

COGNITIVE BIAS IN FORENSIC EXPERT DECISION MAKING:
RECOMMENDATIONS FOR ACTION FOR THE MASSACHUSETTS
FORENSIC SCIENCE OVERSIGHT BOARD

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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 --(ISO/IEC 17020, standard for “Requirements for the operation of various types of bodies performing inspection”)

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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.

→ **Dialogue**

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A few preliminary

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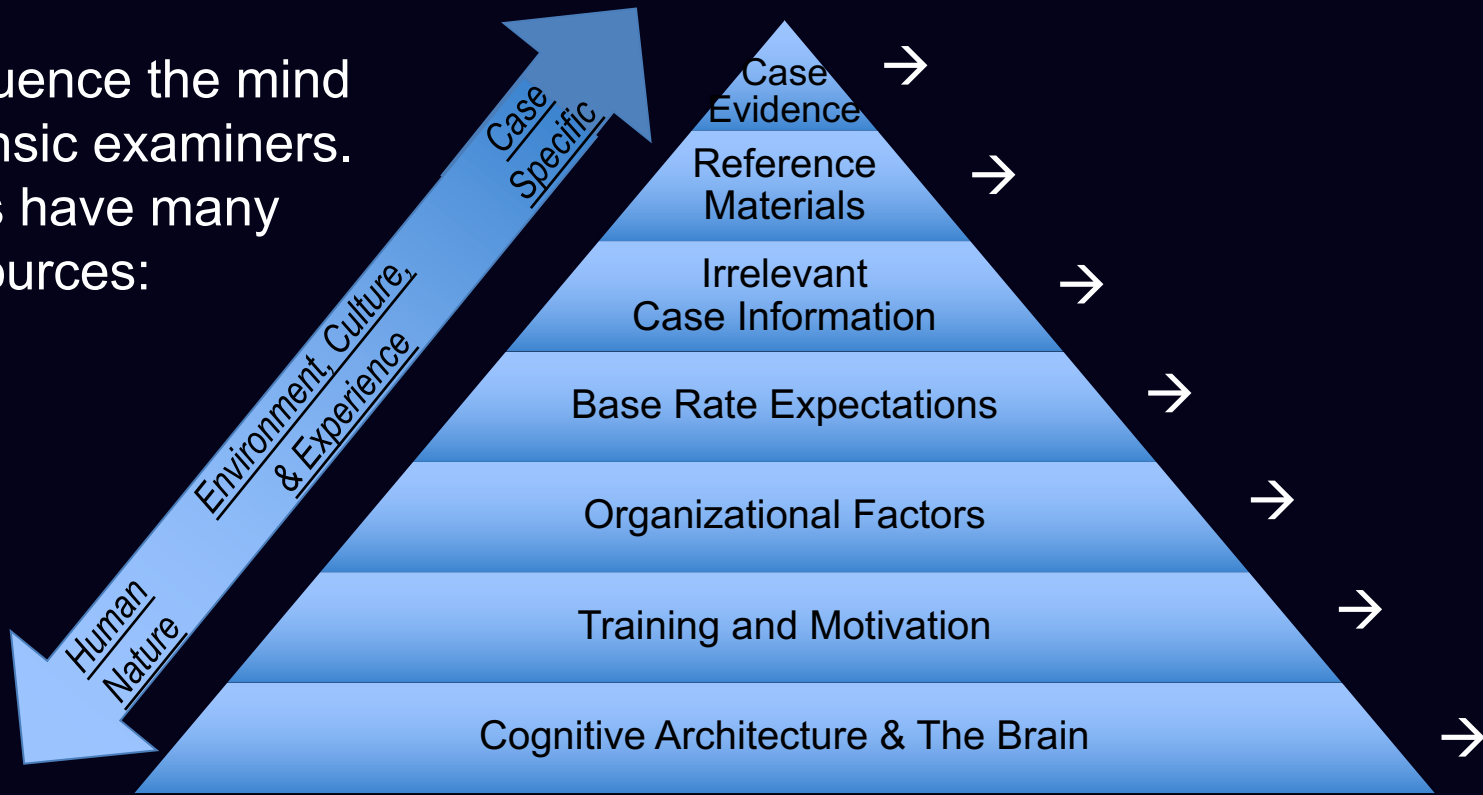
SO, WHAT DO YOU NEED TO KNOW?



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.



The Economist

Forensic science
Ignorance is bliss
Forensic scientists know too much about the cases they investigate



nature

SCIENCE IN COURT

- Is the law ready for DNA evidence?
- A head-on look at fingerprint analysis
- DNA profiling on shaky ground
- Putting the science back into forensics



Forensic Science Regulator

O v e r s e e i n g Q u a l i t y

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**

- These biases are now well accepted
- 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....

