

Cognitive Bias

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Lord Neuberger

"The big problem, as it is everywhere, is with unconscious bias. I dare say that we all suffer from a degree of unconscious bias, and it can occur in all sorts of manifestations. It is almost by definition an unknown unknown, and therefore extraordinarily difficult to get rid of, or even to allow for. "

Fairness in the courts: the best we can do: Address to the Criminal Justice Alliance. Lord Neuberger, 10 April 2015

<https://www.supremecourt.uk/docs/speech-150410.pdf>

What is a bias?

Two (related) kinds of biases

Cognitive bias

- common errors/habits of thought which arise from the use of shortcuts (heuristics)

Unconscious/implicit bias

- biases in judgement, often based on social categories

**How we demonstrate
biases exist**

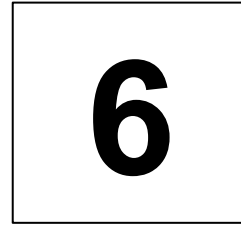
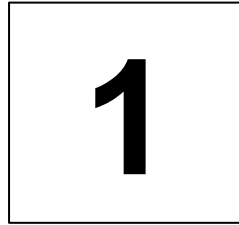
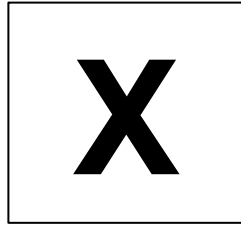
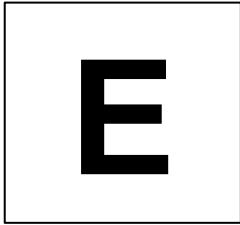
1. When there is a correct answer

Wason's selection task

These four cards all have:

a letter on one side

a number on the other side.



Rule: 'All cards with a Vowel on one side
have an Even number on the other side.'

*Which cards would you have to turn over to
decide whether this statement is true or false?*

Base rate neglect

There is a rare disease, 0.0001% of the population have it (1 in a million)

There is a test for the disease which is 99.9% accurate.

As part of your regular checkup you are tested for the disease and the test comes back positive.

What is the probability you truly have disease?

~0.1%

~1%

~10%

~90%

~99%

~99.9%

2. Against a standard of rationality

Framing: the Asian Disease problem

Imagine that you are the Mayor of a city that is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume the exact scientific estimate of the consequences of the programs are as follows.

- * Program A: "200 people will be saved"

- * Program B: "there is a one-third probability that 600 people will be saved, and a two-thirds probability that no people will be saved"

Framing: the Asian Disease problem

Imagine that you are the Mayor of a city that is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume the exact scientific estimate of the consequences of the programs are as follows.

- * Program 1: "400 people will die"

- * Program 2: "there is a one-third probability that nobody will die, and a two-third probability that 600 people will die"

Anchoring

- Take the last three digits of your phone number
- Add 400. Call this X
- “Do you think Attila the Hun was defeated in Europe before or after that year X?”
- “Which year was Attila the Hun defeated?”

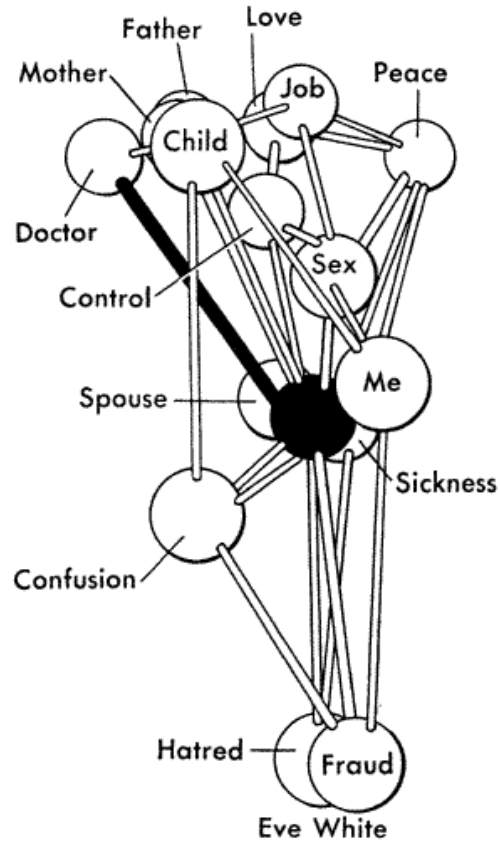
Anchor	-	Average Estimate
400–599	:	629
600–799	:	680
800–999	:	789
1000–1199	:	885
1200–1399	:	988

Expt 1: “Crime is a {wild beast preying on/virus infecting} the city of Addison. The crime rate in the once peaceful city has steadily increased over the past three years. In fact, these days it seems that crime is {lurking in/plaguing} every neighborhood. In 2004, 46,177 crimes were reported compared to more than 55,000 reported in 2007. The rise in violent crime is particularly alarming. In 2004, there were 330 murders in the city, in 2007, there were over 500.”

