Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

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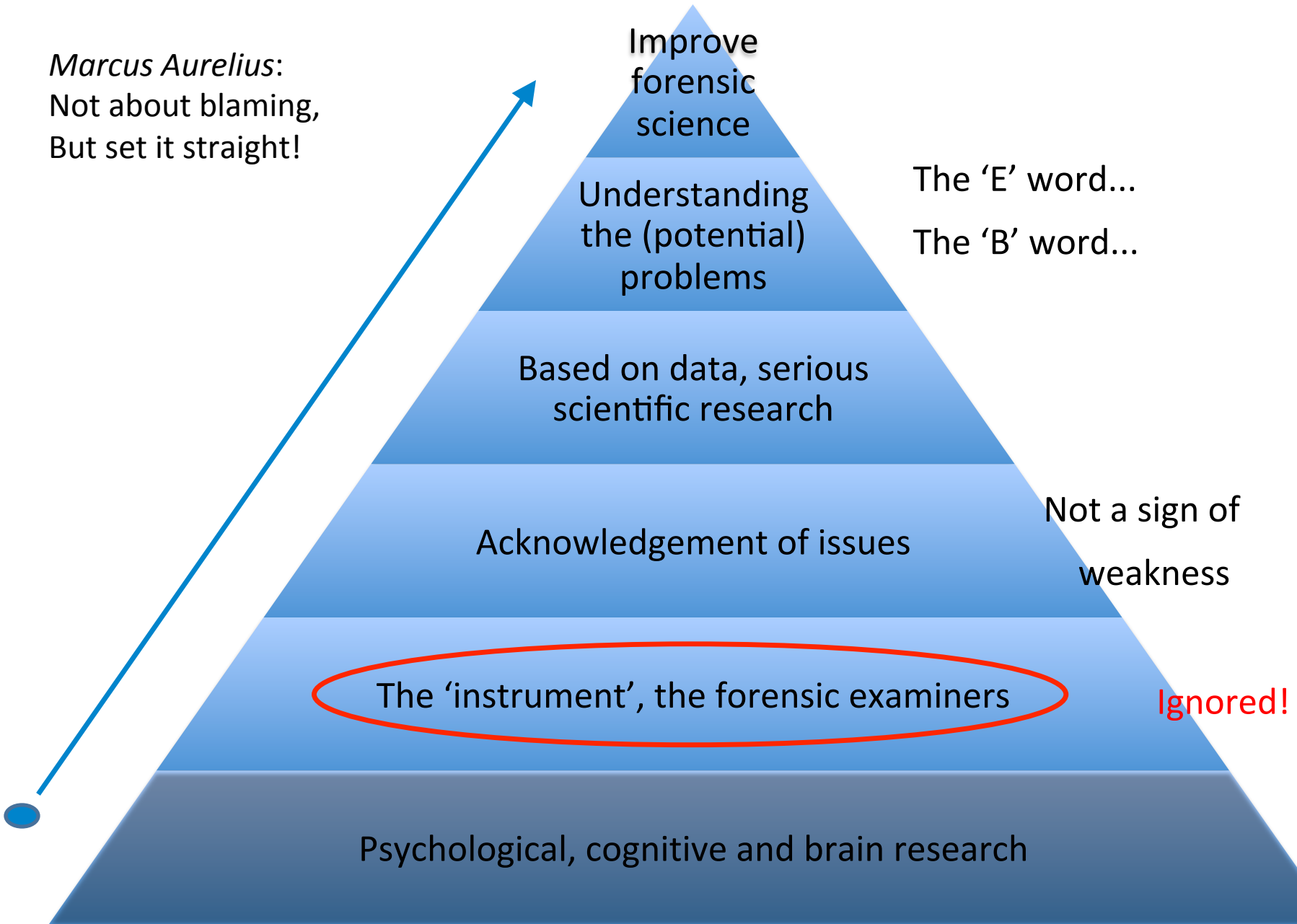
What Are We Here For?

