



Cognitive Bias in Forensic Science

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Forensic Science Errors





To Err Is Human

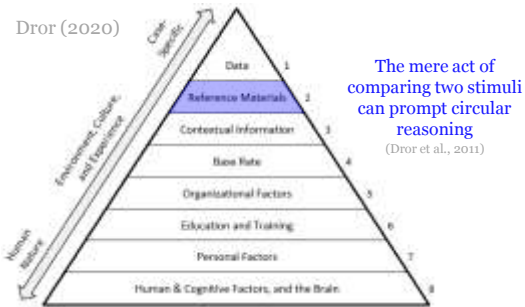


Cognitive bias is **NOT** an ethical, motivational, or competency issue.

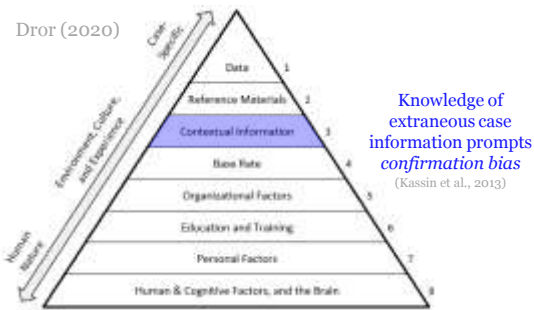
Most examiners are not *dishonest*, *careless*, or *incompetent*...



Sources of Bias / Error



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Three Examples...

Experts reanalyzed the same prints after learning of a confession or alibi.



17% of judgments changed over time

Dror & Charlton (2006)

Trained students tested for presence of opiates with or without extraneous info



Affected tests chosen and tripled error rate

Hamnett & Dror (2020)

Pathologists given same medical info—but different non-medical info.



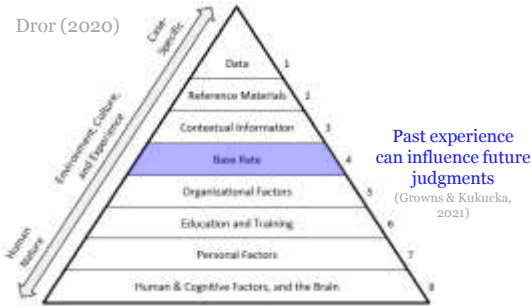
Homicides increased from 13% to 35%

Dror et al. (2021)

... Among Many

- Document examination (e.g., Miller, 1984)
- Fingerprint comparison (e.g., Dror & Charlton, 2006)
- Complex DNA analysis (Dror & Hampikian, 2011)
- Arson investigation (Bieber, 2012)
- Forensic anthropology (e.g., Nakhaeizadeh et al., 2014)
- Crime scene investigation (van den Eeden et al., 2016)
- Blood spatter analysis (e.g., Osborne et al., 2016)
- Forensic pathology (Dror et al., 2021; Oliver, 2016)
- Forensic toxicology (Hamnett & Dror, 2020)
- Footwear impression comparison (Sneyd et al., 2020)
- Bullet/cartridge comparison (Mattijssen et al., 2020)

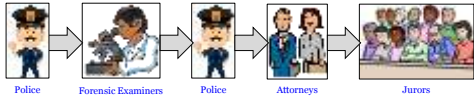
Sources of Bias / Error



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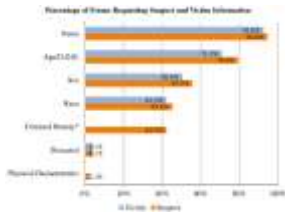
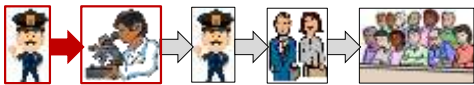
Combating Bias



Where can we break this chain?



What Do Examiners Know?



Many evidence submission forms solicit information that is task-irrelevant and potentially biasing.
 ("Who knew what and when?")

e.g., Gardner et al. (2019)

What Do Examiners Think?

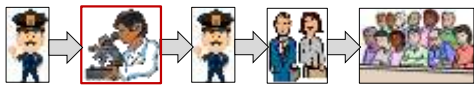


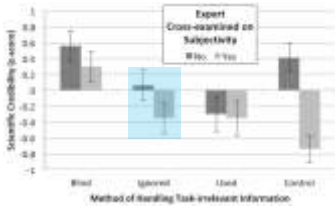
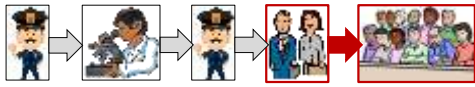
Table 1
 Beliefs (%) about the Scope of Bias

Examiners show a bias blind spot.

	Yes	No	Don't know
In your opinion, is cognitive bias a cause for concern in the forensic sciences in a whole?	70.97	27.37	11.66
In your opinion, is cognitive bias a cause for concern in your specific domain of forensic sciences?	52.36	36.97	10.67
In your opinion, are your own judgments influenced by cognitive bias?	25.69	54.11	20.20

Kukucka et al. (2017)

What Should Attorneys Do?



Highlighting subjectivity of the analysis appears more effective than attacking credentials

Lieberman et al. (2008); Thompson & Scirich (2019)

What Should Examiners Do?



- Blind proficiency testing (e.g., NCFSS, 2016)
- Blind verification (e.g., Ballantyne et al., 2017)
- Case manager model (e.g., Thompson, 2011)
- Linear sequential unmasking (Dror et al., 2015)
- Evidence lineups (Kukucka et al., 2020; Wells et al., 2013)

Suggested Readings

Edmond, G., et al. (2014). How to cross-examine forensic scientists: A guide for lawyers. *Australian Bar Review*, 39, 174-197.

Garrett, B. L. (2021). *Autopsy of a crime lab: Exposing the flaws in forensics*. Berkeley, CA: University of California Press.

Kukucka, J. & Dror, I. E. (2021). Human factors in forensic science: Psychological causes of bias and error. In D. DeMatteo & K. C. Scherr (Eds.), *The Oxford Handbook of Psychology and Law*.

Simon, D. (2018). Minimizing error and bias in death investigations. *Seton Hall Law Review*, 49, 255-305.

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