No. 96-1133

In the Supreme Court of the United States

October Term 1996

UNITED STATE OF AMERICA, PETITIONER

v.

EDWARD G. SCHEFFER, RESPONDENT

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE ARMED FORCES

BRIEF OF THE COMMITTEE OF CONCERNED SOCIAL SCIENTISTS AS *AMICUS CURIAE* IN SUPPORT OF THE RESPONDENT

CHARLES F. PETERSON
Counsel of Record

1317 River Street
Boise, Idaho 83702
(208) 342-4633

person could benefit from a valid credibility assessment technique like the polygraph.

We respectfully urge the Court to deny the petitioner's request to set aside the decision of the United States Court of Appeals for the Armed Forces in this case.

Respectfully submitted.

Charles F. Peterson
Counsel of Record

1317 River Street
Boise, Idaho 83702
(208) 342-4633
FAX (208) 336-2088

children.[40] Thus given the validity data for the polygraph described above, it would appear that a properly conducted polygraph test would offer valid and helpful information to the trier of fact in his or her task of assessing credibility in context of a criminal trial.

CONCLUSION

For the foregoing reasons, the members of the Committee of Concerned Social Scientists respectfully submit that polygraph testing is a valid application of psychological science and that it is generally accepted by the majority of the informed scientific community of psychological scientists as such. Polygraph testing has a known but acceptable error rate that has been well defined by scientific research. Furthermore, there is no scientific evidence that suggest the admission of the results of a polygraph examination before lay jurors will overwhelm their ability to use and value other evidence. Overwhelming the trier of fact is particularly unlikely when the quality and training of the members of a court martial are considered. Many of the traditional objections to the polygraph have been shown by science to be without merit. Although there are problems with the quality of practice in the polygraph profession, such problems are not unique to polygraph test. They are likely to occur in any situation where a human evaluator is needed to interpret data. In any event, the problems of examiner practice are easily remedied by the traditional means of cross-examination and evidentiary rule. Finally, research indicates that average

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[40] See reviews by Paul Ekman TELLING LIES (1986); Paul Ekman and Maureen O'Sullivan 46, *Who can catch a liar?* 913 AMERICAN PSYCHOLOGIST (1991); Bella M. DePaulo 3 *Spotting lies: Can humans learn to do better?* 83 (1994); Marcus Tye, EFFECTS OF EXPERT STATEMENT VALIDITY ASSESSMENT TESTIMONY ON LAY EVALUATIONS OF CHILDREN'S STATEMENTS, approved doctoral dissertation, the University of North Dakota (1996).

VIII. THE UNITED STATES MILITARY HAS PARTICULARLY STRONG STANDARDS FOR TEST ADMINISTRATION AND QUALITY CONTROL

Honts and Perry, although critical of the general level of training for polygraph examiners, note that the Department of Defense Polygraph Institute is "generally considered to be the best training facility for polygraph examiners."[39] All polygraph examiners for the AFOSI have received training at the Department of Defense Polygraph Institute. The United States military polygraph programs maintain strict guidelines for the administration of polygraph tests and every polygraph in a criminal case is reviewed by two levels of quality control, one at operational field level by the field supervisor, and then at the program's headquarters. Examiners who produce substandard work receive additional training or are reassigned to other duties.

IX. WITHOUT THE POLYGRAPH, HUMANS ARE NOT VERY GOOD AT DETECTING DECEPTION

Although the role of credibility assessment has traditionally been left to juries, scientific research suggests that the average person is not very good at detecting deception. This research has been reviewed on a number of occasions and the reviews converge on a conclusion that without an intimate knowledge of the individual, or instrumental assistance, the average adult, including lawyers, judges, police officers, intelligence officers and psychologists are, at best, only slightly better than chance at detecting deception by adults or

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[39] Id at 359.

VII. PROBLEMS ASSOCIATED WITH POORLY CONDUCTED EXAMINATIONS CAN EASILY BE REMEDIED

Honts and his colleagues[36] have noted that the greatest challenge facing the polygraphy is the generally poor training of many polygraph examiners. However, Honts and Perry suggest that New Mexico Rule of Evidence 707 remedies most of the problems associated with poor examiner practice.[37] The single most important provision of New Mexico Rule 707 is a requirement that polygraph examinations be tape recorded. With a tape recording all of the actions of the examiner and the subject are available for scrutiny. If the examiner engaged in any unacceptable practices, those will be obvious to opposing experts and could serve as useful topic for impeachment of the expert witness. The second important requirement of New Mexico Rule 707 requires that all polygraph examinations taken by the subject be disclosed if any result is to be offered as evidence. This prevents or at least discloses any effort by counsel to shop for a favorable result. Finally, Honts and Perry suggest that the traditional methods of cross-examination can be very effective in revealing incompetence on the part of polygraph examiners.[38]

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[36] Supra note 18 at 369 (Honts & Perry); Supra note 2 at 998 (Honts & Quick).

[37] Supra note 18 at 372 (Honts & Perry).

[38] Id at 371, including topics for cross-examination of polygraph examiners.

the American Psychological Society, Washington, D.C (1997, May). The Honts analysis of the FPEH is as follows: The FPEH suggests that polygraph examinations conducted for the defense on a privileged and confidential basis are more likely to produce false negative outcomes than when subjects know that the examiner will report adverse outcomes. The FPEH assumes that if the subject expects that only a favorable outcome will be reported, the subject will have little at stake and will have no fear of the detection of deception. It is surmised that this lack of fear of the detection of deception will reduce the threat posed by the crime-relevant questions in the polygraph examination and the guilty subject will be more likely to pass. Two basic assumptions underpin the FPEH: (1) Fear of the detection of deception is necessary for the CQT to function. (2) There is no fear of detection of deception (or other motivation) in a confidential polygraph examination. First, there is no basis for assuming that fear of the detection of deception is necessary for the CQT to function. Physiological detection of deception has been demonstrated in numerous laboratory studies under no motivation, reward motivation, punishment, and even when the subjects did not know they were in a detection of deception situation. No differences between these motivational conditions has been reliably observed. Although fear may be sufficient for the detection of deception, it clearly is not necessary. Fear is not an important part of any modern theory of CQTs. Even if fear were necessary for detection, it does not follow that a reduction in fear would allow a deceptive person to pass the test. The CQT requires differential reactivity between relevant and comparison questions. A reduction in fear would reduce the fear associated with both question types thus maintaining the differential reactivity between the two. Since these tests are evaluated within-subjects, and not against a normative standard, the effect of reducing the motivation level (fear) would be nil. Finally the FPEH's assumption that there is no fear (or any motivation) in a confidential polygraph is unrealistic. The subject of a confidential polygraph in a criminal case has a clear motivation, the gain she or he will receive from passing the test. Clearly this is a more powerful motivation than the small monetary rewards used in most laboratory studies. Additionally, Honts presented data from both the laboratory and the field that refute the FPEH. See supra, Honts paper presented to APS in Washington, D.C.(May, 1997).