Marcus Aurelius:
Not about blaming,
But set it straight!



The 'E' word...

The 'B' word...

Not a sign of weakness

Ignored!

Bias

Psychological SCIENCE

A Journal of the Association for Psychological Science

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Talis Pater, Talis Filius: Perceived Resemblance and the Belief in Genetic Relatedness

Paola Bressan and

Maria F. Dal Martello

Bias

	Context ‘female’	Context ‘male’
Decision ‘female’	100%	38%

Science and Justice 54 (2014) 208–214

Contents lists available at ScienceDirect

Science and Justice

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

Cognitive bias in forensic anthropology: Visual assessment of skeletal remains is susceptible to confirmation bias

Sherry Nakhaeizadeh [a,*], Itiel E. Dror [b], Ruth M. Morgan [a,b]

Bias

Within-Subject experimental design!

Context 1	Context 2
He confessed to the crime	Someone else confessed to it
An eye witness identified him	Someone else was identified
The detective 'knows' he is guilty	The detective thinks it is not him
	

ELSEVIER

Available online at www.sciencedirect.com

SCIENCE DIRECT®

Forensic Science International 156 (2006) 74–78

Forensic Science International

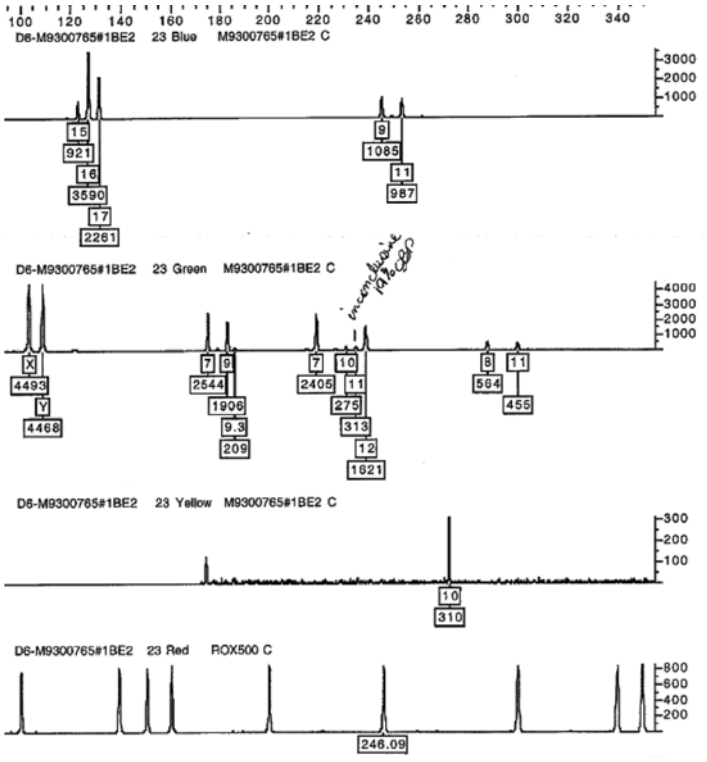
www.elsevier.com/locate/forsciint

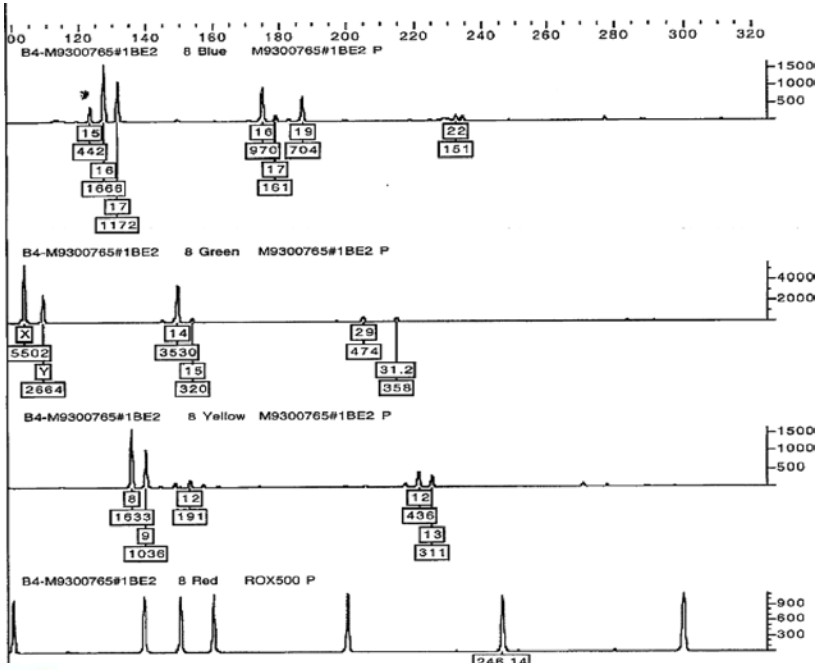
Preliminary communication

Contextual information renders experts vulnerable to making erroneous identifications

Itiel E. Dror *, David Charlton, Ailsa E. Péron

Bias





Science and Justice 51 (2011) 204–208

Contents lists available at SciVerse ScienceDirect

Science and Justice

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

Subjectivity and bias in forensic DNA mixture interpretation ☆

Itiel E. Dror [a,b,*], Greg Hampikian [c]

Bias

General Article

aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Psychological Science
XX(X) 1–9

DOI: 10.1177/0956797613481812
pss.sagepub.com
SAGE

