Future challenges for Data: interpretation, application, communication

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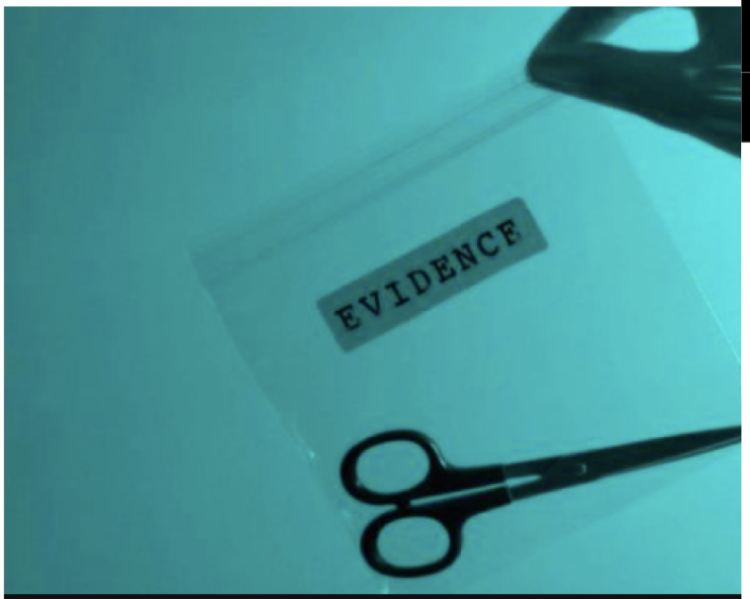
Review over forensic failures Police

8 May 2018



The review will help to determine whether there is any risk to the criminal jus

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ITV REPORT 21 November 2017 at 11:20am

More than 10,000 criminal cases 'may be affected' by forensic data manipulation

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NEWS

Fallout from rogue US forensic chemist continues

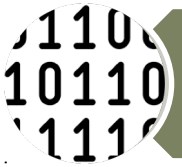
BY REBECCA TRAGER | 17 APRIL 2018

Massachusetts' highest court has dismissed more than 11,000 drug convictions due to serious misconduct by a drug lab chemist