1. REFORM = “diagnose/treat/inoculate”
(e.g. fix the economy, improve education,
provide healthcare)

2. PUNISH = “capture/enforce/punish” (e.
g. calling in the National Guard, instituting
harsher penalties, building more jails)

'Priming'









Implicit bias

An applicant for the police chief job is described as highly educated, but not streetwise. The gender of the applicant affects which characteristics people judge are important for the job

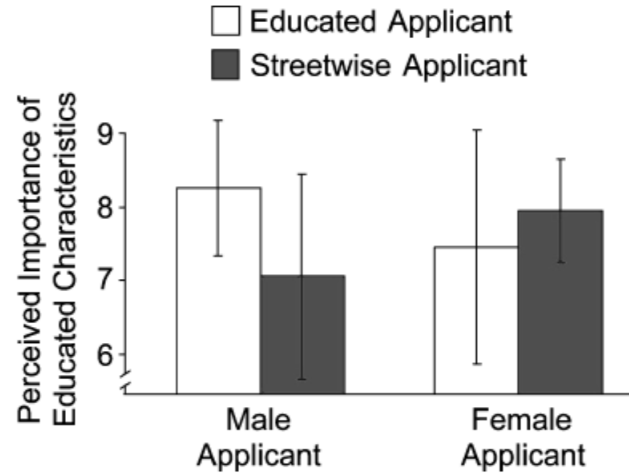


Fig. 1. Results from Experiment 1: perceived importance of “educated” characteristics for the job of police chief, as a function of the applicant’s gender and characteristics. Higher numbers indicate greater perceived importance of educated characteristics. Error bars represent ± 1 standard deviation.

Uhlmann, E. L., & Cohen, G. L. (2005). Constructed criteria redefining merit to justify discrimination. *Psychological Science*, 16(6), 474-480.

Idris Elba is 'too street' to play 007, says James Bond author



He thinks the actor isn't 'suave' enough

<http://www.independent.co.uk/arts-entertainment/films/news/idris-elba-is-too-street-to-play-007-says-james-bond-author-10480532.html>

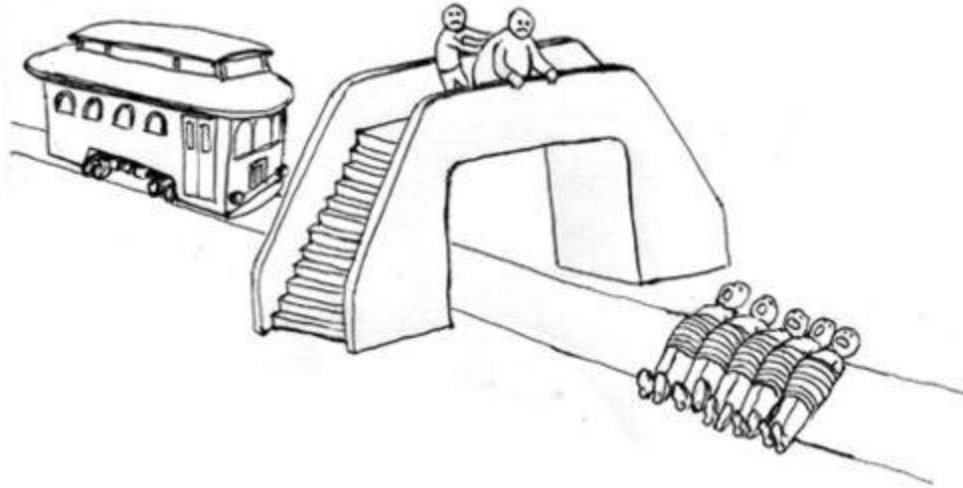
Implicit bias is one component of observed prejudice

Along with/part of

- explicit prejudice
- economic injustice
- institutional biases
- etc

Everybody has biases

Framing



Schwitzgebel, E., & Cushman, F. (2015). Philosophers' biased judgments persist despite training, expertise and reflection
Cognition, 141, 127-137

Over-confidence

tax bracket,
fixed-rate mortgage,
annualized credit,
private equity fund,
interest rate,
pre-rated stocks,
whole life insurance

home equity,
fixed-rate deduction,
revolving credit,
vesting,
retirement,
stock options,
inflation,

Checklists

“The rate of bloodstream infections fell by two-thirds. The average I.C.U. cut its infection rate from 4 percent to zero.