described above. In the context of a mock trial, polygraph testimony was contrasted with testimony concerning identification based on a blood test. The findings consistent showed that mock-jurors were more skeptical of polygraph testimony than they were of blood test testimony, even when the experts reported them to be of the same level of accuracy. There were no indications in any of the studies that polygraph evidence overwhelmed jurors or that they were unable to use and value evidence that ran contrary to the polygraph outcome. We know of no data, published or unpublished that supports the notion that juries give undue weight to polygraph evidence, or that they are unable to evaluate and weigh polygraph evidence in the context of other testimony given at trial.

D. Polygraph Tests Run Under Confidential Circumstances For The Defense Are No Less Valid

Although not at issue in the present case, one common criticism offered against the polygraph is that polygraph examinations conducted in confidence for a defense attorney are less valid that polygraph examinations conducted for law enforcement. This notion has been addressed scientifically and has been found to be without merit.[35] We know of no evidence, published or otherwise, that supports this notion.

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tory style predicts perceptions of expert witness believability. Paper presented at the annual meeting of the American Association of Applied and Preventive Psychology, Chicago (1993). C. R. Honts, & M. K. Devitt, *The hired gun cross-examination tactic reduced mock jurors' perception of expert witness' credibility*. Paper presented at the biennial meeting of the American Psychology-Law Society/Division 41 San Diego, CA (1992).

[35] This notion, known as the Friendly Polygraph Examiner Hypothesis (FPEH) was discussed at length by Honts & Perry, Supra Note 18 at 357 and the notion was found to be without validity. The issue was recently revisited by Charles R. Honts, *Is it time to reject the friendly polygraph examiner hypothesis (FEPH)?*, a paper presented at the annual meeting of

Typical of this research is the study done by Cavoukian and Heslegrave.[33] They report two experiments where cases were presented to mock juries either with or without polygraph evidence. Their mock jurors were asked to give ratings of their perceptions of the likelihood of the defendant's guilt and they were asked to render verdicts. In both experiments, in the absence of polygraph evidence, subjects tended to rate the defendant near the middle (uncertain) portion of the rating scale. This indicates that the evidence was relatively equivocal, the very type of case where polygraph evidence is likely to be offered. The addition of evidence that the defendant had passed a polygraph did shift subjects ratings in the not guilty direction, but the effect was relatively small, shifting from a mean rating of about 3 to a mean rating of about 4 (7-point scale) in one experiment and from a mean rating of about 5 to a mean rating of about 6 (9-point scale) in the other experiment. Polygraph evidence had a significant effect on verdicts in one experiment, but polygraph testimony did not have a significant effect on verdicts in a second study. All effects of polygraph testimony were eliminated by the introduction of negative testimony by an opposing witness who testified that polygraph tests were only 80% accurate and that the results of polygraph tests should be viewed with skepticism. Cavoukian and Heslegrave concluded that concerns about blind acceptance and overwhelming impact of polygraph tests are unjustified. We concur.

Recent research conducted at the University of North Dakota[34] has replicated and extended the findings of the research

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[33] Id.

[34] L. Vondergeest, C. R. Honts, & M. K. Devitt, *Effects of Juror and Expert Witness Gender on Jurors' Perceptions of An Expert Witness.* MODERN PSYCHOLOGICAL STUDIES, 1 (1993). M. K. Devitt, C. R. Honts, & B. Gillund. *Stealing thunder does not ameliorate the effects of the hired gun cross-examination tactic.* Paper presented at the annual meeting of the American Association for Applied and Preventive Psychology, Chicago (1993). C. R. Honts, M. K. Devitt, & S. Amato, *Explana-*

science that would allow or predispose a deceptive person to pass a properly conducted polygraph examination.[31]

C. Polygraph Evidence Will Not Overwhelm The Jury Decision Making Process Resulting In Trial By Polygraph

There is an area of science known as Psychology and the Law that has addressed the impact of testimony concerning the outcome of polygraph examinations on juries. A number of studies have been conducted on this topic.[32] This research has been conducted both as experimental work with mock juries and by conducting post-trial interviews with jury members who had been presented with polygraph testimony. This literature is consistent in showing that juries are not inclined to give extraordinary weight to polygraph evidence. The research provides strong evidence that juries are capable of weighing and evaluating all evidence, including polygraph evidence. Moreover, juries are also capable of rendering verdicts that may be inconsistent with polygraph results. In no case did research suggest that polygraph testimony strongly or overwhelmingly affected the jury decision making process.

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[31] Id., Honts et al.; also see Charles R. Honts, David C. Raskin, & John C. Kircher. (1986, October). *Individual differences and the physiological detection of deception.* Paper presented at the annual meeting of the Society for Psychophysiological Research, Montreal Canada.

[32] e.g. Nancy. J. Brekke, et al., *The Impact of Nonadversarial Versus Adversarial Expert Testimony*, 15 L. & Hum. Behav. 451 (1991). S. C. Carlson, M. S. Passano & J. A. Jannnunzzo, *The Effect of Lie Detector Evidence on Jury Deliberations: An Empirical Study*. 5, J. Police Sci. & Admin. 148 (1977). A. Cavoukian & R. J. Heslegrave, *The admissibility of polygraph evidence in court: Some empirical findings*. 4, L. & Hum. Behav. 117 (1979). A. Markwart & B. E. Lynch, *The Effect of Polygraph Evidence on Mock Jury Decision-Making*. 7 J. Police Sci. & Admin. 324 (1979).

is hopefully difficult to obtain.[28] Honts and Perry note that while there are no easy answers to the problem of countermeasures, it appears that computerized analysis of the physiological records substantially reduces the false negative rate attributable to countermeasure use.[29]

B. Psychopathy and Other Psychological Conditions

The popular notion that a "pathological," "psychopathic," or "criminally hardened" liar cannot be tested successfully with the polygraph has no basis in scientific fact. "Psychopathic" or "criminally hardened" liars, including those clinically diagnosed with Antisocial Personality Disorder respond quite satisfactorily when attempting deception and are as easily detected in their deception as normals.[30]

Psychotic persons may not be suitable subjects for polygraph testing, but only when they experience psychotic episodes, delusions or hallucinations during the examination. Then, the subject might sincerely believe such delusions to be fact. Persons psychotic to this degree would be recognized as such by any reasonable professionally trained person. There are no traits of personality or personality disorders known to

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[28] Supra note 18 at 376 (Honts and Perry); there are no field studies that address the countermeasures.

