



# Metrics, Normalization and Research

Mike Taylor, Digital Science

Head of Metrics Development

Dimensions and Altmetric

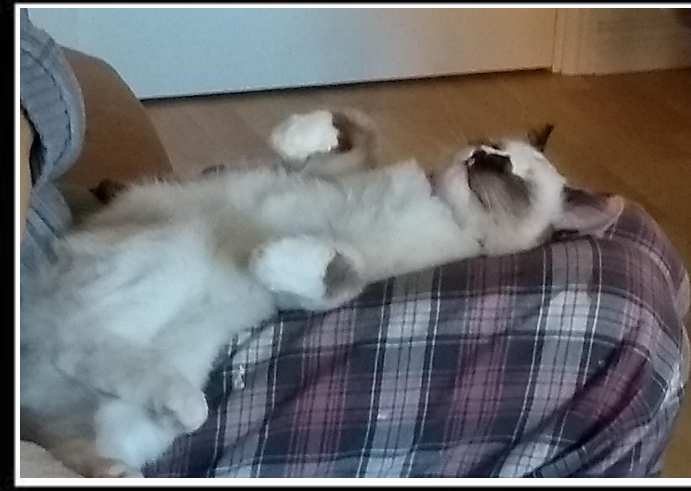
“Head of Metrics Development” is not a classic job title.



