Cognitive Bias in Forensic Expert Decision Making: Recommendations for Action for the Massachusetts Forensic Science Oversight Board

9 July 2019

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A few preliminary points, to be clear:

- Yes, going to put on the table some things for the Board to consider.
- No, not replacing/re-inventing/re-doing/etc. the ISOs
- (in fact, I think we should set a timeline for all labs for ISO accreditation)
- They are general international laboratory standards (right Lucy?) -- (ISO/IEC 17020, standard for “Requirements for the operation of various types of bodies performing inspection”)
- Not specific to forensic science

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A few preliminary points, to be clear:

- Yes, going to put on the table some things for the Board to consider.
- These recommendations (if the Board likes & adopts them…), then I suggest will be put forward to the Mass State Crime Lab for feedback:
  - Doing it already
  - Not doing it, but ‘like’ it
  - Not doing it, and don’t like it

Doing it already

- Great ! ☺
- Include in our audit
- Set as standard/expectation to other labs

Not doing it, but ‘like’ it

- Like it, ‘as is’ (& implementation details…)
- Needs modification (e.g., too cumbersome, needs ‘triage’)
- Agree on timeline

Not doing it, and don’t like it

- Hear why, and then for us to decide whether or not to ‘impose’ on them, and a timeline.

→**<u>Dialogue</u>**

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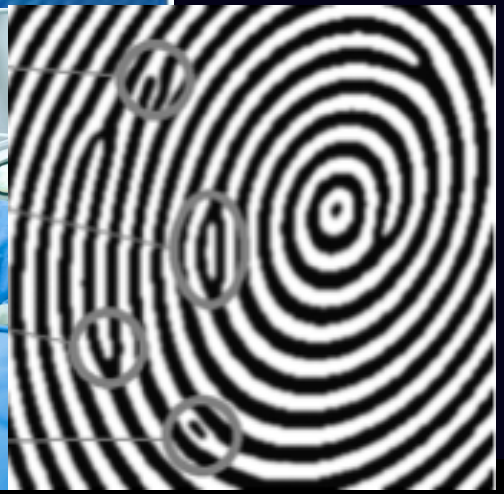
A few prelir ar:

- Not a m otivatio



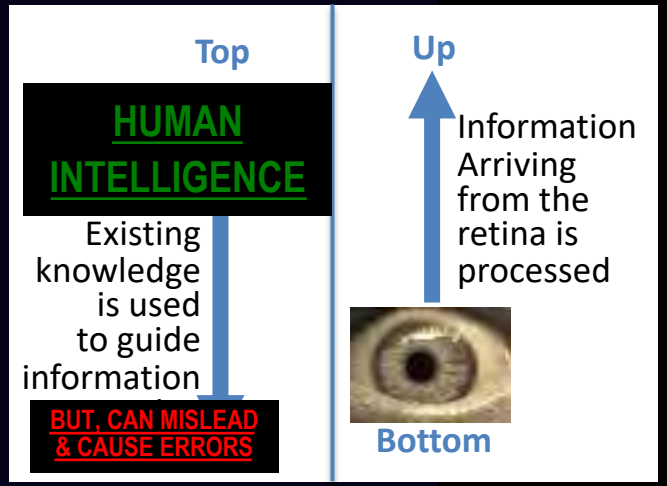
So, what do you need to know?

