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Board for Professional and Occupational Regulation Study of the Utility and Validity of Voice Stress Analyzers

Virginia Department of Professional and Occupational Regulation[1]

Background

On March 26, 2003, Governor Warner signed into law House Bill 2812 and Senate Bill 1296 which provide for the use of alternative truth detection devices, specifically, Computer Voice Stress Analyzers under such conditions determined by the Director.

On May 15, 2003, after reviewing the new law and acknowledging their inexperience with this new technology, the Polygraph Examiners Advisory Board directed staff to approach the Board for Professional and Occupational Regulation (BPOR) and request a study be conducted of the Computer Voice Stress Analyzers (CVSA).

On June 2, 2003, the BPOR, after listening to extensive public comment, reviewed the request made by the Polygraph Advisory Board and agreed to complete the study.

Section 54.1-1805 (Effective until July 1, 2005) of the *Code of Virginia* outlines the instruments to be used by polygraph examiners and approval of other instruments by the Director.

> A. Each examiner shall use an instrument that records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional physiological changes pertinent to the determination of truthfulness.
>
> B. In addition, the Director may approve the use of other instruments that record physiological changes pertinent to the determination of truthfulness or the verification of the truth of statements, including a computer voice stress analyzer, by examiners licensed under this chapter under such conditions as determined by the Director. Such conditions shall include a provision requiring the examiner, prior to the use of such instrument, to (i) complete a Director-approved training course on its operation and (ii) be certified by the manufacturer on the use of such instrument. However, no instrument approved pursuant to this subsection shall be used by a police department in conducting a background investigation of an applicant for employment as a police officer or in administrative investigations involving a police officer.

(1975, c. 522, § 54-922; 1988, c. 765; 2003, cc. 545, 554.)

§ 54.1-1805. (Effective July 1, 2005) Instrument to be used.

> Each examiner shall use an instrument which records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional physiological changes pertinent to the determination of truthfulness.

(1975, c. 522, § 54-922; 1988, c. 765; 2003, cc. 545, 554.)

Statutory Authority

§ 54.1-310 of the *Code of Virginia* (*Code*) provides the statutory authority for the Board for Professional and Occupational Regulation (the Board) to study and make recommendations to the General Assembly on the need to regulate professions or occupations and, if so, the degree of regulation that should be imposed.

[1] Correspondence should be directed to Amy Freiberger, Virginia Department of Professional and Occupational Regulation, 3600 West Broad Street, Richmond, Virginia 23230-4917.

The Board has the authority to advise the Governor and the Director on matters relating to the regulation of professions and occupations. In addition, the General Assembly may request that the Board conduct a study. The General Assembly is the body empowered to make the final determination of the need for regulation of a profession or occupation. The General Assembly has the authority to enact legislation specifying the profession to be regulated, the degree of regulation to be imposed, and the organizational structure to be used to manage the regulatory program (e.g., board, advisory committee, registry).

The Commonwealth's philosophy on the regulation of professions and occupations is that: ***The occupational property rights of the individual may be abridged only to the degree necessary to protect the public.*** This tenet is clearly stipulated in statute and serves as the Board's overarching philosophy in its approach to all its reviews of professions or occupations:

> **. . . the right of every person to engage in any lawful profession, trade or occupation of his choice is clearly protected by both the Constitution of the United States and the Constitution of the Commonwealth of Virginia. The Commonwealth cannot abridge such rights except as a reasonable exercise of its police powers when it is clearly found that such abridgement is necessary for the preservation of the health, safety and welfare of the public. (*Code of Virginia* § 54.1-100)**

Further statutory guidance is provided in the same *Code* section which states that the following conditions must be met before the state may impose regulation on a profession or occupation:

1. The unregulated practice of a profession or occupation can harm or endanger the health, safety or welfare of the public, and the potential for harm is recognizable and not remote or dependent upon tenuous argument;

2. The practice of the profession or occupation has inherent qualities peculiar to it that distinguish it from ordinary work or labor;

3. The practice of the profession or occupation requires specialized skill or training and the public needs, and will benefit by, assurances of initial and continuing professional and occupational ability; and

4. The public is not effectively protected by other means.

Pursuant to § 54.1-311 of the *Code,* when the Board recommends that a particular profession or occupation be regulated, or that a different degree of regulation should be imposed on a regulated profession or occupation, it shall consider the following degrees of regulation in order:

> 1. Private civil actions and criminal prosecutions. – Whenever existing common law and statutory causes of civil action or criminal prohibitions are not sufficient to eradicate existing harm or prevent potential harm, the Board may first consider the recommendation of statutory change to provide more strict causes for civil action and criminal prosecution.
>
> 2. Inspection and injunction. – Whenever current inspection and injunction procedures are not sufficient to eradicate existing harm, the Board may promulgate regulations consistent with the intent of this chapter to provide more adequate inspection procedures and to specify procedures whereby the appropriate regulatory board may enjoin an activity which is detrimental to the public well-being. The Board may recommend to the appropriate agency of the Commonwealth that such procedures be strengthened or it may recommend statutory changes in order to grant the appropriate state agency the power to provide sufficient inspection and injunction procedures.
>
> 3. Registration – Whenever it is necessary to determine the impact of the operation of a profession or

occupation on the public, the Board may implement a system of registration.

4. Certification – When the public requires a substantial basis for relying on the professional services of a practitioner, the Board may implement a system of certification.

5. Licensing – Whenever adequate regulation cannot be achieved by means other than licensing, the Board may establish licensing procedures for any particular profession or occupation.

Pursuant to § 54.1-311.B. of the *Code,* in determining the proper degree of regulation, if any, the Board shall determine the following:

1. Whether the practitioner, if unregulated, performs a service for individuals involving a hazard to the public health, safety or welfare.

2. The opinion of a substantial portion of the people who do not practice the particular profession, trade or occupation on the need for regulation.

3. The number of states which have regulatory provisions similar to those proposed.

4. Whether there is sufficient demand for the service for which there is no regulated substitute and this service is required by a substantial portion of the population.

5. Whether the profession or occupation requires high standards of public responsibility, character and performance of each individual engaged in the profession or occupation, as evidenced by established and published codes of ethics.

6. Whether the profession or occupation requires such skill that the public generally is not qualified to select a competent practitioner without some assurance that he has met minimum qualifications.

7. Whether the professional or occupational associations do not adequately protect the public from incompetent, unscrupulous or irresponsible members of the profession or occupation.

8. Whether current laws which pertain to public health, safety and welfare generally are ineffective or inadequate.

9. Whether the characteristics of the profession or occupation make it impractical or impossible to prohibit those practices of the profession or occupation which are detrimental to the public health, safety and welfare.

10. Whether the practitioner performs a service for others which may have a detrimental effect on third parties relying on the expert knowledge of the practitioner.

Methodology

The Methodology follows the newly adopted *Guidelines for the Evaluation of the Need to Regulate Professions and Occupations* adopted by the Board at its meeting on June 2, 2003:

- Publish the information on the *Study on the Use of Voice Stress Analyzers* in the Virginia Register of Regulations on Monday, August 11, 2003 to begin the sixty day public comment period to end October 10, 2003.

- August 11 and 12, 2003 Mail a Memorandum to the public soliciting written comments and provide information regarding the date, time, and location of the public hearing sessions.

Mailings were sent to the following:

(1) Virginia police departments and sheriff's offices, as well as, any other criminal justice institution registered with the Department of Criminal Justice Services,

(2) Public Participant Group (PPG) list that the Board maintains,

(3) Members of the Virginia General Assembly,

(4) Members of the Virginia Association Civil Liberties Union (ACLU).

- Conduct public hearing session in four geographical locations: Roanoke, Chesapeake, Richmond, and Arlington.
- Research the laws and statutes in other jurisdictions.
- Identify the States and other localities that currently approve or prohibit the use of this detection device.
- Utilize the Internet as a research tool to obtain independent research available on the topic.
- Obtain and review information from other sources on the topic to include publications from books, articles, and journals.
- Review and summarize the written comments from the public received during the sixty day public comment period.
- Review and summarize the contents of the four public comment sessions.

Findings

A. Polygraph history

The polygraph measures changes in a person's body that are associated with the stress of deception. Today, polygraphs customarily measure changes in blood pressure, stomach and chest breathing patterns, galvanic skin response (perspiration), the pulse wave and amplitude. The theory behind polygraph is, when a person lies it produces stress and this stress is reflected in changes in breathing, heart rate and perspiration. Many other changes may occur, but are not necessarily measured by the polygraph equipment: the pupils get larger, digestion slows, and the body's blood supply is redistributed away from the skin and gastrointestinal regions toward the muscles.

Rubber tubes are placed over a subject's chest and abdominal area to measure respiratory activity. Small metal plates attached to the fingers record sweat gland activity and a blood pressure cuff monitors the cardiovascular system.
Conventional machines use moving paper feeders and styluses that record the simultaneous input from the three physiological responses. Computerized polygraphs generate chart analyses from the data and display the results on a computer screen.

A polygraph test consists of only "yes" and "no" questions and is only conducted with the consent of the examinee.

In most cases, decisions are based on analysis of the physiological data recorded using four polygraph channels (cardiovascular, electro dermal, and two respiratory channels). The measures used by the polygraph were selected in the 1920's and 1930's because they were simple to record, they were sensitive, and they were accurate.

The effectiveness of the polygraph has been the subject of hundreds of controlled scientific studies that support its procedures and its continued use. According to Frank Horvath of the American Polygraph Institute, (2002 ABC News, Polygraph Q & A), "critics contend the test is about 70% accurate, while proponents claim it's 90% accurate".

It is generally accepted that polygraph results are not allowed as evidence in court; however, this may vary from state-to-state and on a case-by -case basis.

Current Cost of equipment: Approximately $13,000.00

B. Voice stress analyzer history

According to a report on Voice Stress Analyzers, First Sergeant of the Prince William County Police Department – Donald L. Cahill, "The voice stress analyzer first came into being in the law enforcement arena during the early 1970's through research and development by

private individuals and the U.S. Army. Original [sic] developed in the form of the Psychological Stress Evaluator (PSE); its purpose was to graphically display stress in the voice of a speaker when asked relevant questions" (Cahill, 1999, pg. 1).

The theory is that the voice stress analyzer works by measuring "micro-tremors" in the human voice. Micro-tremors are described as, "inaudible vibrations that speed up uncontrollably when a person is lying" (Webby, S., 2001, pg 2). The tremor varies according to the amount of stress. The more stress, the less tremor (Clede, B., 1998, pg.3). While the subject is speaking, the computer equipment measures and displays any changes in the vibrations. For each voice pattern the machine shows a graph: a high peak denotes a true statement, while jagged plateau indicates a lie.

The current computer analyzer equipment utilizes a microphone and can be used covertly, overtly, via telephone or cell phone, tape recorder, and any other technology that can record a voice.

The National Institute for Truth Verification (NITV) manufactures of the computer voice stress analyzer (CVSA™), report that its analyzer has about a 98% accuracy rate. Michael Brick, a Representative of the Southern Association of Certified Voice Stress Analyzers, Inc., stated at the Richmond Public Hearing Session (Reference Transcript), that "It can test any language. I have tested deaf mutes. As long as they can make a sound. If they can make a sound, they can be tested." He later explained that the youngest person that he tested was four years old and the oldest person was in their late eighties.

As earlier noted with polygraph results, it is generally accepted that voice-stress results are not allowed as evidence in court, however, this may vary from state-to-state and on a case-by-case basis.

Current Cost of the equipment: Approximately $10,000.00 (will vary by type of equipment selected and the Manufacturer)

a. Types of voice stress analyzers

There are currently many available voice stress analyzers (VSA) on the market today. The major VSA vendors market their products on a laptop with specific software, while few are sold as an electronic device with the software embedded on its chips.

* Some examples are:
  - Psychological Stress Evaluator (PSE), Dektor Counterintelligence and Security, Inc.
  - Lantern, The Diogenes Group, Inc.
  - Vericator, Trustech Ltd. Integritek Systems Inc.
  - Computerized Voice Stress Analyzer (CVSA™), National Institute for Truth Verification (NITV)
  - VSA Mark 1000, CCS International Inc.
  - VSA-15, CCS International Inc.
  - Xandi Electronics (markets a kit)

* Reference (Haddad, Ratley, Walter, Smith, 2002)

b. Cost analysis chart of voice stress analyzer v. polygraph

	VSA	Polygraph
Initial cost of system	$9,250.00	$13,000.00
Tuition for 1 student	$1,215.00	$3,000
Length of training	6 days	8 weeks
Cost of Room and Board @ 70.00 per day	$420.00	$3,920.00
Salary for student while in training (U.S. Average)	$769.00	$6,153.84

b. Cost analysis chart of voice stress analyzer v. polygraph continued

	VSA	Polygraph
Number of exams that an examiner can Conduct per day	7 exams	2 exams
Average percent of inconclusive results on exams	0%	20%
Can unit analyze audiotapes for truth verification	yes	no
Do drugs, medical condition, or age affect testing?	no	yes
Total expense to purchase 1 unit and train 1 agent	$11,654.00	$26,073.84

* Reference (Haddad, Ratley, Walter, Smith, 2002)

C. General findings of the literature review

It appears that some law enforcement agencies, outside the boundaries of the Commonwealth of Virginia, are currently utilizing the computer stress analyzer in several different capacities to carry out their duties:

(1) Overt Interview – a live interview by a Computer Stress Analyzer (CSA) examiner. These interviews are conducted with prior knowledge and permission that certain questions will be recorded live and captured by the CSA equipment for analysis.