What data scientists think I do



What non-scientometrician academics think I do



What my cat thinks I do



What my kids think I do



What I think I do



What I actually do

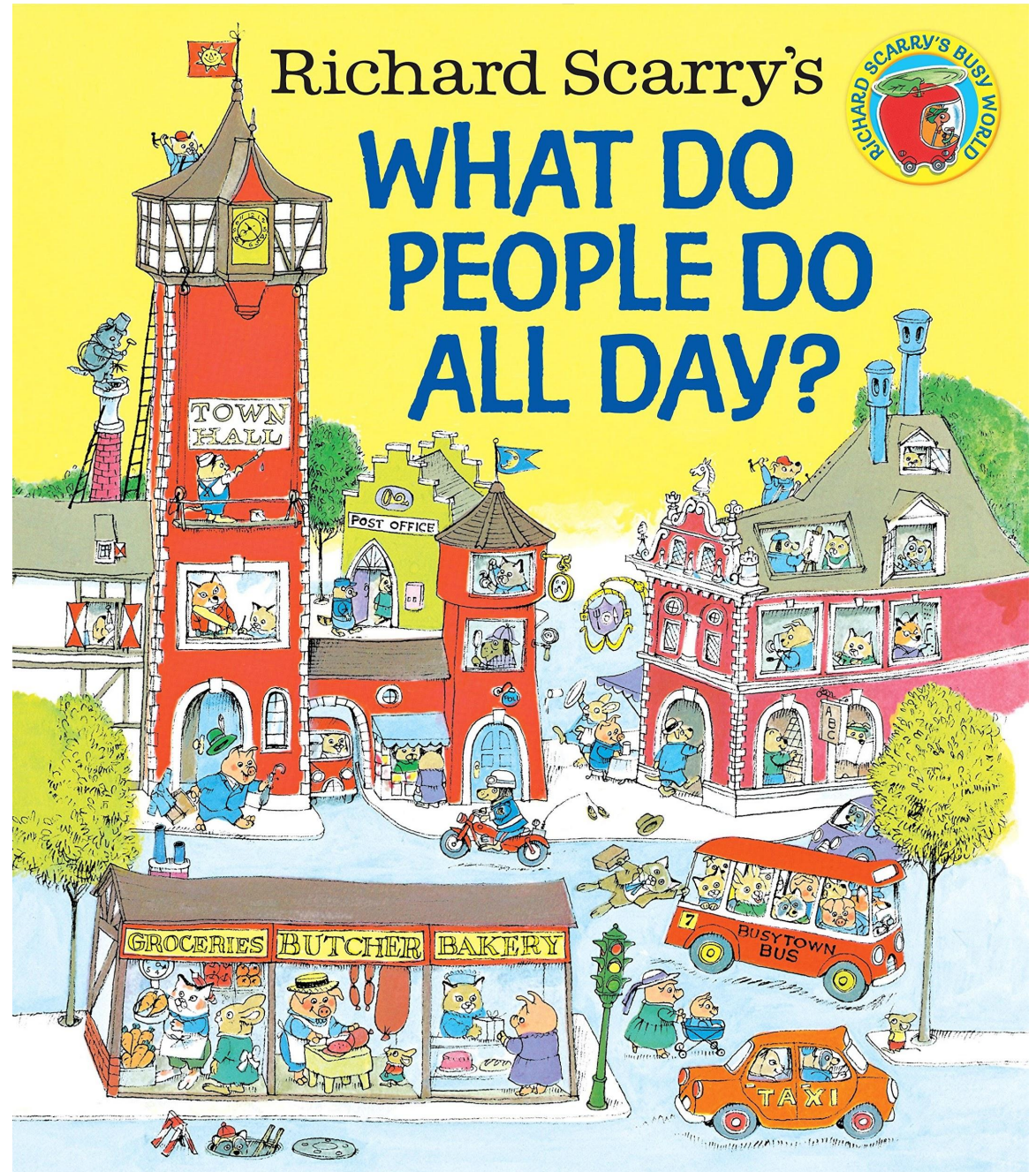


**“Development” is a lot more iterative and investigative than just crunching numbers.**

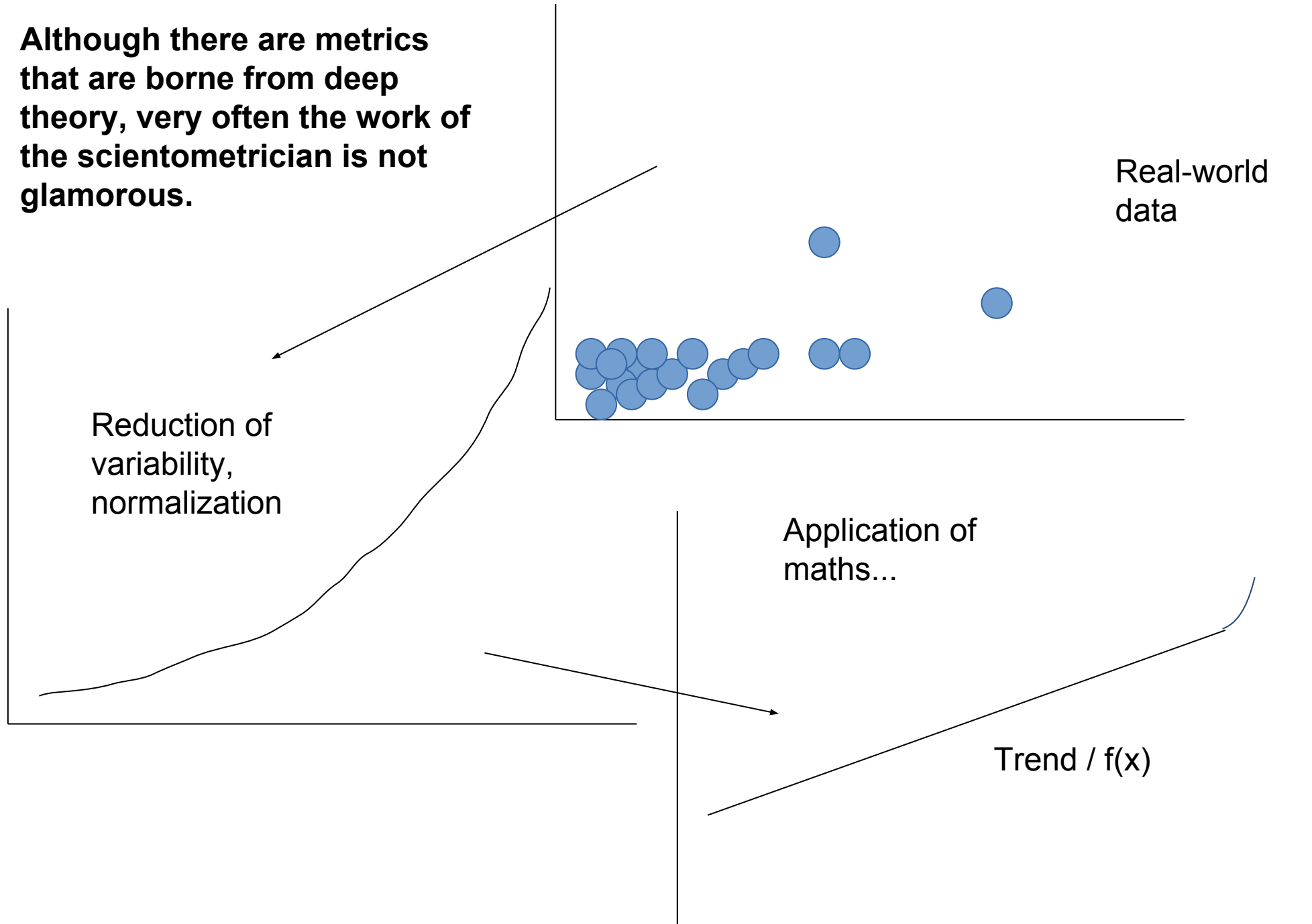
Where is there consensus?