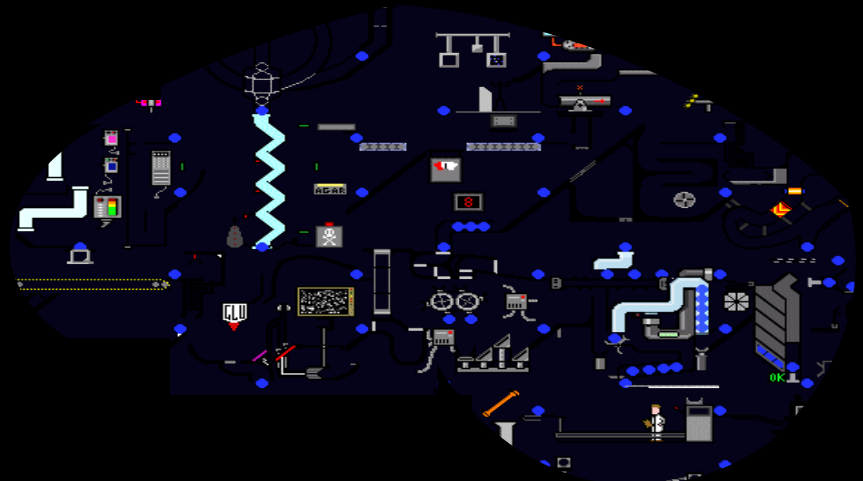
SO, WHAT DO YOU NEED TO KNOW?

- Information gets into the brain, the ‘input’, the ‘data’ → “Bottom-up information”

VS.

- What is already ‘in the brain’ (e.g., experiences, knowledge) → “Top-down information”
- These ‘top-down’ & ‘bottom up’ interact → The Human Mind is Not a Camera.