(2) Covert Interview – a live interview by a CSA examiner. These interviews are conducted without the prior knowledge and permission that certain questions will be recorded live and captured by the CSA equipment for analysis.

(3) Pre-employment screening

(4) Internal affair investigations

Note: At the discretion of the Director of the Department of Professional and Occupational Regulation (§ 54.1-1805), the Commonwealth of Virginia currently prohibits the use of voice stress analyzers to be used in any law enforcement duty related capacity.

Literature, written comments received and the public hearing session document some of the benefits of being able to use the voice stress analyzer are:

- It would allow law enforcement officers to achieve maximum admissible interrogation results by providing a relaxed environment with no sensors, pressure tubes, and pressure cuffs. Or special chair;
- It is convenient and would allow for interviews to "strike when the iron is hot";
- It is cost effective;
- It would all law enforcement to utilize new technology;
- Low training and education time;
- Less time to administer v. the traditional polygraph test.

Detective/Sergeant Don Wiebe of the British Columbia Police Department reports that the CVSA™ has shown a 100% accuracy rate after using it for a six month timeframe. He states that the CVSA™ has been used 35 times and that "all the tests conducted have either had the results confirmed by investigation or confession" (Weibe, no date given, *Conclusion of the six month report on the computer voice stress analyzer prepared for the Saanich, B.C. police department*).

But, are results confirmed by investigation of confessions the same as validity? Some would argue this as "yes", while others would argue "no". This is the center of a revolving argument for those individuals and groups that are either "for" or "against" the use of the voice stress instruments in law enforcement agencies.

A review of the literature revealed that there have been no scientific studies conducted, to date, to measure the validity of the computer stress analyzer to detect deception. It has been argued that the computer stress analyzer is more cost effective, convenient, and more user friendly than the traditional polygraph equipment, however, one question still remains unanswered: how reliable is the equipment in its actual ability to detect, measure, and display changes in voice frequency? Has it ever been scientifically measured? The answer to this question is "no". Manufacturers contest that their computer stress analyzers are 100% accurate and effective by producing testimonials as a foundation to their claims, but this is not widely accepted as scientific validity.

A Court of Appeals Case (Case no.00-01886-CR), State of Wisconsin v. Paul D. Hoppe (2001), indicates that telling a defendant (during questioning) that a "computer voice stress analyzer" test showed that the defendant's answers had not been "completely truthful" to be a coercive tactic. The basis for this claim reads:

> That is, the reliability of the computer voice stress analyzer test as a "truth verification" method has not been established in the scientific community to the Wisconsin courts and it may never be.

The literature review further revealed a publication announcing a "*Warning to the Public*" on the use computer voice analyzer equipment for pre-employment purposes (2003, *The truth about voice stress technologies*, www.voicestress.org).

The announcement was to those individuals who may have lost a job opportunity with a law enforcement agency because they had wrongly failed a voice stress analyzer test. It states:

> Most large police agencies are governed by state or municipal civil service rules or laws, which make them also subject to the US government's Equal Employment Opportunity Commission (EEOC) rule 29 CFR 1607, the Uniform Guidelines on the Employee Selection Procedures (July 1, 1998). According to the EEOC, all employee selection tools must meet the minimum standards, including validation. It is simply a matter of law that departments must use validated tools for hiring, such as the MMPI, CPI, polygraph, urinalysis, intelligence tests or others that have withstood independent scientific investigation. They are specifically prohibited from using unvalidated methods. The voice analyzer technology falls into the unvalidated category. If you took a voice stress to get a law enforcement job, it is a violation of your rights under these EEOC provisions. Contact your attorney for more advice.

A 2002 final report on the investigation and evaluation of voice stress analysis technology tested the methodology and results of the testing and evaluation of two voice stress analysis systems. The report concluded, "That the two VSA units do recognize stress through voice analysis; however, although these systems state they detect deception, it was not proven" (Haddad, Ratley, Walter, Smith, 2002).

Another 2002 study conducted by the Department of Defense Polygraph Institute (DoDPI) research division staff investigated the computer voice stress analyzer (CVSA) for its ability to identify stress-related changes in voice. The study provided no evidence to support the CVSA for its ability to identify stress-related changes in the voice (Meyerhoff, Saviolakis, Koening, & Yurick, 2002).

As previously stated, the polygraph has been the subject of numerous well-controlled laboratory studies and field studies which support the polygraph and its associated procedures and processes. The U.S. Department of Defense Polygraph Institute (DoDPI), which is congressionally mandated to study new technologies and equipment which purport to have values in the area of lie detection, conducts many of these studies. The Department of Defense Polygraph Institute is charged with training all federal examiners including employees of the Secret Service and Federal Bureau of Investigations.

There is an absence of scientific research regarding the voice stress analyzer from the

promoters of the equipment and the scientific community. Proponents of the computer stress analyzer claim relatively high deception detection accuracy rates. However, these claims are based primarily on anecdotal evidence rather than evidence obtained through rigorous systematic study.

David Hughes, Executive Director for the National Institute for Truth Verification, in his discussion at the Richmond Public Hearing Session on his experience with the computer voice analyzer stated: (Reference Transcript)

> Accuracy rate is a nebulous term. Because if you fail the test and you don't confess, I don't know if it was accurate or not, do I? The case may never be resolved. Just like polygraph, when I used it, it was just a tool. Many, many, many times they didn't confess. I don't know if it was correct or not, in my interpretation, my conclusion, as we call it.

A series of studies by the Department of Defense Polygraph Institute was designed to compare the validity of data collected using a traditional polygraph instrument to that collected using CVSA. The studies have produced no evidence that the use of the CVSA provides accuracy rates better than chance. DoDPI acknowledges that the voice analysis could offer many advantages over current polygraph methodology. For example, voice stress samples can be recorded without discomfort to the subject. Such devices could also be of benefit to the nation's intelligence and counterterrorism investigation of they could be used secretly. It found to be valid; ***any*** new device that could supersede the traditional testing devices would be heartily endorsed. Regrettably, DoDPI has found no credible evidence in scientific literature or in their own research that voice stress analysis is an effective tool for determining deception.

Additional studies by DoDPI in 1996 further analyzed the accuracy and effectiveness of the computer voice stress analyzer (Janniro & Cestaro, 1996). Using a mock theft scenario, 109 subjects were randomly assigned to two groups and given detection of deception examinations using a CVSA instrument. Subjects on one group were programmed deceptive and participated in taking $100.00 from a metal box located in a scenario room. The non-deceptive group did not participate in the scenarios nor did they have knowledge of the mock theft. Four trained and verified CVSA examiners conducted the examinations using a CVSA technique called the Modified Zone of Comparison test. Test chart evaluators, who had not taken part in the study and who were blind to subject programming, obtained an overall accuracy of 49.8%. Decisions were not significantly different from chance in determining deceptive or nondeceptive subjects. The results of this particular study are criticized by those who support the use of the CVSA stating a premise that the CVSA is a stress analyzer that captures and displays degrees of stress based on "jeopardy" and a reasonable degree of accuracy cannot be expected where "jeopardy" does not exist.

The Executive Summary released by the Department of Defense reports that The National Research Council also completed a literature review of VSA in October 2002 and the findings were:

> While the initial portion of the report suggests evidence connecting vocal lie production with fluctuations in vocal tension and pitch, the weak support for detecting deception using voice technologies is quickly addressed. Twelve studies were reviewed in this report. The combined results from these VSA studies indicated accuracy rates at or below chance levels, and low levels of reliability, both being necessary cornerstones for a successful diagnostic tool. The report concludes that there is little or no evidence, scientific or otherwise, for the application of VSA in the detection of deception. While it is noted that the possibility exists that VSA may achieve higher accuracy rates with higherstress paradigms, no such work exists in the known literature.

Finally, several studies that were published in 2002 found the following:

Horvath, Frank. (2002). (Abstract) *Experimental comparison of the psychological stress evaluator and the galvanic skin response*

in detection of deception. National Criminal Justice Reference Service. NCJ Number: 196941.
** Full-Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: examine the validity of the Psychological Stress Evaluator (PSE), a voice mediated lie detector.
> Conclusion: findings were consistent with previous research and do not indicate that PSE is effective in detecting deception.

Barland, Gordon. (2002). (Abstract) *Use of voice changes in the detection of deception.* National Criminal Justice Reference Service. NCJ Number 196942.
** Full-Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: conduct two experiments assessing the validity of voice stress analysis for the detection of deception.
> Conclusion: a certain amount of stress must be reached within an individual before reliable stress-related changes occur in the voice.

Lynch, Brian; & Henry, Donald. (2002). (Abstract) *Validity study of the psychological stress evaluator.* National Criminal Justice Reference Service. NCJ Number: 196938
** Full-Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: to investigate the validity and inter-judge agreement of the Psychological Stress Evaluator (PSE) through examining the rate of detection of arousal in spoken words.
> Conclusion: findings indicate that pattern identification of voice stress resulting from utterance of taboo and neutral words was a chance occurrence. It suggests future studies be conducted to investigate the PSE in comparison with other physiological measures to determine if it is dependent on some minimal level of stress to be effective.

Brenner, M.; Branscomb, H; & Schwartz, G. (2002). (Abstract) *Psychological stress evaluator: Two tests of a vocal measure.* National Criminal Justice Reference Service. NCJ
Number: 196939. ** Full-Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: conduct two laboratory tests/experiments on the validity of the Psychological Stress Evaluator (PSE).
> Conclusion: two conclusions drawn from the same evidence include: (1) some aspects of the PSE analysis of stress are valid suggesting the need for further studies; and (2) the present instrument is subject to serious practical problems raising doubts about its appropriateness.

Suzuki, A.; Watanabe, S.; Taheno, Y.; Kosugi, T.; & Kasuya, T. (2002). (Abstract) *Possibility of detecting deception by voice analysis.* National Criminal Justice. Institute. NCJ Number: 196940.
** Full Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: conduct a study to measure, analyze, and record voice pitch, intensity, and duration for the analysis of voice from tape recordings for use in lie detection.
> Conclusion: the results of the analysis of intensity showed no sign of increasing or decreasing of voices in intensity during the questioning. However, analysis on the duration of subjects' answers showed a higher detection rate than pitch or intensity, but it was not applicable in actual cases. From these results, using pitch, intensity, and duration of voices as a means to detect deception appears slim.

Horvath, Frank. (2002). (Abstract) *Detecting deception: The promise and the realty of voice stress analysis.* National Criminal Justice Institute. NCJ Number: 196936.
** Full Text See, Polygraph Journal: Volume 31, Issue (2). 2002.

> Focus: discuss and analyze the major empirical evidence pertaining to the claims made about voice stress analysis, specifically the assertion that

voice stress devices are effective in lie detection.
Conclusion: findings were that voice stress devices extract from the vocal spectrum a sub audible microtremor signal that is seen as useful in detecting stress in a speaker's voice. It was found that the promise of voice stress analysis in the lie detection field was not and may never be a reality. The evidence showed that none of the devices were useful in detecting deception. The reliable evidence that that did exist showed that there was no induced stress.

Krapohl, D.; Ryan, A.; & Shull, K. (2002). (Abstract) *Voice stress devices and the detection of lies.* National Criminal Justice Reference Service. NCJ Number: 196933
** Full Text See, Polygraph Journal; Volume: 31, Issue (2). 2002.

Focus: to review what is known about voice stress devices and to what degree voice stress technology can provide a reliable means for detecting deception.
Conclusion: the general conclusion has been that the accuracy is modest to poor for a handful of experimental approaches and uniformly poor for those relying on the device.

D. Other States, Government agencies and voice stress analyzers

Currently, the Commonwealth of Virginia only recognizes and approves the use of the polygraph instrument to detect deception. On this foundation, Mr. Daniele in his comments at the Roanoke public hearing session made a valid point. He states: (Reference Transcript)

"We trust the fact that state says that it (reference to the polygraph) is a valid, truth-seeking instrument to be used. If you approve this (reference to voice stress analyzers) then automatically just by the appearance of it, that everyone is going to believe that the state, Commonwealth of Virginia, is agreeing that this is a valid instrument".

