Practical Polygraph: Introduction to the Newly Approved Model Policy for Algorithm Use in Evidentiary Polygraph Examinations

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According to the APA Standards of Practice section 1.1.2, evidentiary polygraph examinations are those conducted with the intention that the test result will be introduced to a legal proceeding. In contrast to other polygraph testing circumstances, for which the information from the interview context may be the primary focus of interest, evidentiary polygraphs present a greater need to explain and account for the test result, including the probabilistic information in support of a categorical interpretation and the underlying scientific basis for the test. Like all polygraph examinations, evidentiary exams rely heavily on the interpretation of complex psychophysiological data.

Central to any discussion about polygraph data analysis and polygraph test results is the acknowledgment of the many challenges inherent to both human judgment and manual test data analysis. Studies have repeatedly highlighted how human decision-making and hand scoring are subject to change, affected by numerous elements such as cognitive biases, level of experience, emotional state, tiredness, expectations, education, organizational and societal pressures, among other potential factors. These influences collectively add uncertainty to the decision-making process, posing a risk to both reliability and validity of scientific test results.

Recognizing these inherent limitations, the American Polygraph Association (APA) has published guidance in the form of a Model Policy for Algorithm Use in Evidentiary Polygraph Examinations (APA, 2024a) to improve the informational value of polygraph test results. Prior to this time, the APA has provided little published guidance on the practical aspects of algorithm use. Automated data analysis and computational algorithms present a more convenient solution – compared to paper and pencil calculations – to the requirements of the Standards of Practice

1.8.3 (APA, 2024b) which state that probabilistic results shall be provided to support the examiners reported opinion for all evidentiary examinations.

Peer-reviewed and replicated research has shown that some automated data analysis algorithms can meet or exceed the human experts in polygraph decision making (Blackwell, 1999; Honts et al, 2015; Kircher & Raskin, 1988; Kubis, 1964; Nelson & Handler, 2019; Nelson, Krapohl & Handler, 2008; Raskin et all, 1988). A key advantage of automated data analysis is reliability – the reproducibility of analytic results. Introduction of automated analysis to the polygraph profession offers the opportunity to improve the accuracy and consistency of decision making, as long as it is applied properly. Nevertheless, the ethical use of such technological solutions demands a grasp of ethical considerations, along with some understanding of the technology, adequate training, and adherence to guidelines and standards.

Importantly, the Model Policy emphasizes the role of the human examiner and defines the use of automated data analysis algorithms as supplementary to human expertise. Examiners are tasked with responsibly incorporating algorithmic insights into their decision-making framework, leveraging the strengths of both human intuition and reliable computational precision. At the same time, the policy underscores the effective utilization of technology and the integrity of evidentiary polygraph examinations by emphasizing the availability of information on both validity/accuracy metrics and algorithm design. The Model Policy requires that polygraph data analysis algorithms used in evidentiary polygraph examinations undergo validation processes of similar rigor to analogous studies of manual scoring methods and polygraph techniques in general.

At the heart of the Model Policy is a commitment to transparency and accountability. Developers of algorithmic tools employed in evidentiary polygraph examinations are required to publish their underlying features, mathematical transformations, and decision rules. This transparency not only fosters trust among practitioners and stakeholders but also enables a critical appraisal of algorithmic outputs, ensuring their alignment with established standards of practice. Furthermore, the Model Policy mandates a point of contact at algorithmic companies to address technical queries and provide ongoing support, facilitating seamless integration into polygraph decision-making.

The Model Policy dictates that polygraph field examiners must base their classification of deception or truth-telling on the analysis method they deem most robust and reliable for each examination. This leads to an important consideration, with both scientific and ethical implications. Because analytic results are inherently probabilistic it is virtually inevitable that field examiners may sometimes observe that different methods of analysis yield different statistical and categorical results.

The Model Policy states explicitly that some effort should be made to identify the cause of any observed discrepancies, but it also declares just as plainly that field practitioners are not obligated to report analytic results that do not concur with their reported conclusion. Although

there may be some reasonable and interesting discussion of different perspectives on this point, the published guidance is premised on both practicality and ethics. The practical matter is that field examiners are expected to formulate conclusions about deception and truth-telling based on an analysis of the test data. The ethical matter involves the primary consideration that the field examiner is ultimately responsible for the test and analytic result. Of course, all cases that are introduced as evidence in a legal proceeding may be subject to additional scrutiny and discussion – including the potential for the discussion of other analytical perspectives. This approach aims to prioritize the utilization of the most effective analytical methods while emphasizing the role of the field practitioners.

The development of automated polygraph test data analysis algorithm presents a somewhat natural response to the traditional challenges surrounding polygraph procedures and polygraph test results. Meticulously designed algorithms - capable of processing time-series data with consistency and precision – can offer a pathway towards greater objectivity and reliability in polygraph examinations. It is within this landscape of evolving technological advancements that the Model Policy for Algorithm Use in Evidentiary Polygraph Examinations attempts to equip practitioners, policymakers, and stakeholders with more complete information on how integration of automated data analysis into field practice will ultimately enhance the validity, reliability, objectivity and inherent fairness of polygraph results presented in courts of law or other legal proceedings.

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