[29] Id at 374; also see supra note 22 (Honts et al., 1994).

[30] Numerous studies have addressed the question of whether psychopaths can beat the polygraph, e.g., Supra note 7 (Raskin & Hare); Christopher J. Patrick and William G. Iacono 74 *Psychopathy, threat, and polygraph test accuracy*. JOURNAL OF APPLIED PSYCHOLOGY, 347 (1989); also see the analysis and review by Charles R. Honts, David C. Raskin, & John C. Kircher, 19, *Effects of socialization on the physiological detection of deception*. JOURNAL OF RESEARCH IN PERSONALITY, 373 (1985).

VI. SCIENCE HAS EXAMINED MANY OF THE TRADITIONAL CRITICISMS OF POLYGRAPH TESTING AND HAS PROVIDED DATA TO ADDRESS THEM

A. Countermeasures

Countermeasures are anything that a subject might do in order to distort or defeat a polygraph test. Detailed reviews of the scientific literature on countermeasures are available in a number of locations.[24] This research leads to several conclusions. First, there is no credible scientific evidence that drugs or other countermeasures designed to affect the general state of the subject are effective against the CQT.[25] However, laboratory studies have suggested the possibility that training in specific point countermeasures designed to increase responding to comparison questions might be effective in producing false negative outcomes.[26] Nevertheless, it is also important to note that training in the countermeasures appears critical to their effectiveness. Subjects who spontaneously attempt countermeasures or are only given the information are unable to achieve effects,[27] and the required training

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identified in this journals charter was the psychophysiological detection of deception

[24] e. g., Supra note 18 at 373 (Honts & Perry); Charles R. Honts, *Interpreting research on polygraph countermeasures.* 15 J. POLICE SCIENCE AND ADMINISTRATION 204 (1987); Supra note 23 (Honts, et. al); Raskin et al., supra note 1.

[25] Id., Honts (1987); Supra note 1 (Raskin et al.); David C. Raskin, 1986 *The Polygraph in 1986: Scientific, Professional, and Legal Issues Surrounding Application and Acceptance of Polygraph Evidence*, UTAH LAW REVIEW 29 (1986).

[26] See e.g., Honts, et al., Supra note 22.

[27] Rovner (1986), supra note 7; also see, Charles R. Honts, David C. Raskin, John C. Kircher, & Robert L. Hodes, *Effects of spontaneous countermeasures on the physiological detection of deception*, 16, JOURNAL OF POLICE SCIENCE AND ADMINISTRATION, 91 (1988).

scripts submitted to it for publication. Articles which report matters that are not acceptable psychological science do not usually make it through the peer review process and are not published in the *Journal of Applied Psychology*. The *Journal of Applied Psychology* has published numerous articles on the psychophysiological detection of deception.[22] The publication of numerous articles in main stream journals of scientific psychology gives a clear indication that the psychophysiological detection of deception is generally accepted as valid science by the community of scientific psychologists.

The increasing acceptance of the psychophysiological detection of deception is evidenced by the increasing number of scientific publications on the topic and the involvement of a larger number of psychological laboratories. In addition, a new peer-reviewed archival scientific journal devoted to the topic of credibility assessment began publication in early 1997.[23]

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[22] Some of the articles on the polygraph published in the *Journal of Applied Psychology* are as follows: P. J. Bersh, A validation study of polygraph examiner judgments, *Journal of Applied Psychology*, 399, 53 (1969); P.O. Davidson, Validity of the guilty knowledge technique: The effects of motivation. *Journal of Applied Psychology*, 52, 62-65 (1968); E. Elaad, Detection of guilty knowledge in real-life criminal investigations. *Journal of Applied Psychology*, 75, 521-529 (1990); E. Elaad, A. Ginton & N. Jungman, Detection measures in real-life criminal guilty knowledge tests. *Journal of Applied Psychology*, 77, 757-767 (1992); A. Ginton, D. Netzer, E. Elaad &G. Ben-Shakhar, A method for evaluating the use of the polygraph in a real-life situation. *Journal of Applied Psychology*, 67, 131-137 (1982); C. R. Honts, R. L. Hodes, & D. C. Raskin, Effects of physical countermeasures on the physiological detection of deception. *Journal of Applied Psychology*, 70, 177-187 (1985); C. R. Honts, D. C. Raskin, & J. C. Kircher Mental and physical countermeasures reduce the accuracy of polygraph tests, *Journal of Applied Psychology*, 79, 252-259 (1994); Supra note 16 (Horvath); Supra note 2 (Kircher & Raskin); Supra note 13 (Patrick, & Iacono); Supra note 7 (Podlesny & Truslow).

[23] The *Journal of Credibility Assessment and Witness Psychology* published its first issue on 7 February 1997. One of the main topics

A second and more important indicator of the acceptance of polygraph testing in the scientific community is provided by the large number of original scientific studies published in peer-reviewed scientific journals. Studies reporting positive results for the validity of the polygraph have appeared in journals such as: The *Journal of Applied Psychology, The Journal of General Psychology, Psychophysiology, The Journal of Police Science and Administration, Current Directions in Psychological Science, Psychological Bulletin, The Journal of Research in Personality, and Law and Human Behavior*, to name but a few. To be published in any of these journals, the editor first sends an article out for review by two or three independent scientists who know the area but are not personally involved with the article under consideration. Those peer-reviewers comment on the quality of the literature review, the research design, the statistical analysis, the reasonableness of the conclusions drawn, and the appropriateness of the article for the respective journal. The Editor of the journal also reviews the article and, based on her or his evaluation and on the comments and recommendations of the reviewers, makes a decision about publication. Often revisions are required before publication. Articles with unacceptable scientific methods, statistics, or insupportable conclusions are not published. Articles which are not acceptable within the scientific discipline covered by the journal are simply not published in that journal. For example, the *Journal of Applied Psychology* rejects 85% of the manu-

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make their data available for reanalysis by qualified scientists. On March 10, 1997, and again on April 29, 1997, Drs. Amato and Honts wrote to, first Dr. Iacono, and then to Dr. Lykken requesting the data from their survey for the purpose of reanalysis. To date, Iacono and Lykken have refused to make their data freely available for reanalysis. Given the controversial nature of their survey, and the dramatically different results from the two previous surveys, it would be unwise to use the Iacono and Lykken data for any substantive purpose at this time.

