

## **Benefits of Successive Hurdles Testing in Court Cases**

### *Introduction*

With advancements in credibility assessment in recent years, the argument for the admissibility of lie detection results in court has much more merit. Historically, consideration of a polygraph exam result has rarely been admitted as evidence.

### *Historical Limitations and Current Advancements*

In the past, lie detection technologies, including the de facto standard polygraph, have suffered from inherent error rates and potential examiner bias when tests are manually scored. These limitations hamper their use as reliable evidence in legal proceedings.

The introduction of EyeDetect, an ocular-motor deception test (ODT), represents a significant development in the field. The ODT differs from the polygraph in that it measures changes in cognitive load, involuntary eye movements, and reading behavior during an automated, computerized test. This approach aims for greater objectivity by removing human administration and interpretation of testing data.

### *The Successive Hurdles Model and Statistical Justification*

Meehl and Rosen (1955) proposed a "successive hurdles" model, suggesting that if a person can pass two independent tests on the same topic, the confidence in the test results increases.

The effectiveness of this model hinges on the tests measuring largely independent physiological or cognitive processes. The polygraph measures physiological responses, while EyeDetect measures changes in cognitive load and reading behavior. As such, this difference can satisfy the independence criterion. This allows for the first-time application of the successive hurdles model with reliable confidence.

### *Improved Accuracy and Statistical Inference*

Scientific studies suggest that polygraphs and EyeDetect achieve accuracy above 85%. Combining these results under the framework of Bayes' Theorem (a statistical model for updating probabilities based on new evidence) can achieve a 97-99% outcome confidence.

It is important to distinguish "outcome confidence" from "accuracy" due to inherent limitations in lie detection. Accuracy and outcome confidence are related but distinct concepts.

Accuracy refers to how often a measurement is correct. It measures how close the predicted outcome is to the actual outcome. For example, if a test correctly classifies 80% of innocent and deceptive test subjects, it has 80% accuracy.

On the other hand, outcome confidence refers to the certainty of a prediction. It measures how "sure" the test is that the classification of innocent and deceptive test subjects is correct. This is often expressed as a probability (e.g., 98% confidence).

### *Conclusion*

Advancements in lie detection technology, particularly with the introduction of EyeDetect, combined with the successive hurdles model and Bayes' Theorem, present a compelling argument for reevaluating the admissibility of lie detection results in court.

This approach's improved objectivity and statistical justification warrant further scientific exploration and legal consideration.

### *Sources*

Meehl & Rosen, "Antecedent Probability and the Efficiency of Psychometric Signs, Patterns, or Cutting Scores," *Psychological Bulletin*, 1955.

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