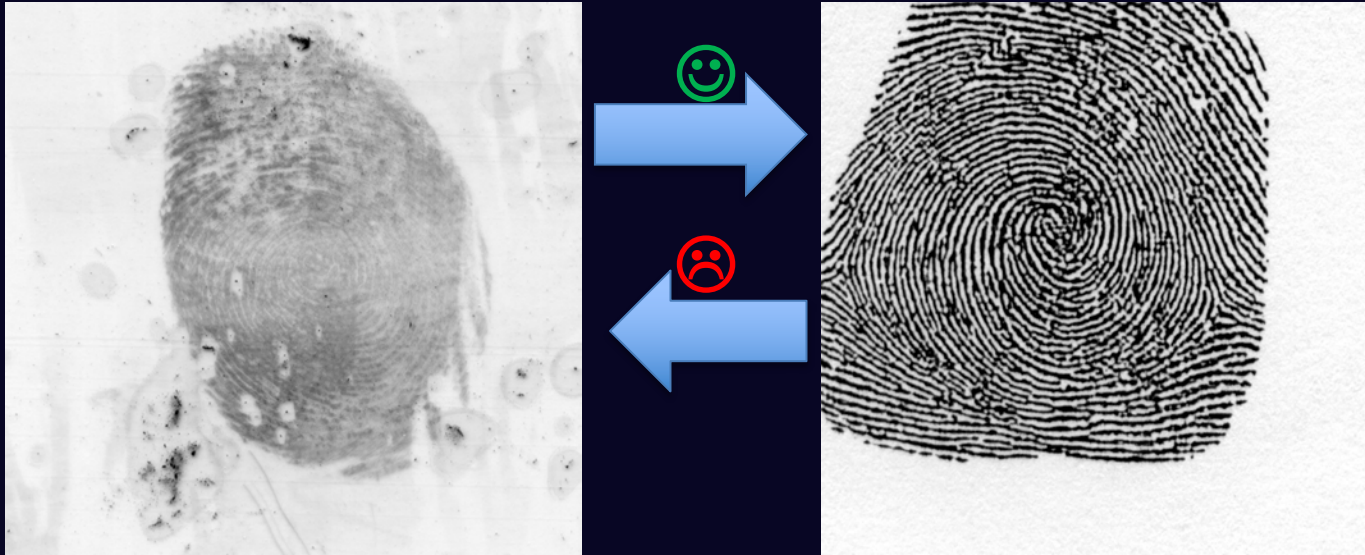
Now down to business (5 bias focused recommendations to you today):

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

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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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.

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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



Linear Sequential Unmasking (LSU)

→ Context Management Toolbox

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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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2. Minimize exposure (as much as possible) to task irrelevant contextual information –Decisions should be based on the relevant information!




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**Ensuring That Forensic Analysis Is Based
Upon Task-Relevant Information**

Decisions should be based on the relevant information

<i>Information</i>	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:

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

Department of Public Safety
Division of State Police
Forensic Laboratory

109311540
FOR LABORATORY USE ONLY
Lab # FD9915109711
Receipt # 4302P

SUBMITTING AGENCY: _____ TYPE OF CRIME/INCIDENT: Homicide
ADDRESS: _____ LOCATION: _____
TELEPHONE NUMBER: _____ DATE: _____
CASE NUMBER: 93 43156

CASE PREVIOUSLY SUBMITTED? [] YES [x] NO EVIDENCE EXAMINED BY ANY OTHER AGENCY?
IF YES, LAB ID#: _____ [] YES [x] NO

VICTIM(S) NAME	D.O.B.	RACE	SEX	SUSPECT(S) NAME	D.O.B.	RACE	SEX
<u>[REDACTED]</u>	<u>12/21/59</u>	<u>W</u>	<u>M</u>	<u>[REDACTED]</u>	<u>2/25/71</u>	<u>B</u>	<u>M</u>

SUMMARY OF CASE: *DPS SERVICE CENTER 20080808 A & B EVIDENCE RECEIVING*
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
<u>5</u>	<u>Prints to be compared to cards supplied of the suspect To be enhanced if possible.</u>	<u>Comparison of suspect's</u>

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. _____ DATE: _____

- Past criminal convictions?
- ...
- ...
- ...
- ...

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.

Det.

