HOW TO READ SCIENTIFIC PAPERS

Essential study skills for the MSc/MPhil in EBSIPE
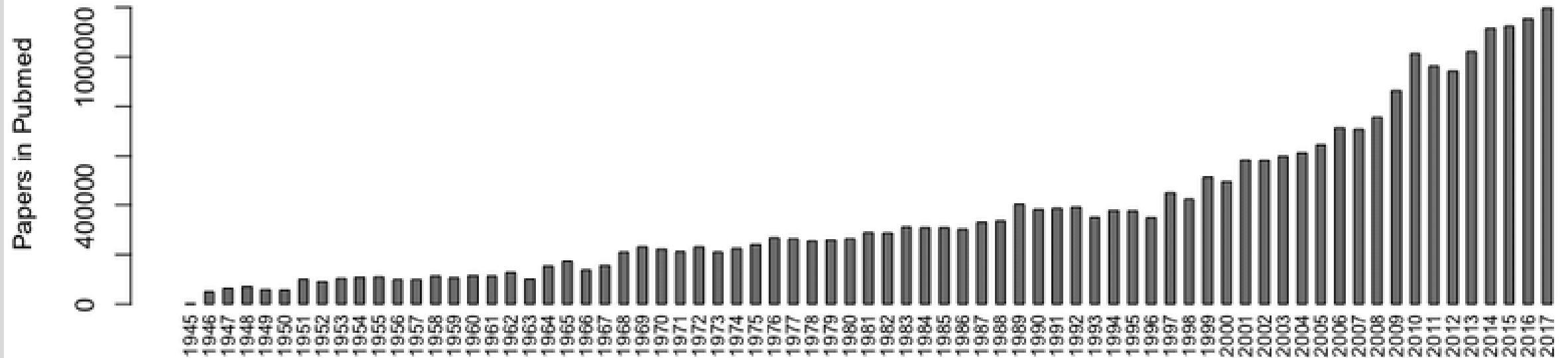
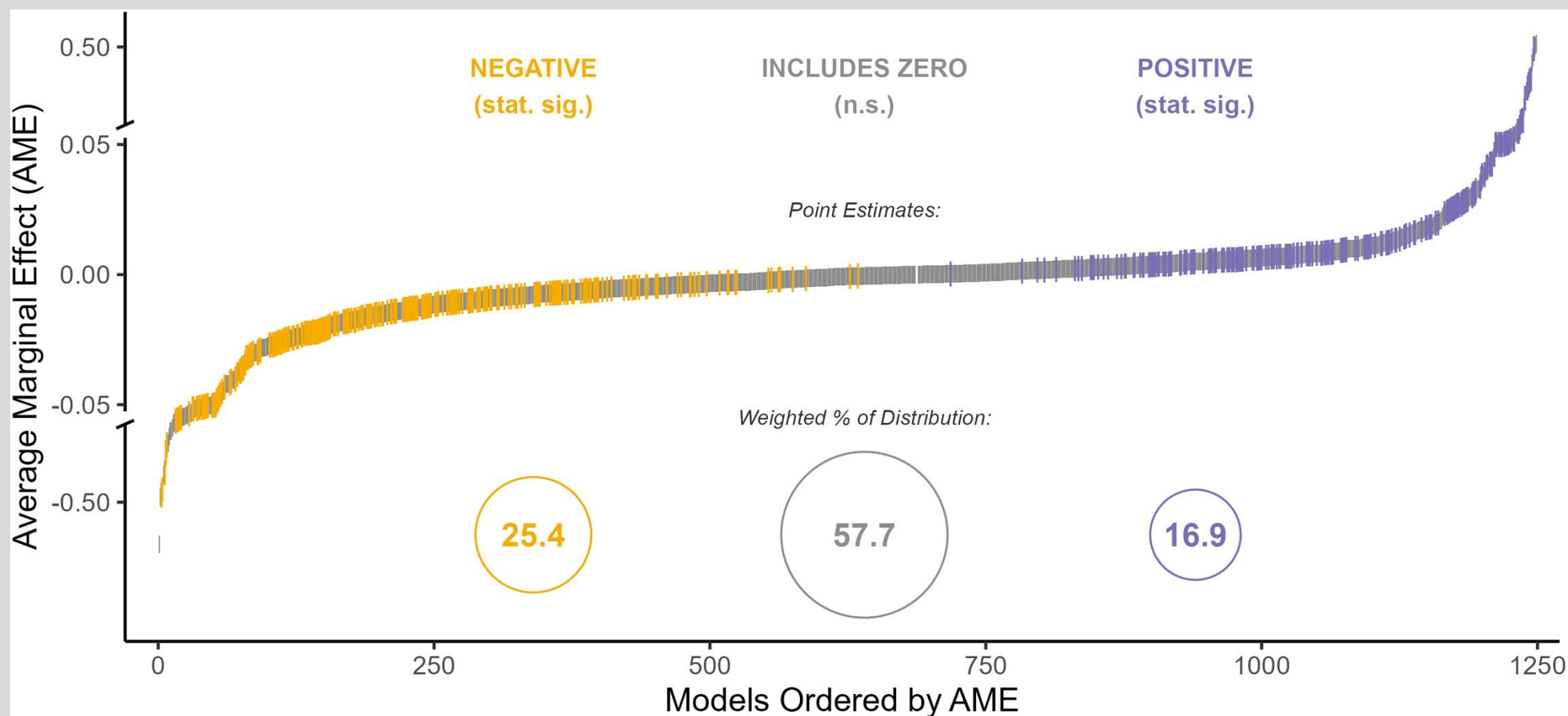Benjamin Goodair