Overview

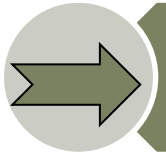
A question for data

Forensic science

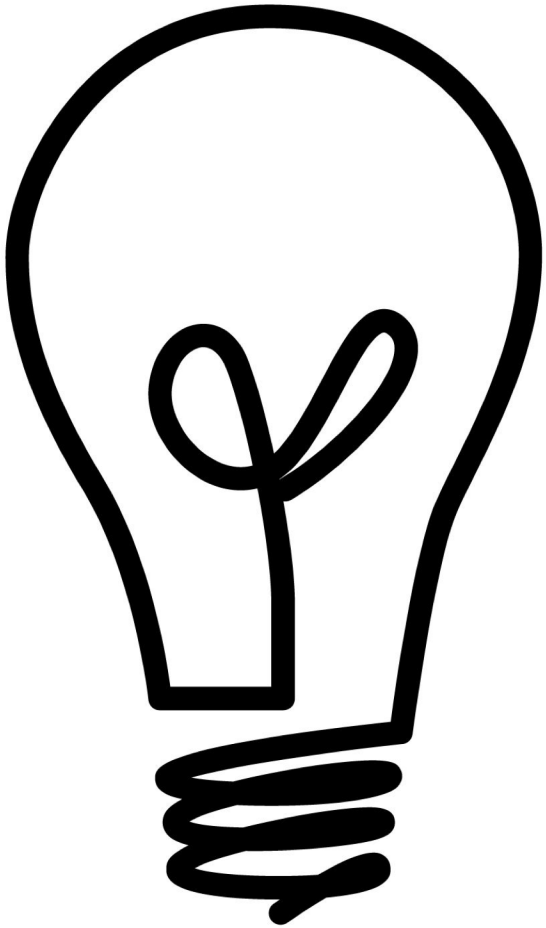


Data in forensic science

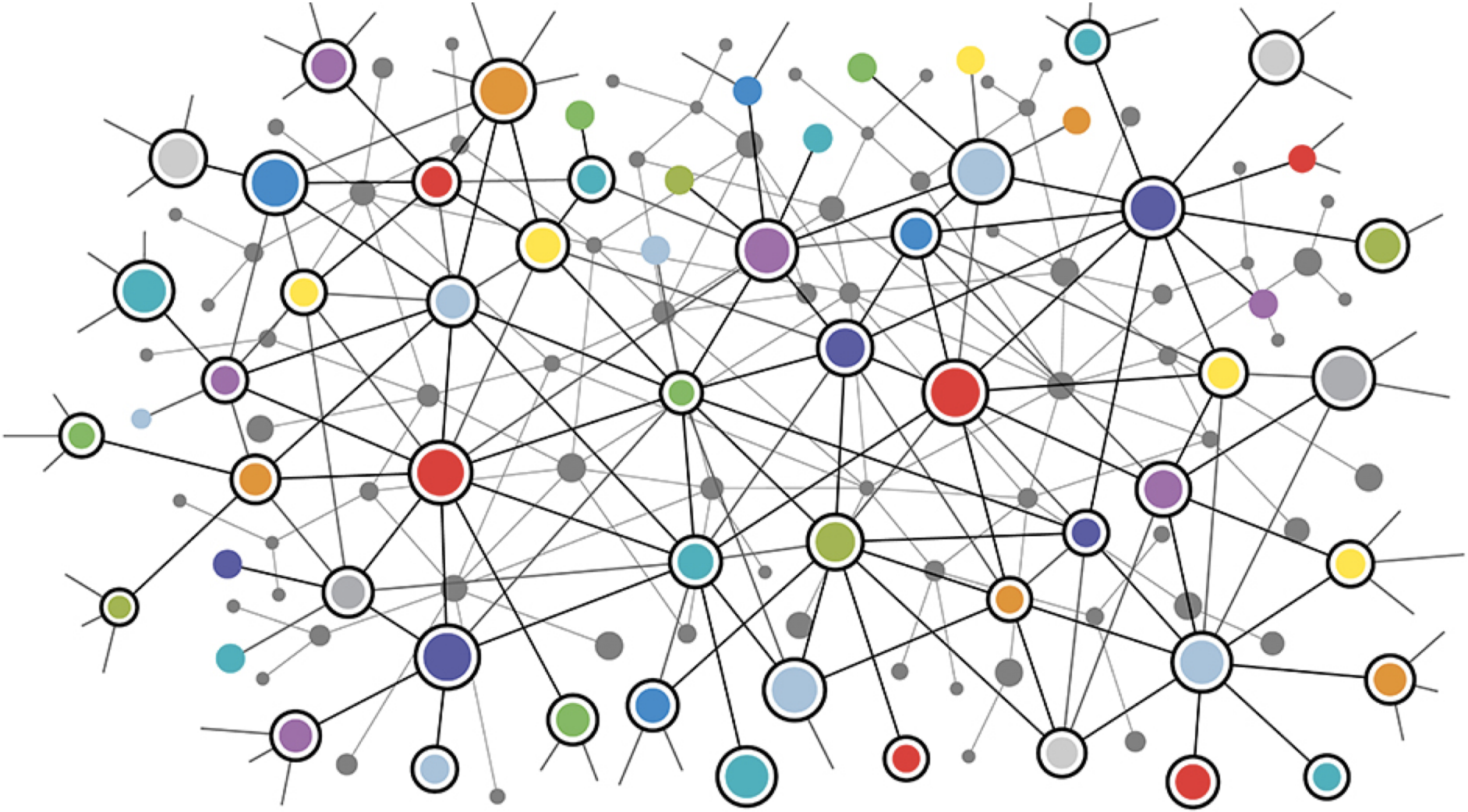
Examples



The challenges going forward



Forensic science



Data in forensic science

Crime scene → Analysis → Interpretation → Intelligence /evidence

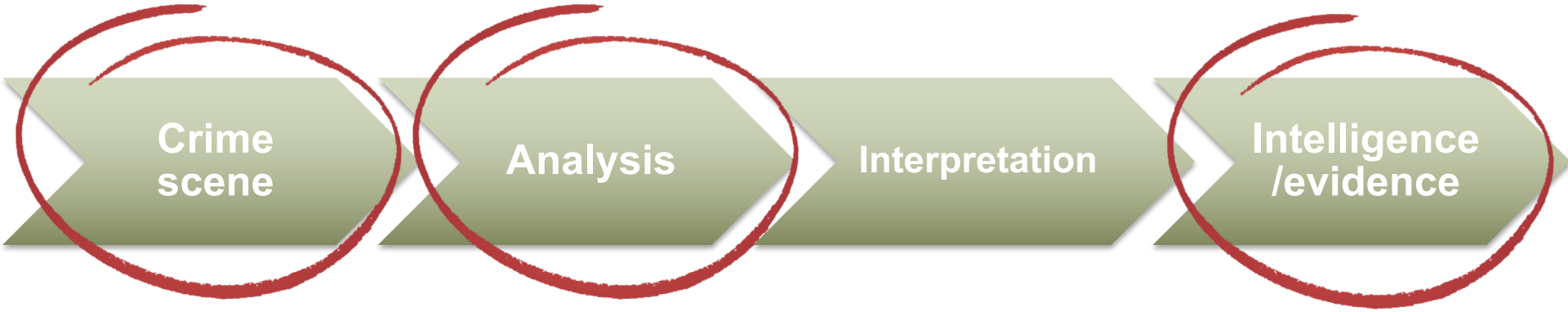
Crime scene → Analysis → Interpretation → Intelligence/ evidence

