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On Bias in Forensic Science

National Commission on Forensic Science – May 12, 2014

Chicago Tribune
NEWS

Hanover Park man gets 35 years for killing woman during robbery

January 27, 2012 | By Clifford Ward | Special to the Tribune

A Hanover Park man who stabbed a grandmother to death during an armed robbery at a convenience store was sentenced today to 35 years in prison.

Dewaun Tate, 21, had pleaded guilty last year to one count of first-degree murder for the November 2008 attack on Vatsala Thakkar at the Dollar Plus store in Hanover Park where Thakkar, a 56-year-old immigrant from India, worked as a cashier.

56-year-old Vatsala Thakkar was a doctor in India but took a job as a convenience store cashier to help pay family expenses.

She was stabbed to death outside her store trying to thwart a theft in November 2008.

Bloody Footwear Impression

Bloody Tire Impression

What was the threat?

1. We failed to ask ourselves if this was a footwear impression.
2. The appearance of the impression combined with the investigator's interpretation created prejudice.

The accuracy of our analysis became threatened by our prejudice.

The Forensic Foundations Group

Types of Cognitive Bias

Available at: http://en.wikipedia.org/wiki/List_of_cognitive_biases | Accessed on April 14, 2014

Anchoring or focalism
Attentional bias
Availability heuristic
Availability cascade
Backfire effect
Bandwagon effect
Base rate fallacy or base rate neglect
Belief bias
Bias blind spot
Choice-supportive bias
Clustering illusion
Confirmation bias
Congruence bias
Conjunction fallacy
Conservatism or regressive bias
Conservatism (Bayesian)
Contrast effect
Curse of knowledge
Decoy effect
Denomination effect
Distinction bias
Duration neglect
Empathy gap
Endowment effect
Essentialism
Exaggerated expectation
Experimenter's or expectation bias
Functional fixedness
Focusing effect
Forer effect or Barnum effect
Framing effect
Frequency illusion
Gambler's fallacy
Hard-easy effect
Hindsight bias
Hostile media effect
Hot-hand fallacy
Hyperbolic discounting
Identifiable victim effect
Illusion of control
Illusion of validity
Illusory correlation
Impact bias
Information bias
Insensitivity to sample size
Irrational escalation
Just-world hypothesis
Less-is-better effect
Loss aversion
Mere exposure effect
Money illusion
Moral credential effect
Negativity effect
Negativity bias
Neglect of probability
Normalcy bias
Observation selection bias
Observer-expectancy effect
Omission bias
Optimism bias
Ostrich effect
Outcome bias
Overconfidence effect
Pareidolia
Pessimism bias
Planning fallacy
Post-purchase rationalization
Pro-innovation bias
Pseudocertainty effect
Reactance
Reactive devaluation
Recency illusion
Restraint bias
Rhyme as reason effect
Risk compensation / Peltzman effect
Selective perception
Semmelweis reflex
Social comparison bias
Social desirability bias
Status quo bias
Stereotyping
Subadditivity effect
Subjective validation
Survivorship bias
Time-saving bias
Unit bias
Well travelled road effect
Zero-risk bias
Zero-sum heuristic
Actor-observer bias
Defensive attribution hypothesis
Dunning–Kruger effect
Egocentric bias
Extrinsic incentives bias
False consensus effect
Forer effect (aka Barnum effect)
Fundamental attribution error
Group attribution error
Halo effect
Illusion of asymmetric insight
Illusion of external agency
Illusion of transparency
Illusory superiority
Ingroup bias
Just-world phenomenon
Moral luck
Naive cynicism
Naïve realism
Outgroup homogeneity bias
Projection bias
Self-serving bias
Shared information bias
System justification
Trait ascription bias
Ultimate attribution error
Worse-than-average effect
Bizarreness effect
Choice-supportive bias
Change bias
Childhood amnesia
Conservatism or Regressive Bias
Consistency bias
Context effect
Cross-race effect
Cryptomnesia
Egocentric bias
Fading affect bias
False memory
Generation effect (Self-generation effect)
Google effect
Hindsight bias
Humor effect
Illusion of truth effect
Illusory correlation
Lag effect
Leveling and Sharpening
Levels-of-processing effect
List-length effect
Misinformation effect
Modality effect
Mood-congruent memory bias
Next-in-line effect
Part-list cueing effect
Peak-end rule
Persistence
Picture superiority effect
Positivity effect
Primacy effect, Recency effect & Serial position effect
Processing difficulty effect
Reminiscence bump
Rosy retrospection
Self-relevance effect
Source confusion
Spacing effect
Spotlight effect
Stereotypical bias
Suffix effect
Suggestibility
Telescoping effect
Testing effect
Tip of the tongue phenomenon
Verbatim effect
Von Restorff effect
Zeigarnik effect