CQT was set in the context of the O. J. Simpson case and subjects were told that countermeasures against the CQT were effective. This is in clear contrast the Amato survey (Supra note 19) which was set in the context of whether or not the Society for Psychophysiological Research should have a formal scientific policy regarding the validity of polygraph testing. The context of the Iacono and Lykken survey is clearly inappropriate since few, if any, of the members of the SPR have the legal background to make an admissibility assessment. 2) The sample of respondents to the Iacono and Lykken survey describe themselves as very uninformed about the topic of polygraph examinations. When asked, "About how many empirical studies, literature reviews, commentaries, or presentations at scientific meetings dealing with the validity of the CQT have you read or attended?" the average respondent replied 2.6, with a standard deviation of 1.5. This means that 83% of the respondents had read or attended fewer than 4.1 papers or presentations on polygraph. Moreover, fewer than 2% of the respondents had read more than 5.6 articles. Given the large number of scientific articles and presentations on this topic (Dr. Charles Honts has either authored or co-authored over 100 such papers and presentations by himself, many of which were given at the Society for Psychophysiological Research meetings), these data provide a strong indication that the Iacono and Lykken sample was, as a whole, highly uninformed about the polygraph, and thus has little to offer in terms of informed opinion about its scientific validity. 3) There is one known anomaly in the Iacono and Lykken data analysis that makes it impossible to compare some of their results to the other surveys in any meaningful way. In determining their highly informed group, Iacono and Lykken cut the distribution at 4 and above on their 7-point scale. In forming their highly informed group, Amato and Honts cut the distribution at 5 and above. This difference in cutting scores makes it impossible to compare these results across the two surveys. Iacono and Lykken's choice of a cutting point almost certainly reduced the confidence estimate by their highly informed subjects. 4) In their chapter in the Faigman et al. book, supra, Iacono and Lykken represent their survey as a random survey. However, Iacono recently admitted under cross-examination that the Iacono and Lykken survey was in fact not based on a random sample. Drs. Raskin, Honts, and Kircher were deliberately left out of the sampling frame and thus did not have an opportunity to review, respond, or be represented in the survey. 5) Because of the serious anomaly in the data analysis and the self-admitted misrepresentation of the survey in a publication intended for the legal profession, Drs. Amato and Honts sought to obtain the data from the Iacono and Lykken survey for reanalysis. Under the ethical standards of the American Psychological Association, psychologists are required to

veyed stated that they felt that polygraph tests were a valuable diagnostic tool when considered with other available information or that it was sufficiently reliable to be the sole determinant.[20] In the Amato study, when only those respondents who reported they were highly informed about the polygraph literature are considered, the percentage who report that polygraph tests are a useful diagnostic tool rises to 83%. Of those individuals who rated themselves as highly informed, fewer than 10% report being involved in conducting polygraph examinations professionally. Therefore, these results are not suspect on the grounds that the responses were skewed by the financial self-interest of the respondents. These results would seem to indicate that there is a great deal of acceptance of these techniques in the relevant scientific community.[21]

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[20] Respondents in both surveys gave responses to the following question: Which one of these four statements best describes your own opinion of polygraph test interpretations by those who have received systematic training in the technique, when they are called upon to interpret whether a subject is or is not telling the truth? A) It is a sufficiently reliable method to be the sole determinant, B) It is a useful diagnostic tool when considered with other available information, C) It is questionable usefulness, entitled to little weight against other available information, D) It is of no usefulness.

[21] There has recently been a third survey of the members of the SPR. That survey was reported by William Iacono and David Lykken of the University of Minnesota, *The Scientific Status of Research on Polygraph Techniques: The Case Against Polygraph Tests*, in MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY, D. L. Faigman, D. Kaye, M. J. Saks, & J. Sanders (Eds. 1997). Drs. Iacono and Lykken are two of the most outspoken critics of polygraph testing. However, at present there are reasons to believe that the Iacono and Lykken survey is so flawed and at this time so controversial that it cannot be used for any substantive purpose. Problems with the Iacono and Lykken study include: 1) The cover letter for the Iacono and Lykken survey sets the survey in the context of the legal admissibility of the polygraph in court, rather than about the scientific acceptance and validity of the technique. In effect this is asking the respondents to make a political and legal judgment rather than a scientific one. Moreover, the

V. ALTHOUGH THE SUBJECT OF SOME CONTROVERSY, POLYGRAPH TESTS ARE ACCEPTED AS VALID SCIENCE WITHIN THE RELEVANT SCIENTIFIC COMMUNITY OF PSYCHOLOGISTS AND PSYCHOPHYSIOLOGISTS.

The notion that the polygraph is generally accepted in the relevant scientific community as a valid technique is supported by several sources of evidence. There have been two surveys of the Society for Psychophysiological Research that have directly attempted to address the general acceptance issue.[19] The Society for Psychophysiological Research is a professional society of scientists (Ph.D. and M.D.) who study how the mind and body interact. Thus, the Society for Psychophysiological Research would seem to be the appropriate scientific community for assessing general acceptance. An initial survey was undertaken by the Gallup Organization in 1982. That survey was replicated and extended in 1993 in Susan Amato's Master's Thesis at the University of North Dakota. The results of those surveys were very consistent. Roughly two thirds of the Ph.D. and M.D. members of the Society for Psychophysiological Research who were sur-

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among the validity estimates for the polygraph, eyewitness identification and finger print analysis.

[19] The Gallup Organization, *Survey of the members of the Society for Psychophysiological Research concerning their opinions of polygraph test interpretations*, 13, POLYGRAPH, 153 (1984); Susan L. Amato, A SURVEY OF THE MEMBERS OF THE SOCIETY FOR PSYCHOPHYSIOLOGICAL RESEARCH REGARDING THE POLYGRAPH: OPINIONS AND IMPLICATIONS. Accepted Master's Thesis, the University of North Dakota, Grand Forks (1993); also as Susan L. Amato and Charles R. Honts 31 *What do psychophysiologists think about polygraph tests? A survey of the membership of SPR,* PSYCHOPHYSIOLOGY S22 (1994).