Technical knowledge

Skills

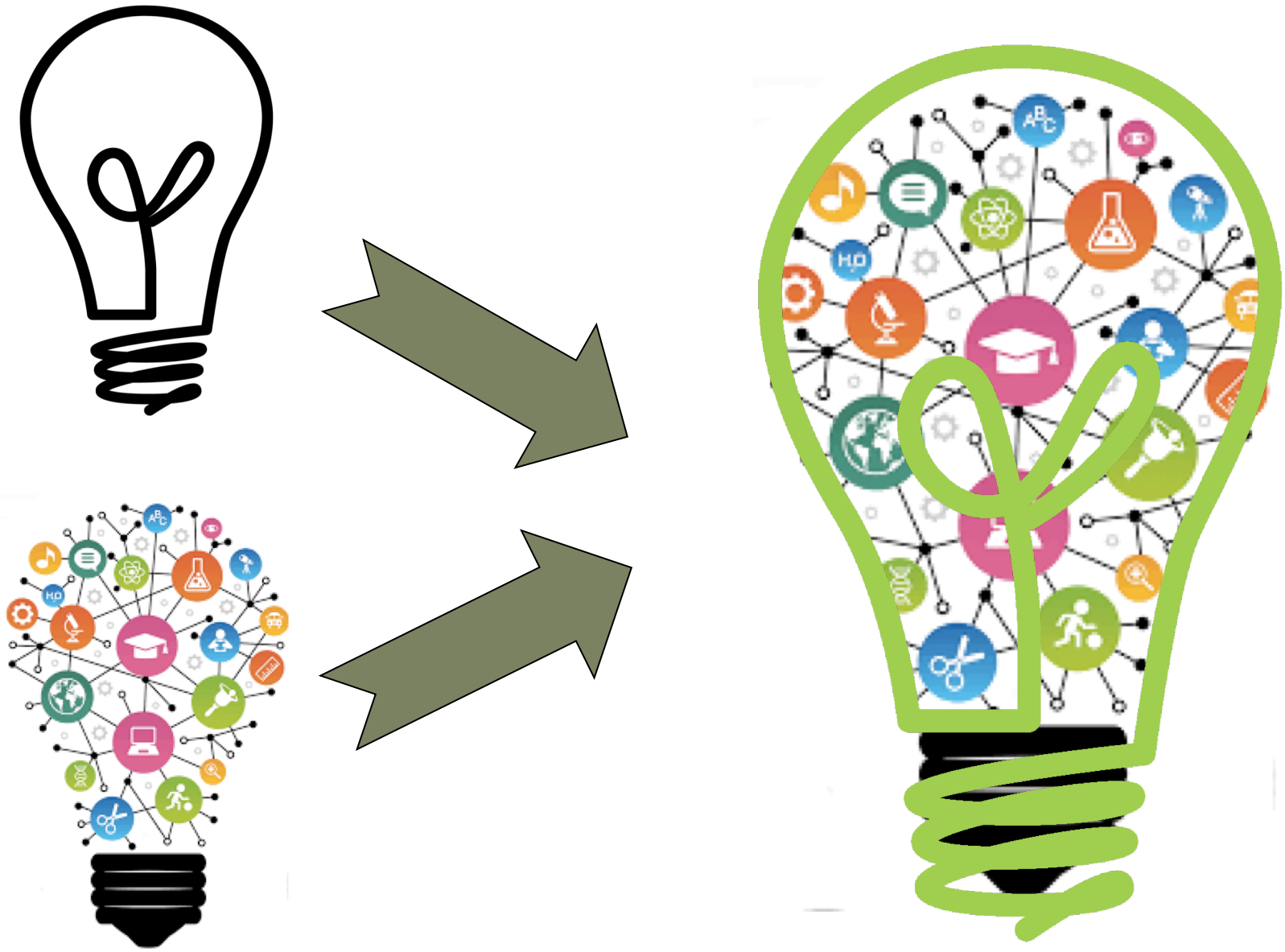
Experience and routines

The forensic science process



'…the published data available to support the evaluative interpretation of forensic evidence are still limited. The data sets that do exist tend to be fragmented between different organisations. **This leaves a substantial amount of interpretation based solely on the practitioner's opinion, which risks lack of consistency and reliability.'**