Written comment letters (Newby, David) and public hearing sessions (Hughes, David and Brick, Michael – Richmond session) made note that the Department of Defense and other federal agencies are using voice stress technology on a regular basis for homeland security and terrorism investigations. However, the statement received from the American Polygraph Association, after investigating this claim, states: "No Department of Defense agency uses any form of voice stress analysis for investigative purposes." (Written comment – Baum, Sandi). The only information that this study was able to verify relates to the recent aviation security measures signed by President Bush, S.1447 Sec. 109 (7). This authorizes the Secretary of Transportation to take certain measures, including but not limited to using the computer voice stress analyzer (see Appendix C). It could not be verified if the Secretary of Transportation is presently utilizing the computer voice stress analyzer with success under this provision.

Recent legislation shows that in January 2003, the State of Illinois recently *rejected* a bill that would:

Amend the Detection of Deception Examines Act. Allows an examiner who is a qualified operator of a Computer Voice Stress Analyzer that records voice stress factors pertinent to the detection of deception to use a Computer Voice Stress Analyzer in place of the instrument that records the subject's cardiovascular, respiratory, and galvanic skin response patterns. Sets the minimum training standards for a qualified operator.

Other states that have recently *rejected* similar bills are Texas (1999) and Oklahoma. It appears that out of the 50 states, there are currently only nine states that *do not recognize or approve* the use of computer voice analyzers.

* The complete list:
- Illinois
- Oklahoma
- Michigan
- Texas
- Vermont

- Virginia
- South Carolina
- Kentucky
- North Dakota

* USA TODAY article (2002)

Some other additional information that was found about other states:

Wisconsin - Does not appear regulated, however, voice stress analyzer is part of the definition of "lie detector" in the section of the code regarding employment law. § 111.37(1)(b)

West Virginia - While not specifically prohibiting voice stress analyzers the West Virginia Code seems very much designed (in the education and licensure requirements) to be geared toward polygraph machines. 42CSR6

Utah - Allows the use of computer stress analyzers

Texas – No information found specifically pertaining to voice stress analyzers, however the polygraph law seems to be very similar to Virginia.

Tennessee – No information found specifically pertaining to voice stress analyzers, however the polygraph law requires a polygraph examiner (5) "Polygraph examiner" means any person who purports to be able to detect deception or verify truth of statements through instrumentation or by means of a mechanical device) to successfully complete a school approved by the American Polygraph Association. (Tennessee Code, Title 62, Chapter 27)

Conclusions & Recommendations

A review of the current literature and summarization of the four public hearing sessions and written comments uncover a continuing polarized debate between the polygraph and voice stress communities. The conflict arises from the lengthy history and regulation of the polygraph compared to the mostly unregulated new technology of voice analyzer equipment. There have been several scientific studies conducted on the polygraph over the years, and while no study has indicated the polygraph to be 100% accurate, it has still been deemed a reliable instrument to detect deception when used correctly. On the other hand, there has been no independent scientific evidence to indicate that the computer voice analyzer is a valid instrument to detect deception. The only evidence that has been presented and reviewed, to date, consists of testimonials and other anecdotal evidence.

It is not discounted or overlooked that the computer stress analyzers currently in use, are very well received by the law enforcement at large in the United States. In spite of this, the Polygraph Examiners Advisory Board must rely upon scientific data and research available.

Because there have been no independent scientific studies conducted on the reliability of the computer voice analyzer to detect deception, the Board recommends to the Director of the Department of Professional and Occupational Regulation that computer voice analyzer equipment should not be approved in Virginia at this time.

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Aviation and Transportation Security Act. S.1447; Sec. 109. (a)(7).

Barland, Gordon. (2002). (Abstract) Use of voice changes in the detection of deception. *National Criminal Justice Reference Service. NCJ Number 196942.* ** Full-Text See, *Polygraph*: Volume 31, Issue (2). 2002.

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Appendices

Appendix A - Summaries of Written Comments Received
Appendix B - Attendees of the Public Hearing Session(s)
Appendix C – Aviation and Transportation Security Act S.1447
Appendix D - House Bill No. 2812
Appendix E - Senate Bill No. 1296

Appendix A

Name and Affiliation	Summary of Comments
Leslie C. Cash, Jr., Greene County Sheriff's Office	Supports the use of the CVSA (Computer Voice Stress Analyzer) instruments in law enforcement investigations. Reference to the CVSA as a cost effective "tool" for conducting investigation interviews. Support for investigative use only and not for use in pre-employment or Internal Affair areas.
Leonard G. Cooke, Commonwealth of Virginia, Department of Criminal Justice Services	Reports research from two sources: (1) International Association of Chiefs of Police (IACP) website and (2) the National Institute for Justice (NIJ). The IACP website does not present a position of pro or con on the use of voice stress technology. The NIJ revealed various studies that indicate voice stress technology may work, and others that say they do not. Concludes that these devices (voice stress analyzers) have not been shown to differentiate between truth and deception and that most research has produced "negative or mixed findings" of a relationship between voice stress and deception.
Jerrauld C. Jones, Commonwealth of Virginia, Department of Juvenile Justice	Reports that the Department of Juvenile Justice has never used computer voice stress analyzers, nor have they conducted any studies into the use of such devices.
George W. Gibbs	Does not support the use of the voice stress analyzer device. Reference to several scientific studies conducted by the U.S. Department of Defense noting an overwhelming conclusion indicating that the accuracy rate of voice stress analysis in detecting deception is no better than chance. Reference to flipping a coin to determine if someone is telling the truth or not. Admits the polygraph isn't perfect, but certainly better than flipping a coin. Main concern is not that the voice stress analyzer would replace the polygraph, but, because the voice stress analyzer test is quick, easy and can be conducted without the subject's knowledge or consent, that some officers may elect to trust its results rather than take the time to have a polygraph exam conducted. Concludes that shortcuts of this nature do not serve the public interest and that the scientific research has proven that voice stress does not work.
Donald A. Weinstein, American Polygraph Association	Support against the use of voice stress technology in Virginia. Attached several documents from studies conducted on the validity and utility of the voice stress technology for review. The Department of Defense Polygraph Institute in their Voice Stress Analysis Position Statement (September 11, 1996) concluded that they had found no credible evidence in information furnished by the manufacturers, the scientific literature, or in their own research, that voice stress analysis is an effective investigative tool for determining deception.

David Newby, City of Chesapeake Office of the Sheriff	Support for the use of the voice stress technology to aid law enforcement to do its job better. Stresses the use of the voice stress technology as a tool to better direct resources to meet the needs of law enforcement. Discussion on the studies that have been done to test the credibility of this technology to conclude that the testing of this technology in a laboratory setting without real jeopardy would not produce realistic results. States that the Department of Defense and other federal agencies are using voice stress technology on a regular basis for homeland security and terrorism investigation. Specifically, the Aviation and Transportation Security Act Sec. 109 (a) In General – The Secretary of Transportation for Security may take the following actions: (7) Provide for the use of voice stress analysis, biometric, or other technologies to prevent a person who might pose a danger to air safety or security from boarding the aircraft of an air carrier or foreign air carrier in air transportation or interstate air transportation.
Sandi Baum, Virginia Beach Police Department	Strong support against the use of voice stress technology in Virginia. Main themes: (1) It has not been proven to be an accurate detector of deception (makes references to six studies published in the American Polygraph Association 2002 Volume 31, Number 2); (2) The voice stress technology can be used without the examinee's awareness making compliance with consent regulations such as those the Board has developed for polygraph, easy to subvert, placing the public at greater risk; (3) the American Polygraph Association has investigated the claim that the government is using the voice stress technology on its war on terrorism and issued this statement, "No department of defense agency uses any form of voice stress analysis for investigative purposes."
Donald L. Cahill, Prince William County Police Department	Support for the use of voice stress technology as a "tool" which will help guide the investigation in the proper direction. Discussion on the cost effectiveness of the instrument to enhance the ability of law enforcement staff without the burden of excessive added costs. Minimum standards for training programs are suggested as well as the examination requirements and the Board's role as an oversight board.
William I. Ames, Jr., The Diogenes Company	Support for the use of voice stress analysis system as an instrument that records physiological changes pertinent to the determination of truthfulness or the verification of the truth of statements in Virginia. Discussion of approval sought regarding their training and certification program that includes a continuing education. Make claim that their systems are operating in 15 countries and within US Federal agencies. • Provided an ISSA (International Society of Stress Analysis) Fact Sheet.

	• Provided a Diogenes Brochure • Provided a Diogenes written report The paper addresses an emerging technology for a tool for security and law enforcement applications. Claim that voice stress analysis are methodologies for revealing physiological indicators of differences in the stress level of the human subject. • Provided a Prince William County Virginia report on VSA • Provided a course of instruction presentation brochure • And a state of Florida special hearing report
National Institute for Truth Verification	• Provided "testimonials" submitted by detectives involved in actual cases. • Provided a list of 131 Florida Law Enforcement Agencies that Utilize the CVSA™ (Computer Voice Stress Analyzer). • Provided a list of 55 North Carolina Law Enforcement Agencies that Utilize the CVSA™. • Provided a list of Major Law Enforcement Agencies that utilize the instrument, as noted, "By prior agreement federal agencies are not listed". • Provided a list of 20 Maryland Law Enforcement Agencies that Utilize the CVSA™ • Provided An Executive Summary regarding the computer Voice Stress Analyzer™. • Provided a comparative cost of the Computer Voice Stress Analyzer™ vs. the polygraph. • Announcement for the fourth quarter, certified examiners courses to be held nationwide. • Article posted in the Washington Times (Tuesday, July 22, 2003 – Author, Rowan Scarborough) titled: *Saddam's loyalists thwart polygraph tests.* • Present argument that states, "Unlike the old polygraph, the CVSA™ can analyze both telephonic transmissions as well as recorded conversations to accurately detect deception." • S. 1447 The Aviation and Transportation Security Act as enacted by the U.S. Congress – Sec. 109. Enhanced Security Measures, (7) Provide for the use of voice stress analysis, biometric, or other technologies to prevent a person who might pose a danger to air safety or security from boarding the aircraft of an air carrier or foreign air carrier in the air transportation or intrastate air transportation. • Article titled, "U.S. Department of Defense Begins Deployment of the CVSA™". Argument presented states that: The U.S. Department of Defense has begun the deployment of the Computer Voice Stress Analyzer™ throughout the Intelligence community. Although virtually the entire U.S. law enforcement community (nearly 1,400), including

	most major metropolitan departments, has already switched to the CVSA™ , the DoD (Department of Defense) had no begun deployment of the system due to a negative report issued by the DoD Polygraph Institute. In the report, authored by a DoD Polygraph researcher, Dr. Victor Cestaro, it was reported that after testing the system, the accuracy rate of the CVSA was below 50% in detecting deception.
Bernard H. Levin	Support against the use of voice stress technology as a device to determine deception. Comments were not intended to be comprehensive, but mainly intended to address the question of whether the computer voice stress analyzer can be justified on the basis of available scientific evidence.