How to read scientific papers
Learning objectives:

- The basics, and dark underbelly, of scientific papers.

- Group activity

- How to read well:

  – How to decipher relevance?

  – How to measure quality?

- Group activity

Research is produced... frequently

Research is produced… variably

Research is produced... imperfectly

NEW YORKER

ANNALS OF INQUIRY

THEY STUDIED DISHONESTY. WAS THEIR WORK A LIE?

Dan Ariely and Francesca Gino became famous for their research into why we bend the truth. Now they've both been accused of fabricating data.

By Gideon Lewis-Kraus

September 30, 2023

https://datacolada.org/

So we have to be practical and critical readers.

What is a research paper?

What is a research paper?

An **argument** produced by **trained people** with **theoretical** foundations, presented alongside their **constructed** evidence, **published** in academic journals following a **process of peer-review.**

Group task:

An **argument** produced by **trained people** with **theoretical** leanings, presented alongside their **constructed** evidence, **published** in academic journals following a **process of peer-review.**

In a group of 3, read the abstract, then:

a) Identify the processes **in bold**

b) Come up with one question about how this research was produced

IMPACT OF EDUCATION ON POVERTY REDUCTION

Masood Sarwar Awan[1], Nouman Malik[2], Haroon Sarwar[1], Muhammad Waqas[1]
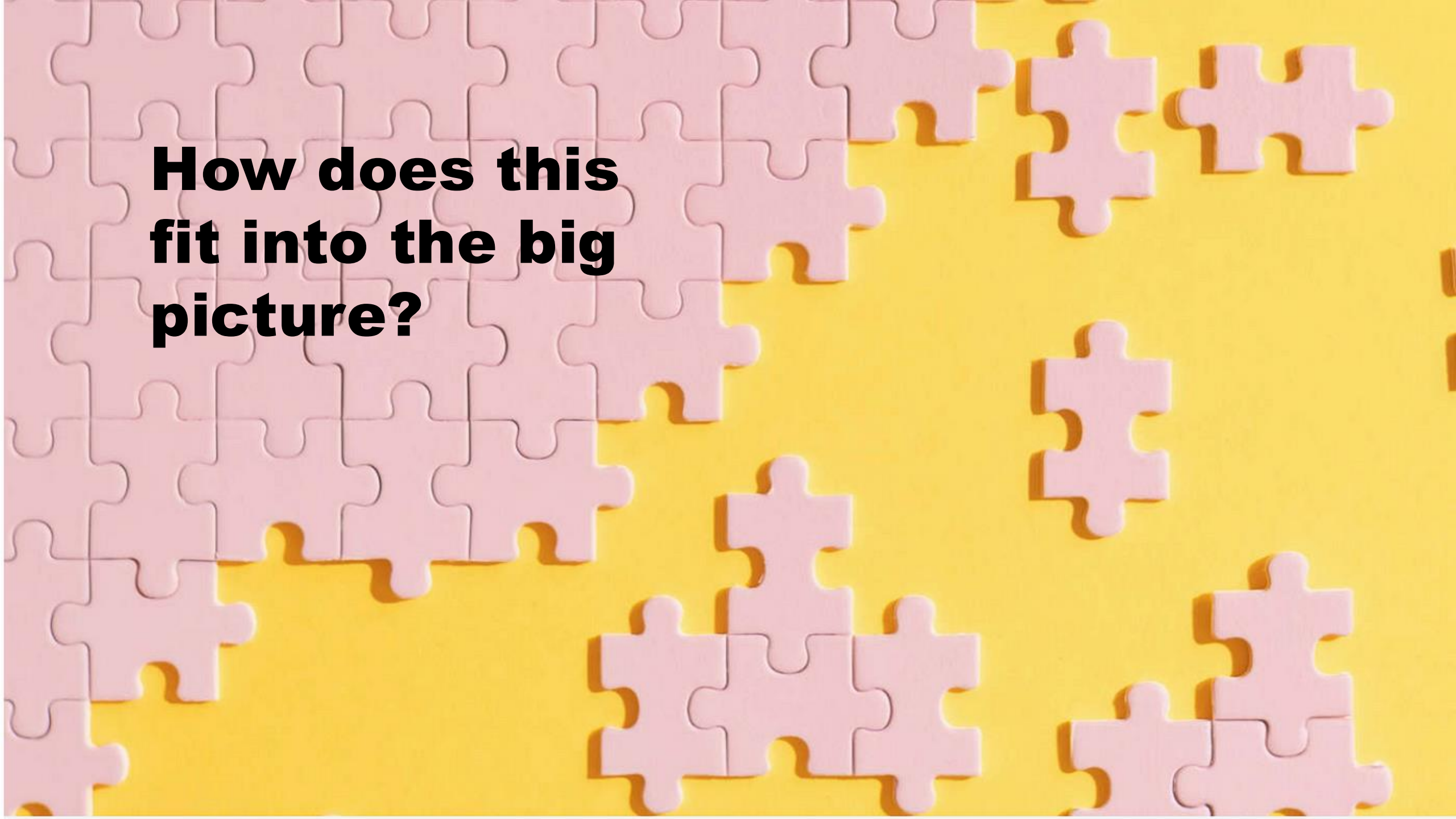
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ABSTRACT

Poverty is a stumbling block in the way of achieving economic development. Cognizant of the essence of Millennium Development Goals (MDGs) and 'Education for All' program, education is promulgated as the primary weapon against poverty prevalence. Hence it is important to seek out the effect of different levels of education upon poverty in Pakistan. This study evaluates the effect of different levels of education, experience and gender of the employed individuals (employers, self-employed, wage earners and unpaid family workers) as the determinants of poverty. The data for this task comes from the Household Integrated Economic Survey (HIES) for the years 1998-99 and 2001-02. A logistic regression model is estimated based on this data, with the probability of an individual being poor as the dependent variable and a set of educational levels, experience and gender as explanatory variables. It is found that experience and educational achievement is negatively related with the poverty incidence in both years. Also as we go for the higher levels of education the chances of a person being non-poor increases. Moreover, being a male person provides an advantage in retaining a position above poverty level.

Practical guide to reading

How does this fit into the big picture?

Read smarter, not harder

1. Read the title
   – *Does it seem relevant?*

2. Read the abstract **<u>carefully</u>**
   – *Is the study answering the type of question you're asking?*
     • Intervention effectiveness, cost-effectiveness, causes of a problem, policy implementation issues, theoretical stuff, etc.