The Forensic Science Regulator Annual Report 2017



Examples

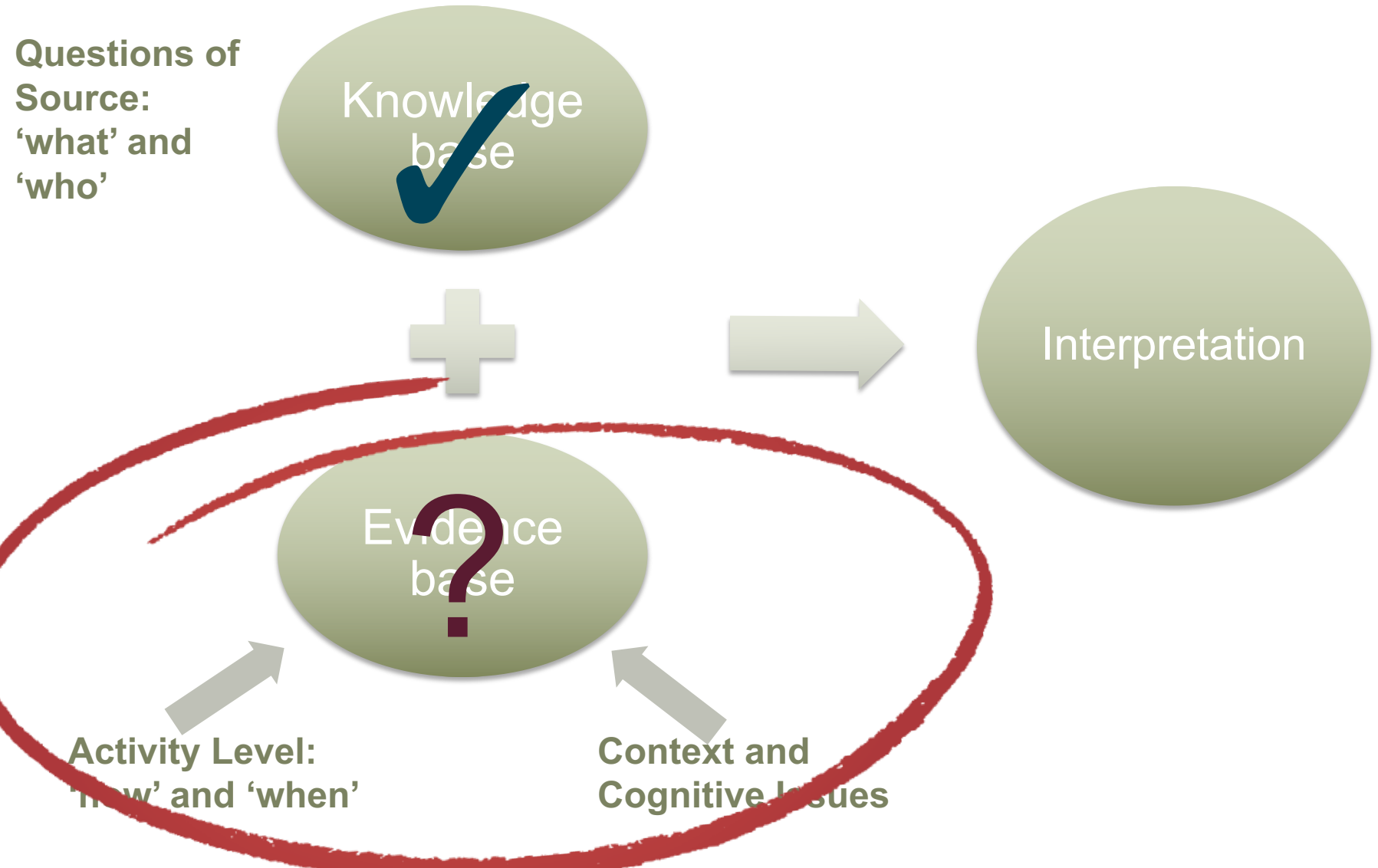
Small scale

- Transfer and persistence
- Human decision making
- Data acquisition methods

Large scale

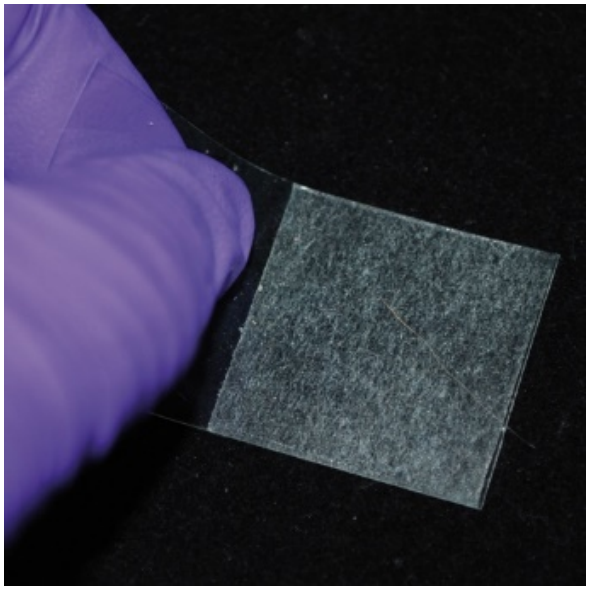
- How to get the data (& nature of the data)

Questions of Source: 'what' and 'who'



1. Trace DNA: Regular wearer versus most recent wearer

Can we tell from the DNA profile who was the most recent wearer?



What happens to DNA when items are cleaned?

'Tiger Kidnapping'

Glasses used by the perpetrators were identified but they had been cleaned by bleach…

Can DNA persist after cleaning with these products?

Stabbing at a house party

Knives believed to have been used in the altercation were washed in washing-up liquid…

Should these items be recovered for DNA analysis?

DNA recovery from plastic knife handles after cleaning

Can we recover DNA from plastic knife handles that have been cleaned?

