

Using Data While Human



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Who I Am



SCHOLAR

PhD from the University of Cambridge, UK



SCIENTIST

Researching across multiple continents and diverse fields



ENTREPRENEUR

Founded and run Merakinos, an analytics education and data services company for nonprofits





We are pattern-making champions

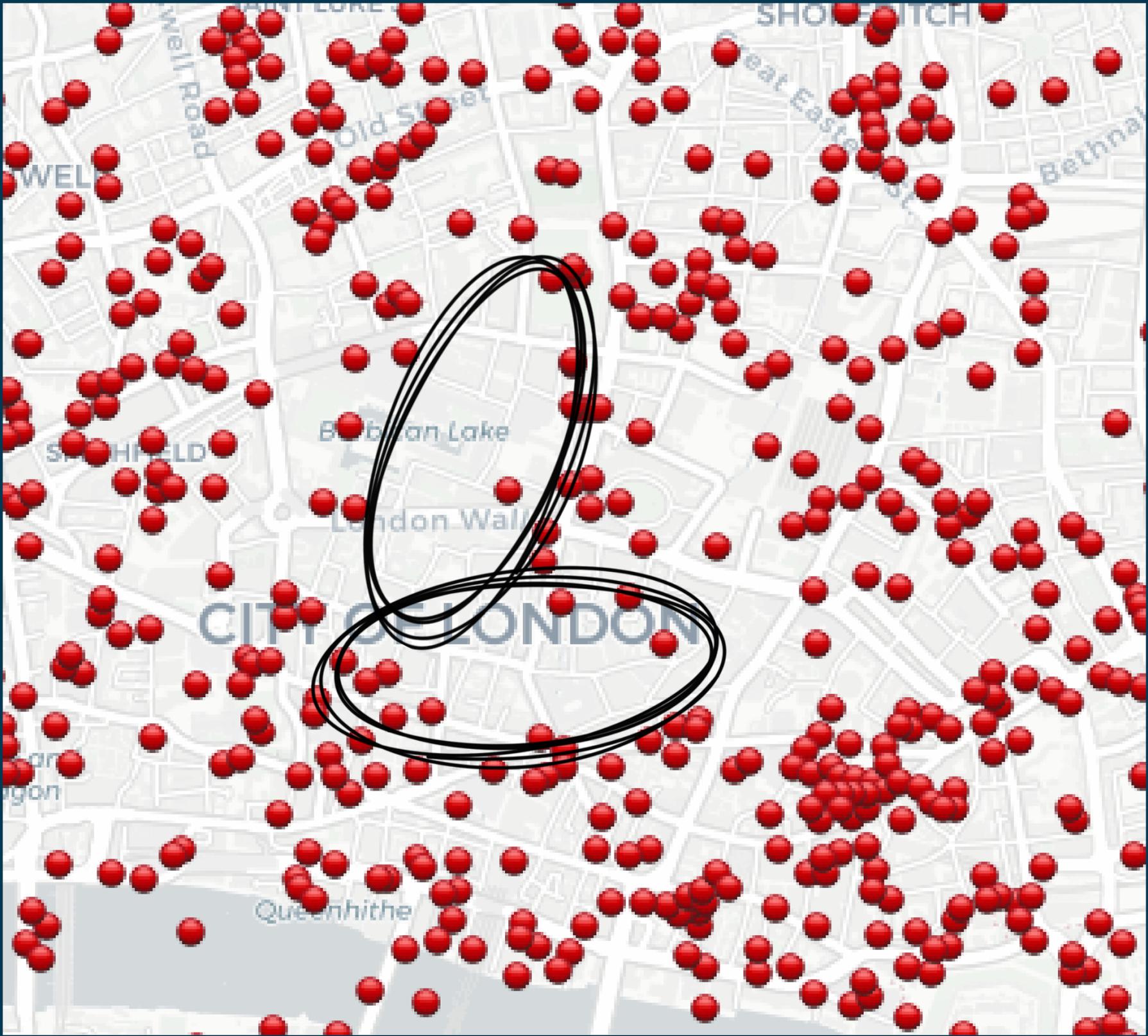


Great for making sense of the world quickly.
Bad for dealing with randomness.