Are Forensic Experts Biased by the Side That Retained Them?

Daniel C. Murrie[1], Marcus T. Boccaccini[2], Lucy A. Guarnera[1], and Katrina A. Rufino[2]

JOURNAL OF FORENSIC SCIENCES

J Forensic Sci, March 2012, Vol. 57, No. 2
doi: 10.1111/j.1556-4029.2011.02013.x
Available online at: onlinelibrary.wiley.com

PAPER

GENERAL

Base-rate bias

Itiel E. Dror,[1,2] Ph.D.; Kasey Wertheim,[3] M.B.A.; Peter Fraser-Mackenzie,[2,4] Ph.D.; and Jeff Walajtys,[3] B.A.

The Impact of Human–Technology Cooperation and Distributed Cognition in Forensic Science: Biasing Effects of AFIS Contextual Information on Human Experts*

Forensic Science Policy & Management, 4(3–4):1–9, 2013

ISSN: 1940-9044 print / 1940-9036 online
DOI: 10.1080/19409044.2014.901437

Taylor & Francis
Taylor & Francis Group

Practical Solutions to Cognitive and Human Factor Challenges in Forensic Science

Itiel E. Dror
Center for the Forensic Sciences, University College London (UCL), London, UK; Cognitive Consultants International (CCI), London, UK

ABSTRACT The growing understanding of the central role of human factors and cognition in forensic science has paved the way to develop and implement practical solutions to enhance work in forensic laboratories. Cognitive insights provide relatively simply practical solutions to minimize bias by increasing examiners' independence of mind. These derive from understanding the spectrum of biases—not only those that can arise from knowing irrelevant case informa-

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doi: 10.1111/j.1556-4029.2011.01940.x
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Dror (2012) Combating Bias:
The Next Step in Fighting Cognitive and Psychological Contamination

"For forensic science to successfully take on the issue of contextual bias, it is important that one correctly considers the risks, that measures are taken when needed, and that they are proportionate and appropriate."