2. Human decision making: context

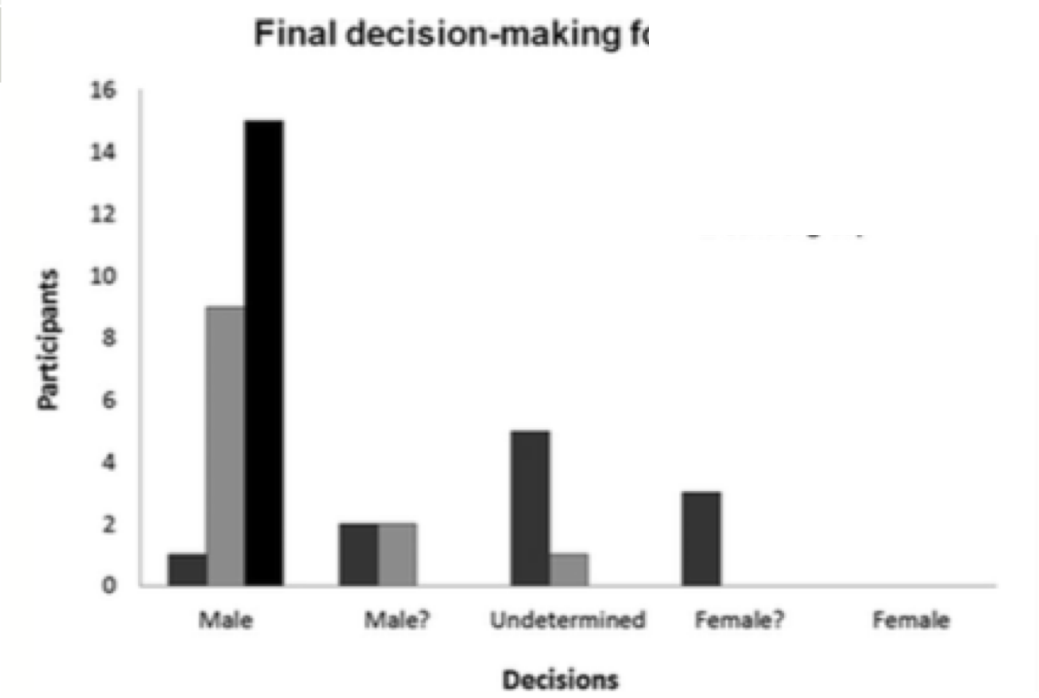
Crime scene → Analysis → Interpretation → Intelligence /evidence