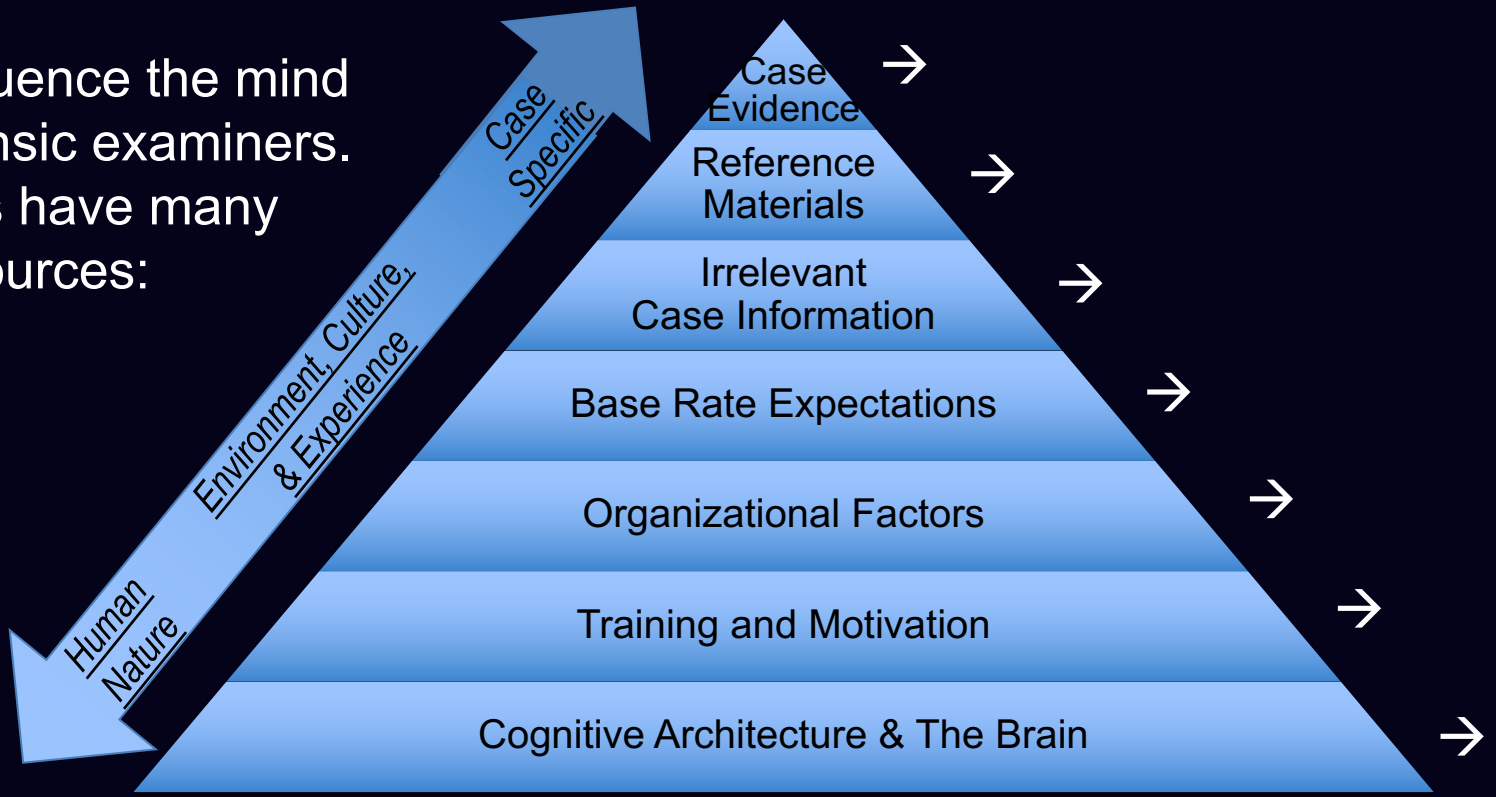




Each source has specific countermeasures

SO, WHAT DO YOU NEED TO KNOW?

Biases influence the mind of the forensic examiners. The biases have many different sources:



A few preliminary points, to be clear:

- Not a matter of competence, motivation, proficiency, etc.
- NOT an ethical issue
- Hard working, dedicated, professional experts.

Last preliminary point…:

- These biases are now well accepted
- E.g., a recent review paper: (Cooper & Meterko "Cognitive bias research in forensic science: A systematic review" Forensic Science International) identifies dozens of primary source (research) studies.

Forensic Science Regulator

Overseeing Quality

Cognitive Bias Effects

Relevant to Forensic Science Examinations

FSR-G-217

NATIONAL COMMISSION ON FORENSIC SCIENCE

NIST National Institute of Standards and Technology U.S. Department of Commerce

Ensuring That Forensic Analysis Is Based Upon Task-Relevant Information

- <u>These biases are now well accepted</u>
- Also by governmental bodies and expert working groups
- And, now also by the courts (including in Massachusetts!)

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A few preliminary points….

Now down to business (5 bias focused recommendations to you today):

1. The evidence should be driving the forensic work, not a ‘target’ suspect

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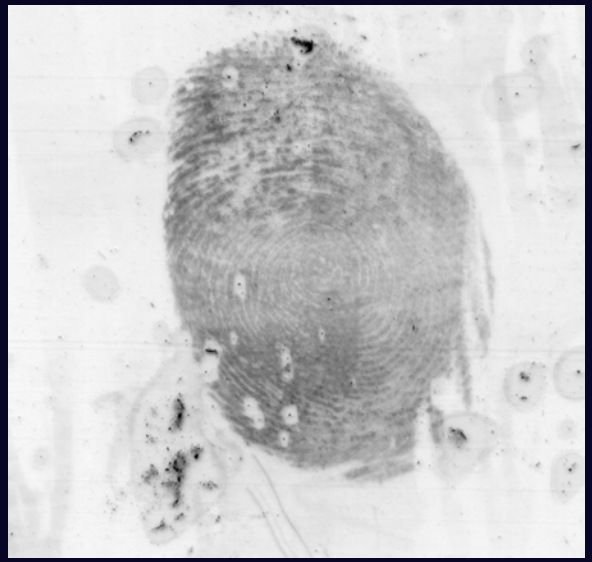

The evidence should be driving the forensic work, not a ‘target’ suspect

DNA… same story:

Go from the profile of the biological material collected from the crime scene, to the profile of the suspect.

→ Do not see/know/develop the suspect’s DNA profile, before you fully developed and characterized the DNA profile from the crime scene.

Why? So you do not (unintentionally) interpret the evidence to fit the suspect (e.g., concluding allelic drop-out, etc.).

