THE DATA DIFFERENCE

How data-driven insight can improve our communities and our lives

Rufus Pollock

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Who am I?

Part I

Cambridge

10 years later

How do we make decisions?

Lew Goldberg & colleagues at the ORI

Cancer and Oncologists

Findings

Man versus Model of Man

Simple data-driven models do better than experts

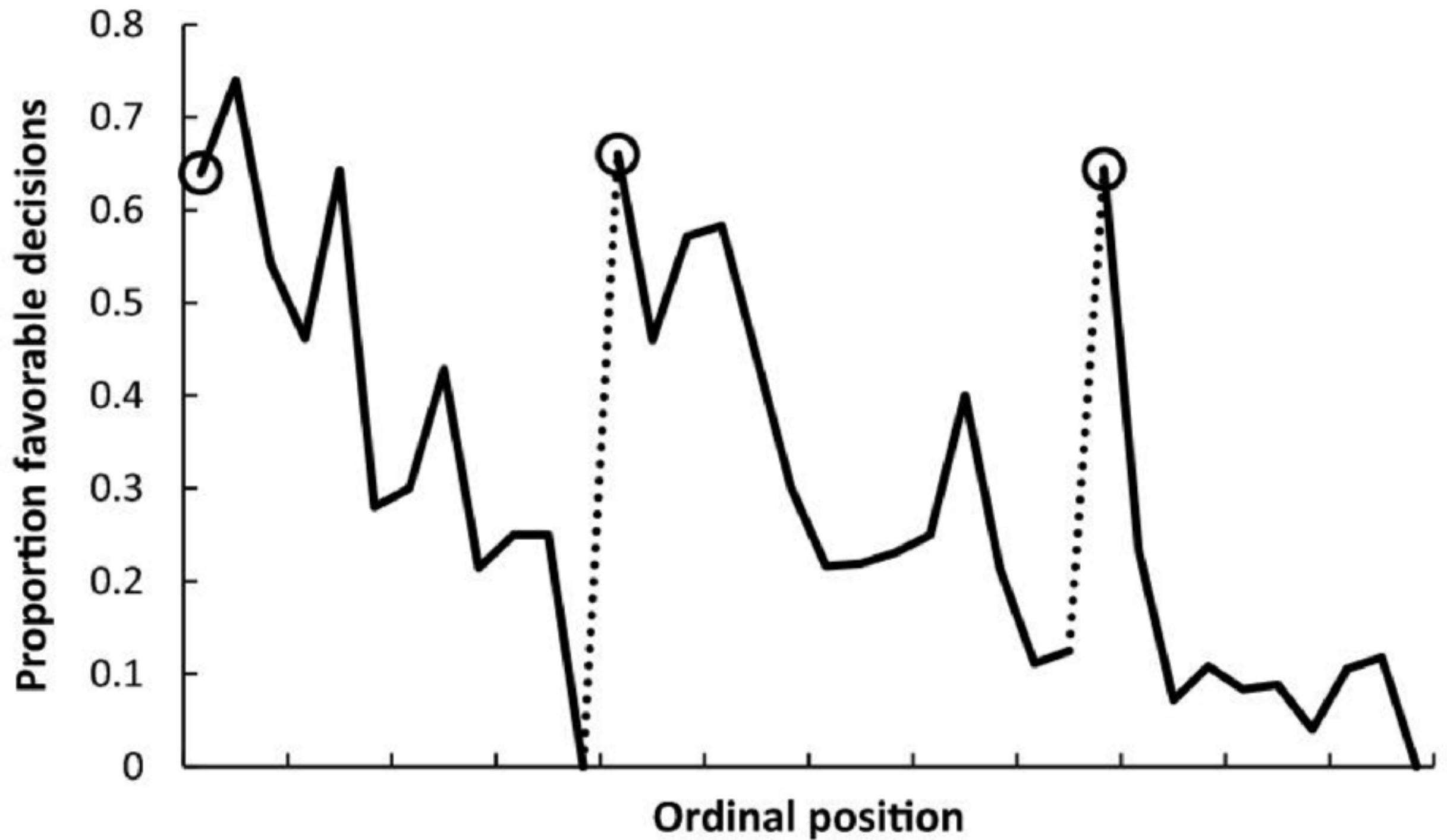(100s of studies)

Why?

Sheep can count to three

Jennifer and her irregular heart

Representativeness, Availability and Anchoring

Judgment under Uncertainty: Heuristics and Biases.
Amos Tversky; Daniel Kahneman
Science, New Series, Vol. 185, No. 4157. (Sep. 27, 1974), pp. 1124-1131.

Danziger, S., Levav, J., & Avnaim-Pesso, L. (2011). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences of the United States of America*, 108(17), 6889–6892. http://doi.org/10.1073/pnas.1018033108

Reluctance to accept facts

Part I: Data-driven algorithms are surprisingly good

Often perform better than human experts in areas ranging from forecasting the outcome of football games to diagnosing cancer.

Why? Because humans operate from approximate heuristics and are not well adapted to these types problems.

However, we remain reluctant to accept these well-established facts.

Part II: Smart Data

The Library of Babel

From *"The Garden of Forking Paths" 1944 by Jorge Luis Borges*

1. <u>Relevant</u> Data

not big data

"Facebook Overestimated Key Video Metric for Two Years"

– Sep 2016, Wallstreet Journal

Tarnished Brand, Diminished Trust, Internal Costs

2. <u>Reliable</u> Data

Part II: Data-driven value

Curb your enthusiasm – before you rush out and order your next big-data toolkit!

It can be harder to derive value from data that you might think – it's neither simple nor a solution for everything.

Why? You need <u>relevant</u> data and <u>reliable</u> data.

3Rs: Right data for the Right problem at the Right time

Smart Data not Big Data

Part III: Synthesis

Human doctors identified the seven features to look for in the stomach x-ray

Humans – or human-built processes – collected the data and designed the algorithm

Humans had to act on those predictions and insights

Conclusion: Man *and* Machine

Insight and value can only be derived from data when directed and combined with human intelligence

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