potential rate of error. “A small number of fMRI-based CQT studies” claim that the test is between 78% and 90% accurate. However, these tests have only been conducted in simulated environments, and thus have not been applied to real-world situations. Therefore, it seems somewhat clear that the use of fMRI technology does not fulfill the requirements of F.R.E. 702 at this time.

The administration of polygraph examinations using CQT-based questioning should not be admissible in federal court. Neither traditional CQT testing nor fMRI-based CQT testing satisfy F.R.E. 702. Both variations of CQT testing are not generally accepted in their fields, nor have potential rates of error that are satisfactory under F.R.E. 702. Therefore, federal courts should not admit polygraph examiners as experts to give opinion testimony based on their administration of a polygraph examination using the CQT method.

The CIT-based polygraph examination is significantly different from CQT testing, and thus must be examined under F.R.E. 702 independently. CIT testing has been analyzed by studies over the past two decades. Studies have determined the CIT-based polygraph examinations’ accuracy by “conducting the test on an individual for whom ground truth is known.” While testing regarding real-world application of the CIT is somewhat unclear, it is nevertheless clear that the CIT can be and has been studied over the past few decades.

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134 Id. at 1480.
135 See Kozel, et al., supra, at 610; Langleben, supra, at 269.
137 Meixner, supra, at 1482.
138 Id. at 1483 (internal citations omitted).
Unlike CQT-based polygraph examinations, CIT examinations have been generally accepted within its field. Surveys have shown that CIT polygraph examinations largely have been accepted.\textsuperscript{139} When compared to CQT testing, it is overwhelmingly clear that CIT testing is much more accepted in the scientific community.\textsuperscript{140} For example, surveyed members of the Society for Psychophysiological Research had much higher regard for CIT testing than CQT testing.\textsuperscript{141} 77% of respondents found CIT testing to be based on scientifically sound principles, while only 36% found the same for CQT testing.\textsuperscript{142} Moreover, 72% stated that CIT testing was scientifically sound, while only 30% believed CQT testing to be scientifically sound.\textsuperscript{143} These significant discrepancies bolster a CIT-based polygraph examiner’s probability to be admitted as an expert witness, although they diminish CQT-based polygraph examiners’ probability to be admitted.

Like CQT-based polygraph examinations, CIT-based examinations have an uncertain potential rate of error. Some studies have claimed that CIT polygraph examinations have an 80% to 90% accuracy rate, while others have found as low as a 50% accuracy rate.\textsuperscript{144} Like CQT examinations, CIT examinations have not been thoroughly studied in real-world environments; most studies are conducted in simulated situations, such as mock terrorist attacks.\textsuperscript{145} However,

\textsuperscript{139} Id. at 1484 (citing Iacono & Lykken, \textit{The Validity of the Lie Detector: Two Surveys of Scientific Opinion}, 82 J. Applied Psychol. 426, 426-28 (1997)).
\textsuperscript{140} Id.
\textsuperscript{141} Iacono & Lykken, supra, at 430 tbl.2.
\textsuperscript{142} Id.
\textsuperscript{143} Id.
\textsuperscript{144} Id. (citing Allen, \textit{The Identification of Concealed Memories Using the Event-Related Potential and Implicit Behavioral Measures: A Methodology for Prediction in the Face of Individual Differences}, 29 Psychophysiology 504 (1992); Farwell & Donchin, \textit{The Truth Will Out: Interrogative Polygraphy ("Lie Detection") with Event-Related Brain Potentials}, 28 Psychophysiology 531, 539 tbl.2 (1991); Rosenfeld, supra, at 161; Rosenfeld, \textit{Simple Effective Countermeasures to P300-Based Tests of Detection of Concealed Information}, 41 Psychophysiology 205, 209 & tbl.1 (2004); Mertens & Allen, supra, at 293 tbl.3).
\textsuperscript{145} See, e.g., Meixner & Rosenfeld, supra, at 150-51 & tbl.1.
CIT-based polygraph examinations do not have a well-documented list of studies concerning the ease by which one can manipulate results. CIT-based examinations are not as noticeably deficient as CQT-based examinations and are certainly more accepted in the relevant scientific community. Therefore, CIT-based polygraph examinations likely have a higher probability of being admitted under F.R.E. 702 than CQT-based polygraph examinations.

