



GESIS Leibniz Institute
for the Social Sciences

From Evidence Gap Maps to Systematic Reviews and Meta-Analyses: Approaches, Techniques, and Tools

Leibniz
Association

Jessica Daikeler

Hybrid event A5, 6, Room A231 + Zoom
October 30, 2024, 13:45-15:15 CEST



Hi, my name is ...

Dr. Jessica Daikeler

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[linkedin.com/company/kodaqs/](https://www.linkedin.com/company/kodaqs/)



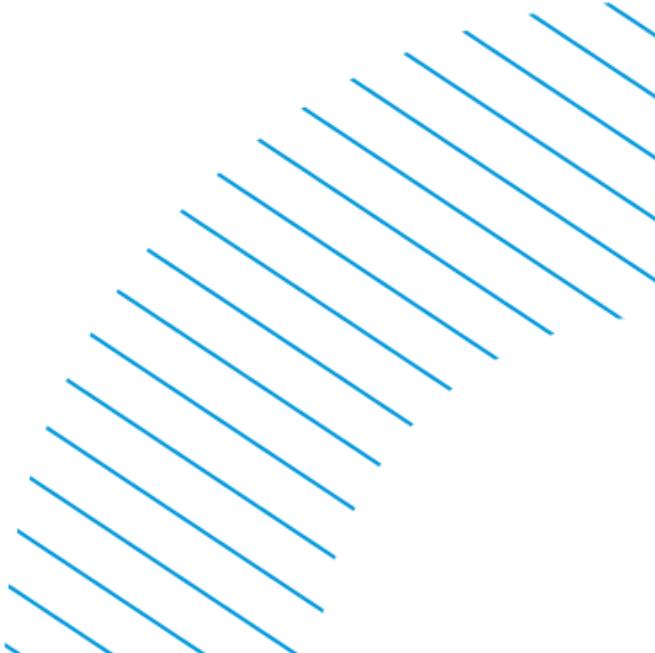
[@JeSs_Dalk](https://twitter.com/JeSs_Dalk)



[@kodaqs](https://twitter.com/kodaqs)



[@kodaqs.bsky.social](https://bluesky.social/@kodaqs.bsky.social)



About me: Jessica Daikeler



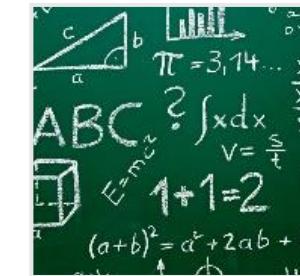
Education

- PhD from the **University of Mannheim** in Survey Methodology (Social Science department)
- Dissertation on the **Application of Evidence-Based Methods in Survey Methodology**



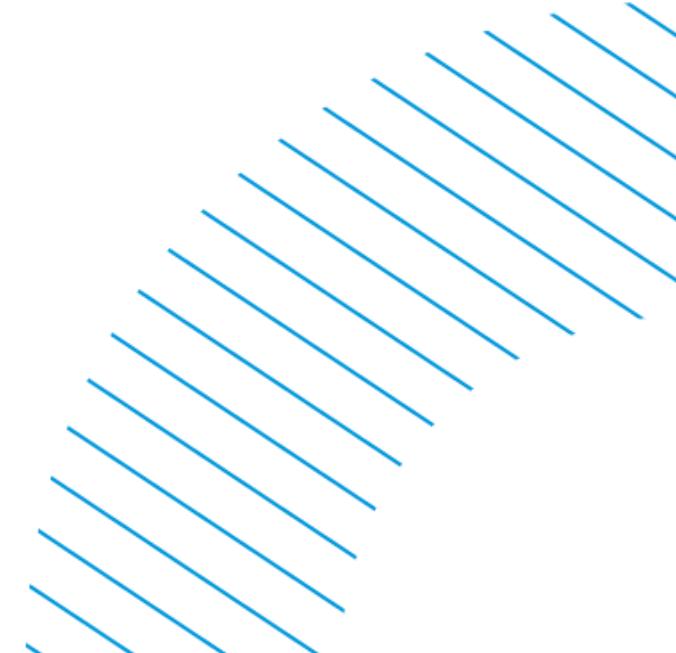
Work

- @ GESIS
- **Survey Design and methodology department Team lead Assessing Survey Data Quality**
- Project coordinator **KODAQs**
- PI Pub Bias
- Consulting on systematic reviews and meta-analysis