WHAT TO WATCH FOR:



High variability



WHAT TO WATCH FOR:



1

High variability

2

A leap from local to global



WHAT CAN YOU DO?



- Be mindful in your language and extrapolations
 - How much of the cow can you see?
- Triangulate evidence for possible patterns
- Use appropriate stats to control for noise



We find how to
make things **happen!**



Great for all human advancement.

Bad for avoiding spurious correlations.



Japanese passenger cars sold in the US correlates with Suicides by crashing of motor vehicle

Correlation: 93.57% ($r=0.935701$)



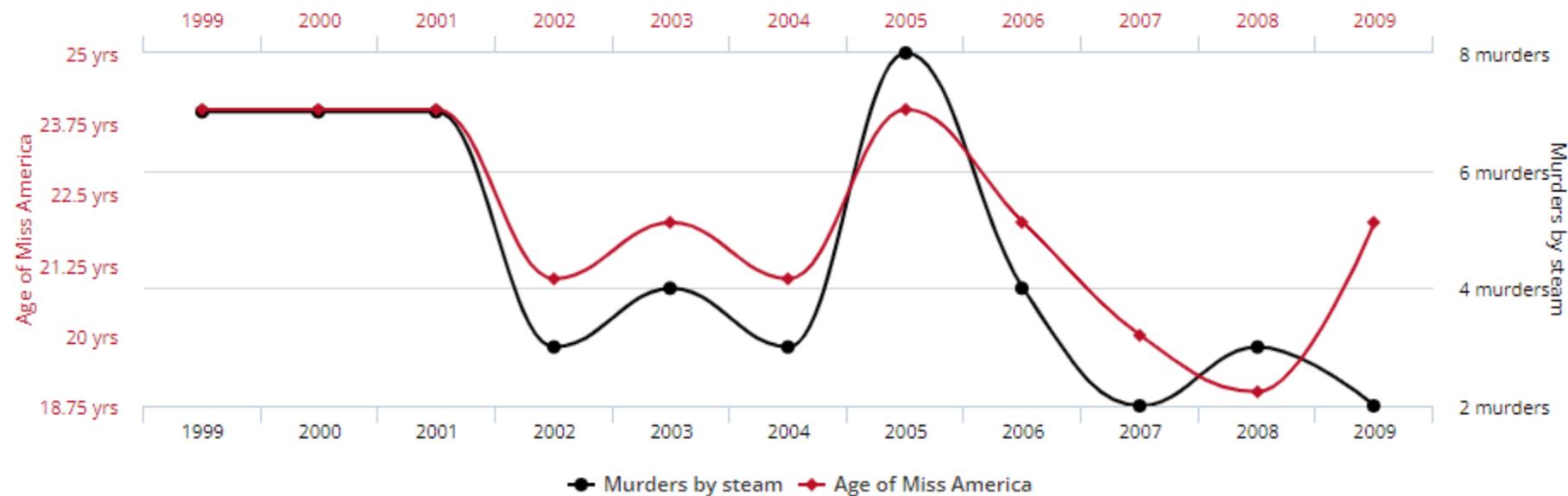
Data sources: U.S. Bureau of Transportation Statistics and Centers for Disease Control & Prevention

<http://www.tylervigen.com/spurious-correlations>

Age of Miss America correlates with

Murders by steam, hot vapours and hot objects

Correlation: 87.01% ($r=0.870127$)



Data sources: Wikipedia and Centers for Disease Control & Prevention

tylervigen.com



WHAT TO WATCH FOR:



"Bacon causes cancer!"



WHAT TO WATCH FOR:



1

"Bacon causes cancer!"

2

Only association is temporal



WHAT TO WATCH FOR:



1

"Bacon causes cancer!"