What are reasonable processes to apply for a given data set?

When are we measuring phenomena versus the system?

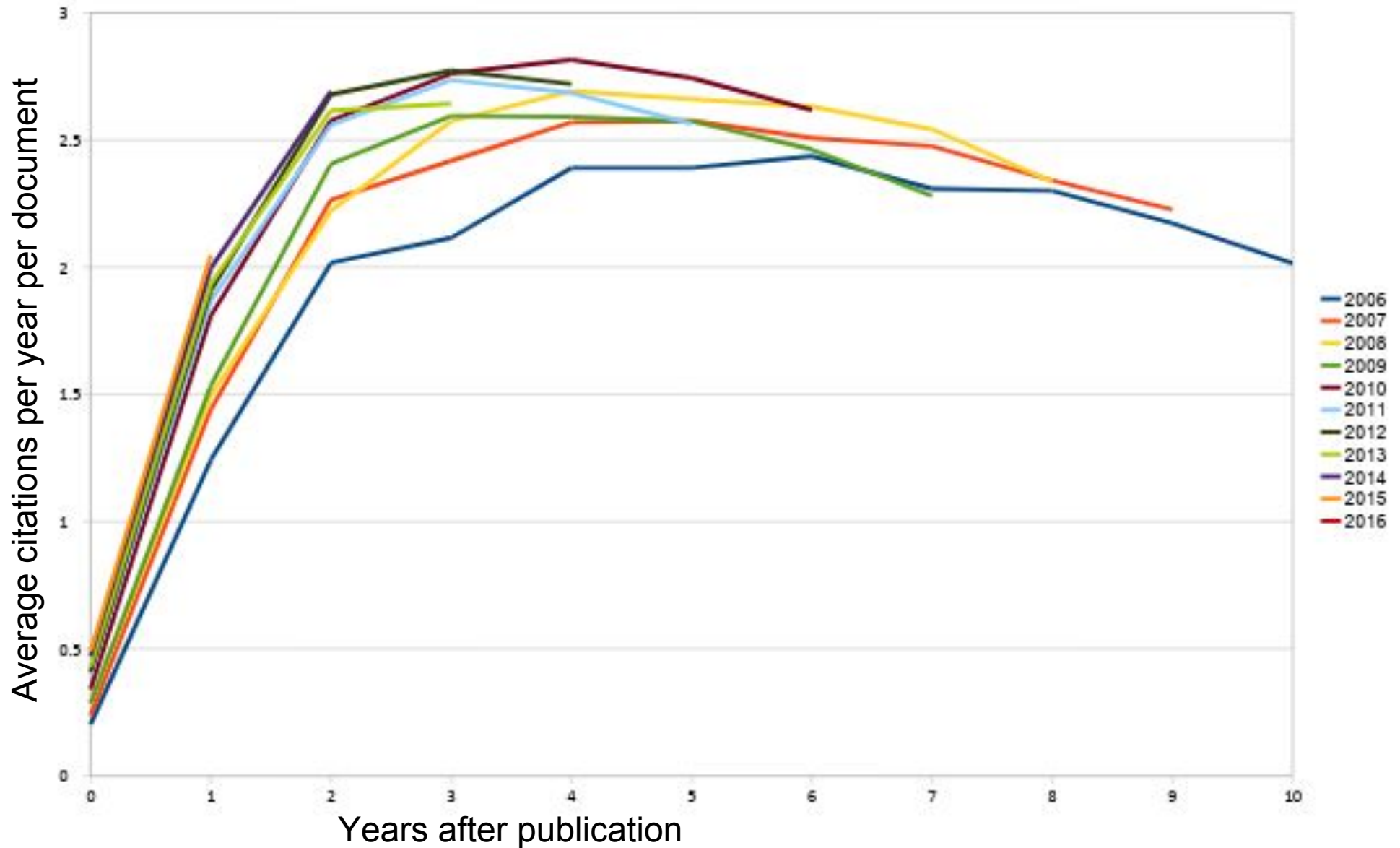


**Although there are metrics that are borne from deep theory, very often the work of the scientometrician is not glamorous.**