Washington DC DNA Crime Lab external audit found exactly such bias, and the lab was shut down…!

The evidence should be driving the forensic work, not a ‘target’ suspect

DNA… same story

Firearms… same story, etc., etc.

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Simple solution:

➔ Start with the evidence!

Linear Sequential Unmasking (LSU)

→ Context Management Toolbox

JOURNAL OF FORENSIC SCIENCES

J Forensic Sci, July 2015, Vol. 60, No. 4
doi: 10.1111/1556-4029.12805
Available online at: onlinelibrary.wiley.com

Context Management Toolbox: A Linear Sequential Unmasking (LSU) Approach for Minimizing Cognitive Bias in Forensic Decision Making

ELSEVIER

Contents lists available at ScienceDirect

Science and Justice

journal homepage: www.elsevier.com/locate/scijus

Strengthening forensic DNA decision making through a better understanding of the influence of cognitive bias

CrossMark

Linear Sequential Unmasking (LSU)

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Implementing context information management in forensic casework: *Minimizing contextual bias in firearms examination*

THE SOLUTION

Linear Sequential Unmasking (LSU)

- LSU is aimed:
  - To make sure the data/evidence drives the forensic decision making process.
  - To avoid ‘suspect/target driven bias’
  - To avoid working backward, circularly
  - Start with the evidence, document, then exposure to the suspect
  - (allows to go back to evidence, but with documentation and restrictions)

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NATIONAL COMMISSION ON FORENSIC SCIENCE

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

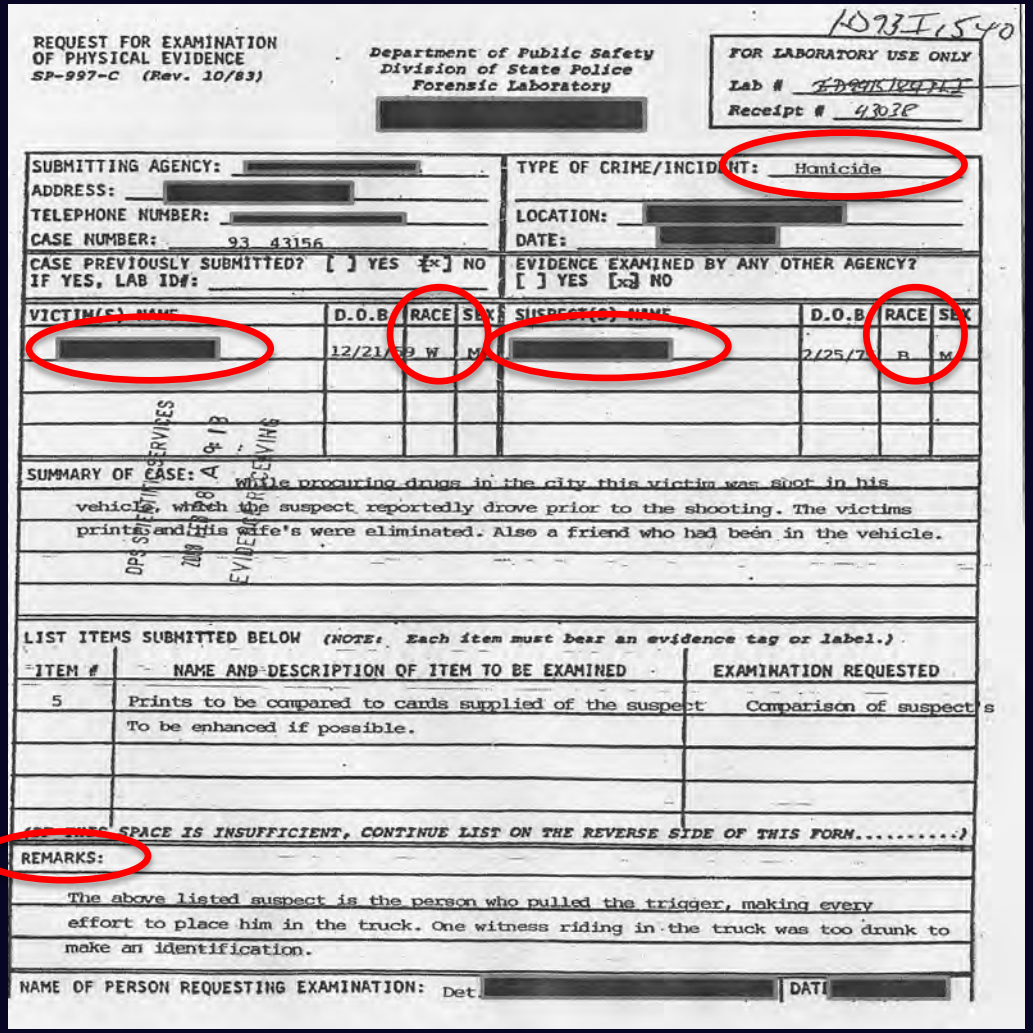
Ensuring That Forensic Analysis Is Based Upon Task-Relevant Information