Appendix B
Attendees and Speakers of the Public Hearing Session(s):

** Denotes a Speaker*

(1) Roanoke, Virginia – August 19, 2003

Raynard Jackson, Chairman of the Board for Professional and Occupational Regulation Dana Martin, Board Member
Louise F. Ware, Director of the Department of Professional and Occupational Regulation Sandra W. Ryals, Chief Deputy
Eric Olson, Executive Director
Kimberly L. Freiberger, Regulatory Boards Administrator

* L. C. Cash
* Brian Roberts
* Karl Holzbach
* Rick Daniele
* George McMillan
Rodney Davis
Anthony Ezell
Tim Sanok
George Gibbs
Denise Likens

(2) Chesapeake, Virginia – August 28, 2003

Raynard Jackson, Chairman of the Board for Professional and Occupational Regulation Thomas J. Meany, Jr., Board Member
Louise F. Ware, Director of the Department of Professional and Occupational Regulation Sandra W. Ryals, Chief Deputy
Eric Olson, Executive Director
Kimberly L. Freiberger, Regulatory Boards Administrator

* Brian Roberts
* Rick Daniele
* Sandi Baum
* Karl Holzbach
* David Newby
* Jim O'Sullivan
* James Eckenrode
* Irby Turnbull
* D. L. Callahan
* Delegate John Cosgrove
* Senator Blevins

(3) Arlington, Virginia – October 1, 2003

Raynard Jackson, Chairman of the Board for Professional and Occupational Regulation Julie Clifford, Board Member
Louise F. Ware, Director of the Department of Professional and Occupational Regulation
Sandra W. Ryals, Chief Deputy
Eric Olson, Executive Director
Kimberly L. Freiberger, Regulatory Boards Administrator
* Joe Hughes
* Victor L. Cestaro

* Jim O'Sullivan

(4) Richmond, Virginia – October 7, 2003

Raynard Jackson, Chairman of the Board for Professional and Occupational Regulation
Julie Clifford, Board Member
Susan Ferguson, Board Member
Maxime Frias, Board Member
Dana Martin, Board Member
Leroy Pfeiffer, Board Member
Louise F. Ware, Director of the Department of Professional and Occupational Regulation
Sandra W. Ryals, Chief Deputy
Eric Olson, Executive Director
Kimberly L. Freiberger, Regulatory Boards Administrator
Jim O'Sullivan
Jennifer V. Luckritz
* Karl Holzbach
* David Newby
* David A. Hughes
* Kent Willis
* Otis Whitaker
* Joe Hughes
G. Brain Michaels
A. W. Omohundro
* James Eckenrode
* Michael D. Brick
* Brain Roberts

Appendix C
Aviation and Transportation Security Act S.1447

From the Congressional Records
[DOCID: f:publ071.107]

[[Page 115 STAT. 597]]

Public Law 107-71
107th Congress

An Act

To improve aviation security, and for other purposes. <<NOTE: Nov. 19, 2001 - [S. 1447]>>

Be it enacted by the Senate and House of Representatives of the United States of America in Congress <<NOTE: Aviation and Transportation Security Act.>> assembled,

SECTION 1. SHORT TITLE. <<NOTE: 49 USC 40101 note.>>

This Act may be cited as the ``Aviation and Transportation Security Act''.
TITLE I--AVIATION SECURITY

SEC. 101. TRANSPORTATION SECURITY ADMINISTRATION.

(a) In General.--Chapter 1 of title 49, United States Code, is amended by adding at the end the following:

``Sec. 114. Transportation Security Administration

``(a) In General.--The Transportation Security Administration shall be an administration of the Department of Transportation.

``(b) Under Secretary.--
``(1) Appointment.--The head of the Administration shall be the Under Secretary of Transportation for Security. The Under Secretary shall be appointed by the President, by and with the advice and consent of the Senate.
``(2) Qualifications.--The Under Secretary must--
``(A) be a citizen of the United States; and
``(B) have experience in a field directly related to transportation or security.
``(3) Term.--The term of office of an individual appointed as the Under Secretary shall be 5 years.

``(c) Limitation on Ownership of Stocks and Bonds.--The Under Secretary may not own stock in or bonds of a transportation or security enterprise or an enterprise that makes equipment that could be used for security purposes.

``(d) Functions.--The Under Secretary shall be responsible for security in all modes of transportation, including--
``(1) carrying out chapter 449, relating to civil aviation security, and related research and development activities; and
``(2) security responsibilities over other modes of transportation that are exercised by the Department of Transportation.

``(e) Screening Operations.--The Under Secretary shall--

``(1) be responsible for day-to-day Federal security screening operations for passenger air transportation and intrastate air transportation under sections 44901 and 44935;

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``(2) develop standards for the hiring and retention of security screening personnel;

``(3) train and test security screening personnel; and

``(4) be responsible for hiring and training personnel to provide security screening at all airports in the United States where screening is required under section 44901, in consultation with the Secretary of Transportation and the heads of other appropriate Federal agencies and departments.

``(f) Additional Duties and Powers.--In addition to carrying out the functions specified in subsections (d) and (e), the Under Secretary shall--

``(1) receive, assess, and distribute intelligence information related to transportation security;

``(2) assess threats to transportation;

``(3) develop policies, strategies, and plans for dealing with threats to transportation security;

``(4) make other plans related to transportation security, including coordinating countermeasures with appropriate departments, agencies, and instrumentalities of the United States Government;

``(5) serve as the primary liaison for transportation security to the intelligence and law enforcement communities;

``(6) on a day-to-day basis, manage and provide operational guidance to the field security resources of the Administration, including Federal Security Managers as provided by section 44933;

``(7) enforce security-related regulations and requirements;

``(8) identify and undertake research and development activities necessary to enhance transportation security;

``(9) inspect, maintain, and test security facilities, equipment, and systems;

``(10) ensure the adequacy of security measures for the transportation of cargo;

``(11) oversee the implementation, and ensure the adequacy, of security measures at airports and other transportation facilities;

``(12) require background checks for airport security screening personnel, individuals with access to secure areas of airports, and other transportation security personnel;

``(13) work in conjunction with the Administrator of the Federal Aviation Administration with respect to any actions or activities that may affect aviation safety or air carrier operations;

``(14) work with the International Civil Aviation Organization and appropriate aeronautic authorities of foreign governments under section 44907 to address security concerns on passenger flights by foreign air carriers in foreign air transportation; and

``(15) carry out such other duties, and exercise such other powers, relating to transportation security as the Under Secretary considers appropriate, to the extent authorized by law.

``(g) National Emergency Responsibilities.--

``(1) In general.--Subject to the direction and control of the Secretary, the Under Secretary, during a national emergency, shall have the following responsibilities:

[[Page 115 STAT. 599]]

``(A) To coordinate domestic transportation, including aviation, rail, and other surface transportation, and maritime transportation (including port security).

``(B) To coordinate and oversee the transportationrelated responsibilities of other departments and agencies of the Federal Government other than the Department of Defense and the military departments.

``(C) To coordinate and provide notice to other departments and agencies of the Federal Government, and appropriate agencies of State and local governments, including departments and agencies for transportation, law enforcement, and border control, about threats to transportation.

``(D) To carry out such other duties, and exercise such other powers, relating to transportation during a national emergency as the Secretary shall prescribe.

``(2) Authority of other departments and agencies.—The authority of the Under Secretary under this subsection shall not supersede the authority of any other department or agency of the Federal Government under law with respect to transportation or transportation-related matters, whether or not during a national emergency.

``(3) Circumstances.--The Secretary shall prescribe the circumstances constituting a national emergency for purposes of this subsection.

Appendix D - House Bill No. 2812
CHAPTER 545

An Act to amend and reenact § 54.1-1805 of the Code of Virginia, relating to professions and occupations; regulation of polygraph examiners.
[H 2812]
Approved March 18, 2003

Be it enacted by the General Assembly of Virginia:

1. That § 54.1-1805 of the Code of Virginia is amended and reenacted as follows:

§ 54.1-1805. Instruments to be used; approval of other instruments by Director.

A. Each examiner shall use an instrument which *that* records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional physiological changes pertinent to the determination of truthfulness.

B. In addition, the Director may approve the use of other instruments that record physiological changes pertinent to the determination of truthfulness or the verification of the truth of statements, including a computer voice stress analyzer, by examiners licensed under this chapter under such conditions as determined by the Director. Such conditions shall include a provision requiring the examiner, prior to the use of such instrument, to (i) complete a Director-approved training course on its operation and (ii) be certified by the manufacturer on the use of such instrument. However, no instrument approved pursuant to this subsection shall be used by a police department in conducting a background investigation of an applicant for employment as a police officer or in administrative investigations involving a police officer.

2. That the provisions of this act shall expire on July 1, 2005.

Appendix E - Senate Bill No. 1296
CHAPTER 554

An Act to amend and reenact § 54.1-1805 of the Code of Virginia, relating to professions and occupations; regulation of polygraph examiners.

[S 1296]
Approved March 18, 2003

Be it enacted by the General Assembly of Virginia:

1. That § 54.1-1805 of the Code of Virginia is amended and reenacted as follows:

§ 54.1-1805. Instruments to be used; approval of other instruments by Director.

A. Each examiner shall use an instrument which *that* records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional physiological changes pertinent to the determination of truthfulness.

B. In addition, the Director may approve the use of other instruments that record physiological changes pertinent to the determination of truthfulness or the verification of the truth of statements, including a computer voice stress analyzer, by examiners licensed under this chapter under such conditions as determined by the Director. Such conditions shall include a provision requiring the examiner, prior to the use of such instrument, to (i) complete a Director-approved training course on its operation and (ii) be certified by the manufacturer on the use of such instrument. However, no instrument approved pursuant to this subsection shall be used by a police department in conducting a background investigation of an applicant for employment as a police officer or in administrative investigations involving a police officer.

2. That the provisions of this act shall expire on July 1, 2005.

Serial Killers
A Homicide Detective's Take

Lieutenant Nelson Andreu[1], Miami Police Department

1. Credentials and Interest

It was during my tenure of over 20 years as a homicide Detective and Detective Sergeant with the Miami Police Department that I investigated six serial murder cases. I like to think that the experience I gained in those investigations has given me a most rudimentary glimmer of understanding as to what motivates a serial killer in undertaking his atrocities.

These six serial murder cases, which accounted for the murders of nearly 50 people, all took place in the Miami area. All six offenders were men: two Hispanic/white males, two African-American males, and two white Anglo males. They all had different, although equally macabre, reasons for their acts. Three of the killers confessed their crimes while the others took their reasons to their graves, dying of AIDS while in prison or taking their own lives. The three men who confessed provided us with many, sometimes distressingly vivid, details of how, why, and when they committed their crimes.

Although part of my job as a homicide detective is to analyze the motives of killers, my interest goes beyond the requirements of my job. I have acquired and extensively studied a lengthy and well-written dissertation prepared by a convicted and, to me unknown, serial killer, and material from this document is incorporated into this article. Because I do not know his name I cannot give specific credit to its author.[2]

I can, however, vouch for the validity of this document by providing some history about how I obtained it. While working the Rory Conde case, the investigative team was receiving copious leads, but none were panning out. One of the investigators assigned to the Task Force received by mail a letter from a local therapist. The author of this glimpse into a killer's mind prepared it as part of his psychological treatment at the request of his therapist, who chose to protect the identity of his source. The document that we received was a photocopy of what had apparently originally been handwritten on a lined legal pad in a consistent fine point that appeared to have been ink. The letter was perfectly legible and the printing was so nearly perfect that at first glance it appeared almost to have been typewritten. Close inspection revealed, however, the slight variations of human penmanship. The writing was meticulous, a nearly perfect hand that neatly compacted two rows of text between every two lines. Approximately five pages long, the document showed *no* mistakes and appeared completely free of erasures, strike-outs, even hesitation. If the writer employed such precision and planning in implementing the hideous deeds he described, it seemed nothing short of miraculous that he was ever caught. With hundreds of years of collective investigative experience behind the assembled investigative team, or Serial Killer Task Force as we were called, we harbored no doubt that whoever had written this document was a perverse, sadistic, frighteningly sick individual who was highly likely to have committed the unspeakable acts that he reduced to writing.

Revealed in this article are presumably candid thought processes provided by this protected source, as well as information provided by serial killers whom I have investigated. Although serial killers vary in the details of their mental constructs, certain procedural similarities are common among them, and enable us to construct a very general profile. In this article I attempt to track similarities among people who kill strangers.

[1]Correspondance should be sent to Nelson Andreu, PO Box 133247, Hialeah, FL 33013-3247

[2]Anon, article postmarked October 1994.

2. Common Knowledge

During the six serial killer cases I investigated, I dealt extensively with Criminal Profilers from both the FBI and the Florida Department of Law Enforcement (FDLE). Their training and work experience are extensive and years in the making, and I have found these specialists to be truly invaluable resources.[3]

First, a few statistics. Keep in mind, of course, that these are generalities; always there will be those who fall outside the bell curve. The following is a consensus of the majority of criminal profilers, based on actual cases they have investigated. Serial killers tend to be mostly white males; between 20 and 40 years of age[4]. Most, although not all, serial killers begin their lives as petty criminals; initially they may have been peeping-Toms, animal torturers, arsonists, or any other of a wide range of pre-killing crimes. I have yet to hear of a provably "upstanding" citizen who begins his life of crime by killing people for personal and/or sexual gratification. In addition, as you may have observed from the examples given above, the "petty crimes" engaged in by nascent serial killers tend away from harmless "pranks" such as vandalism and opportunistic burglary and in the direction of more highly "anti-social" behaviors.

3. Genesis of a Serial Killer

Serial killers frequently suffer from low self-esteem, often complicated by some sort of sexual dysfunction. Many were themselves the victims of sexual abuse and/or were raised in violent households. Never having received much training in social graces and lacking in confidence, they tend to be introverted and friendless. Some, like emotional adolescents that never reach adulthood, maintain unhealthy ties to a family member, often the mother. And although certain serial killers have counted their mothers among their victims, in my belief such instances are not sexual in nature, but more a revenge or to halt years of real or perceived domination. In nearly all cases, deviant and recurring sexual desires and fantasies are what drive these people to murder multiple victims.

