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# COGNITIVE BIAS AS PRESENTED IN THE NIST/NIJ EXPERT WORKING GROUP FOR HUMAN FACTORS IN FORENSIC HANDWRITING EXAMINATION REPORT

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## Introduction

The *Forensic Handwriting Examination and Human Factors: Improving the Practice Through a Systems Approach* [1] Report (HFHE Report), produced by the NIST/NIJ Expert Working Group on Human Factors in Forensic Handwriting Examination (the Working Group), dedicates a significant portion of its chapter on Interpretation and Technology to the topic of cognitive bias. Here, we present a summary of some highlights of that discussion and a working example of contextual information management (CIM). We recommend that readers interested in this topic review Chapter 2 of the HFHE Report [1]. Readers should also refer to the introductory article of this special series [2] which includes a full list of the Working Group's recommendations.

## Cognitive bias in Forensic Handwriting Examination

The forensic document examiner (FDE) is the main instrument in the interpretation of handwriting, therefore the Working Group determined it essential to understand the potential for cognitive bias and ways to mitigate it. Cognitive bias is a systematic pattern of deviation in human judgement ([1] Section 2.1). It also “refers to the class of effects by which an individual’s preexisting beliefs, expectations, motives, and situational context may influence their collection, perception, or interpretation of information, or their resulting judgments, decisions, or confidence.” [3] Prior

to the Working Group’s efforts, several authoritative reports had already called for forensic laboratories to address the issue in their practices.

A committee of the National Research Council (NRC) recommended “standard operating procedures [and] model protocols to minimize, to the greatest extent possible, potential bias . . . in forensic science.” [4] The NIST Expert Working Group on latent print analysis [5] noted “the desirability of procedures to help avoid bias” (p. 41). Furthermore, the National Commission on Forensic Science (NCFS) expressed its view that “[f]orensic laboratories should take appropriate steps to avoid exposing analysts to task-irrelevant information through the use of context management procedures detailed in written policies and protocols.” [6, p. 1-2]

The HFHE Report describes practical strategies to address the issue of bias in forensic science ([1], Section 2.1.7). These CIM strategies aim to minimize exposure to task-irrelevant information while still allowing the FDE to access information that is relevant to their task. The Working Group recommended that FDEs adopt CIM in handwriting examinations (Recommendation 2.2). Central to CIM development is understanding when and what types of contextual information to utilize or avoid; that is, the determination of what constitutes task-relevant and task-irrelevant information.

The HFHE Report includes an in-depth discussion of task-relevance and how different sources of contextual information might affect forensic casework and FDE opinions ([1], Section 2.1.1). First presented by Stoel and colleagues [7] the Working Group discussed a general framework for deciding when and what type of action should be taken to manage contextual information, according

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	<b>Task-Relevant Information</b>	<b>Task-Irrelevant Information</b>
Biasing	Keep, but take measures	Shield FDE from this information
Not Biasing	Use	Not strictly necessary to shield FDE but shield if possible and efficient

Table 1 (Table 2.1 in the HFHE WG Report): Overview of general actions to manage contextual information

to whether information is biasing and relevant (Table 1). Although in theory, no action is needed for information that is not biasing, it is not always clear when information is biasing. In practice, even though it may be more efficient not to do anything with (i.e., leave in) irrelevant non-biasing information, it may be best to exclude all task-irrelevant information whenever practical.

### **Applying Contextual Information Management in Practice**

The HFHE Report provides several ways to manage contextual information to mitigate the potential negative effects of cognitive bias ([1] Section 2.1.7). Here, we provide some examples of CIM procedures currently employed in a small (three-person) forensic document examination team that is part of a larger state government laboratory in Australia (Forensic Science SA):

- Task-irrelevant, potentially biasing case information is shielded from the reporting FDE by another examiner, although due to the small size of the team, sometimes the other examiner ends up also being the reviewer.
- An organization-wide policy regarding cognitive bias is in place. This policy informs staff about potential sources of cognitive bias in operational activities and provides general guidance to reduce the potential impact of cognitive bias in casework decision-making and interpretation. The policy includes:

- Regular cognitive bias awareness training and assessment for all staff, including an introduction to cognitive bias at induction.
- Limiting access to task-irrelevant information by:
  - Staff not unnecessarily discussing case-specific information/results with staff in other disciplines.
  - Not having individual staff perform analyses or reviews across multiple disciplines in the same matter, where possible.
  - Not accessing reports generated in other disciplines, unless necessary for operational reasons.
  - Limiting staff involvement with analyses and interpretation of the results if they have been involved with exhibit triaging decisions or case management meetings where they may have been exposed to task-irrelevant information.
- Considering redaction of task-irrelevant information from submission paperwork.
- Reducing expectation bias by analyzing and interpreting the unknown sample prior to consideration of the known,

where this does not negatively affect efficiency. As described in the HFHE Report's Process Map ([1] See Chapter 1) the document examination team analyze and document features of the questioned writings before they analyze the known writings.

## Conclusion

There is a plethora of experimental research on contextual bias in other forensic disciplines, but relatively few studies address forensic handwriting examination. The HFHE Report (see Recommendation 2.1) suggested that studies, conducted in collaboration with the research community and forensic document examiners, should investigate:

- whether some sources of contextual information are more biasing than others,
- the optimal order for FDEs to perform their tasks and receive task-relevant information,
- the efficacy of CIM protocols, and
- a cost/benefit analysis of the threshold at which information loss has a greater detrimental impact than risk of bias.

However, the Working Group stresses that it is not necessary to await the results of these studies. There is already sufficient justification in existing literature to support the immediate implementation of CIM protocols (Recommendation 2.2). The outcomes from studies that result from Recommendation 2.1. should be used to improve the impact and efficiency of any CIM protocol utilized.

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