Decisions should be based on the relevant information

Information	Task relevant	Task irrelevant
Biasing		☹
Not biasing		

What is irrelevant?…
For lab to decide… (we will audit it)
But some things are obviously, never relevant:
E.g., whether the suspect confessed to the crime, whether the detective believes the suspect is guilty, etc.
More details/examples:

- Past criminal convictions?
- …
- …
- …



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REQUEST FOR EXAMINATION OF PHYSICAL EVIDENCE
SP-997-C (Rev. 10/83)

Department of Public Safety
Division of State Police
Forensic Laboratory
[redacted]

FOR LABORATORY USE ONLY
Lab # [illegible]
Receipt # 43038

SUBMITTING AGENCY: [redacted]
ADDRESS: [redacted]
TELEPHONE NUMBER: [redacted]
CASE NUMBER: 93 43156

TYPE OF CRIME/INCIDENT: Homicide
LOCATION: [redacted]
DATE: [redacted]

CASE PREVIOUSLY SUBMITTED? [ ] YES [x] NO
IF YES, LAB ID#:

EVIDENCE EXAMINED BY ANY OTHER AGENCY?
[ ] YES [x] NO

VICTIM(S) NAME	D.O.B	RACE	SEX	SUSPECT(S) NAME	D.O.B	RACE	SEX
[redacted]	12/21/59	W	M	[redacted]	2/25/7[illegible]	B	M

DPS SCIENTIFIC SERVICES
2008 FEB 28 A 9:18
EVIDENCE RECEIVING

SUMMARY OF CASE: While procuring drugs in the city this victim was shot in his vehicle, which the suspect reportedly drove prior to the shooting. The victims prints and his wife's were eliminated. Also a friend who had been in the vehicle.

LIST ITEMS SUBMITTED BELOW (NOTE: Each item must bear an evidence tag or label.)

ITEM #	NAME AND DESCRIPTION OF ITEM TO BE EXAMINED	EXAMINATION REQUESTED
5	Prints to be compared to cards supplied of the suspect To be enhanced if possible.	Comparison of suspect's

(IF THIS SPACE IS INSUFFICIENT, CONTINUE LIST ON THE REVERSE SIDE OF THIS FORM.....)

REMARKS:

The above listed suspect is the person who pulled the trigger, making every effort to place him in the truck. One witness riding in the truck was too drunk to make an identification.

