

Human Factors

Mitigation of Forensic Error Rates in Evaluating Pattern-Based Handwriting Evidence Using a Lineup Process

Dr. Larry Miller, East Tennessee State University, United States; Heidi Harralson

Abstract: It is documented that forensic science errors in pattern-based sciences can be mitigated through management of potentially biasing information. Biasing information can include contextual information about a case or a suspect, but errors can also be incurred through perceptual judgment (e.g., seeing similarities in patterns between samples while overlooking subtle differentiating details). Previously, through published research concerning bias in the forensic analysis of handwriting and human hair, forensic examiners error rate decreased when they were provided with a 'lineup' as a part of their decision-making process, helping to guard against contextual bias (Miller, 1984, 1987). When the testing subjects were provided with biased information concerning the case details and a single suspect, rather than a lineup, the subjects' error rate significantly increased.

To illustrate the problems associated with bias that occur in forensic examination and presentation of evidence in the courtroom, a forensic handwriting examination case study is presented by the authors involving a questioned block printscript sample that was 'matched' to a single suspect's handwriting samples and identified by a forensic document examiner. When the case was adjudicated, it was demonstrated, through a lineup process, how the simple, block printscript matched class or common characteristics of several writers, not only the suspect. The study also demonstrated how, through a lineup process, several evaluators mistakenly picked the wrong suspect out of the handprinting lineup. Through the case study, it is demonstrated how simple matches in pattern-based evidence are persuasive and potentially misleading to judges and jurors, especially since the sensationalism of forensic evidence in the media promotes perceptual error through making simple assumptions about matching samples.

Research has shown that the brain's experience with patterns can create perceptual expertise causing the brain to automatically process information and create holistic patterns rather than observe its featural characteristics (Curby & Gauthier, 2010). Assumptions about how handwriting is unique and identifiable also need critical examination as the accuracy of this assumption is dependent upon the unique qualities and quantity of the samples available. Forensic practitioners who evaluate pattern-based evidence need training that targets the automatic processing that occurs during perceptual expertise and challenge assumptions when working with comparative evidence. This training should also include how to counter the cognitive biases and perceptual expertise effects that judges and jurors are suspect to when observing comparative evidence. Creating checks and balances in the procedures and protocols in evaluating pattern-based evidence should be developed. Forensic practitioners can guard against and mitigate these errors by employing simple laboratory protocol and procedures. Methods and procedures for developing and using lineup processes accurately and effectively will be discussed and demonstrated.

Curby, K. M., & Gauthier, I. (2010). To the trained eye: perceptual expertise alters visual processing. *Topics in Cognitive Science*, 2(2), 189-201.

Miller, L. S. (1984). Bias among forensic document examiners: A need for procedural changes. *Journal of Police Science and Administration*, 12(4), 407-411.

Miller, L. S. (1987). Procedural bias in forensic science examinations of human hair. *Law and Human Behavior*, 11(2), 157.