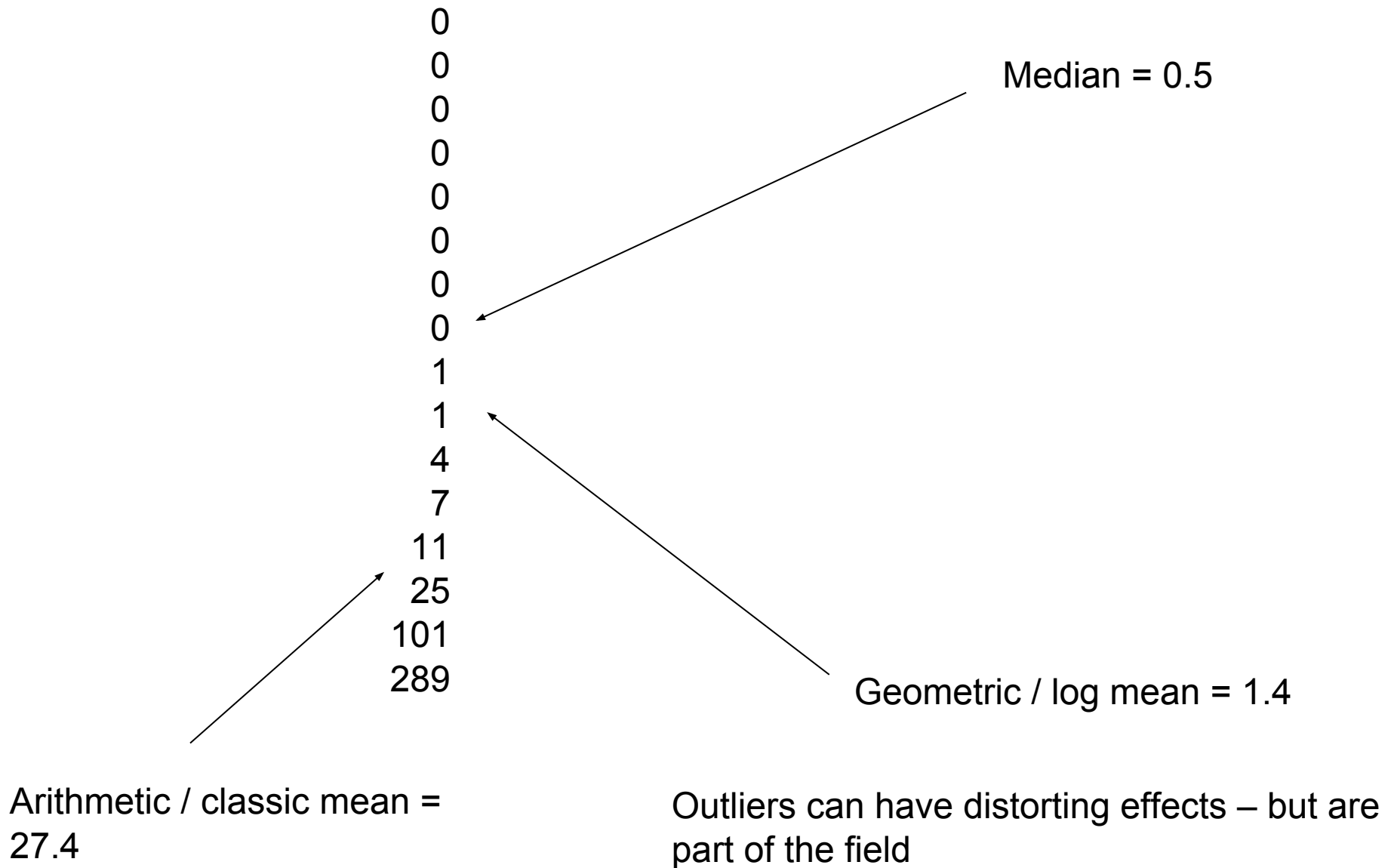


**Noise can be reduced by increasing the number of documents  
– but at the cost of a loss of signal!**

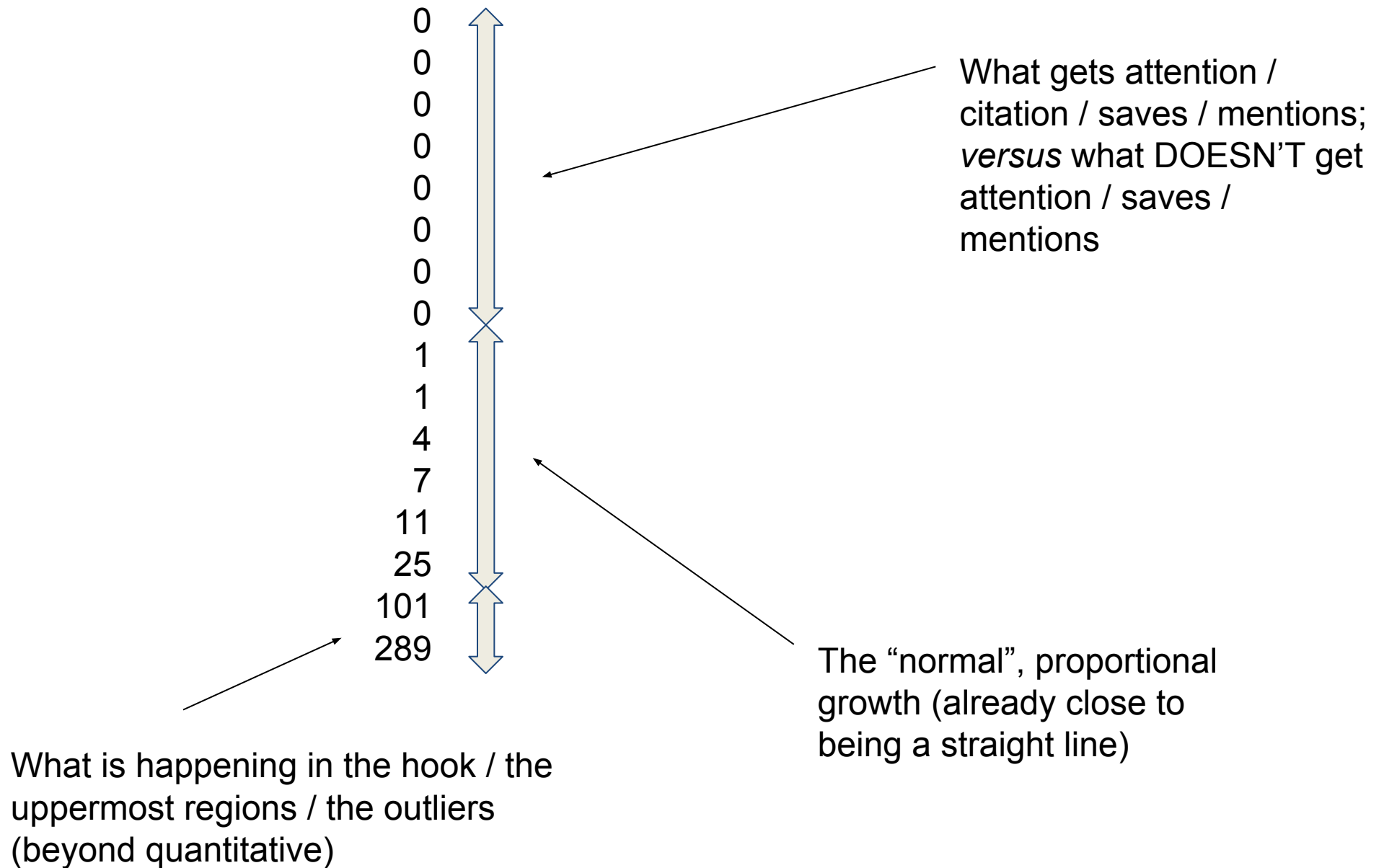
*Changes in citation rate in biomaterials*