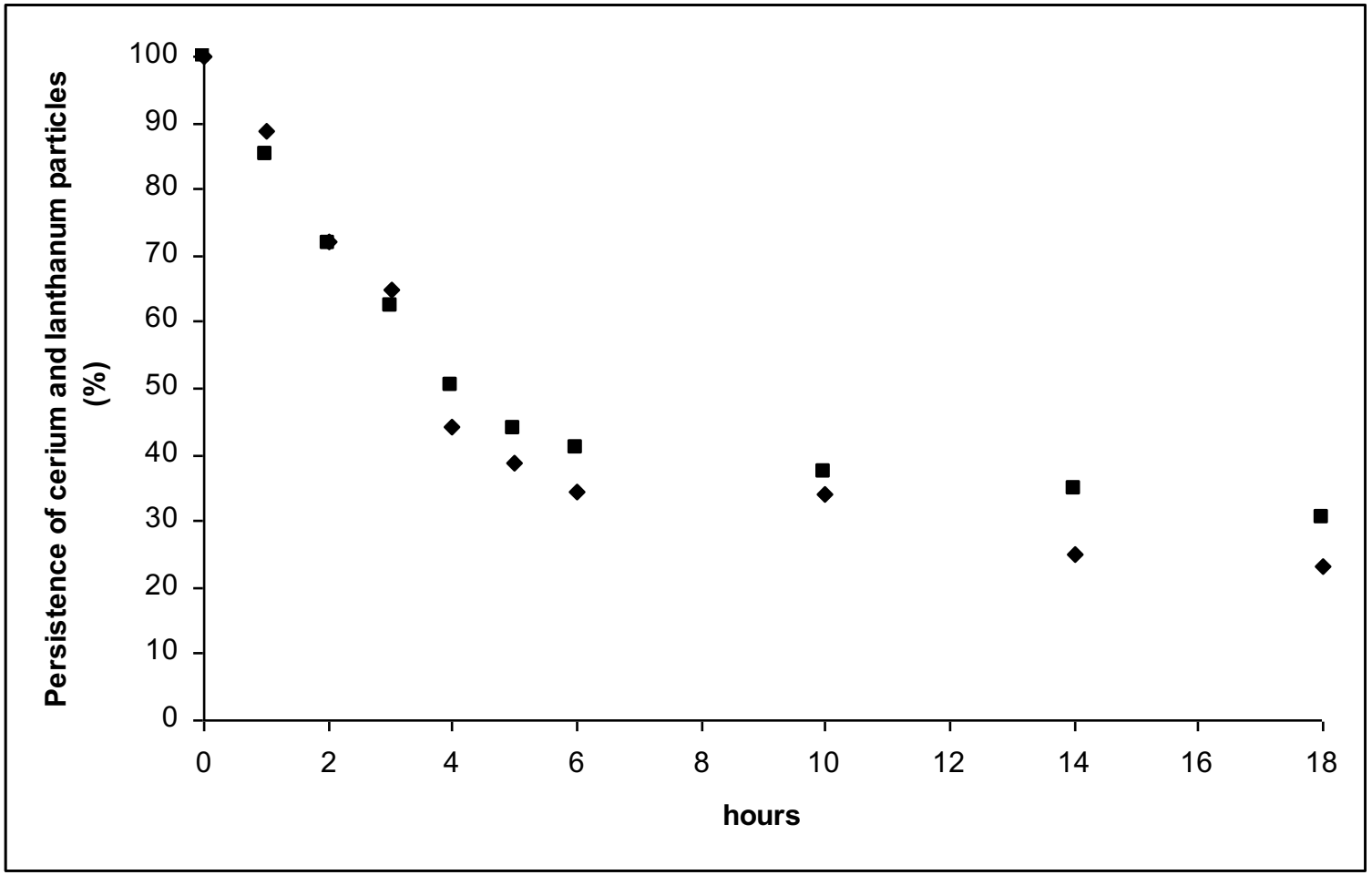

To what extent can context influence the interpretation of evidence?

Nakhaeizadeh, S., Morgan, R. M., Rando, C., and Dror, I.E. 2017 Cascading bias of initial exposure to information at the crime scene to the subsequent evaluation of skeletal remains. *Journal of Forensic Sciences* 63(2): 403-411

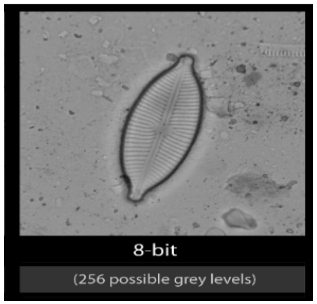
Sex estimation	Group 1
Male	1
Male?	2
Undetermined	5
Female?	3
Female	