	LATENT FINGERPRINT									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
	22	9	15	8	9	3	8	11	7	10
	21	11	25	7	10	9	9	10	6	5
	19	9	18	10	7	9	15	19	6	6
	21	21	29	14	12	9	8	9	4	8
	17	16	15	11	16	9	7	12	5	5
	20	14	22	9	10	7	13	18	7	9
	22	17	15	10	10	8	11	24	8	11
	9	9	19	6	9	8	18	16	9	10
	30	15	25	10	12	12	19	22	12	17
	25	13	18	13	12	10	13	15	7	10
Min	9	9	15	6	7	3	7	9	4	5
Max	30	21	29	14	16	12	19	24	12	17
SD	5.49	4.01	4.93	2.49	2.45	2.32	4.25	5.15	2.23	3.54
Range	**21**	**12**	**14**	**8**	**9**	**9**	**12**	**15**	**8**	**12**

LPE		A	B	C	D	E	F	G	H	I	J
1	Time 1	27	15	17	9	9	7	16	13	7	13
	Time 2	26	14	21	10	8	5	13	15	7	12
2	Time 1	31	16	14	9	10	7	12	13	6	9
	Time 2	23	13	19	10	9	9	10	8	8	11
3	Time 1	19	11	13	5	9	5	8	12	6	10
	Time 2	18	8	16	8	15	9	17	21	7	12
4	Time 1	20	12	17	6	10	8	7	8	6	7
	Time 2	22	9	19	11	10	9	8	8	6	8
5	Time 1	19	11	19	6	10	13	9	14	8	12
	Time 2	25	13	21	9	14	12	12	11	8	9
6	Time 1	34	16	21	12	13	13	12	11	8	12
	Time 2	25	12	23	11	17	7	12	16	9	13
7	Time 1	21	9	19	9	12	9	10	18	6	10
	Time 2	21	13	14	7	8	6	7	11	6	10
8	Time 1	19	14	14	10	9	6	12	13	7	11
	Time 2	22	13	18	10	15	8	13	17	5	11
9	Time 1	19	11	11	7	9	4	8	15	5	2
	Time 2	23	14	20	7	13	8	11	14	4	5
10	Time 1	19	10	9	8	4	2	10	8	6	5
	Time 2	20	10	9	7	8	3	6	7	6	5

LPE	A	B	C	D	E	F	G	H	I	J	MEAN
1	1	1	4	1	1	2	3	2	0	1	1.6
2	8	3	5	1	1	2	2	5	2	2	3.1
3	1	3	3	3	6	4	9	9	1	2	4.1
4	2	3	2	5	0	1	1	0	0	1	1.5
5	6	2	2	3	4	1	3	3	0	3	2.7
6	9	4	2	1	4	6	0	5	1	1	3.3
7	0	4	5	2	4	3	3	7	0	0	2.8
8	3	1	4	0	6	2	1	4	2	0	2.3
9	4	3	9	0	4	4	3	1	1	3	3.2
10	1	0	0	1	4	1	4	1	0	0	1.2
MEAN	3.5	2.4	3.6	1.7	3.4	2.6	2.9	3.7	0.7	1.3	2.58

Forensic Science International 208 (2011) 10–17

Contents lists available at ScienceDirect

Forensic Science International

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

Cognitive issues in fingerprint analysis: Inter- and intra-expert consistency and the effect of a 'target' comparison

Itiel E. Dror [a,b,*], Christophe Champod [c], Glenn Langenburg [c,d], David Charlton [e,f], Heloise Hunt [a], Robert Rosenthal [g]

J Forensic Sci, July 2008, Vol. 53, No. 4
doi: 10.1111/j.1556-4029.2008.00762.x
Available online at: www.blackwell-synergy.com

Itiel Dror,[1] *Ph.D. and Robert Rosenthal,*[2] *Ph.D.*

Meta-analytically Quantifying the Reliability and Biasability of Forensic Experts

“The Paradoxical Brain”, Cambridge University Press, 2011

➔ **COGNITIVE TRADE-OFFS**

Chapter 9

The paradox of human expertise: why experts get it wrong

Itiel E. Dror
University College London (UCL) and Cognitive Consultants International (CCI)
E-mail: i.dror@ucl.ac.uk WWW: http://cci-hq.com