Over 18 months, the program saved more than 1,500 lives and nearly \$200 million”



Many analysts, one dataset: Making transparent how variations in analytical choices affect results. Silberzahn R et al (under review)

- "97 percent of judges (thirty-five out of thirty-six) believed that they were in the top quartile in “avoid[ing] racial prejudice in decisionmaking”"

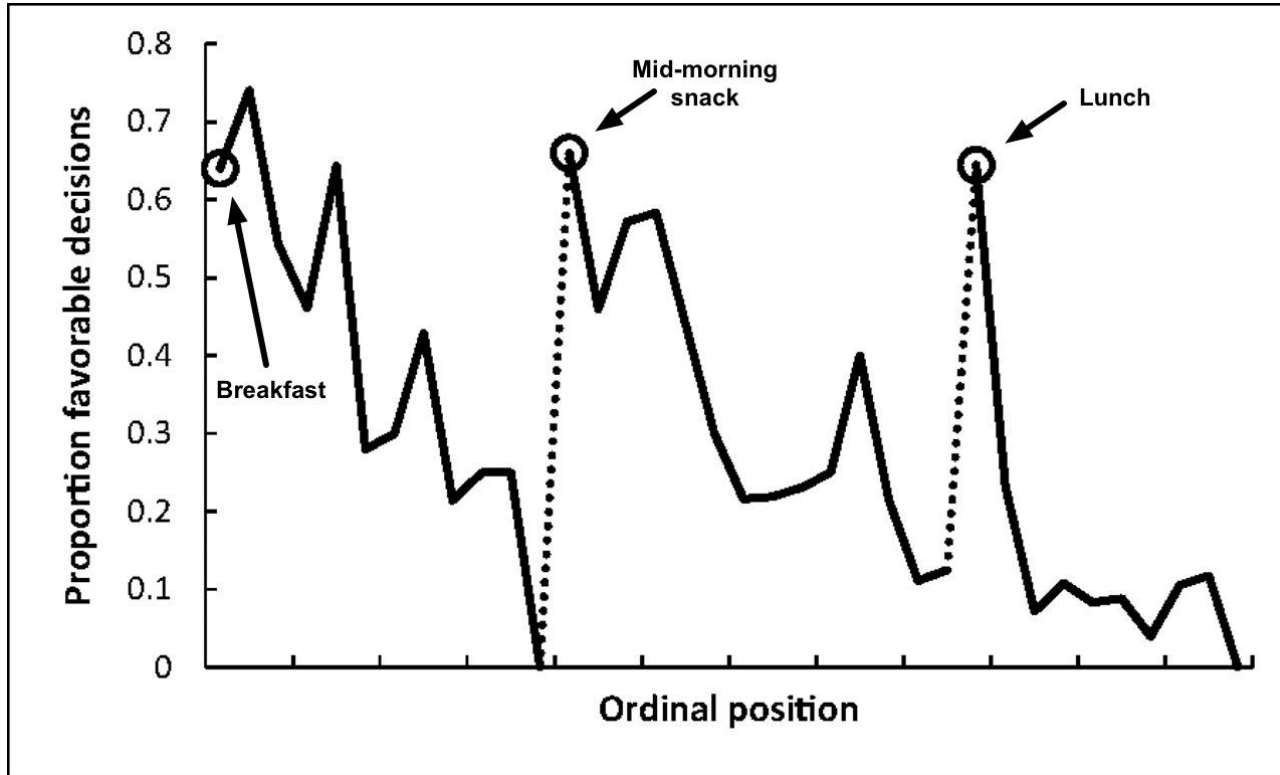
Rachlinski, J. J., Johnson, S. L., Wistrich, A. J., & Guthrie, C. (2009). Does unconscious racial bias affect trial judges?. *notre dame law review*, 84(3), 09-11.

Anchoring

Enough, B., & Mussweiler, T. (2001). Sentencing Under Uncertainty: Anchoring Effects in the Courtroom. *Journal of Applied Social Psychology, 31*(7), 1535-1551.

Chapman, G. B., & Bornstein, B. H. (1996). The more you ask for, the more you get: Anchoring in personal injury verdicts. *Applied cognitive psychology, 10*(6), 519-540.

Lunch



Danziger, S., Levav, J., & Avnaim-Pesso, L. (2011). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences*, 108(17), 6889-6892.

Why everyone has biases

- Perfect rationality isn't possible
- Systemmatic errors arise because of cognitive shortcuts (heuristics)
 - many biases are “principled mistakes”
- Our minds lean towards associative/gestalt evaluation, even if we've declared explicit criteria
- It is easiest to confirm most likely scenario

Mitigation strategies

1. Humility

Don't think you are free of bias or perfectly objective

- Mere awareness of stereotypes doesn't prevent (and may promote) their deployment
- Limited evidence of effectiveness of most 'diversity training'
- Ignoring category membership (e.g. 'colour blindness') doesn't work

Duguid, M. M., & Thomas-Hunt, M. C. (2015). Condoning stereotyping? How awareness of stereotyping prevalence impacts expression of stereotypes. *The Journal of applied psychology, 100*(2), 343-359.