3. Skim through the paper to confirm it's worth reading
   – Remember: *Focus on study aims and methods*

4. If you decide to read it, do so w/ specific questions in mind

Familiarity helps selecting papers efficiently…

1. Become familiar with IMRaD
2. Become familiar with article types (research, commentary, review)
3. Know your research question better
4. Understand the keywords and/or key texts used in your debate
5. Learn what contributions different papers might make (empirical, theoretical)

But…

But reading papers will always take a long time...

There is a genuine risk with generative AI that we create an educational system where no one learns anything.

- Avoid:
  - Summarising papers in ChatGPT
  - Using tools that identify an answer to a research question
  - Solely using search tools powered by AI

Is a paper good quality?

Find a copy of this book and read it (copies available in the Bod, SSL etc.)

- Online version available free through Oxford Library and earlier version as a series of papers in the BMJ

Indispensable resource for reading, **critically appraising** and assessing study **"quality"**

So, how do we determine quality?

Methods

"Strictly speaking, if you are going to trash a paper, you should do so before you even look at the results." (p. 29)

The offline roots of online hostility: Adult and childhood administrative records correlate with individual-level hostility on Twitter

Stig Hebbelstrup Rye Rasmussen, Alexander Bor, and Michael Bang Petersen   Authors Info & Affiliations

1. Link twitter data to administrative records (criminal records, housing, school, employment, care).
2. Download tweets from 5k Danish people, identifying levels of aggression.
3. Correlate tweet hostility to administrative records.
4. Identify the significant roots of online hostility.

"Reducing hostility in social media interactions is a key public concern. Most extant research emphasizes how online contextual factors breed hostility. Here, we take a different perspective and focus on the offline roots of hostility, that is, offline experiences and stable individual-level dispositions."

The offline roots of online hostility: Adult and childhood administrative records correlate with individual-level hostility on Twitter

Stig Hebbelstrup Rye Rasmussen, Alexander Bor, and Michael Bang Petersen   Authors Info & Affiliations

1. "We demonstrate that individuals with more aggressive dispositions (as proxied by having many more criminal verdicts) are more hostile in social media conversations.

2. We also find evidence that features of childhood environments predict online hostility. Time spent in foster care is a strong correlate

3. Furthermore, people from more resourceful childhood environments—those with better grades in primary school and higher parental socioeconomic status—are more hostile on average, as such people are more politically engaged."

Read with a purpose

Questions to ask yourself while reading

- *What is the study's research question?*

- *Why was the study needed?*

- *What methods did the authors use?*

- *Are the data collected appropriate to answer the stated research question?*

- *How were the data analyzed?*

- ***Do the authors' interpretations and conclusions follow logically from the data? Is their reasoning sound?***

Read with a practice

Practices to conduct while reading (advisory, and self-styled):

- Find a reference manager of choice

- Consider your best practice of note-taking and reflections
  - Read first? Answer questions? Avoid summarising

- Efficient referencing processes save time
  - And prevent plagiarism.
    - This is not an obvious point.

- Library, SS division workshops!
  - https://www.bodleian.ox.ac.uk/ask/workshops/reference-management-workshop-handouts

Any questions?

Do we want a break?

Does austerity worsen health?

"Reader et al. (2024) conducts a quasi-experimental study of the impact of two-child limit to child tax credits on the mental health of mothers with more than two children. They use administrative data from the DWP and run difference-in-difference regressions (ibid.). The find a mothers with more than two children have a 2% (95% CI 1.3-2.6) reduction in mental health scores compared to mothers with 2 or fewer children (ibid.). They conclude austerity is harmful (ibid.)."

Does austerity worsen health?

"Austerity can take the form of benefit conditionality – which worsens mental health for those impacted (Reader et al. 2024). Austerity, therefore, is harmful to mothers."

Does austerity worsen health?