NAME OF PERSON REQUESTING EXAMINATION: Det. [redacted] DATE [redacted]

REMARKS:

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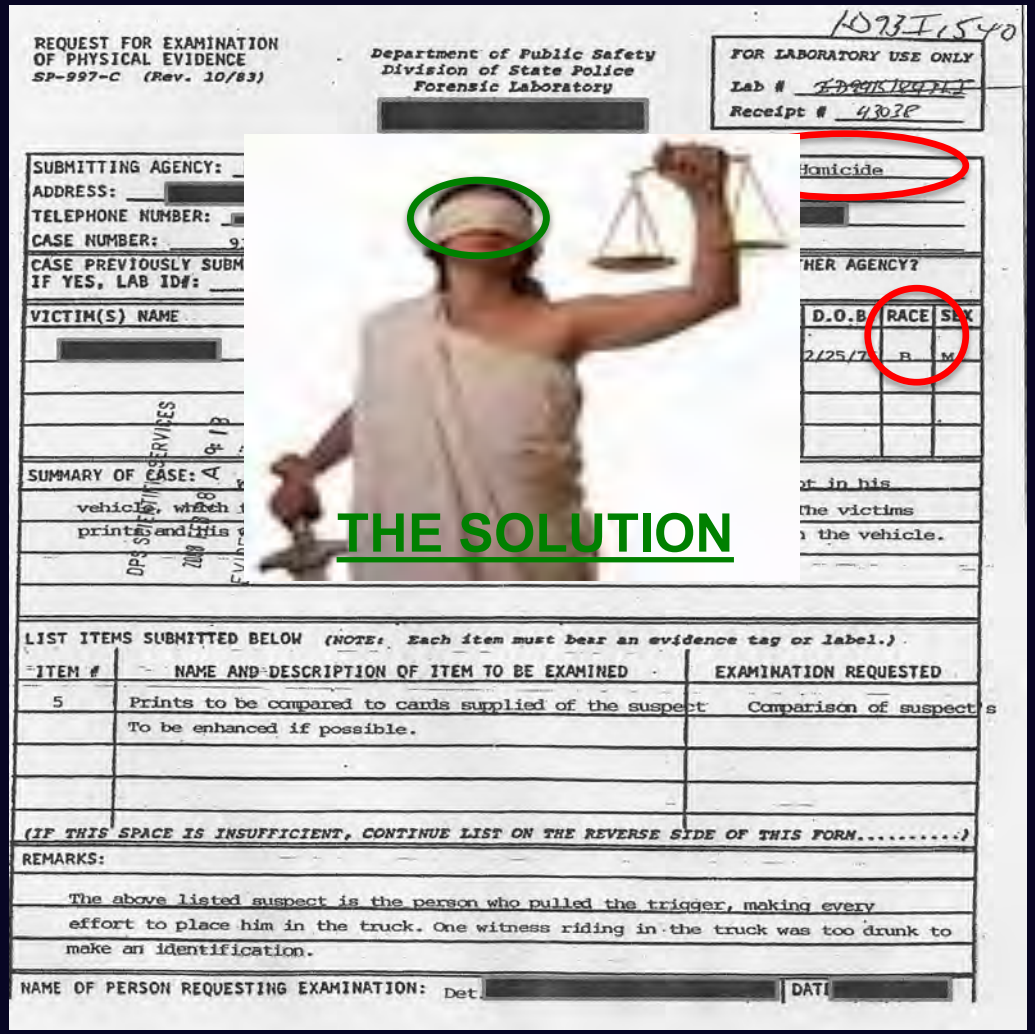
NAME OF PERSON REQUESTING EXAMINATION: Det. [redacted] DATE [redacted]

Just as effort and attention is taken to minimize ‘physical contamination’,

→ Effort & attention should also be given to minimize ‘cognitive contamination’

- Minimize exposure (as much as possible) to irrelevant information
  - E.g., submission forms
  - E.g., avoid bias cascade (A-A B-B → A-B B-A)
  - Case managers
  - Etc., etc.
- **Document!!! (if/when there is exposure, document and include in Report! – transparency!)**