IV. SUMMARY OF THE SCIENTIFIC DATA ON THE VALIDITY OF THE COMPARISON QUESTION TESTS

The scientific data concerning the validity of the polygraph can be summarized as follows: High quality scientific research from the laboratory and the field converge on the conclusion that the CQT is a highly accurate discriminator of truth tellers and deceivers. The research results converge on an accuracy estimate that exceeds 90 percent. Moreover, original examiners, who are most likely to offer testimony, produce even higher estimates of accuracy. There may be a tendency for the CQT to produce more false positive than false negative errors, but this trend in the current literature is not particularly strong.[17] Moreover, no tendency toward false positive errors is seen in the decisions of the original examiners. The scientific validity of a properly administered polygraph examination in a real life case compares favorably with such other forms of scientific evidence as x-ray films, electrocardiograms, fiber analysis, ballistics comparison tests, blood analysis, and is far more reliable than other forms of expert testimony (e.g., psychiatric and psychological opinions as to sanity, diminished capacity, dangerousness and many of the post traumatic stress/recovered memory syndromes).[18]

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[17] This is especially true if the outlying data produced by the Patrick and Iacono study, supra note 13, are discounted.

[18] See the discussion by Charles R. Honts & Mary V. Perry, *Polygraph Admissibility: Changes and Challenges*, 16, L. & HUM. BEHAV. 357 (1992), and by Honts & Quick, Supra note 3; Also see J. L. Peterson, E. L. Fabricant, and K. S. Field, LABORATORY PROFICIENCY TESTING RESEARCH PROGRAM (Contract Nos. 74-NI-99-0048 and 76-NI-99-0091). U. S. Department of Justice, Washington, D.C. (1978), showing high error rates for traditional forensic analyses; J. Widacki & F. S. Horvath, 23 *An Experimental Investigation Of The Relative Validity And Utility Of The Polygraph Technique And Three Common Methods Of Criminal Identification*, JOURNAL OF THE FORENSIC SCIENCES, 596 (1978) describing an experiment showing a favorable comparison

The data for the original examiners are presented in Table 3. These data clearly indicate that the original examiners are even more accurate than the independent evaluators.

Table 3. Percent Correct Decisions by Original Examiners in Field Cases

Study	Innocent	Guilty
Horvath (1977)	100	100
Honts and Raskin (1988)	100	92
Kleinmuntz and Szucko (1984)	100	100
Raskin, Kircher, Honts, & Horowitz (1988)a	96	95
Patrick and Iacono (1991)	90	100
Honts (1996)b	100	94
Means	**98**	**97**

[a] Cases where all questions were confirmed.

[b] Includes all cases with some confirmation.

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fails to meet the criteria for a useful field study because: The subjects were employees who were forced to take tests as part of their employment, not criminal suspects. The case selection method was not specified. The data were evaluated by students at a polygraph school that does not teach blind chart evaluation. Moreover, those students were given only one ninth of the usual amount of data collected in a polygraph examination and were forced to use a rating scale with which they were not familiar. The study reported by Frank Horvath, The effects of selected variables on interpretation of polygraph records, 62, JOURNAL OF APPLIED PSYCHOLOGY 127 (1977), also fails to meet the criteria for a useful study because: About half of the innocent subjects were victims of violent crime, not suspects. Virtually all of the false positive errors in that study were with innocent victims, not innocent suspects. In addition, the persons doing the blind evaluations were all trained at a polygraph school that does not teach blind chart evaluation. Finally, cases were not selected at random. Some cases were excluded from the study because of the nature of the charts. An interesting fact that critics almost never mentioned is that the decisions by the original examiners in the Horvath Study were 100% correct. Also see the discussion in David C. Raskin, Methodological issues in estimating polygraph accuracy in field applications, 19, CANADIAN JOURNAL OF BEHAVIOURAL SCIENCE 389 (1987).

Table 2. The Accuracy of Independent Evaluations in High Quality Field Studies

Study	Guilty n	% Correct	% Wrong	% Inc	Innocent n	% Correct	% Wrong	% Inc
Control Question Tests								
Honts (1996)a	7	100	0	0	6	83	0	17
Honts & Raskin (1988)b	12	92	0	8	13	62	15	23
Patrick & Iacono (1991)c	52	92	2	6	37	30	24	46
Raskin et al. (1989)d	37	73	0	27	26	61	8	31
Means	108	89	1	10	82	59	12	29
Percent Decisions		**98**	**2**			**75**	**25**	

[a]Sub-group of subjects confirmed by confession and evidence.

[b]Decision based only on comparisons to traditional control questions.

[c]Results from the mean blind rescoring of the cases "verified with maximum certainty" (p.235)

[d]These results are from an independent evaluation of the "pure verification" cases.

Although the high quality field studies indicate a high accuracy rate for the CQT, all of the data represented in Table 2 were derived from independent evaluations of the physiological data. This is a desirable practice from a scientific viewpoint, because it eliminates possible contamination (e.g. knowledge of the case facts, and the overt behaviors of the subject during the examination) in the decisions of the original examiners. However, independent evaluators rarely offer testimony in legal proceedings. It is usually the original examiner who gives testimony. Thus, accuracy rates based on the decisions of independent evaluators may not be the true figure of merit for legal proceedings. Raskin and his colleagues have summarized the data from the original examiners in the studies reported in Table 2, and for two additional studies that are often cited by critics of the CQT.[16]

[16] Those two studies are, Benjamin Kleinmuntz and Julian J. Szucko, A field study of the fallibility of polygraphic lie detection, 308, NATURE, 449 (1984), Frank Horvath, The effects of selected variables on interpretation of polygraph records, 62, JOURNAL OF APPLIED PSYCHOLOGY 127 (1977). Neither of these studies meets the generally accepted requirements for useful field studies but nevertheless they are frequently cited by critics of the CQT as evidence that the CQT is not accurate. The study reported by Benjamin Kleinmuntz and Julian J. Szucko, A field study of the fallibility of polygraphic lie detection, 308, NATURE, 449 (1984)

able to find four field studies[13] that met the above criteria for meaningful field studies of psychophysiological detection of deception tests. The results of the independent evaluations for those studies are illustrated in Table 2. Overall, the independent evaluations of the field studies produce results that are quite similar to the results of the high quality laboratory studies. The average accuracy of field decisions for the CQT was 90.5 percent.[14] However, with the field studies nearly all of the errors made by the CQT were false positive errors.[15]