Kalev, A., Dobbin, F., & Kelly, E. (2006). Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *American sociological review, 71*(4), 589-617.

2. Avoid risk factors for biased decisions

- Fatigue
- High emotion
- Time pressure
- Information paucity
 - including lack of feedback

3. Declare criteria in advance

4. Representational redescription

Selection task

“You must be 18 to drink alcohol”

Beer	Water	16	19
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Base rate neglect

Use natural frequencies rather than probabilities

Gigerenzer, G., & Edwards, A. (2003). Simple tools for understanding risks: From innumeracy to insight. *British Medical Journal*, 327, 741– 744

Natural frequencies (example)

1,000,000 people

1 has the disease; 999,999 don't

Test them all

With the disease: ~ 1 tests +ve

Without the disease: $999,999 \times 0.009$ test +ve
= ~ 1000 tests +ve

Chances you have disease = 1000 to 1

5. 'Imaginative redescription'

Effort after individualisation

Information required for repeat scenario

'Pre-mortems'

"Before You Make That Big Decision..." by Daniel Kahneman, Dan Lovallo & Olivier Sibony in Harvard Business Review. <https://hbr.org/2011/06/the-big-idea-before-you-make-that-big-decision>

Klein, G. (2007). "Performing a Project Premortem". Harvard Business Review 85 (9): 18–19.

6. Information control

7. Procedural checks

Checklists

‘Linear Sequential Unmasking’ (Dror et al, 2015)

Dror, I. E., Thompson, W.C., Meissner, C.A, Kornfield, I., Krane, D., Saks, M., & Risinger, M. (2015). [Context Management Toolbox: A Linear Sequential Unmasking \(LSU\) Approach for Minimizing Cognitive Bias in Forensic Decision Making](#). Journal of Forensic Sciences, 60 (4), 1111-1112.

END

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Resources and further reading

(for legal professionals)

- Parliamentary Office of Science and Technology (POST) note on '**Unintentional Bias in Court**' (coming Sept '15) <http://www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/publications/postnotes/>
- National Center for State Courts, '**Helping Courts Address Implicit Bias**' www.ncsc.org/IBReport
- Helping courts address implicit bias: Resources for education <http://www.ncsc.org/ibeducation>
- Kassin, S. M., Dror, I. E., & Kukucka, J. (2013). The forensic confirmation bias: Problems, perspectives, and proposed solutions. *Journal of Applied Research in Memory and Cognition*, 2 (1), 42-52. <http://www.sciencedirect.com/science/article/pii/S2211368113000028>

Resources and further reading

(on bias more generally)

- **Breaking the Bias Habit®**: A Workshop to Promote Gender Equity <http://wiseli.engr.wisc.edu/bias.php>
- **Reviewing Applicants: Research on Bias and Assumptions** http://wiseli.engr.wisc.edu/docs/BiasBrochure_3rdEd.pdf
- **Project Implicit** (Harvard) <https://implicit.harvard.edu/implicit/>

Resources and further reading

(on decision making)

- **Reckoning with Risk: Learning to Live with Uncertainty** by Gerd Gigerenzer (2002)
- **The Power of Intuition: How to Use Your Gut Feelings to Make Better Decisions at Work** by Gary Klein (2004)
- **The Invisible Gorilla: And Other Ways Our Intuitions Deceive Us** by Christopher Chabris and Daniel Simons (2010)
- **Thinking, Fast and Slow** by Daniel Kahneman (2011)

Resources and further reading

(scholarly work)

- Kang, J., Bennett, M. W., Carbado, D. W., Casey, P., Dasgupta, N., Faigman, D. L., ... & Mnookin, J. (2012). [Implicit bias in the courtroom](#). *UCLA Law Review*, 59(5).
- Lai, C. K., Hoffman, K. M., & Nosek, B. A. (2013). [Reducing implicit prejudice](#). *Social and Personality Psychology Compass*, 7(5), 315-330.
- Stafford, T. (2014). [The perspectival shift: how experiments on unconscious processing don't justify the claims made for them](#). *Frontiers in Psychology*, 5, 1067.
- Holroyd, J. and Kelly, D. '[Implicit Bias, Character, and Control](#)' to appear in *From Personality to Virtue: Essays in the Philosophy of Character*, Eds. J. Webber and A Masala. Oxford University Press.