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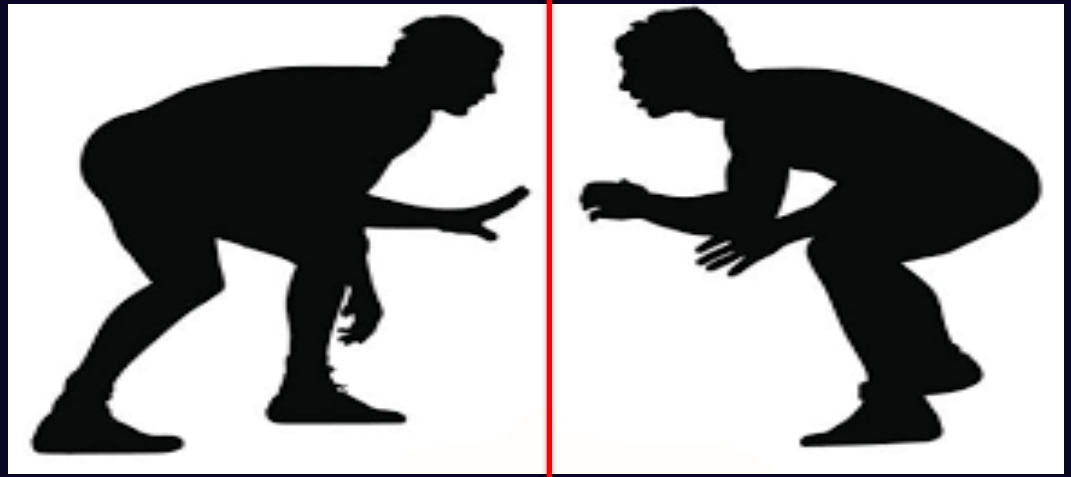
3. State Crime Laboratory to:

    Give full access to defense (‘forensic disclosure’).

    Take work for defense.

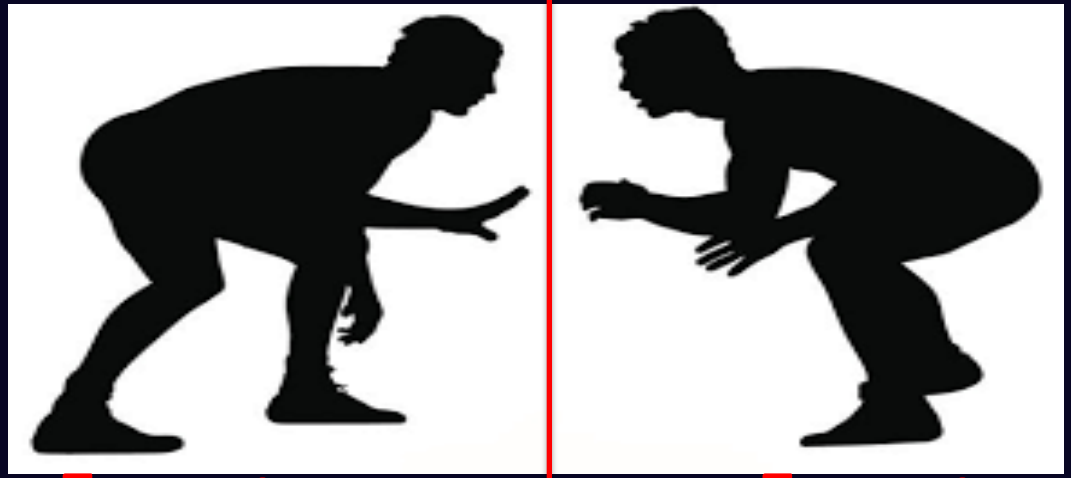
Experts

Prosecution | Defense



Impartiality

Prosecution Defense



Experts Experts

The Myth of Impartiality

→ Allegiance effect

General Article

aps
ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

Are Forensic Experts Biased by the Side That Retained Them?

Psychological Science
XX(X) 1–9
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5. Verifications should be as blind as possible.

Verifications should be as blind as possible

What do verifiers know…. (better not to know…):

- Who did the initial analysis
- What they did, how they reached their conclusions
- What was decided (only verify IDs)
-
-

→ The more the verification is blind, the better!

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Thank you very much!