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An inconvenient truth: More rigorous and ecologically valid research is needed to properly understand cognitive bias in forensic decisions

Lee J. Curley, James Munro, Martin Lages

Faculty of Arts and Social Sciences, School of Psychology and Counselling, The Open University, Milton Keynes, England, UK
School of Applied Sciences, Edinburgh Napier University, Edinburgh, Scotland, UK
College of Science and Engineering, The School of Psychology, The University of Glasgow, Glasgow, Scotland, UK

Cognitive bias is an umbrella term used to explain subjective perceptions of people, objects and/or events that deviate from a normative framework [1]. Biases are normally created through an interaction of heuristics (cognitive short-cuts [2]; with world experiences [3]. Assessing the prevalence, impact and type of cognitive bias on decision making in different parts of the justice system should be prioritised to ensure continued trust in the system [4].

1. Juror decision making and their perceptions of forensic evidence

Due to the weight of responsibility placed on jurors, any factors which impact their decisions are, understandably, of particular interest. For example, our understanding of the impact of racial biases [5], rape myths [6], and gender biases relating to defendants, victims and expert witnesses [7,8] on jurors have been markedly improved by a wealth of rigorous and experimentally valid research. More recently, Curley and colleagues have studied the processes through which jurors form their judgements and make their final verdict [4,9]. Forensic psychology, legal research and now decision science research are making joint headway in understanding the impact of biases on the decisions made at each stage of the legal process.

Jurors place different weight on different types of evidence presented to them. Forensic evidence (evidence obtained using scientific methods such as fingerprints, blood splatter, bite mark or DNA analysis) is typically weighted strongly by juries [10]. Lynch [10] suggests that DNA evidence is presently viewed as the current ‘gold standard’ in relation to the evidence presented in court. Brodard [11] determined that the likelihood of a conviction after DNA evidence was presented to a jury was much higher than without DNA evidence. The convicted criminals themselves put a strong emphasis on DNA evidence when considering the dangers of committing a crime. Prainsack and Kitzberger [12] interviewed criminals to determine their views on DNA and other forensic evidence. These criminals believed that it was impossible not to leave a DNA fingerprint at a crime scene, and that DNA evidence is both impenetrable and intimidating due to the scientific rigour applied by an expert when interpreting the evidence. Furthermore, evidence provided by a forensic science laboratory, despite being circumstantial, is seen as strong, important and influential by legal laypersons when making decisions.

A recent review by Eldridge [13] discusses some of the difficulties in presenting forensic evidence by an expert to a layperson jury. For example, the review highlighted that jurors see the term “match” as indicating a strong association between the suspect and the forensic evidence left at a crime scene, whereas forensic examiners perceive the term match as a weaker association than terms like “individualisation” and “identification”. Eldridge [13] also argues that jurors may prefer numerical testimony but may not fully understand said testimony; visual aids that help jurors understand probability may help here. Further, communication errors may not be confined to juries and the adversarial system, as Canela et al. [14] found that legal experts, in the inquisitorial system, self-reported that they had a relatively poor understanding of medical evidence, and that there was no consensus on how legal experts should evaluate medical and forensic reports. Furthermore, legal
decision making research has highlighted that forensic laypeople struggle with scientific and mathematical terms, making it difficult for expert witnesses to communicate their evidence effectively to said individuals. To mirror the point of Eldridge [13], future research (particularly from cognitive psychologists and decision scientists) is needed to further understand how jurors process forensic evidence, and how their comprehension can be aided.

2. Previous research on cognitive bias in forensic science

The United Kingdom Home Office, Association of Police and Crime Commissioners, National Police Chief’s Council and the House of Lords all agree that the fair administration of justice relies upon public trust in the criminal justice system [15,16]. This public trust depends on proper interpretation of forensic evidence by examiners, and how said information is communicated to jurors [17]. Therefore, to ensure that the public has trust in the legal system, research from decision scientists is needed to ensure how forensic scientists and other legal actors (such as police and jurors) are making decisions.

Dror and Colleagues took pioneering steps in the field of forensic science to identify and highlight the stability of the effects of bias across different forensic domains [17,18]. Their research highlights that task-irrelevant contextual information can influence (or bias) the judgments of forensic scientists when they are presented with ambiguous information [17,18]. Bias produced from task-irrelevant contextual information in forensic scientists (aptly named contextual bias) may therefore impede the legal systems ability to deliver justice in society.

Dror [19] also discussed ‘bias cascades’ and a ‘bias snowball’, where bias from one piece of an investigation can accumulate, potentially increasing the strength of the bias as each element of an investigation interacts. Real-life cases (e.g., Madrid bombing) have indicated that bias in forensic decision making may not be confined to the researcher’s lab and may lead to miscarriages of justice. Once again highlighting the importance that can be placed on investigations into contextual bias and the potential effects that it can have on the decision making of forensic scientists.

3. An inconvenient truth: more rigorous and ecologically valid research is needed

Bias, from a layperson’s perspective, is a word synonymous with error. The concept of anyone involved in the criminal justice system making biased judgements – especially forensic scientists – is an anathema. In the papers discussed above, it is assumed that cognitive biases in forensic decision making reduce the accuracy of the decisions. Indeed, very few studies have gone as far as to show, for example, that biases may, or may not, have on forensic scientists process forensic evidence, and how their comprehension can be aided.

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However, where decision scientists need guidance from forensic scientists is on the selection of stimulus material, contextual (both task-relevant and task-irrelevant) information and experimental manipulations [32]. Together, decision scientists and forensic scientists can provide ecologically valid scientific data that can reveal the true impact of task-irrelevant contextual information on forensic decision making.
Declaration of competing interest

None of the authors report any conflict of interest.

CRediT authorship contribution statement

Lee J. Curley: Conceptualization, Writing - original draft, Writing - review & editing. James Munro: Conceptualization, Writing - original draft, Writing - review & editing. Martin Lages: Writing - review & editing, Writing - original draft, Conceptualization.

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