

Cognitive Effects and Cognition of Forensic Experts

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Agenda

1. Who am I?
2. My research
3. Some problems and their possible solutions
4. The BIG problem

1. Who am I?

- Itiel Dror
- Got my Ph.D. at Harvard in cognitive psychology
- Do mainly theoretical work on human performance: decision making, expertise, and visual cognition
- Application to a variety of real world domains, such as military (US Air Force), policing, medical, and forensics (mainly fingerprints)

2. My research (in forensics)

- Examining a variety of issues that pertain to cognition of forensic experts:
 - Visual-mental representation
 - Decision model (really how they do it, not ACE-V)
 - Top-down effects on perception and judgment
 - Contextual influences (perceptual and conceptual)
 - Psychological state (e.g., motivation, emotion, state of mind)
 - Bias & error (confirmation bias is only one!)
- forensic decision making

Examples published articles:

- Applied Cognitive Psychology (2005)
- Forensic Science International (2006)
- Journal of Forensic Identification (2006)
- Journal of Forensic Sciences (in press, 2008)
“Meta-analytically Quantifying the Reliability and Biasability of Forensic Experts”

Examine the potential of context (perceptual and conceptual) as influencing the determinations made by forensic experts.

- Application of a known phenomena to the domain of forensics
- Used a within-subject experimental design
- Covert, ecologically valid, data collection

3. Some problems & their possible solutions

- Generally, lack of scientific underpinning and guidance:
 - Selection (paper)
 - Training (paper)
 - Procedures
 - Use of technology

- ➔ Guided by psychological research and empirical experimentation (properly done!)

3. Some problems & their possible solutions

- Generally, lack of scientific psychological research and empirical validation:
 - Selection (paper)
 - Training (paper)
 - Procedures
 - Use of technology

However, these issues are:

1. Not unique to forensics
2. Solvable

4. The BIG problem

- Not the bias, nor the findings, etc.
- But the responses and attitude to research, the lack of openness and willingness to take on challenges
- In contrast to other real 'life and death' domains (such as medical and military), forensics (and in particular fingerprint) are resistant and even resentful to criticism, examination, scrutiny, etc.
 - necessary tool for any field to advance

- As if they are in court, in an adversarial set-up, where different sides have a priori positions and are against one another. Rather than we are all on the same side, wanting to advance and promote reliable, valid, and widely used forensics.
- The response and attitude of the forensic community (not all), and in particular fingerprint (not all), is the biggest obstacle in the advancement of this field.

Bias is an old and established phenomena

- **Some, not all, references:**

- Ask, K., and Granhag, P. A. (2005). Motivational sources of confirmation bias in criminal investigations: The need for cognitive closure. *Journal of Investigative Psychology and Offender Profiling*, 2, 43–63.
- Balcetis, E., and Dale, R. (in press). Conceptual set as a top-down constraint on visual object identification. *Perception*.
- Balcetis, E., and Dunning, D. (2006). See what you want to see: Motivational influences on visual perception. *Journal of Personality and Social Psychology*, 91, 612-625.
- Ditto, P. H., and Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of Personality and Social Psychology*, 63, 568–584
- Edwards K. and Smith E. E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of Personality and Social Psychology*, 71, 5-24.
- Evans, J. St. B. T. (1989). *Bias in human reasoning: causes and consequences*. Hillsdale, NJ: Erlbaum.
- Haselton, M. G., Nettle, D., and Andrews, P.W. (2005). The evolution of cognitive bias. In D. M. Buss (Ed.), *Handbook of Evolutionary Psychology*, (pp. 724-746). Hoboken: Wiley.
- Kunda, Z. (1990). The Case for Motivated Reasoning. *Psychological Bulletin* Vol. 108, No. 3, 480-498.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2, 175–220.
- Stelfox, P., and Pease, K. (2005). Cognition and detection: Reluctant bedfellows? In M. J. Smith and N. Tilley (Eds.), *Crime science: New approaches to preventing and detecting crime* (pp. 191-207). Cullompton, Devon: Willan Publishing.
- Zhaoping, L. and Guyader, N. (2007) Interference with bottom-up feature detection by higher-level object recognition. *Current Biology* 17, 26–31

- **Scientific (and even non-scientific) domains have been addressing it, e.g., blind ratings, interpreter reliability, etc**

Examples to illustrate the problem:

1. SWGFAST:

Does not have, never had, a single cognitive psychologist.

Not that having one will 'solve' the problems, but what does it reflect that the body that establishes procedures to 'combat' bias and other cognitive effects (e.g., Mayfield) has resisted having any expertise in this area

(or even properly learning about these issues).

(result, e.g. → naive view that 'knowing' and 'being aware' by itself is sufficient).

2. The Friction ridge Sourcebook. Cognitive and contextual bias have led to erroneous identification (e.g., Mayfield), they are discussed in courts (e.g., Maryland vs. Rose)
→ You would think that a sourcebook would emphasise and bring to the forefront such issues...

Well, think again!

In fact, attempts to hide/bury/censor these issues!

3. The letter of the Head of the Fingerprint Society, published in their professional journal:

Any forensic experts that may be susceptible to cognitive bias or/and contextual effects are “immature”, “incapable” and “should seek employment in Disneyland”!

Those who collaborate should “know better”, etc.

It is also important to stress that it is not all 'bad news'; there is change and there is openness by some. However, these are limited, slow, and unsystematic.

I want to thank the National Academia of Science committee for inviting me and listening, and I hope the committee will do the right things to deal with these issues and advance this important domain.

Thank you,

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