c. Polygraph Examiner Testimony Under F.R.E. 403

If any method of administering polygraph examinations fulfills the requirements of F.R.E. 702, the court must then analyze its prejudicial value compared to its probative value under F.R.E. 403. Prior to Daubert, courts had frequently ruled that polygraph examinations were inadmissible under F.R.E. 403, finding that they were highly prejudicial and that this prejudicial value substantially outweighed their probative value. According to the Alexander opinion, polygraph examination testimony was highly prejudicial because it would deceive jurors into thinking that it is “infallible,” and jurors may “give significant, if not conclusive, weight to a polygraphist’s opinion.”

After Daubert, federal courts continued to question polygraph evidence’s admissibility under F.R.E. 403. The United State Supreme Court’s Scheffer ruling noted that the “aura of infallibility attending polygraph evidence can lead jurors to abandon their duty to assess credibility and

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146 See Daubert, supra, at 595.; see also Fed. R. Evid. 403.
147 See, e.g., United States v. Miller, 874 F.2d 1255, 1263 (9th Cir. 1989); Brown v. Darcy, 783 F.2d 1389, 1396 (9th Cir. 1986); United States v. Falsia, 724 F.2d 1339, 1342 (9th Cir. 1983); United States v. Alexander, 529 F.2d 161, 168 (8th Cir. 1975).
148 Alexander, supra, at 168.
Many circuit courts have also ruled polygraph evidence as being inadmissible due to its highly prejudicial nature.150

Past studies have affirmed the prejudicial nature of polygraph examination evidence.151 A 1939 study found that five out of nine jurors accepted polygraph evidence’s veracity without question during trial.152 Another study in 1979 determined that twenty-two of forty-two jurors changed their not-guilty verdicts to guilty after the presentation of polygraph evidence.153 Polygraph evidence by itself was shown by another study to change the verdicts of 40% of jurors’ verdicts from not-guilty to guilty.154 These studies continue to be applicable today, as polygraph examinations still have the “aura of infallibility,” as stated by Justice Stevens.155

Polygraph examination evidence is certainly prejudicial; courts and studies have found this to be true. If a polygraph examiner is allowed to give opinion testimony under F.R.E. 702,156 the testimony should nevertheless be inadmissible under F.R.E. 403 due to its highly prejudicial nature. Federal courts today have agreed with this proposition and should continue to rule that this evidence is inadmissible.

149 Scheffer, supra, at 314.
150 See, e.g., United States v. Ramirez-Robles, 386 F.3d 1234, 1245 (9th Cir. 2004); United States v. Robbins, 197 F.3d 829, 844 (7th Cir. 1999); United States v. Waters, 194 F.3d 926, 930 (8th Cir. 1999).
151 See Henseler, supra, at 1290-96.
152 Id. at 1292 (citing Forkosh, The Lie Detector and the Courts, 16 N.Y.U. L. Q. Rev. 202, 229-30 (1939)).
153 Id. (citing Markwart & Lynch, The Effect of Polygraph Evidence on Mock Jury Decision-Making, 7 J. Police Sci. & Admin. 324, 324 (1979)).
154 Id. (citing Koffler, The Lie Detector – A Critical Appraisal of the Technique as a Potential Undermining Factor in the Judicial Process, 3 N.Y.L.F. 123, 138-46 (1957)).
155 Scheffer, supra, at 314.
156 See § IV(b)(ii), infra.
V. CONCLUSION

Polygraph examinations should not be admissible in federal court. Examiners may not pass the threshold requirements of the Federal Rules of Evidence due to issues relating to certification requirements. Moreover, the examination itself and the way it is administered have been questioned by numerous studies and courts, and currently may not be reliable enough to be presented to a jury. Most importantly, the results of a polygraph examination and an examiner’s testimony regarding the results are exceedingly prejudicial in nature. Therefore, federal courts should continue rule that polygraph examiners cannot give opinion testimony due to the many issues arising from the current status of polygraph examinations and examiners.