Summary

Expertise is correctly, but one-sidedly, associated with special abilities and enhanced performance. The other side of expertise, however, is surreptitiously hidden. Along with expertise, performance may also be degraded, culminating in a lack of flexibility and error. Expertise is demystified by explaining the brain functions and cognitive architecture involved in being an expert. These information processing mechanisms, the very making of expertise, entail computational trade-offs that sometimes result in paradoxical functional degradation. For example, being an expert entails using schemas, selective attention, chunking information, automaticity and more reliance on top-down information, all of which allows experts to perform quickly and efficiently; however, these very mechanisms restrict flexibility and control, may cause the experts to miss and ignore important information, introduce tunnel vision and bias and can cause other effects that degrade performance. Such phenomena are apparent in a wide range of expert domains, from medical professionals and forensic examiners, to military fighter pilots and financial traders.

1093I,540

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 # ~~ED99IS124FLI~~
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]	2/25/75	B	M

DPS SCIENTIFIC SERVICES
2008 FEB 8 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]

(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]

The image of the car, taken from camera #6 at 00:17.20.

This is the only frame that includes the registration plate of the car.

The image of the car, taken from camera #6 at 00:17.20.

This is the only frame that includes the registration plate of the car.

Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

ACTIONS/RECOMMENDATIONS:

1. Context management

1.1 NIST/NIJ (via OSAC) standards, guidelines, best practices
1.2 Tool kit ("The Contextual Management Tool kit" -blind verification, sequential unmasking, linear comparison, case managers, lineups, etc.)
1.3 How & when to use

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1.3 How & when to use

- 1.3.1 Triage -(the 'bias danger zone')
- 1.3.2 What is relevant/irrelevant? (& how important and biasing?)
- 1.3.3 What is a difficult decision?

1.4 Attorney General Guidelines on Cognitive Bias

- 1.4.1 For forensic labs
- 1.4.2 For judges, attorneys, & jurors

Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

ACTIONS/RECOMMENDATIONS:

1. Context management

2. Training

2.1 For Forensic examiners –Serious Educational Programs.

They are well aware of physical contamination (& take steps to minimze it)

→ What about cognitive contamination?...

2.1.1 For new examiners, as part of their basic training

2.1.2 For existing examiners

2.2 For attorneys (both prosecutors & defense), as well as Judges

Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

ACTIONS/RECOMMENDATIONS:

1. Context management

2. Training

3. Research

3.1 Continued support from NIST & NIJ on these specific issues

3.2 Involve psychologists!!!

(e.g., via NSF, but reach researchers in psychology & law –LSS (Law & Social Sciences) which is under the Division of Social and Economic Sciences (SES), not under the Division of Behavioral and Cognitive Sciences (BCS))

Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

ACTIONS/RECOMMENDATIONS:

1. Context management

- 1.1 NIST/NIJ (via OSAC) standards, guidelines, best practices
- 1.2 Tool kit ("The Contextual Management Tool kit" -blind verification, sequential unmasking, linear comparison, case managers, lineups, etc.)
- 1.3 How & when to use
  - 1.3.1 Triage -(the 'bias danger zone')
  - 1.3.2 What is relevant/irrelevant, how important it is, and the biasing effect
  - 1.3.3 What is a difficult decision
- 1.4 Attorney General Guidelines on Cognitive B
- ias 1.4.1 For forensic labs
  - 1.4.2 For jurors

2. Training

- 2.1 For Forensic examiners –Serious Educational Programs
  - 2.1.1 For new examiners, as part of their basic training
  - 2.1.2 For existing examiners
- 2.2 For attorneys (both prosecutors & defense), as well as Judges

3. Research

- 3.1 Continued support from NIST & NIJ on these specific issues
- 3.2. Involve psychologists!!! (e.g., via NSF psychology & law)

Human Factors and Forensic Science: A Lot of Talk, but Not Enough Action!

Thank you very much!!!

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