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[13] Charles R. Honts, Criterion development and validity of the control question test in field application, THE JOURNAL OF GENERAL PSYCHOLOGY, 509, 123 (1996); Charles R. Honts & David C. Raskin, A Field Study of the Directed Lie Control Question, 16 J. POLICE SCI. ADMIN. 56 (1988); Christopher J. Patrick & William G. Iacono, Validity of the Control Question Polygraph Test: The Problem of Sampling Bias, 76, J. APPLIED PSYCHOL. 229 (1991); David C. Raskin et. al., A STUDY OF THE VALIDITY OF POLYGRAPH EXAMINATIONS IN CRIMINAL INVESTIGATIONS, Final Report to the National Institute of Justice, Grant Number 85-IJ-CX-0400, Department of Psychology, Salt Lake City, University of Utah. (1988).

[14] The results exclude inconclusive outcomes as they are not decisions.

[15] See the discussion in Raskin et. al., supra note 1, and in Honts, supra note 13, concerning the performance of original examiners in these studies. They note that the original examiners in the Patrick and Iacono study perform at a much higher level than the independent evaluators. This finding was not representative of the other three field studies. The original examiners in the Patrick and Iacono study, supra note 13, correctly classified 100% of the guilty and 90% of the innocent subjects. This performance is quite similar to the original examiners in the Honts (1996) field study, supra note 11, who were from the same law enforcement agency. Raskin et. al., supra note 1, and Honts, supra note 13, have argued that the independent evaluator data from the Patrick and Iacono study should be viewed as an anomaly. If the Patrick and Iacono data are excluded, the field estimate of the accuracy of CQT decisions is 95.5%, Raskin et. al., Supra Note 1.

is in fact telling the truth. Although a number of approaches have been taken, it is generally agreed that confessions are the best available criterion for ground truth in these studies.[10] It now seems to be generally agreed by persons doing field research in this area that useful field studies of the psychophysiological credibility assessment tests should have all of the following characteristics:[11]

(a) Subjects should be sampled from the actual population of subjects in which the researcher is interested. If the researcher wants to make inferences about tests conducted on criminal suspects, then criminal suspects should be the subjects who are studied.

(b) Subjects should be sampled by some random process. Cases must be accepted into the study without reference to either the accuracy of the original outcome or to the quality of the physiological recordings.

(c) The resulting physiological data must be evaluated by persons trained and experienced in the field scoring techniques about which inferential statements are to be made. Independent evaluations by persons who have access to only the physiological data are useful for evaluating the information content of those data. However, the decisions rendered by the original examiners probably provide a better estimate of the accuracy of polygraph techniques as they are actually employed in the field.

(d) The credibility of the subject must be determined by information that is independent of the specific test. Confessions substantiated by physical evidence are presently the best criterion available.

In their recent review, Raskin and his colleagues[12] also examined the available field studies of the CQT. They were

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[10] The problems associated with field research in this area are discussed in detail in, Supra note 1 (Raskin).

[11] Supra note 1 (Raskin, Honts, & Kircher).

[12] Id.

examined. Although field studies are plagued by numerous problems,[9] the chief problem lies in unambiguously determining ground truth. That is, some method that is independent of the outcome of the test is needed for determining who

[9] Supra Note 4 (Cook & Campbell).

studies are illustrated in Table 1. The high quality laboratory studies indicate that the CQT is a very accurate discriminator of truth tellers and deceivers. Over all of the studies, the CQT correctly classified 91 percent[8] of the subjects and produced approximately equal numbers of false positive and false negative errors.

Table 1. The Results of High Quality Laboratory Studies of the Control Question Test

	Guilty				Innocent			
Study	n	% Correct	% Wrong	% Inc	n	% Correct	% Wrong	% Inc
Driscoll et al. (1987)b	20	90	0	10	20	90	0	10
Ginton et al. (1984)	2	100	0	0	13	85	15	0
Honts, et al. (1994)a	20	70	20	10	20	75	10	15
Horowitz, et al. (1994)b	15	53	20	27	15	80	13	7
Kircher & Raskin (1988)	50	88	6	6	50	86	6	8
Podlesny & Raskin (1978)	20	70	15	15	20	90	5	5
Podlesny & Truslow (1993)	72	69	13	18	24	75	4	21
Raskin & Hare (1978)	24	88	0	12	24	88	8	4
Rovner et al. (1979)c	24	88	0	12	24	88	8	4
Means	**247**	**80**	**8**	**12**	**210**	**84**	**8**	**8**
Percent Decisions		**90**	**10**			**92**	**8**	

[a]Countermeasure Subjects Excluded

[b]Traditional Control Question Subjects Only

The alternative approach to studying psychophysiological credibility assessment is to conduct field studies. In this approach, polygraph tests conducted in actual cases are

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PSYCHOL. 252 (1994); Horowitz et al., 34 *The Role of Comparison Questions in Physiological Detection of Deception* PSYCHOPHYSIOLOGY 108 (1997); Supra note 2 (Kircher & Raskin); Podlesny & Raskin, supra note 1; John A. Podlesny & Connie M. Truslow, *Validity of an Expanded-Issue (Modified General Question) Polygraph Technique in a Simulated distributed-Crime-Roles Context*, 78 J. APPLIED PSYCHOL. 788 (1993); David C. Raskin & Robert D. Hare, *Psychopathy and Detection of Deception in a Prison Population*, 15 PSYCHOPHYSIOLOGY, 126 (1978); Louis I. Rovner, *The accuracy of physiological detection of deception for subjects with prior knowledge*, 15 POLYGRAPH 1 (1986).

[8] This figure excludes the inconclusive outcomes as they are not decisions.

credibility assessment in particular, can be criticized for a lack of realism. This lack of realism may limit the ability of the scientist to apply the results of the laboratory to real-world settings.[5] Some scientists who conduct research on psychophysiological credibility assessment have attempted to overcome this limitation by trying to make the laboratory simulations as realistic as possible.[6] The goal of making laboratory simulations as realistic as possible would seem to be reasonable and should provide results that have at least some applicability to field situations.