**Taking a set of data: which could be citations or tweets or Mendeley saves - one number can't rule them all**

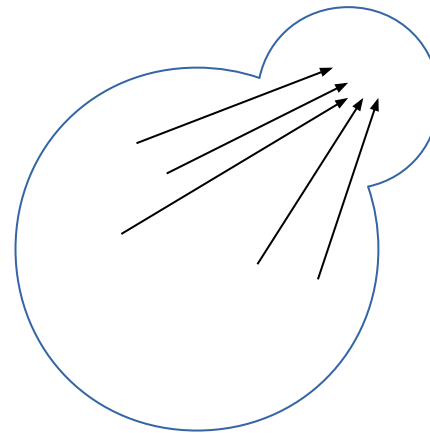
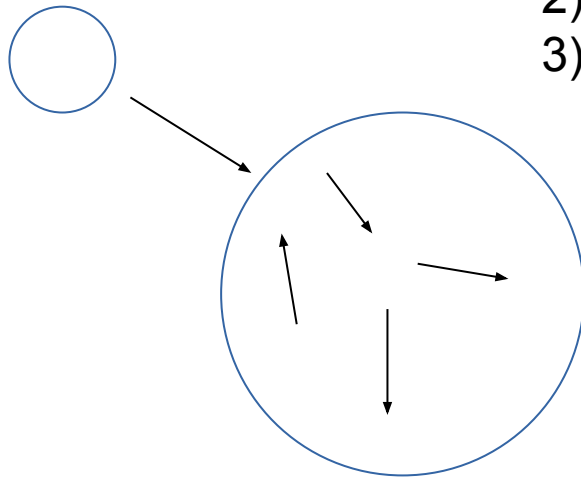