Spending much time alone, those who will depart the social norms tend to inhabit an imaginary world. Their fantasies, which in my experience always involve sex, begin small. At first they are able to achieve gratification merely by imagining these scenarios, and in that way they may not differ from other people who for reasons of their own concoct socially unacceptable fantasies that never see the light of day.

For those who develop into serial killers, at some point imaginary scenarios start to become insufficient. When thoughts and self-stimulation no longer suffice, some of these people may act their visions out in the limited but sometimes quite realistic realm of sado-masochistic sex. In time, even that is not enough. For reasons of their own, some people require more and greater stimuli to satisfy their turbulent desires, until finally they enact the killing of their first victim.

This is a big step, even for a highly aberrant mind. The perpetrator himself may be shocked and frightened, even disgusted, and it may take a while for the first-time murderer to reestablish his personal mandate. While doing so, he may relive his actions over and over in his mind, thus receiving again that gratification obtained during the actual murder and, perhaps, by doing so actually setting the stage for his progression. Some killers take something, a trophy if you will, from their victim. It may be an article of clothing or a photograph, a swatch of hair or piece of jewelry, something of use to embellish their mental re-living of their actions. This suffices for a while but, in time, their ability mentally to revisit their victim's demise will fade. By the time this happens, if he has reconstructed his entitlement and begins to hunt another victim, such a person has come to fit the classical mold of a serial killer.

[3]One such profiler from FDLE is Leslie D'Ambrosia. She and I worked almost daily on not just these cases, but several others that showed a potential to become serial in nature.

[4]One of the few female serial killer, Aileen Wuornos, was executed in Florida in October of 2002.

4. Victim Selection

How does a serial killer select victims? The traditional school of thought holds that generally they select victims based on certain physical and/or personal characteristics. This assertion presupposes that, within the mind of each serial killer, there evolves synthesis of preferred characteristics and, ultimately, a clear, specific picture of his "ideal" victim, be it male or female, black or white, young or old, short or tall, large busted or small, shy or forward, and so on. Then, when that "typical" serial killer begins an active search for human prey, he will go to certain lengths to capture and victimize only those individuals who closely fit the mold.

Unexpectedly, I have observed that most serial killers never actually find and kill their "dream victim." People fitting such detailed and perfected images may not only be hard to come by, but may also not be easily available in the venues haunted by "hunting" serial killers. So when that ideal victim cannot be found, and when their internal impetus becomes powerful enough, they will settle for a substitute. Ignoring for a moment the disparity between deviant human and normal feline behavior, a serial killer can be compared to a hungry lion that lies in wait for his favorite meal. It may be the lion knows an impala has the most tender or tasty meat. He waits for an opportunity to kill and eat the impala and in doing so may allow easy but not-so-attractive prey to pass unmolested. In time, hunger pains growing and no impala in sight, the famished lion will settle for an unwary bird that happens by. After devouring the bird, which gives his hunger a brief respite, the lion again has time to savor the taste of an impala, and the cycle begins again.

Like the lion, a serial killer just will not defer acting out his urge to kill simply because his "ideal" victim refuses to materialize at his beck and call. But his reason for settling for something less divulges from that of the lion. There are two basic, interrelated reasons for this disparity. The first centers on the extra caution exercised by a serial killer in his search for a victim; the second, upon the nature of the compulsion that drives him to violence.

Addressing the former reason first, it can be said that a serial killer is among the most alert and cautious of all human beings. Such caution can be explained by his foremost concern, that being to carry out his activities without being caught, that he may continue to enjoy his pursuits. Incidentally, this awareness of right versus wrong, at least to the extent of shielding his own identity, distinguishes the mental processes of a serial killer, however deviant they may be, from the insanity manifested by true psychosis. However much he has inwardly justified his intentions, he nevertheless *does* have an unacknowledged sense or awareness of the heinous—not to mention illegal—nature of the acts he will commit. He *is* aware of the stakes involved—that there is absolutely no room for error—and therefore will mark no one for his prey unless he perceives the odds to be overwhelmingly in his favor. His motto may well be "whom I cannot seize safely, I will not seize at all."

In theory, a serial killer could reject all other easy prey until; at last, his "ideal" victim was to appear in circumstances perfectly suited to his caution. If that were often true, however, we may not have run across many instances of serial murders. But this intense and mounting hunger for real-life violence against a real-life captive can be contained only so long before it inevitably compels him to settle for second-best. The ideal victim of a human serial killer may be a voluptuous blonde movie star or a beautiful brunette model, but his search for this richly imagined victim may well meet with failure. Failure is something the serial killer cannot tolerate, so he settles for an easier target, usually a prostitute, or a homeless or drug-addicted woman. These types of victims, although not the killer's "ideal or dream" victim, make easy targets. They are usually willing to go with the killer to another location with the lure of money and/or drugs, thus giving the serial killer the opportunity to have the victim on his turf. Additionally, the killer may have prepared a killing scheme that can include restraints, knock-out drugs, or a variety of contingency plans that he has carefully prepared to snare his victim.

The first time he kills may not be perfectly choreographed. Sometimes it may actually take the perpetrator by surprise or be

accidental in nature. But, inspired by the intense satisfaction the killing produces, he starts to plan in earnest. As he perfects his trade, future victims may increasingly undergo a more torturous, orchestrated, even ritualistic death.

5. Victim Objectification

As a serial killer steps away from his base, whatever it may be, to begin the hunt for human prey, it is almost always true that he knows absolutely nothing about the person who is fated to become his victim. This is true even in the case of such serial killers as William Cody in Colorado, who cultivated his victims over lengthy periods (acquiring their possessions as well as their trust) before finally and viciously ending their lives. But for him as well, each future victim began as a stranger about whom he knew nothing. In this way does a serial killer differ from a man who, in a burst of anger, kills his adulterous wife, as well as the cold-blooded planner who kills for revenge.

It may be that having no prior knowledge of a future victim further enables the process of that victim's objectification. For as far as he is concerned, his next victim is not even a human being, in the accepted sense. So, well before he ever crosses paths with his next victim, he has already stripped that person of all human meaning and worth; he has unilaterally decreed from afar that the person is deserving of no human consideration whatsoever. Thus, then, in a serial killer's perception of his victims; past and future: that each is nothing more than an object, depersonalized in advance, existing only for himself and his enjoyment, and solely to be seized and used as he sees fit. Moreover, he perceives his unseen prey not just as an object to be used, but as an object unworthy of any consideration, worthy only of extreme contempt, vicious abuse, and ultimate destruction.

Why does the serial killer hold such an extreme and irrational disregard for others? How can he so utterly despise and count worthless another human being whom he has even yet to meet? The answer to these questions is that, after years of privately nurturing and reinforcing his compulsion for violence, a serial killer has arrived at a place where he is compelled to act out his brutal fantasies. This mandates the killer to perceive living human beings—the only pool from which he can obtain real-life victims—as worthless objects deserving the violence he desires to mete out. Mentally he transforms them into hateful creatures, because, in the twisted morality of his own making, it is only against such richly deserving objects that he can justifiably and joyfully inflict his personal brand of justice. Perhaps, in the carefully constructed mentation of a serial killer, no one but himself really deserves to live.

To preserve this mentation, a serial killer must lie to himself. He lies as he denies his own "badness" and projects it upon his as-yet free, future victim. He lies as he stands in judgment and pronounces his victim "guilty" for the "crime" of imagining him- or herself a worthy human being. All such self-serving justifications, of course, are nothing more than self-delusion that has come to be, in the killer's mind, reality. To a serial killer, such a construction of reality is entirely necessary. For deep inside of himself, each serial killer contains an unacknowledged awareness of the fact that his future victims *are* innocent human beings, utterly undeserving of his wrath. Yet, to admit this fact, he would also have to recognize that he, and the violence he intends to inflict, is altogether unjust and wrong. And, for a man grown accustomed to the: "goodness" and "rightness" of his proclivity for violence and the pleasure it provides, any such admission of actual wrong is impossible to countenance.

6. Denouement

Once a serial killer is in possession of a living victim, and has this victim where he feels safe enough to act out his fantasies, the acts he carries out are often performed as if on "auto-pilot." The killer's acts appear to be a close reenactment of what he previously did in his imagination. So, from among an array of violent fantasies, he picks and chooses the individual cruelties that he feels will assure the most in the way of "self-fulfillment." Yet, if a serial killer places this kind of special emphasis on the careful and systematic acting out of his favorite mind pictures, it is only because of the tremendous meaning and

pleasure he derives from watching the degrading, dehumanizing effect they have upon his victim as he methodically carries them out. To him, nothing is more important than to see his victim reduced to the very lowest depths of misery and despair. For if there is any single reason that a serial killer does what he does, it is so that he may feel enlarged and magnified in his own eyes—through the willful and violent degradation of another human being. This need for self-magnification is always, I believe, a mandatory pre-requisite to any episodes of violence.

As for the actual commission of the murder itself, I believe this is usually nothing more than a postscript to a serial killer's overall scheme of violence. His real gratification comes from the subjugation, terrorization, and brutalization of his victim, and almost not at all from the actual murder itself. Thus, from a serial killer's viewpoint, his victim might be likened to a disposable paper cup, from which he takes a long and satisfying drink of water. Once the water is gone, his thirst quenched, the cup has served its purpose; it is useless, and therefore can be crushed without thought and thrown away without concern. Since he has met his need to terrorize and abuse, his victim is perceived as an object of inconvenience, a worn-out and no-longer-needed piece of baggage. So, his only concern now is for quick extermination and safe disposal of the victim he no longer needs or wants.

Once he murders his victim, a serial killer's tactics for disposal of the body remain entirely self-centered. If, for example, he takes the time and effort to bury his victim's remains, he almost certainly does this *not* out of any last-minute concession toward decency, but, instead, simply to hide the evidence. Should conditions be favorable, he will simply dump the body unceremoniously someplace where prompt discovery is unlikely, unwilling either to make the effort to dig, or risk being seen digging, anything so eye-catching as a body-sized hole in the ground.

Eager though he may be to be rid of the victim's body, a typical serial killer, if he has a choice, is not apt to dispose of the body in open view, where it can be quickly and easily found. Although certain serial killers have done exactly this, taking additional and special delight in flaunting their atrocities, I believe most have no desire to advertise what they have done. They have already had their excitement and experienced their relief. Anything else is anticlimactic. They may go to great lengths to cover up their tracks, only so that a body cannot be traced back to them. One Florida serial killer, Danny Rolling, took a great deal of pleasure in strategically and carefully positioning his dead victims in the most shocking pose he could concoct. When police entered the victims' rooms, they were greeted by the deceased bodies positioned in a variety of graphic and ghastly poses.

A serial killer generally does have an idea for where he wants to dispose of the victim's remains, or at least, he has a general idea of the type of locale that would best suit his needs. Usually, this is a remote or secluded locale, a place where he can discard the victim's body quickly and without the likelihood of being seen, yet which affords some ready concealment over his victim's remains. If the whole violent episode occurred at such a locale in the first place, he will simply kill and leave his victim right there. If not, he will generally always put forth some effort to reach a secluded and preferred dumping ground. But, as always, his every action will be governed solely by self concern.

It is fortunate for us, investigators trying to solve these brutal crimes, that serial killers are not perfect. Because of their human nature, they, in most cases, unknowingly leave clues behind. It is a known fact in criminal investigations that, as well as leaving something behind, a perpetrator will *always*, even if unconsciously, take something from the scene of the crime. This is true not just of serial killers, but of nearly all crime scenes. These clues are often very subtle and nearly impossible to identify and collect. Therefore, it is of utmost importance to secure a crime scene and search for these faint clues the killer has inadvertently left behind. If we are to have any hope of solving these cases, it is imperative that we not overlook or miss those subtle clues the killer provides.

7. Case Histories

Some of the serial murder cases I investigated conformed to these generalities while others did not; variations in such exceptionally deviant behavior are only to be expected. In the case of Charles Williams, one suspect who died of AIDS in a Florida penitentiary, many of what we came to believe were his victim's deaths were not initially classified as murders. The original detectives and medical examiners investigating these cases in a predominantly low-income area of Miami found large quantities of drugs in the bodies of women, most of whom were, based on previous arrest histories and family interviews, known prostitutes and/or drug addicts, and consequently most of these deaths were initially classified as drug overdoses. But as the body count among such women in a relatively circumscribed area continued to rise, we homicide investigators became increasingly concerned that a pattern was emerging. Consequently many of the cases were reopened, bodies disinterred, and autopsy findings reviewed.