A review of the scientific literature reveals nine laboratory studies of the CQT that have attempted to simulate the field situation with specific incentives associated with the test outcome and with representative subject populations and polygraph methods.[7] The results of those realistic laboratory

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[5] Id.

[6] See John C. Kircher, Steven W. Horowitz, & David C. Raskin, Meta-analysis of mock crime studies of the control question polygraph technique, 12, LAW AND HUMAN BEHAVIOR, 79 (1988). Three factors have been identified as contributing to the realism of laboratory research on the CQT. 1) Use of realistic subject populations. College student subjects have been associated with low accuracy rates, while more representative subject samples from prison populations and the community have been associated with higher accuracy rates. 2) Use of representative field examiners, techniques, and scoring methods. Those laboratory studies that have used field polygraph examiners, and field techniques for administering and scoring the examinations have produced higher accuracy rates. 3) The use of incentives associated with the outcome of the examinations. Usually, subjects are paid money if they pass the examination, although other studies have used negative events associated with failing the test. Studies with explicit motivations associated with the outcome of the test have produced higher accuracy rates.

[7] Lawrence N. Driscoll, et. al., The Validity of the Positive Control Physiological Detection of Deception Technique, 15 J. POLICE SCI. ADMIN. 46 (1987); Avital Ginton et. al., *A Method for Evaluating the Use of the Polygraph in a Real-Live Situations*, 67 J. APPLIED PSYCHOL. 131 (1982); Charles R. Honts et al., *Mental and Physical Countermeasures Reduce the Accuracy of Polygraph Tests*, 79 J. APPLIED

III. THE THEORIES UNDERLYING POLYGRAPH TECHNIQUES HAVE BEEN SUBJECTED TO SCIENTIFIC TESTING. THOSE SCIENTIFIC TESTS HAVE RESULTED IN NUMEROUS PUBLICATIONS IN PEER-REVIEWED SCIENTIFIC JOURNALS

The basic theory of the psychophysiological detection of deception and the various techniques used for the detection of deception have been put to numerous scientific tests over the past 25 years. There are many studies published in peer-reviewed scientific journals that test the theory of the psychophysiological detection of deception and provide estimates of the error rates for comparison question tests. Science has approached the problem of assessing the accuracy of comparison question tests in two venues, laboratory studies and field studies.

Laboratory research has traditionally been an attractive alternative because the scientist can control the environment. Moreover, with regard to credibility assessment studies, the scientist can know with certainty who is telling the truth and who is lying by randomly assigning subjects to conditions. Laboratory research on credibility assessment has typically made subjects deceivers by having them commit a mock crime (e.g. "steal" a watch from an office), and then instructing them to lie about it during a subsequent test. From a scientific viewpoint, random assignment to conditions is highly desirable because it controls for the influence of extraneous variables that might confound the results of the experiment.[4] However, laboratory research in general, and

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[4] See the extensive discussion of the advantages of random assignment to conditions in T. D. Cook and D. T. Campbell, QUASI-EXPERIMENTATION: DESIGN AND ANALYSIS ISSUES FOR FIELD SETTINGS (1979).

son question tests (CQT)[3]. The theory of these comparison question tests is as follows: The CQT assesses a person's credibility by looking for a differential reaction between two types of questions. The first type of question is known as the relevant question. Relevant questions are direct accusatory questions that address the issue under investigation (e.g., Did you shoot John Doe?) Comparison questions are ambiguous questions to which the subject is maneuvered into answering, "No" (e.g., Before 1994, did you ever do anything that was dishonest?). The theory of the comparison question test predicts that guilty subjects will produce larger physiological responses to the relevant questions to which they know they are deceptive, than to the relatively unimportant comparison questions. Innocent subjects are expected to produce larger responses to the comparison questions, to which they are assumed to be either deceptive, or at least uncertain of the veracity of their answer, than to the truthfully answered relevant questions. This type of comparison question is known as a probable lie comparison question and is the most commonly used comparison question in the field. Other types of comparison questions are also used. The second most commonly applied comparison question is the "directed lie" question. The directed lie is a question to which the subject is instructed to lie. The subject is told that it is important that he or she respond appropriately when she or he lies. The predicted differential reactions and rationale of the directed lie are the same as for the probable lie.

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[3] Supra note 1 (Raskin); Charles R. Honts & Bruce D, Quick, The polygraph in 1995: Progress in science and law, NORTH DAKOTA LAW REVIEW, 71 (1995).

by the autonomic nervous system. Recordings are usually made of palmar sweating (also known as the galvanic skin or electrodermal response), relative blood pressure (obtained from an inflated cuff on the upper arm), and respiration (obtained from volumetric sensors placed around the chest and/or abdomen). Many instruments will also provide a measure of peripheral blood flow (usually obtained from a photoelectric plethysmograph placed on one of the fingers).

Following the conclusion of the questioning, the physiological data are evaluated by the polygraph examiner according to specified numerical scoring system. In some cases the data are evaluated statistically by computer. A decision of truthful or deceptive is then given, except in those cases where the data are found to be equivocal, then an opinion of inconclusive is rendered.[2]

II. THE THEORETICAL BASIS FOR POLYGRAPH TESTING

Polygraphy, also known as the psychophysiological detection of deception and psychophysiological credibility assessment, is based upon a scientific theory that can be tested with the methods of science (falsified). Any conscious effort at deception by a rational individual causes involuntary and uncontrollable physiological responses which include measurable reactions in blood pressure, peripheral pulse-amplitude, breathing and the electrodermal response.

The various techniques used in polygraphy for the detection of deception are also capable of being tested through the methods of science. The most commonly used techniques for the psychophysiological detection of deception are compari-

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[2] A description of the numerical and computer scoring procedures can be found in John C. Kircher and David C. Raskin, *Human Versus Computerized Evaluations of Polygraph Data in a Laboratory Setting*, 73 J. APPLIED PSYCHOL. 291 (1988).

those promulgated in *Gipson* and in New Mexico Rule of Evidence 707 and through the traditional means of cross-examination.

For these reasons the undersigned Committee of Concerned Social Scientists urges the Court to affirm the decision of the United States Court of Appeals for the Armed Forces and return the status of polygraph in court-martial proceeding to the status originally established by *Gipson*. Under *Gipson* the trial court rules on a case-by-case approach assuring that incompetently conducted tests will not be admitted as evidence, while ensuring the defendant's right to present scientifically valid evidence in his or her defense.