## Are there three phenomena?

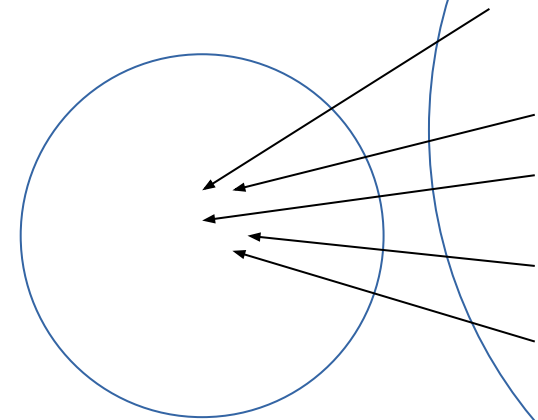


# Hypotheses of high levels of citation / sharing / saving behaviour

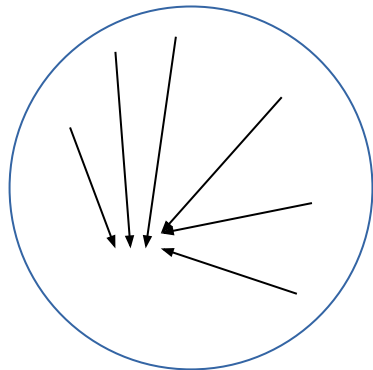
- 1) Unlikely to be a single phenomena
- 2) Especially not for eg Mendeley *and* Twitter *and* citation
- 3) What might cause this behavior?



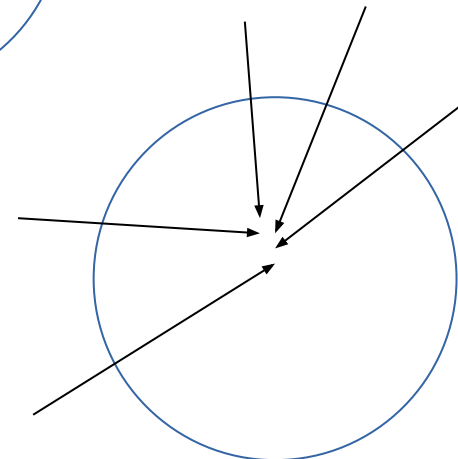
- A Kuhnian step



- Unification with a highly citing / sharing / saving field



- A canonical method, theory or description – eg CRISPR



- Controversy / argument / political discourse





## Dimensions and Altmetric

Dimensions is more focussed on the numbers - with a particular desire to see new metrics emerging from the community based on the numbers.

Altmetric is more qualitative - and being used to support narratives.

The two together tell a fascinating story: for example, with the zika crisis, you can weave a narrative around the funding, the social data, publications etc.

Altmetric's view of the world helps us inform Dimensions, eg, identifying types of behavior that drives high levels of citation.

Dimension's view opens up a vision of classification of Altmetric data that can't be achieved on its own eg, normalization and benchmarking



# Digital Science and metrics

The biggest focus of my work so far has been on Dimensions

<https://www.dimensions.ai>

We have three routes to developing metrics.

1) Implementation of metrics that are 'close to the data' and that have proven community acceptance and use.

e.g. Average Citation Rate, H-index

2) Supporting the community to develop new metrics, especially ones that combine different data

e.g. Grants, patents, articles, clinical case studies, institutions (GRID), researchers

3) Implementation of new community developed metrics.

e.g. National Institutes of Health's RCR; Prof. Thelwall's MLNCS (aka FCR)

We are very keen to coalesce around the Leiden principles and translate their ten points into policies for Dimensions, to support responsible metrics.

# Altmetrics for impact prediction and benchmarking

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Mike Thelwall  
University of  
Wolverhampton



Mike Taylor  
Digital Science