"Austerity can do specific harm to the health women who are responsible childcare. One study found lower mental health for mothers after limits were introduced on the number of children applicable for tax credit support (Reader et al. 2024). Although, this study is difficult to translate to other settings because their results failed to account for the support of multiple generations of care givers – something that my thesis will…"

Collective task

- Back in your groups of 3
- Google scholar… one each of…
  - "What is the impact of income inequality on health?"
  - "what is the impact of parental education on academic attainment?"
  - "What is the impact of benefit conditionality on on mental health?"
- Skim results and abstracts.
- Each find 2 papers you think aren't relevant/ quality
- And find 2 papers you think are relevant/ quality
- Describe how you managed this with eachother and what you decided was important

Thank you

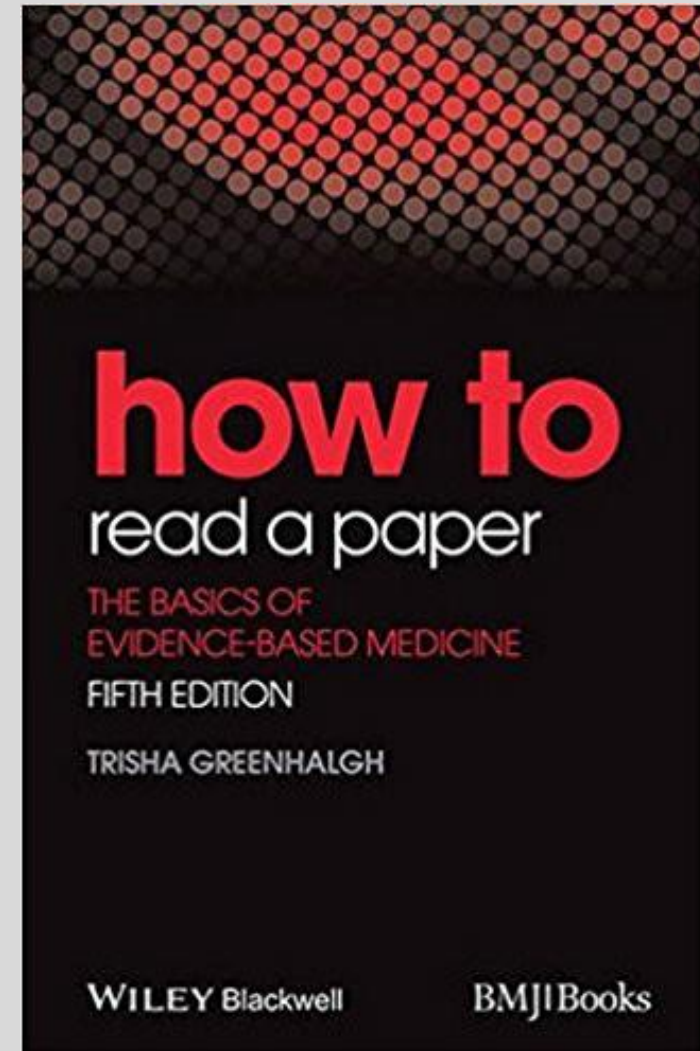Any thoughts?

The structure of scientific papers

I   **Introduction**

M   **Methods**

R   **Results**

A   and

D   **Discussion**

The structure of scientific papers

I   Introduction

- Provides background information
  - *Why did the authors choose to conduct the study?*
  - *What is the purpose of the research project? What are the research questions?*
  - *What is known about this topic or what is the existing evidence in the field and/or topic area?*

The structure of scientific papers

M   Methods

- Details the process of the research
  - *How did the authors conduct this study?*
  - *Who were the participants?*
  - *What measures were used?*
  - *What was the procedure?*
  - *How were the data analyzed?*
- Good reporting of methods facilitates **replication**

The structure of scientific papers

R   Results

- Describes the study findings (Explains what the data show)
  - If quantitative, should normally contain tables and figures
  - If qualitative, should usually include direct quotations from participants (or other data sources)

The structure of scientific papers

D   Discussion

- Presents the authors' interpretations of the results
  - *What do they think the results mean?*
  - *How do they relate to the established literature?*
  - *What are the strengths and limitations of the study?*
  - *What are the authors' recommendations moving forward?*