ARGUMENT

I. WHAT IS A POLYGRAPH TEST?

Polygraph testing involves measuring physiological responses from an individual while that individual answers a series of from 8 to 12 questions. Those questions are reviewed with the subject of the test, prior to the beginning of the test[1].

In practice, virtually all polygraph instruments used for psychophysiological credibility assessment record measures from at least three physiological systems that are controlled

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[1] Details of the instrumentation used, the various physiological measures that can be taken, and the specific questioning techniques employed, can be found in John A. Podlesny & David C. Raskin, *Effectiveness of Techniques and Physiological Measures in the Detection of Deception*, 15 PSYCHOPHYSIOLOGY, 344 (1978); David C. Raskin, *Polygraph Techniques for the Detection of Deception*, in David C. Raskin (Ed.) PSYCHOLOGICAL METHODS IN CRIMINAL INVESTIGATION AND EVIDENCE, 276 (1989) at 264; David C. Raskin, Charles R. Honts, and John C. Kircher, *The Scientific Status of Research on Polygraph Techniques: The Case For Polygraph Tests*, in MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY, D. L. Faigman, D. Kaye, M. J. Saks, & J. Sanders (Eds. 1997).

Petitioner asserts that the reliability and helpfulness of polygraph tests are widely questioned by the scientific community and that polygraph tests lack broad acceptance within the scientific community. Petitioner also argues that polygraph tests are not necessary for reliable credibility assessments of witnesses at trial.

An examination of the scientific literature on the credibility assessment in general, and on the polygraph in particular reveals a very different situation than the one asserted by the petitioner. Research reveals that polygraph tests are generally accepted in the scientific community as evidenced by the volume of publications in peer-reviewed scientific journals and by surveys of scientists. Moreover, the scientific literature clearly shows that the science of polygraph testing has advanced to the point where it can easily meet the evidentiary requirements of *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993). There is a scientific theory that has been tested with the methods of science. The results of those scientific tests have been published in peer-reviewed scientific journals. There are known estimates of the error-rates of the commonly used field polygraph techniques. The polygraph is generally accepted by a majority of the informed scientific community as a valid scientific technique. There are standards for the administration of polygraph tests.

The primary problem with the widespread use of polygraph tests concerns the generally low level of training among the members of the polygraph profession. However, polygraph examiners in the United States Military are generally recognized as some of the best trained examiners in the world. Moreover, the United States Military polygraph programs maintain a high level of quality control over the administration of polygraph examinations. These factors work to ensure that the quality of polygraph practice in the United States Military is quite high. In any event, the problems associated with poor training or incompetent examiners can easily be remedied by evidentiary requirements such as

graph tests have comparable or better reliability than the other products of psychological science that presently are admitted as evidence in courts of law.

As the polygraph is a reliable, valid, and accepted scientific technique, the members of the Committee support the Respondent in seeking to sustain the judgment of the Court of Appeals. As required by Rule 37, the Committee of Concerned Social Scientists has sought and obtained consent of both parties prior to filing this brief.

INTRODUCTION AND SUMMARY OF ARGUMENT

In *United States v. Gipson*, 24 M.J. 246 (1987) the Court of Military Appeals (now the Court of Appeals for the Armed Forces) concluded that polygraph tests had reached a level of scientific reliability such that they should not be routinely excluded from court-marital proceedings. Under *Gipson*, the Military Judge was given the role of gatekeeper and was provided with a set of evidentiary standards to use in the analysis of the admissibility of any offered polygraph examinations. Subsequently, the President of the United States responded to *Gipson* by promulgating Military Rule of Evidence 707 which provided for a total prohibition of the use of polygraph results in any court-martial proceeding. Respondent attempted to offer the results of an exculpatory polygraph in his defense at court martial. The military judge denied the request and noted that "the polygraph is not a process that has sufficient scientific acceptability to be relevant". The Air Force Court of Criminal Appeals rejected respondent's appeal noting that there are "valid concerns" about polygraph examinations. The United States Court of Appeals for the Armed Forces reversed. Petitioner has appealed to the United States Supreme Court. Petitioner makes a number of legal arguments but also raises a number points that have to do with the science of polygraph testing.

No. 96-1133

In the Supreme Court of the United States

October Term 1996

UNITED STATE OF AMERICA, PETITIONER

v.

EDWARD G. SCHEFFER, RESPONDENT

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE ARMED FORCES

BRIEF OF THE COMMITTEE OF CONCERNED SOCIAL SCIENTISTS AS *AMICUS CURIAE* IN SUPPORT OF THE RESPONDENT

INTEREST OF THE *AMICUS CURIAE*

The Committee of Concerned Social Scientists is a group of learned professionals involved in scientific research, professional training, and/or practice involving the psychophysiological detection of deception. Members of the committee believe that the state of the science of polygraphy has advanced to the point that properly administered poly-

RULES

THE COMMITTEE OF CONCERNED SOCIAL SCIENTISTS

Charles R. Honts, Ph. D., Primary Scientific Author of the Brief, Boise State University
Susan Amato, Ph. D., Boise State University
Gordon Barland, Ph. D., Department of Defense Polygraph Institute
Tim F. Branaman, Ph.D., Professional Psychological Services
Garvin Chastain, Ph. D., Editor, *The Journal of General Psycholgy,* Boise State University
Mary K. Devitt, Ph. D., Oklahoma State University
Ed Gelb, Ph. D., Intercept, Inc.
Eric, A. Holden, M.A., Behavioral Measures & Forensic Services
Frank Horvath, Ph. D., Michigan State University
John C. Kircher, Ph. D., University of Utah
James A. Matte, Ph. D. Matte Polygraph Service
Marcia L. Moberg, M.A., ABD
Albert M. Prestrude, Ph. D., Virginia Polytechnic Institute and State University
David C. Raskin, Ph. D., University of Utah, Professor Emeritus
Ronald M. Reuss, Ed. D., Buffalo State College
J. Peter Rosenfeld, Ph. D., Northwestern University
Isaac T. Van Patten, Ph. D., Radford University

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QUESTION PRESENTED

Whether Military Rule of Evidence 707, Which provides that evidence of a polygraph examination is not admissible in court-martial proceedings, is an unconstitutional abridgment of military defendants' right to present a defense.