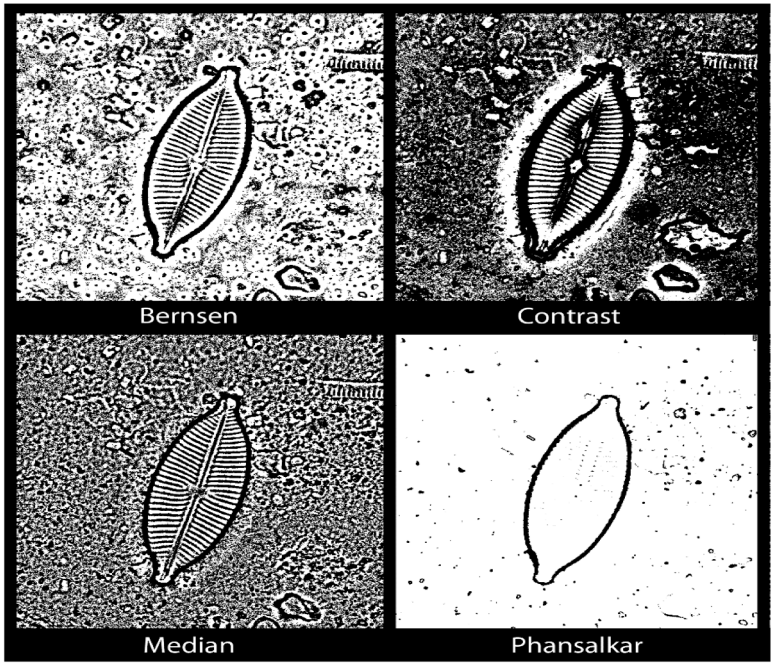


3. Data acquisition: persistence of trace evidence

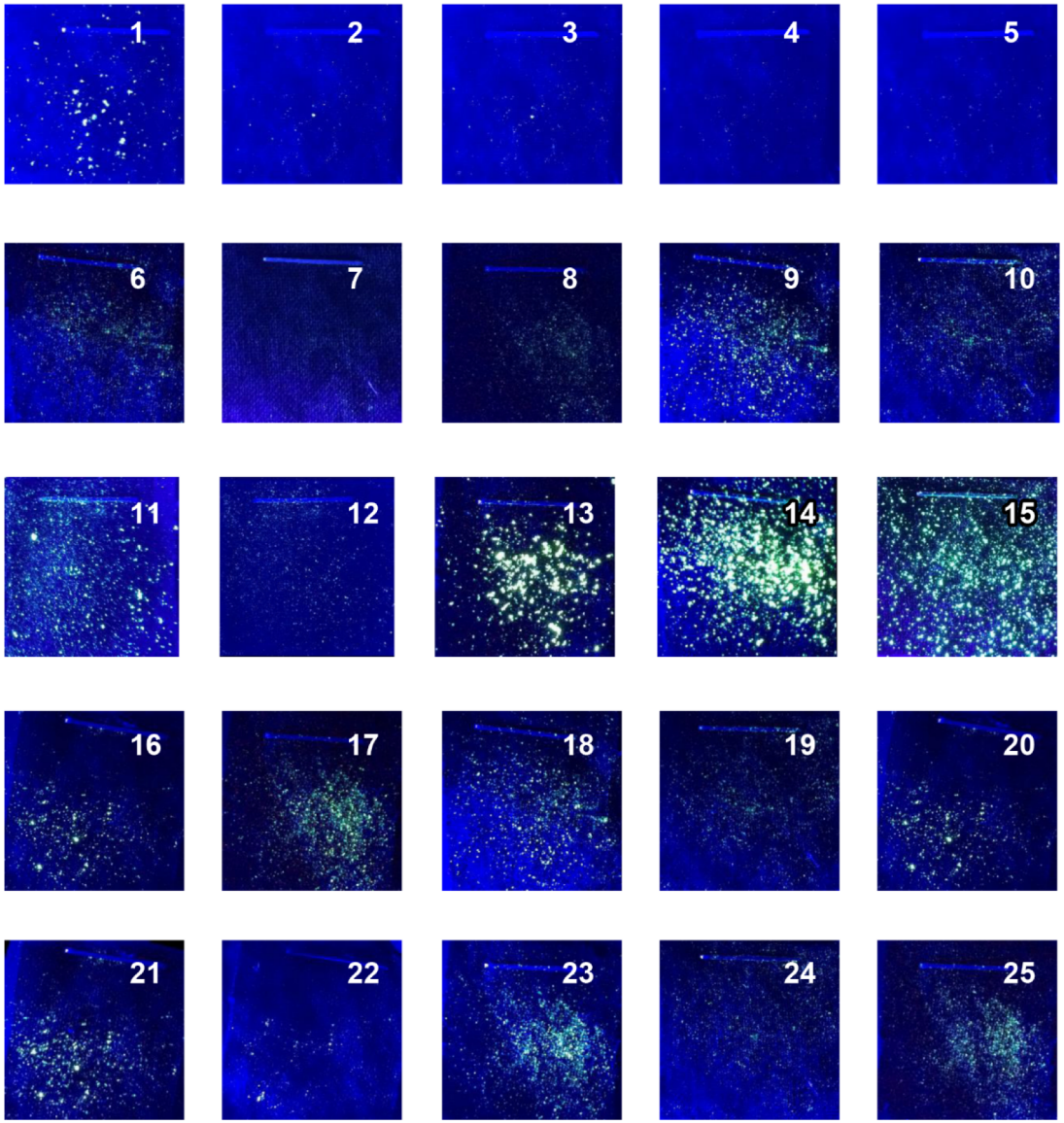


Data acquisition methods



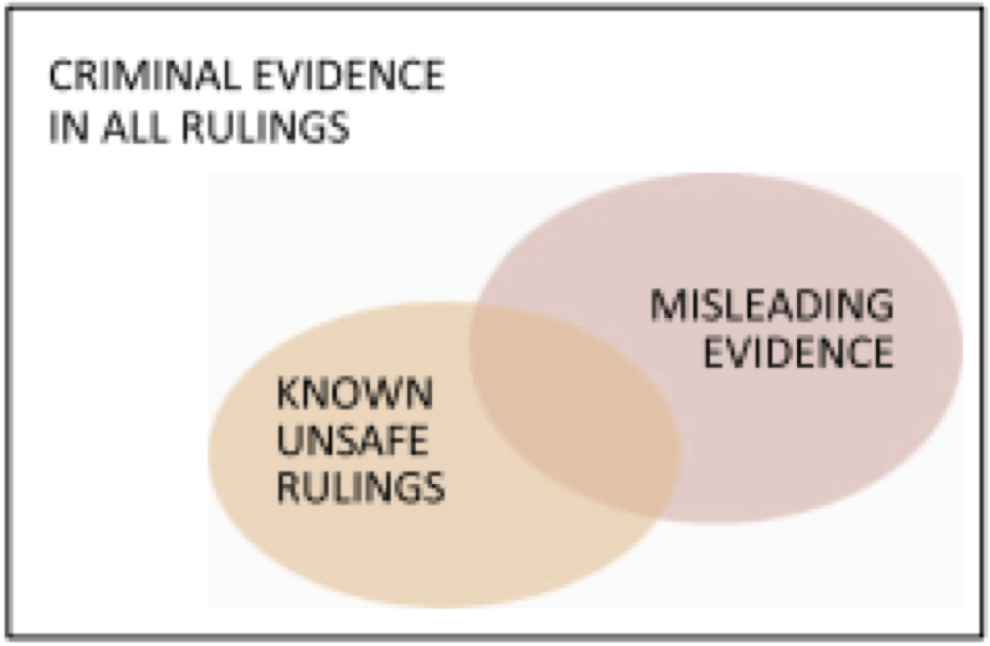


Source: Emma Levin, UCL

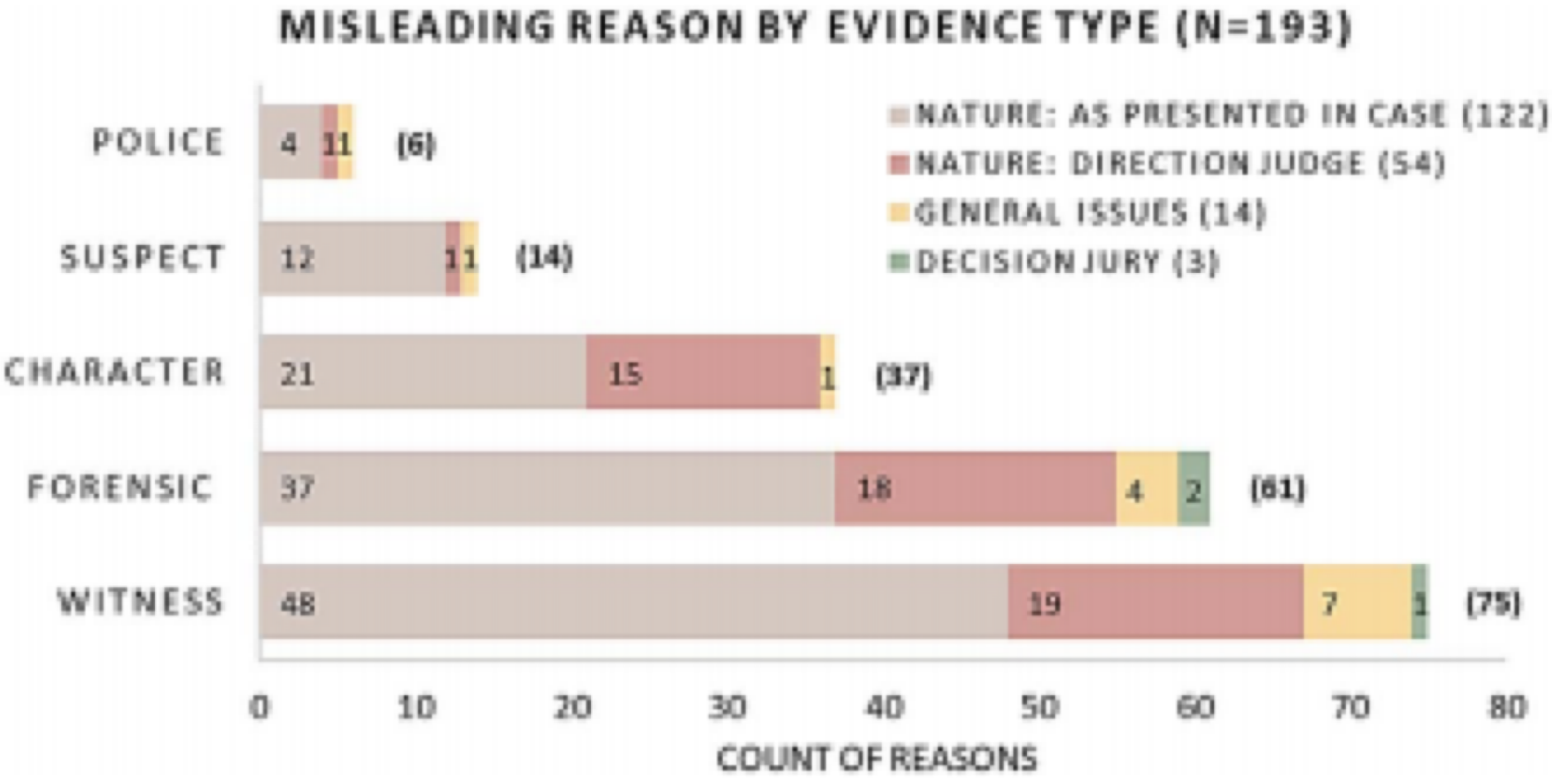


Source: Emma Levin, UCL

Large scale: Getting the data that we need



Smit, N. M., Morgan, R. M., Lagnado, D.A. 2018 A systematic analysis of the misleading evidence in unsafe rulings in England and Wales *Science and Justice* 58: 128-137



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Conclusion

Challenges

- Significance
- Data to understand the decision making
- Context sensitive solutions
- Holistic approach
- Justification of the challenge

Acknowledgements

- Dr Georgina Meakin
- Dr Sherry Nakhaeizadeh
- Emma Levin
- Nadine Smit
- Dr Itiel Dror
- Dr Carolyn Rando
- Professor Viv Jones
- UCL Department of Security and Crime Science, UCL Institute of Archeology, UCL Geography.
- The Engineering and Physical Sciences Research Council of the UK (EPSRC) through the Security Science Doctoral Research Training Centre (UCL SECReT) based at University College London (EP/G037264/1).

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