Williams was born and raised in Miami and lived in the same neighborhood that the murders took place. He would lure his victims, provide them with drugs, have sexual intercourse with them, and manually strangle them during the sex act. I speculate that he derived his pleasure from not only the sexual act, but also by being in such total control that their lives were given to satisfy his unnatural needs. In one instance, a Miami police officer ran right by Williams as he was having sex with his victim in a field. The officer, involved in a foot chase of another criminal, glimpsed but paid no further attention to the couple. It was not until the next day when the victim was found lying in the precise spot where the officer had seen the couple that realization dawned. Unfortunately but understandably, given the circumstances of the sighting, the officer did not recognize Williams as the person who was having sex with the prostitute.

Although I actively participated in this investigation, the credit for actually solving the case and gathering the evidence to convict Williams goes to then-Homicide Detective Tony Rodriguez, now a Captain with the Miami Police Department. The investigation spanned a period of many years and was ultimately focused on Williams through DNA testing, bite-mark comparisons, and Williams's denial—which flew in the face of his known proclivities of ever having been with the victim. DNA testing was in the infancy stage at the time Williams was killing his victims, but DNA nevertheless linked him to the decisive case he was charged and convicted with. This lead to at least seven deaths being reclassified and attributed to Williams, who was ultimately tried, convicted, and sentenced to life imprisonment. Although Williams was suspected of having killed over 30 women in the greater Miami area, comprising several different police jurisdictions, in the end he was charged and convicted on just one Miami Police Department case.

In the case of Rory Conde, nicknamed "The Tamiami Strangler," six prostitutes were found manually strangled and their bodies discarded at various locations near US-41, which in Miami is called Tamiami Trail. Conde's wife of many years lived in constant fear of beatings and abuse at Conde's hands. Once when his wife was absent Conde brought a prostitute home and dressed her in his wife's pajamas, videotaping their sex acts. When his wife eventually discovered the videotape, she moved out. The couple had several children and Conde had trouble visiting them as he tried to reconcile with his estranged wife. In his confession he blamed the prostitutes for his failed marriage and for losing his children.

Of the six people Conde killed, five were women and one was a transvestite. They were all prostitutes, picked up from within a few-blocks-square area known as a hangout for quick sex. Conde had sex with all of his victims and would strangle them during the sex act. The women were not beaten or brutalized; they all were strangled manually, with little other trauma. After killing his victims, he would often talk to the corpses, giving them advice—as though by such taking of extreme control he had made them "his." He would always re-dress the women after killing them and discard their bodies in locations such as residential neighborhoods, where they were easily discovered. Initially, when we discovered the second victim, we suspected a serial killer, but were not one

hundred percent sure. This fact somehow made its way into the media and with his third victim, Conde wrote a message on her back with a permanent magic marker, leaving us not doubt this was his third victim. Apparently Conde wanted the police to know and inform the media that he was responsible for all three killings. In this message he indicated he would call one of the local television anchors, but he never did. And his killings continued.

The woman who was to become Conde's seventh victim was able to escape and notify the police, and this ultimately led to his apprehension. Conde had captured this woman and left her locked in his apartment while he attended a court appearance on a shoplifting charge. The terrorized woman escaped from the apartment and led us back to his apartment, where he was captured on his return. Once Conde's potential victim explained some of the details of her terrifying experience, investigators were practically certain he was the "Tamiami Strangler." Some tire tracks left on the scenes had been positively linked to an older model Toyota Celica. A quick computer check verified that he owned the exact type of car we were looking for. He was convicted of one of the murders and sentenced to death. He subsequently pled guilty to the others and was sentenced to five consecutive life sentences without parole. Conde was not a "typical" serial killer in that he did not apparently achieve any sexual gratification in torturing or beating his victims. Yet, he did achieve a peculiar satisfaction in his perception that—following his own pleasure—he was ridding the world of the type of woman who had caused his family life to disintegrate.

The forth serial killer investigation in which I participated does not fit the mold of "serial killer," so far as one exists. Robert Rozier was a former pro football player drafted by the St. Louis Cardinals who later played with the Oakland Raiders. He joined a radical black-supremacist Hebrew sect called the "Temple of Love." The cult, led by self proclaimed "Son of God" Hulon Mitchell Jr., who called himself Yahweh Ben Yahweh, was suspected of having killed 14 people in various states. Although neither Rozier nor Mitchell killed for sexual gratification or stimulation, their murders were carried out as a power struggle to keep cult defectors from ruining Mitchell's eight-million-dollar Miami empire. As proof of the killings, Mitchell required that Rozier sever the ears of his victims and bring them to him. Although the purpose of most killings was simply to keep cult members "in line," several white male victims were randomly murdered as part of the initiation to the secret "brotherhood." Severing the ears of victims threw investigators off track for a while: they hypothesized that the killer could have been a crazed war veteran, since some had been known to cut off the ear of a dead enemy soldier for some macabre reason.

Rozier was convicted of committing four murders under orders from the cult. He later admitted to seven killings and was sentenced to 22 years in prison, agreeing to cooperate with the authorities. He was released after serving just 10 years and became a federally protected witness. After relocating to his California home he violated his program and, under California's "three strikes law," was sentenced to life imprisonment.

The fifth serial-killer case I helped investigate was more notorious. In the mid 1980s, Christopher Wilder, the jet-setting racecar driver and photographer, scoured the country for beautiful women, luring them with the pretext of being a fashion-model photographer. Wilder was a more sadistic killer, systematically torturing his victims with electricity, even gluing their eyes closed with superglue. During the Miami Grand Prix, an aspiring model named Rosario Gonzalez, hired to work at the Grand Prix, met Wilder. Although we may never know the exact details of what transpired, we suspect he enticed her with the prospect of her photographs appearing in a prominent magazine.

Ms. Gonzalez apparently went with Wilder and met her demise. To this day her body has never been found. Just recently, I spoke to Lieutenant Jorge Morin who, when Rosario Gonzalez disappeared, was the lead homicide detective assigned to her case. Nearly 20 years after Rosario vanished, Morin is still baffled at the fact her body was never found. Although there was never any solid evidence that she was in fact dead, the investigation led us to that assumption, and Lieutenant Morin

hopes someday to bring closure to this as-yet-unsolved investigation. Wilder was suspected of using this same MO to torture and kill at least eight women, and was the subject of a nationwide manhunt that culminated in a police chase. On the verge of capture, he shot and killed himself.

I also helped investigate another very notorious serial killer who escaped apprehension through suicide. This case too spanned several states and concluded on a houseboat in Miami Beach. Although none of his murders actually took place within the jurisdictional boundaries of the City of Miami, the close proximity of Miami Beach enabled my detectives and me to assist the Miami Beach Police Department. Andrew Cunanan had been tracked across the United States after a multi-state killing spree, his guns linking one case to another. After killing Gianni Versace as the man was entering his home, Cunanan found temporary refuge in an empty houseboat. He lived there for many days after the murder and was discovered by the houseboat's caretaker, who ran out and notified the police. With the houseboat surrounded and bullhorns beckoning Cunanan to come, he shot himself in the head. Once again a serial killer took his demented reasons for his actions to his grave.

The final serial killer case in which I was involved was that of Fransisco Del Junco, a Cuban Mariel refugee who severely beat and set fire to four African-American prostitutes, killing all of them. By the time the second victim was found, in almost the same location as the first, we knew we were dealing with a serial killer. Linked by more than proximity, the first two victims' injuries were nearly identical. All four women were found in areas of Miami frequented by homeless people and low-priced prostitutes. Hundreds of federal, state, and local law enforcement personnel began interviewing, photographing, and obtaining DNA samples from hundreds of Miami's homeless community. One woman who claimed she was attacked, months before, by a Hispanic man from whom she was able to escape became one more potential witness among hundreds of other leads we were following. Months later, this same woman notified a uniformed police officer that the man who had attacked her was riding a bicycle in the area. All Miami police officers were aware of the high-profile serial-killer case. Anticipating that the serial killer was overdue for killing again the Task Force was out in full force, and soon after the uniformed officer's radio transmission the cyclist was located. Within minutes I arrived at the scene.

Weeks earlier, the body of Del Junco's forth victim had been discovered in an abandoned gas station. Inside, acoustic ceiling tiles had fallen under the weight of water from a leaky roof and were strewn about the floor. After having stepped in some greasy oil from the work area of this garage, Del Junco then left shoe prints on several of the white ceiling tiles. This left near-perfect impressions of a very distinctive shoe pattern. For months I visited dozens of shoe stores looking in vain for this pattern, which had become deeply ingrained in my memory.

My first request of the detained cyclist was to see the bottom of his shoe. When he lifted his foot, at last I saw the pattern I had so desperately been trying to identify. This, coupled with the fact a small pill container containing gasoline was strapped to the underside of his bicycle seat, left no doubt in my mind he was our killer. It took nearly four days of interviewing before Del Junco admitted his atrocities—four days during which, because he had not been charged, he was allowed to return home and go to work under constant police surveillance. When he finally confessed, Del Junco blamed voices in his mind that ordered him to do these things. He is charged in all four murders and is currently awaiting trial in Miami.[5]

[5] had two veteran Miami Police Department homicide detectives, Carlos Avila and Jack Calvar, assisting me during this investigation. These men were instrumental in compiling the necessary evidence to charge Del Junco with these grisly murders. Even though I am now retired from the police department, as the prosecution prepares for trial, the three of us are once again thrust into the case, gathering witnesses, reviewing interviews and Del Junco's confession, as well as a host of those other pre-trial prepartions mandated in all murder prosecutions.

The profile I submit in this article is only that, a profile. People who kill strangers all have their own macabre reasons for their acts. Nevertheless, we can learn from those who are willing to divulge their reasons, and sometimes from the acts of those who don't. Since retiring from the Miami Police Department in May of 2002, I have continued my quest to learn all that I can about serial killers and the gruesome reasons they contrive for their ghastly deeds. I plan to interview imprisoned serial killers to further educate myself on their behaviors, extracting information that may be of predictive or clinical use, and present my findings in book form.

The Role of Forensic Psychophysiology in the Pre-Trial Review in Slovenia

Polona Selič[1] and Andrej Juratovec[2]

Abstract

With the use of the polygraph device, forensic psychophysiologists examine the veracity of suspects' statements, as specified in Article 54 of the Police Act. A highly professional and more systematic use of the polygraph method in the investigation of criminal offences with elements of violence (murder and attempted murder, armed robbery, rape, sex-related violence, child abuse) has in the four year span from 1997 to 2000 proved to be exceptionally efficient, especially in cases where material evidence or traces were scarce, in cases of incorrectly constructed versions, too superfluous data collection, and too great a time lapse from the time of the act. Past use of the polygraph method in criminal police investigations was, to a greater or lesser extent, burdened by inadequate and poorly argued decisions, which resulted in the depreciation of the exceptional orientational and informational value of polygraph examination results and professional psychophysiology. Years of ignorance have devalued polygraph examination in criminal practice to the level of an "acquired skill", which is probably the reason for some recent considerations and doubts about the necessity, significance, and role of this supportive investigation method in criminal investigation practice. On the other hand, "modern" forensic psychophysiology has proved itself invaluable in the pre-trial procedure in many criminal investigations of which have captured public interest. In this article we discuss the apparent uselessness of the polygraph method, the results of which are of no value in criminal procedures, and present its orientational role, through the analysis of some aspects of cases of sexual abuse of children, rape, murder, attempted murder and robbery. We discuss the "zero" value of a confession given after a polygraph test. In the conclusion, we explain the possibilities of the development of forensic psychophysiology in Slovenian criminal investigation practice, if the management policy of the criminal police will support such development, or at least not seriously hinder it.

Introduction

In 1959, the Croatian Ivan Babić (at the time Croatia was in the SFRY) practiced a polygraph method with the use of the Keeler polygraph. The polygraph laboratory of Zagreb, which operated between 1959 and 1967 (Matte, 1998) is also where Zvonimir Roso started his professional career in 1967. During the mid-1990s he was still the only polygraph examiner with adequate professional references and qualifications in this part of Europe recognized in American psychophysiological circles. During the 1970s, polygraph laboratories in the former Yugoslavia were in Rijeka, Split, Zagreb, and Belgrade. Roso (1996) reports of a 37-year-old tradition of the polygraph method and emphasizes the dominant role of Croatian psychophysiologists, but we must point out that during the 1980s the Serbian polygraph school was also quite important from both research and operational aspects (Krstić, 1984; 1985; 1988; 1989). The "Ljubljana" (Slovenian) polygraph school was ostensibly developing during this period, but there is no structured and/or published literature to support this claim.

