INSIGHTS

A Practical Tool for Information Management in Forensic Decisions:

Using Linear Sequential Unmasking-Expanded (LSU-E) in Casework

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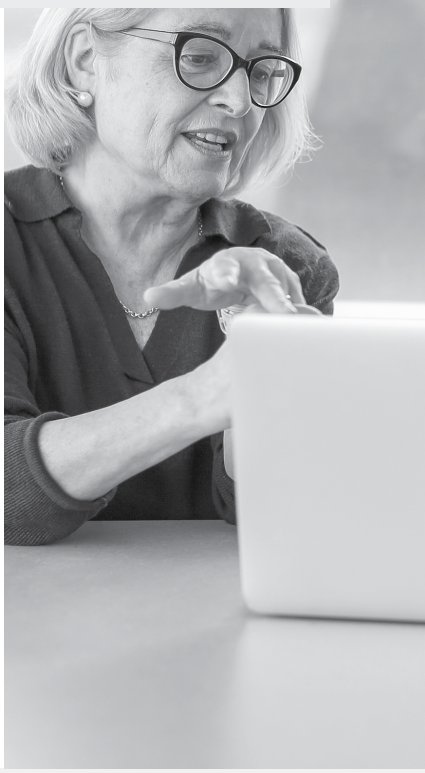

OVERVIEW

While forensic analysts strive to make their findings as accurate and objective as possible, they are often subject to external and internal factors that might bias their decision making. Researchers funded by CSAFE created a practical tool that laboratories can use to implement *Linear Sequential Unmasking-Expanded* (LSU-E; Dror & Kukucka, 2021)—an information management framework that analysts can use to guide their evaluation of the information available to them. LSU-E can improve decision quality and reduce bias but, until now, laboratories and analysts have received little concrete guidance to aid implementation efforts.

GOALS

- Identify factors that can bias decision-making.
- Describe how LSU-E can improve forensic decision processes and conclusions.
- Present a practical worksheet, as well as examples and training materials, to help laboratories incorporate LSU-E into their casework.

TYPES OF COGNITIVE BIAS

Cognitive biases can emerge from a variety of sources, including:

- The specific evidence and facts associated with a particular case.
- An analyst's education, training, and experience.
- A laboratory's regular practices.
- Features of the human brain and cognition, which manifest when anyone makes subjective decisions.

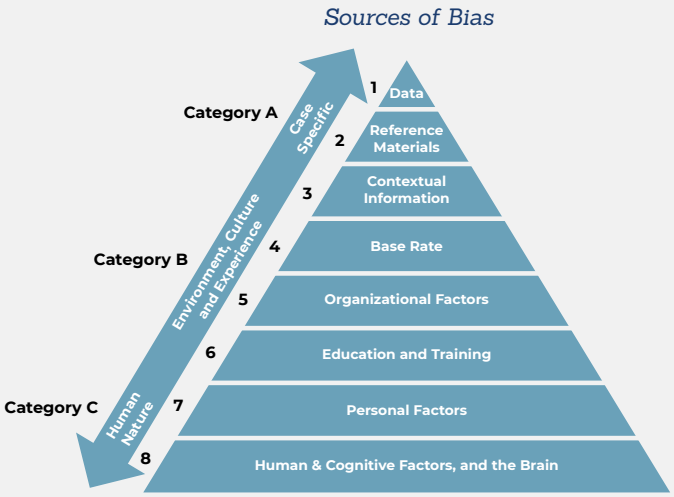

Figure 1. Eight sources of cognitive bias in forensic science (Dror, 2020)

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COGNITIVE BIAS IN FORENSIC SCIENCE

As shown in Figure 1, there are many potential sources of information that can influence analysts' decisions. Of particular concern is suggestive, task-irrelevant contextual information (such as a suspect's race, sex, or prior criminal record) that can bias analyst's decisions in inappropriate ways.

In one famous example, FBI latent print analysts concluded with "100 percent certainty" that a print linked to the 2003 Madrid train bombing belonged to a US lawyer, Brandon Mayfield. It transpired that these analysts were all wrong—that was not Mayfield's print. Mayfield was Muslim, which might have biased the analysts given the strong, widespread attitudes towards Muslims post 9/11. Also, Mayfield was on the FBI's "watch list" because he provided legal representation to someone accused of terrorist activities. Combined, these facts led to confirmation bias effects in the analysts' evaluations and conclusions about Mayfield's fingerprints.

LSU-E AND INFORMATION MANAGEMENT

LSU-E is an approach information management which prioritizes case information based on three main criteria:

- **Biasing power:** how strongly the information might dispose an analyst to a particular conclusion.
- **Objectivity:** the extent to which the information might be interpreted to have different "meanings" from one analyst to another.
- **Relevance:** the degree to which the information is essential to the analytic task itself.

IMPLEMENTING LSU-E IN FORENSICS

Quigley-McBride et al. have created a practical worksheet for laboratories to use when assessing new information.

- First, the user specifies the information in question and its source
- Second, they consider the three LSU-E criteria, and rate the information on a scale of 1-5 for each criterion
- Finally, they describe strategies to minimize any adverse effects the information may have on the decision-making process

FOCUS ON THE FUTURE

- Ideally, LSU-E procedures would be applied before the information reaches the analyst. That said, it is still effective when used at any point in the analyst's workflow and can help analysts become aware of information that can inappropriately influence their work.
- In addition to benefits for analysts, implementing LSU-E could help jurors evaluate the reliability of forensic expert testimony. This would not only encourage healthy skepticism among jurors, but could bolster an expert's credibility by providing documentation of methods used to evaluate and mitigate potential biases in their decisions.

LEARN MORE

To learn more, the full paper can be found here: forensicstats.link/ImplementationofLSUE

Additionally, explore relevant publications:

- What do forensic analysts consider relevant to their decision making? forensicstats.link/WhatDoForensicAnalystsConsiderRelevant
- The Costs and Benefits of Forensics forensicstats.link/CostsandBenefitsofForensics

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