2

Only association is temporal

3

Easy or tangential measurements
about complex things



WHAT CAN YOU DO?



- Use more "associated with" and a lot less "causes"
- Seek repeatability & experiments
- Require a reasonable, evidence-based mechanism for causation
- Remain skeptical!



I have to **believe it**
to see it.



Great for consistency and avoiding overwhelm.
Bad for updating our views.

LET'S PLAY A GAME

You want to know:

Is it the animal toys that are responsible for all the repairs?



TRUCK



ANIMAL



**BROKEN
TOY**



OK TOY

CONFIRMATION BIAS



- We continually seek information that confirms the beliefs we already hold
- We discount information that contradicts those beliefs
- Builds confidence & security
 - Avoids "cognitive dissonance"



WHAT TO WATCH FOR:



"That makes sense"



WHAT TO WATCH FOR:



1

"That makes sense"

2

"I'm sure that there's something wrong with that data."



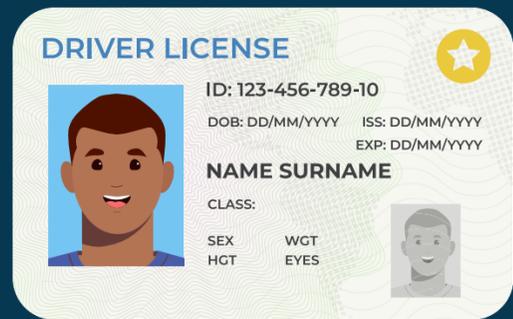
WHAT CAN YOU DO?



- "What data would change my mind?"
- Assign or take on 'the devil's analyst' role
- Get exposure to info you disagree with
- Set benchmark/decision points BEFORE you get the results

LET'S PLAY A GAME

You want to know:
Is everyone drinking alcohol over the age of 21?



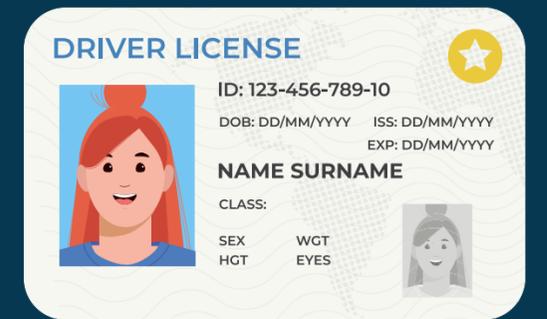
25



COKE



BEER



16



Good people do **good things**.
Bad people do **bad things**.



Great for maintaining relationships.
Bad for objective judgment.





ATTRIBUTION THEORY



Ascribing a why beyond what the facts say that aligns with how you feel about it.

- Why did the past donor not donate this year?
- Halo (and horns) effect

WHAT TO WATCH FOR:



Confirmation bias flags



WHAT TO WATCH FOR:



1

Confirmation bias flags

2

Assumptions on what others are thinking or feeling



WHAT TO WATCH FOR:



1

Confirmation bias flags

2

Assumptions on what others are thinking or feeling

3

"Too much," and "not enough"



WHAT TO WATCH FOR:



1

Confirmation bias flags

2

Assumptions on what others are thinking or feeling

3

"Too much," and "not enough"

4

Comforting sense-making



WHAT CAN YOU DO?



- What is fact - and what is a value judgment?
- Stop your summary before 'because...'
- Brainstorm multiple 'whys'
- Be okay with not knowing



THE FEATURES



PATTERN-SEEKING

Seeing what isn't there

CAUSALITY

Assuming influence from coincidence or secondary connection

CONFIRMATION BIAS

Seeking support of what you already believe

ATTRIBUTION

Assigning a 'why' beyond your evidence



YOUR ACTIONS



PATTERN-SEEKING

Triangulate your data

CAUSALITY

Experiment more

CONFIRMATION BIAS

"What data would change my/your mind?"

ATTRIBUTION

Keep your language within your evidence