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It would of course be unrealistic to compare to the possibilities for the development of psychophysiological methods in Slovenia with those in the USA, Japan or Israel, but even a comparison with Romania and Croatia produces completely different tendencies and attitudes towards this practice. In Croatia, Roso (Matte, 1998) systematically monitored the possibilities of the use of the polygraph method and wrote several professional and scientific articles and the book titled *The Polygraph in Criminal Investigation Practice* (first edition 1987, second edition 1996), which was available in Slovenia. But the practice neglected even the basic rules and requirements of the application of polygraph tests found to be valid since the 1930s (Marston, 1938), such as prescribed intervals between questions (Marston, 1938; Roso, 1996). Albeit we had already been forced to select "polygraphists" in an utterly unsuitable manner, it seems impossible that the latter would be unable to read and/or understand a simple instruction, such as "at intervals of 15–20 seconds" (Roso, 1996).

The first edition of Roso's *The Polygraph in Criminal Investigation Practice* should, after 1987, have become the standard textbook, not only read by every "polygraphist" but also by everybody who lectured at any level of psychology (and even criminology and criminalistic theory) within the internal affairs administration's teaching programme. If "polygraphists" in Slovenia had observed this content they could have met the professional standards at least as "polygraph operators". And if third and later fourth level educators knew and/or understood at least as much psychophysiology as Roso (1996) had set down in the introductory chapters, they could have avoided some of the professional blunders on the part of their students (e. g., Kumer, 1999).

2 Use and Abuse of the Forensic Psychophysiology (Polygraph Method)

2.1 Professionally incompetent "polygraphists"

Abuse is 'the use of something positive for negative, evil, purposes; use contrary to the law and jurisdiction and calculated use for one's own interests' (SSKJ [dictionary of the Slovene language], 1998).

The most blatant abuse of the polygraph method is if the polygraph is operated by a professionally incompetent person. Unfortunately, the Slovenian criminal police still consider the term "polygraph method" to mean operating a polygraph. In truth, operating the device is the easiest part of the method, which, apart from average manual dexterity, requires no special knowledge or capacities. Someone who has learned to handle the device is neither a polygraph examiner nor a polygraph operator. And a person who has operated the polygraph for several years is still neither of those, especially not in the eyes of the competent professional public.

In 1950, Inbau started cautioning against the danger presented by inadequately trained polygraph examiners (Inbau, 1999), at which he especially emphasized, apart from the necessary background education, the personal characteristics necessary for the correct use of the polygraph method. He wrote that "a person of average intelligence and with average education in humanities will inevitably make more mistakes than a person with the structured education of a polygraph examiner. A professionally inadequately trained person is one who lacks the necessary fund of knowledge and who risks making a mistake in each interpretation of the polygraph test results, even if the person tends towards negative assessments" (Inbau, 1999).

A structured and verified training system and constant monitoring of the quality of work are indispensable requirements for establishing and preserving the profession. The Romanians accepted this maxim 20 years ago, the Croatians a decade later. Even the best polygraph examiner with a clear professional identity, and, most of all, with respect for his professional field, cannot afford to "teach the skill" to a future polygraph operator. On this subject Inbau (1999) wrote that: "anybody who understands and recognizes the value of the polygraph method should not accept a candidate for training if the latter lacks the basic knowledge about the polygraph, no matter what the price offered to him or which he (*in the sense of sanctions,* author's note) might have to pay.

2.2 *A professionally incompetent "polygraphist" in the role of diagnostician of the veracity of statements*

In a criminal case, the suspect's statement becomes proof after it has been written in the interrogation records (Pavišić & Modly, 1995). In the narrower sense of the two terms, the association method and most of all the polygraph method (Pavišić & Modly, 1995) are, in forensic psychology, connected to the diagnosis of the veracity of statements and the relating diagnosis of the situation (facts) (Selič, 2001). The use, and primarily the information value of the polygraph method are based on the structure of the appropriate polygraph tests. The selection of the questions and the plan of the polygraph test in the direct sense (quality of the tests and the appropriate sequence of the tests) are of key importance in the polygraph method, which should, according to generally accepted standards, be conducted only by an adequately trained polygraph examiner specialized in psychophysiology (O'Hara & O'Hara, 1994). After all these requirements in the preparation and execution have been fulfilled, the polygraph method can be an important support method in heuristic criminology, especially in the elimination of those not involved in a particular crime.

Incorrectly and unprofessionally prepared polygraph tests nullify the information value of the polygraph method and can result in erroneous diagnosis of the veracity of statements. Incorrectly eliminated (e.g. "falsely negative") and/or incorrectly verified (e.g. "falsely positive") suspects are released and often (temporarily?) eliminated from the criminal investigation ("falsely negative"), or else they remain in the center of police attention ("falsely positive"). In both cases mistakes are made, human resources are irrationally used, as are material sources, and most of all, time is lost. Because a psychophysiological veracity examination is more than just operating the polygraph, and because the opinion on the suspect's connection to the criminal act in question directly depends on the quality of the tests, the professional standards and requirements should be consistently observed.

We strongly believe that the "eternal" questions of why the conclusions (results) of a polygraph examination do not have a procedural value, why polygraph results are not accepted as evidence and the like are essentially unimportant and unnecessary. Such would be professionally, morally, and ethically unacceptable in the situation we describe. An uneducated "polygraphist" cannot and does not know how to prepare the tests according to the minimum professional standards. A system which does not ensure this and does not recognize the necessity of controlling the quality of the work of polygraph laboratories neglects the basic professional principles (in criminalistic theory and criminal investigation practice), such as *the principle of truth, objectivity, methodical and tactical work, thoroughness and persistency and, most of all, the principles of professionalism and specialization* (Krivokapić, 1987). In this we have not yet considered the rights of clients who have, in good faith, voluntarily agreed to take polygraph examinations, by which they have inadvertently been exposed and could, instead of suspects, become the victims of mistakes.

2.3 *One more aspect of the abuse of the polygraph method*

Persons who "use" the polygraph device despite their lack of knowledge are abusing psychphysiology as a profession, or, more probably, they themselves are being abused by their clients (the crime investigation management), by being used as a swift service for urgent cases, often on unrealistically short terms. Disregard for all the elements and principles of the polygraph procedure, which from a certain aspect does give the impression of exceptional time and cost efficiency, is the main cause of mistakes in polygraph examinations (Abrams & Abrams, 1993). Such conduct by an adequately educated polygraph examiner is, to say the least, unethical and, of course, professionally unacceptable. Persons without the necessary training in the field of forensic psychophysiology should not be allowed to operate polygraph devices. Both these forms of misconduct can be controlled by a system of monitoring performance quality, which is in the USA developed on both the state and the federal level (Abrams & Abrams, 1993).

Modly (1998) also understands abuse of the polygraph method in the sense of inadequate preparation for the use of the method. He maintains that the polygraph method should not be used without adequate preparation and planning, and that the preparation should be conducted according to the rules of the criminalistic profession. We are convinced that it is the duty of each criminal police employee to respect the rules of the profession and its principles, because mistakes could do damage to *material* and *indicative truth.* In discovering the truth, the polygraph method is irreplaceable, but only so long as it is not abused. An inadequately trained "polygraphist" will undoubtedly find it more difficult (professionally) to act confidently in his relation to his client (criminal investigator and/or management) and will sooner consent to insufficiently prepared cases or will be unable to evaluate the significance of individual data or groups of data needed for the professionally correct use of the polygraph method.

The apparent "easiness" and "speed" of the work of such "polygraphists" is of course appealing and appears effortless to the criminal investigators, who should, after all, question themselves whether the *truth* can in fact be established so easily, during a short discussion or a lunch break, and whether the "negative cases" (according to the "polygraphist's" assessment) are indeed not involved in the criminal act in question.

Although professionally well-trained polygraph examiners are not immune to making mistakes, the probability of such an occurrence is substantially smaller (Inbau, 1999). The more consistently the rules and principles of the profession are followed, the smaller the chances of making mistakes. An inadequately trained "polygraphist" can also be successful, and might even achieve the suspect's confession, but this must be clearly accepted as an interaction of various factors, in which the "effect of the polygraph device and the material records" plays the main part. In other words, in some cases even a photocopier can ensure success (the suspect's confession) or, as the Slovenian saying goes, even a blind hen finds the grain. Psychophysiology has developed dramatically and now provides a new quality to criminal investigation, also in more complex cases and where the "effect of the polygraph" is, due to the suspect's personal characteristics, substantially less strong. It would therefore be appropriate to discuss the matter with professional arguments, which shorter or longer "misguided practice" is surely not.

3 The Informational and Orientational Value of the Polygraph Examination

By presenting the key elements from real life cases we will reveal the informational and orientational value of the polygraph method in criminal investigation. The information by which the victims and culprits could be identified has been omitted. The documentation on all these cases is kept by the Criminal Police Administration's Investigation Support Unit at the General Police Administration.

3.1 The importance of forensic psychology in polygraph examinations

Between 1997 and 2001 we used the polygraph method in four cases of suspected child abuse of children below 15 years of age, in which no material evidence was available apart from the statements made by the victims and/or their mothers. In all four cases, the suspects were the children's fathers, all of whom denied their involvement in the act.

The use of the polygraph method in the investigation of sexual abuse undoubtedly requires knowledge of test formats and approaches specially tailored to this topic and above all an understanding of the perpetrator's psychology and the dynamics of this type of criminal offence. It is impossible to diagnose the veracity of statements made by a person of whom the polygraph examiner has no previous knowledge. The polygraph examiner must notice, feel and (together with the client) formulate how the latter feels under suspicion and what he expects from the polygraph method (Abrams & Abrams, 1993). An understanding of the suspect and his relation to the victim is indispensable in preparing high quality tests adjusted to the problem in question, which the Control Question Test (CQT; Roso, 1996) used during past decades in Slovenian polygraph laboratories was certainly not.

We often attempt to prepare peak of tension (PoT; Roso, 1996) tests for the polygraph method, which are (if they are contextually and methodically correctly formulated) significantly more reliable in differentiating between suspects who were probably invalid and those who probably weren't involved in the crime (Ben-Shakhar, 1992; Matte, 1980). A review of the PoT test format compared to other test formats (Matte, 1998) indicates that the PoT tests are accurate in revealing the truth (elimination of the uninvolved suspects). They may be better at detecting truthfulness than they are at detecting deception (Matte, 1998).

In cases of sex abuse, there is usually insufficient useful data to prepare PoT tests and even when these data exist, the test questions must be such that they are equally important or unimportant and/or threatening or unthreatening for a person who is not guilty. This makes an extensive and therefore an exhaustive, partially structured, and focused interview prior to the polygraph test necessary; in a sex abuse case such an interview should not only clarify the suspect's family, health, and professional anamnesis, his relation to the victim and the offense in question, but also the suspect's relation towards sexuality, his sexual history, and similar factors (Selič, 2000).

The latter requires adequate education in psychophysiology and extensive psychological knowledge – and, ultimately, the polygraph examiner's personal maturity. The use of polygraph examination in sex abuse cases demands a special approach in the interview preceding the polygraph test. The choice of a male and a female interviewer should be standard practice (Selič, 1999).

In three of the four cases which we will describe, we could eliminate the suspicion of involvement in a criminal offence to the greatest possible extent on the basis of interviews before and after the polygraph tests and the results of the tests. One person whom we suspected of sexually abusing his daughter had been sentenced, despite having denied the act. In the other three cases the polygraph diagnosis directed the criminal investigation work towards discovering the elements of a false accusation.

3.2 Preparation and directed collection of information

We have successfully used the polygraph method in the investigation of a rape case which was reported much later than it occurred. The first inspection of the crime scene did not reveal any conclusive material evidence; indeed it might also have been done less attentively because of the time lapse and the criminal investigators' attitude might have been that "so much time had passed that the perpetrator had already removed all the evidence".

In this case we again interviewed the victim prior to conducting a polygraph test with the suspect and thus revealed new information on the basis of which we could prepare several PoT tests. Had we been satisfied with the data provided by the criminal investigation unit who ordered the polygraph method (one of the units for homicide investigation and sexual violation), the use of the polygraph method would have been questionable. Such demands for immediate and simplified polygraph diagnosis do occur in the course of operative criminal work, but they are unacceptable. A teamwork approach, which the involvement of a polygraph examiner in criminal investigations undoubtedly is, demands cooperation between experts on equal grounds, in which nobody works in another's place and in which all are jointly trying to discover the truth. Good preparation for polygraph examination does not mean that the criminal investigators work (collect information) *for* or *instead of* the polygraph examiner, but that they are investigating a criminal offence according to the principles of the profession (Modly, 1998). "A polygraphist" who consents to the use of the polygraph method in an inadequately prepared case inevitably works against the interests of the criminal investigation management, and in a way, against the truth.

After the use of the polygraph method we concluded that the suspect probably had committed rape. We proposed that the criminal investigators re-examine the crime scene and, later, in the Centre for Criminal and Technical Investigations, they discovered micro-traces and biological traces on the collected specimens.