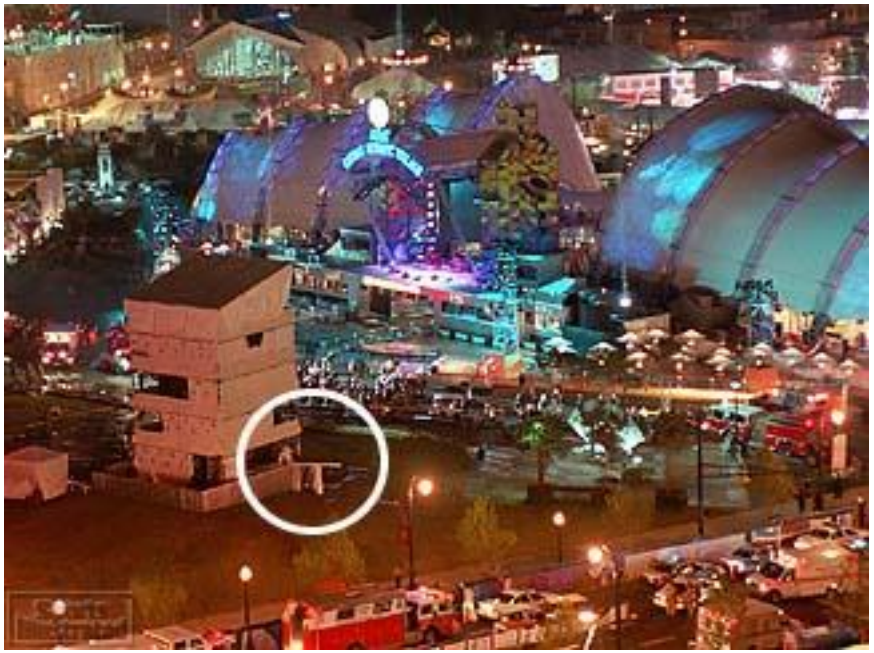
National Institutes of Health

"Bias is defined as any tendency which prevents unprejudiced consideration of a question."

National Institutes of Health

"Bias is defined as any tendency which prevents unprejudiced consideration **or answering** of a question."

1996 Olympic Bombing - Atlanta



John Iacono

Julian Gonzalez/Black Star

Photos available at: http://sportsillustrated.cnn.com/events/1996/olympics/weekly/960805/tragedy.html

Masonry Nails

Analysis by Jerry Miller, ATF Lab Atlanta

Stamped Surface (impressions)

Cut surface (striations)

Cut surface (striations)

Nails from the Olympic Bomb were cut by the same machine as nails found at Eric Rudolph's residence.

What was the threat?

The associative power of the identical toolmark patterns would have been easy to over-state into a compelling case of guilt.

We must respect the threat of bias, know where it lives, and what may cause it to strike.

We respect it, but we don't fear it. We mitigate the risk.

Where the threat "lives" in forensic science

1. Subordinate employees conducting quality assurance checks for their supervisors.
2. Wanting to please the "customer."
3. Allowing scientific meaning to be lost in legal translation – "zealous advocacy"
4. Ambiguity / variance in reporting (written/oral).

Comparative Severity

Bias/Human Factors ← **Less prepared** — **Pressure/Neglect of the Forensic Science Workforce**

Photos available at: http://jimburnsphotos.com/media/Western-Diamond-backed-Ratt.jpg and http://lovellchronicle.blogspot.com/2010/05/freight-train-derails-at-wind-river.html

Culture, Values, and Communication

Outliers by Malcolm Gladwell

"The kinds of errors that cause plane crashes are invariably errors of **teamwork and communication**. One pilot knows something important and doesn't tell the other pilot. One pilot does something wrong, and the other pilot doesn't catch the error. A tricky situation needs to be resolved through a complex series of steps – and somehow the pilots fail to coordinate and miss one of them."

A Final Thought

Dr. Peter F. Gerhardt, Researcher

“The interplay between choice and control is called competence.”

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