DATE

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!)**

10931540

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

Department of Public Safety
Division of State Police
Forensic Laboratory

FOR LABORATORY USE ONLY

Lab # FD9915109712

Receipt # 43028

SUBMITTING AGENCY: _____

ADDRESS: _____


TELEPHONE NUMBER: _____

CASE NUMBER: _____

CASE PREVIOUSLY SUBMITTED IF YES, LAB ID#: _____

VICTIM(S) NAME: _____

SUMMARY OF CASE: A vehicle, which prints and his



THE SOLUTION

OTHER AGENCY? _____

D.O.B.	RACE	SEX
2/25/70	B	M

of in his

the victims

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
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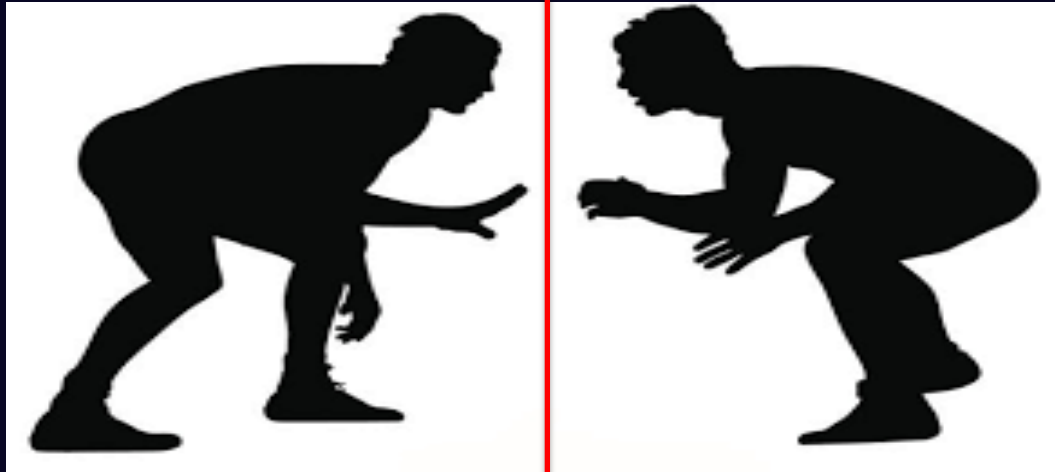
FORENSIC SCIENCE OVERSIGHT BOARD

1. The evidence should be driving the forensic work, not a 'target' suspect
2. Minimize exposure (as much as possible) to task irrelevant contextual information – Decisions should be based on the relevant information!
3. State Crime Laboratory to:
 - Give full access to defense ('forensic disclosure').
 - Take work for defense.

Experts

Prosecution

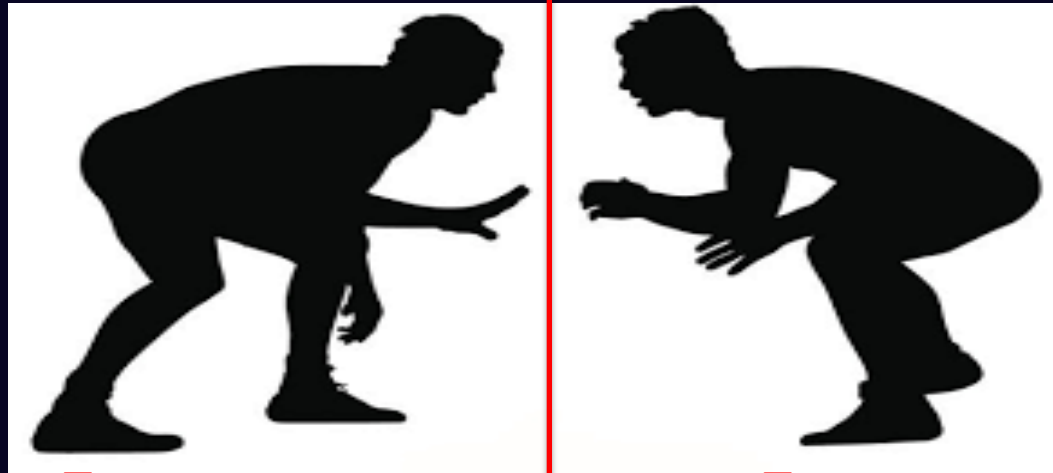
Defense



Impartiality

Prosecution

Defense



Experts

Experts

The **Myth** of Impartiality

→ Allegiance effect

General Article



Are Forensic Experts Biased by the Side That Retained Them?

**Daniel C. Murrie¹, Marcus T. Boccaccini², Lucy A. Guarnera¹,
and Katrina A. Rufino²**

¹Institute of Law, Psychiatry, and Public Policy, University of Virginia, and ²Department of Psychology and Philosophy, Sam Houston State University

Psychological Science

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 - Take work for defense.
4. All forensic reports should specify: weaknesses, limitations, scope, exposure to irrelevant information, potential for error and bias, etc.

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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!