3.3 The importance of the polygraph examiner's inspection of the crime scene

When an elderly male was found murdered in his flat, the criminal investigators found themselves with a group of three suspects after several days of collecting information. There was no material evidence or traces and the victim was found some days after the murder, after the body had considerably changed due to decay. With their statements two of the three suspects pointed at the third, who persistently denied any connection with the crime.

At the polygraph examiner's inspection of the crime site a few days after the examining judge's inspection, we were confronted with a series of problems due to the considerable changes at the scene. From the photos we reconstructed a general picture of the area and the possibilities of movement, communication, manipulation of the victim, etc. A picture of the crime scene is very important to the polygraph examiner. Moreover, the inspection gave the polygraph examiner an opportunity to register and document noticeable markings and details which the perpetrator might have noticed and which could be used in preparing the PoT polygraph tests. In their work, the criminal investigators do not usually pay attention to the contents and elements which the polygraph examiner needs for preparing his tests. In plain language, a person who has been in an apartment for several hours is more likely to remember more details than someone who has only been there for five minutes. A person who has been sitting on a bright coloured sofa for an hour and a half will probably remember the colour. It is not the criminal investigators' role to think *instead* of the polygraph examiner, but it certainly is their duty to ensure a polygraph (examination) inspection of the crime scene if they find that this is necessary; and the right time for a polygraph (examination) inspection is unarguably during the static phase of the technical inspection of the scene.

After the polygraph (examination) inspection we had sufficient data to prepare a series of PoT tests and after completing them we could designate the suspect as someone who probably did not commit the crime. The criminal investigators continued to intensely collect information and repeated their interviews with the other two suspects. Finally, one of them admitted to the crime. The polygraph examination did not confirm the criminal investigators' version and eliminated the "real suspect", but in this specific case, it did direct the investigation in the correct direction.

3.4 The importance of the correct contents of the polygraph tests (observing the specific characteristics of each client in the polygraph examination)

After several months an alleged victim reported a murder attempt, allegedly committed by a closely related person. It was a case of an elderly, feuding, and divorced couple who lived in the same house for economic reasons and passed their days in occasional outbursts of anger, violence, and threats. The man would at times get drunk and in this condition often provoked the woman by his behaviour. The children were grown and had moved out.

When the woman demanded greater alimony from her ex-husband, his lawyer accused her of having tried to kill him by pouring a plant protection agent into his wine. He noticed the unusual and spicy taste of the drink on the first gulp and immediately spat it out. He showed the bottle to his neighbours, without alerting his former wife to the fact that he thought something was amiss. He had an analysis of the liquid in the bottle done through some acquaintances and the analysis showed that it contained an herbicide. After the criminal investigators had interviewed both of them they offered the women the use of the polygraph method, because she claimed that she had never meant her ex-husband any harm.

A polygraph (examination) inspection of the crime scene was made and the plaintiff was interviewed. There were scarce elements for preparing the tests since the plaintiff did not know which chemicals he had had at his home at the time nor did he know which herbicides he had used during the critical period. He also believed that his ex-wife had no idea what herbicides or other substances were. Moreover, he could not remember any useful events or details of that day.

In the interview preceding the polygraph test, the suspect gave an exhaustive description of her relationship with her ex-husband, which made the final completion of the polygraph tests (PoT type) and formulating the control questions for the use of the so-called direct method easier. The correctly constructed tests about the purpose and the manner of poisoning and the suspect's physiological responses to the test questions served as the grounds for a more focused interview following the actual polygraph tests. The client explained that she only wanted to frighten her ex-husband and to make him feel repulsion for the drink, because he was oppressive, violent and difficult when he got drunk. She had not intended to kill him, which we had anticipated already before applying the polygraph tests and adjusted the questions to this assumption. During the testing the client forcefully reacted to the questions of whether she wanted to frighten him or poison him, but did not respond to the question of whether she had intended to murder her ex-husband.

A superfluous interview preceding the polygraph tests and inappropriately prepared tests and questions unadjusted to the client's thought patterns and understanding could have resulted in a "false negative" polygraph diagnosis, which would have led to the suspicion of the plaintiff's false accusation.

The suspect admitted the act to the examining judge. By this she confirmed her confession during the polygraph examination, which does not have any procedural value, but if the procedure and the relationships are correct (of the polygraph examiner and the client), these are usually repeated on the court of law. Regardless of the fact that the criminal investigation police management often downplays the suspect's confession during the polygraph examination, we have managed to obtain a range of information useful for the criminal investigation in every polygraph examination, and we therefore cannot accept the *a priori* thesis that the suspect's confession has no value.

3.5 The importance of extending the polygraph examination for successful use of the polygraph method

Bank and exchange office robberies create a great public response, which is one of the reasons why the criminal investigation police want to close these cases swiftly and efficiently. Among a number of suspects which we have dealt with in our polygraph examinations in recent years, our meeting with a person suspected of robbing a bank in a provincial town in the north of the country was professionally the most interesting and demanding. We used the polygraph method in a case when the details of the robbery were published in the public media the second day after the robbery took place. The criminal investigators had identified a group of possible suspects, but they had not (yet) discovered any material evidence.

In this specific case of the use of the polygraph method in a robbery investigation, most of the (potentially) useful data was compromised for the PoT format, because the public had already been able to learn them from written and/or electronic media. Nevertheless, in order to obtain data which only the perpetrator could have known, and not also the various readers of Slovenske novice, Delo, Dnevnik or Pop TV audiences, we conducted a targeted interview of the police officer who had followed the perpetrator. In our interview we clearly defined the elements and contents which the perpetrator would have noticed during the long car chase. On this basis we prepared a series of PoT tests (about what and whom the perpetrator had seen during his escape, where and how), and with the use of the polygraph method we identified a very probable perpetrator. The latter did not want to cooperate in the interview following the polygraph test. However the analysis of the polygraph results, the contents, and most of all the manner (non-verbal expression) of the suspect's cooperation in the pretest interview were enough to justify a positive polygraph opinion.

Our conclusions directed the criminal investigators into further searches for information on the same circle of suspects. The following day, they also found material evidence which undeniably associated the suspect who took the polygraph test with the crime. Although it seemed that we were losing time in interviewing the police officer, we could professionally use the polygraph method only by involving an eyewitness. This was one of the cases in which we had the opportunity to

feel and understand Matte's (1980) declaration that forensic psychophysiology is not only a science, but in some situations borders on an art which in some cases requires the most creative solutions in an otherwise clearly structured process.

3.6 Criminal profiling and polygraph examination practice

Turvey (1999) opens the chapter on 'alternative' methods of offender profiling with a quotation saying that we should not believe the statistics until we have carefully studied what they do not say. Turvey's understanding of *polygraphy* – which he criticizes with the charge that it is not a scientific method without quoting or arguing with a single author from the field of psychophysiology – might be acceptable, if only with great reservation; we do, however, agree with his classification of forensic psychophysiology among the profiling methods, in the same way as we are only too familiar with the statement that he quotes.

Due to objective circumstances and limitations, in Slovene forensic psychology only extremely small samples of relevant cases are treated and analyzed. This is true in profiling, where we remain on the inductive level, i.e. on the level of individual case studies. It seems to be of quite secondary importance whether we conceptually rely on Canter and Heritage (1990), whether we make every effort to follow the FBI standards, whether we draw from the psychodynamic bases, or whether we put our money on behavioural pattern analysis – this is an area where we will have to continue to build mainly our own fund of knowledge and experience. Some ten odd, and these even completely different, cases by no means allow for a proper statistical processing. The small number of cases is an eternal problem of these studies (Canter & Heritage, for instance, processed 27 cases). It is therefore little wonder that their authors receive substantial criticism, which we believe, for the most part, to be justified.

In the area of forensic psychophysiology, there is a completely different situation. Here we have at our disposal several hundred empirical and more than a hundred experimental cases. We have started to combine profiling and polygraph examination. At first, the offender's specific profile is made and after that a polygraph examination is conducted. The obstacles to a more cogent scientific contribution are of a logistical and surmountable nature. For this reason we firmly believe that the combination of criminal profiling and psychophysiological veracity examination is the most important contribution of forensic psychology to more efficient criminal investigation in Slovenia.

Conclusions

At the turn of the century, forensic psychophysiology in the Slovenian police is behind the USA, particularly concerning the available data. The idea that the polygraph method has no future in criminal investigation practice, because by entering the European Union, Slovenia looks forward to compatibility and uniformity of work methods with other European police institutions, is preposterous. It is based on the false assumption that apart from the countries of the former Yugoslavia, nobody in Europe uses the polygraph method. Even if it were not an issue of considerable value, any knowledge as rare as some imagine psychophysiology is in Europe should be especially carefully nourished and developed.

Currently the use and study of psychophysiological veracity examinations with the help of the polygraph is undergoing intense development in Korea, Japan, Canada, South Africa, Romania, the Russian Federation (Barland, 1994), Poland, and some South American countries, not to mention the USA and Israel (Matte, 1998). The period of doubts and magical mistrust of the reliability and validity of the polygraph method is in the distant past in these environments, where the research results have confirmed the value of forensic psychophysiology. We are of course speaking of environments where forensic psychophysiology *is* a science, which the users and practitioners of this profession, and ultimately also the persons who decide about the human and material resources, understand.

In recent years we have consistently adhered to professional standards by a clinical approach to psychophysiological examination in a limited part of the Slovenian criminal police system, and have consistently achieved

reliable results. In 1998, Dr. Gordon Barland visited Slovenia. He encouraged our ideas and concepts and brought us a considerable number of articles. The numerical approach was also explained and introduced to us properly. A clinical approach with the analysis of the verbal and non-verbal behaviour of the clients in all phases of the polygraph examination reduces the possibility of an unclear opinion (Arther, 1983, 1984; Reid & Inbau, 1977), which is of great importance for the criminal investigation management. Although the clinical approach is to a certain extent subjective, a properly trained, experienced and professionally competent forensic phsychophysiologist (polygraph examiner) can detect deception with a 90% accuracy (Matte, 1998). Nowadays the authors of this paper still use the clinical approach although scoring of charts is present. We (the authors) have made every effort to follow the development of forensic psychophysiology and to get in touch with key figures in this development.

In most Slovenian polygraph laboratories, only and exclusively the clinical approach is used in polygraph examinations, yet most of the practitioners of this profession did not have the appropriate education. The possible mistakes made because of this situation could have influenced the present view of the polygraph method. This does not reflect the value of the method, but the service's attitude towards the special knowledge and forensic psychophysiology as a profession. A reduction or even cessation of the use of the polygraph method in criminal investigation practice is possible; the question is whether this is sensible, rational, and professionally justified. The general European practice is a questionable argument supported by lacking information. If we *hypothetically* take 100 suspects and *eliminate* 85 by the polygraph method, the criminal investigators will have to deal with *only* 15 persons. If out of 100 (again hypothetical) actual versions the polygraph method confirms 60 and rejects 30 of the versions in the first days after the event/criminal offence had occurred, this is still an important contribution to he criminal investigation, particularly in the distribution of human resources and the rational use of the taxpayer's money.

If we consent to "polygraphic charlatanism" or even encourage it, and if we fail to adjust the new test formats for use in the Slovenian environment and do not establish a central polygraph laboratory for the development and control of the quality of work, it is certainly better to immediately restrict the use of the polygraph method in criminal investigation. A profession which does not have the support or the means for its existence is undoubtedly doomed even before it has been formed. A system which does not observe the fundamental professional standards and conditions and which has no regard for psychophysiology, because it doesn't acknowledge or understand it, most probably isn't a healthy environment for its development. The vulgar pragmatic view that *"if it has been good enough during the past decades it will also be so in the future"*, can only promote abuse and mistakes. Forensic psychophysiology has so far developed without any substantial share or contribution from Slovenia and there is no reason why it could not continue to do so.

Some general support of the forensic psychophysiology (polygraph profession) has been expressed during the past decade, but for some time has failed to find any operational solutions. A targeted long-term project *The management of forensic psychophysiology in criminal investigations services* initiated in 1997 triggered the process of acquiring contemporary knowledge of psychophysiology (two foreign trained polygraph examiners), of establishing the fundamental professional standards and of shaping a training system for polygraph examiners. Inevitably these efforts clashed with the legacy of the accustomed approach and attitude towards the use of the polygraph method. In these segments merely a general support of the service leadership is no longer sufficient. The establishment and/or development of the psychophysiological profession in any system cannot lean only on the support of one or two individuals, regardless of their deliberations, persistency, and additional research projects. The training of (future) polygraph examiners in the first Slovenian school of forensic psychophysiology is a task which demands active support at all levels of the criminal police system. Systems in which the leading structures respect and value knowledge are, in principle, much easier to

develop, and will sooner achieve quality changes. Uniform solutions which neglect the content and its particularities can stifle even the greatest professional and/or personal potential.

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