Research

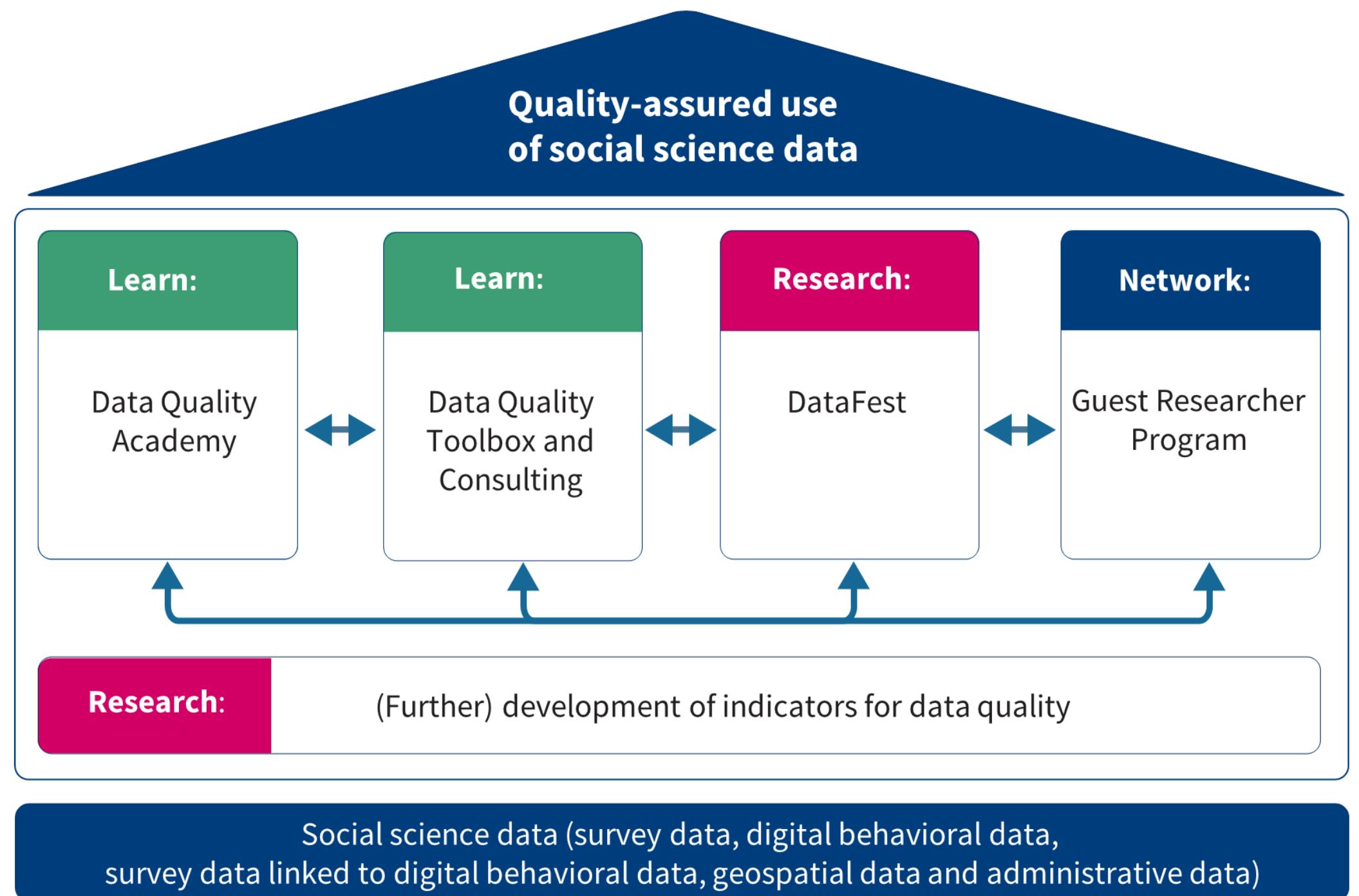
- Explaining and preventing nonresponse
- Survey mode effects
- Survey recruitment via SNS
- Data Donation research Meta-Analysis, systematic reviews, gap maps and experiments in survey methods
- Some substantial meta-analysis on refugees' skills, gender discrimination, skill deficit of preborn babies



[Learn more about KODAQS](#)

KODAQS

Competence Center Data Quality in the Social Sciences



Input talk aims

Familiarizing with Evidence-Based Methods:

Participants will be introduced to various evidence-based methods for summarizing literature and will understand which method is best suited for different types of research questions.

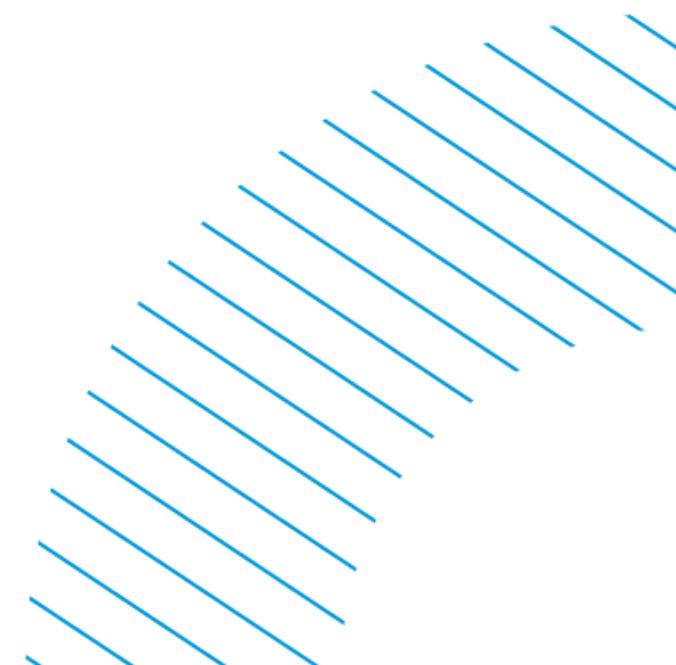
Learning the Fundamental Steps of Systematic Reviews and Meta-Analyses:

Participants will learn about the fundamental steps involved in conducting systematic reviews and meta-analyses, gaining insight into the overall process.



What I intend to do with you:

- **Methodological introduction**
 - Why research synthesis is important in the social sciences
 - **Key concepts:**
 - Evidence Gap Maps
 - Systematic Review
 - Meta-Analyses
 - **Case studies**
 - Case study 'Evidence Gap Map'
 - Systematic review case study
 - Meta-analysis case study
- **Some new cool tools improving your life**
- **Evaluation criteria for Evidence Syntheses**
- **Some last thoughts/ conclusion**

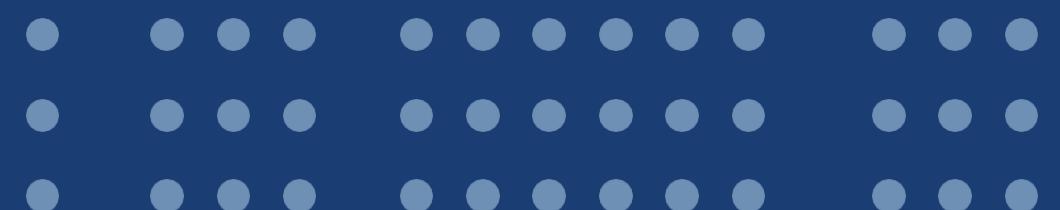




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for the Social Sciences



Methodological Introduction



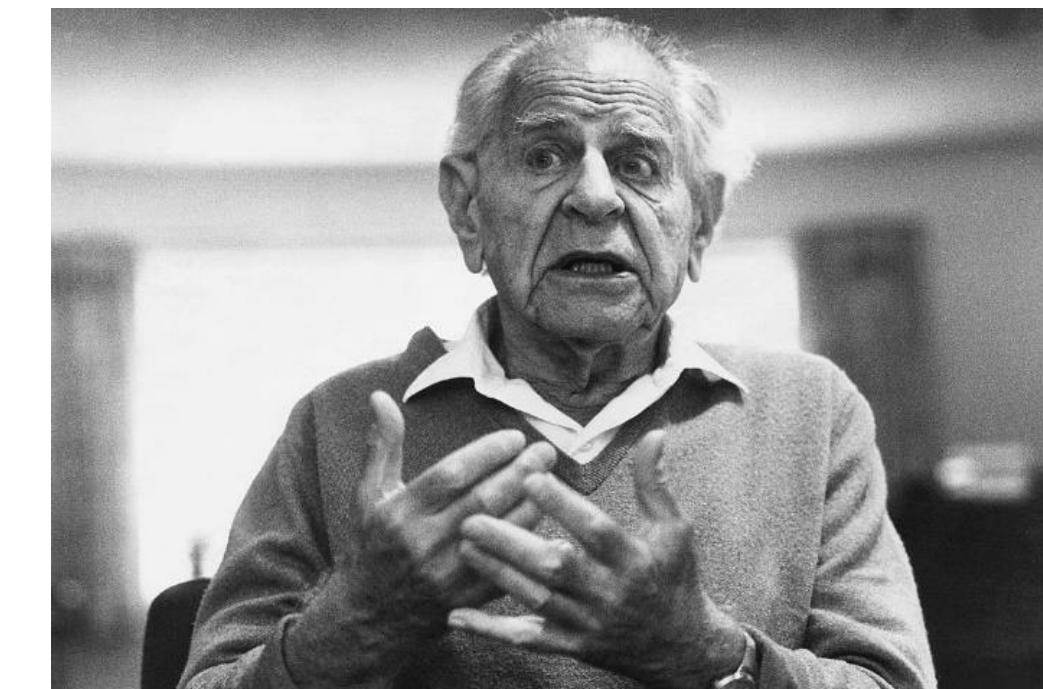
Social science as a cumulative science

- “*If I have seen further, it is by standing on the shoulders of giants.*” (Isaac Newton)



[CC BY-SA Wikipedia](#)

- “*Non-reproducible single occurrences are of no significance to Science.*”
(Popper, 1956)



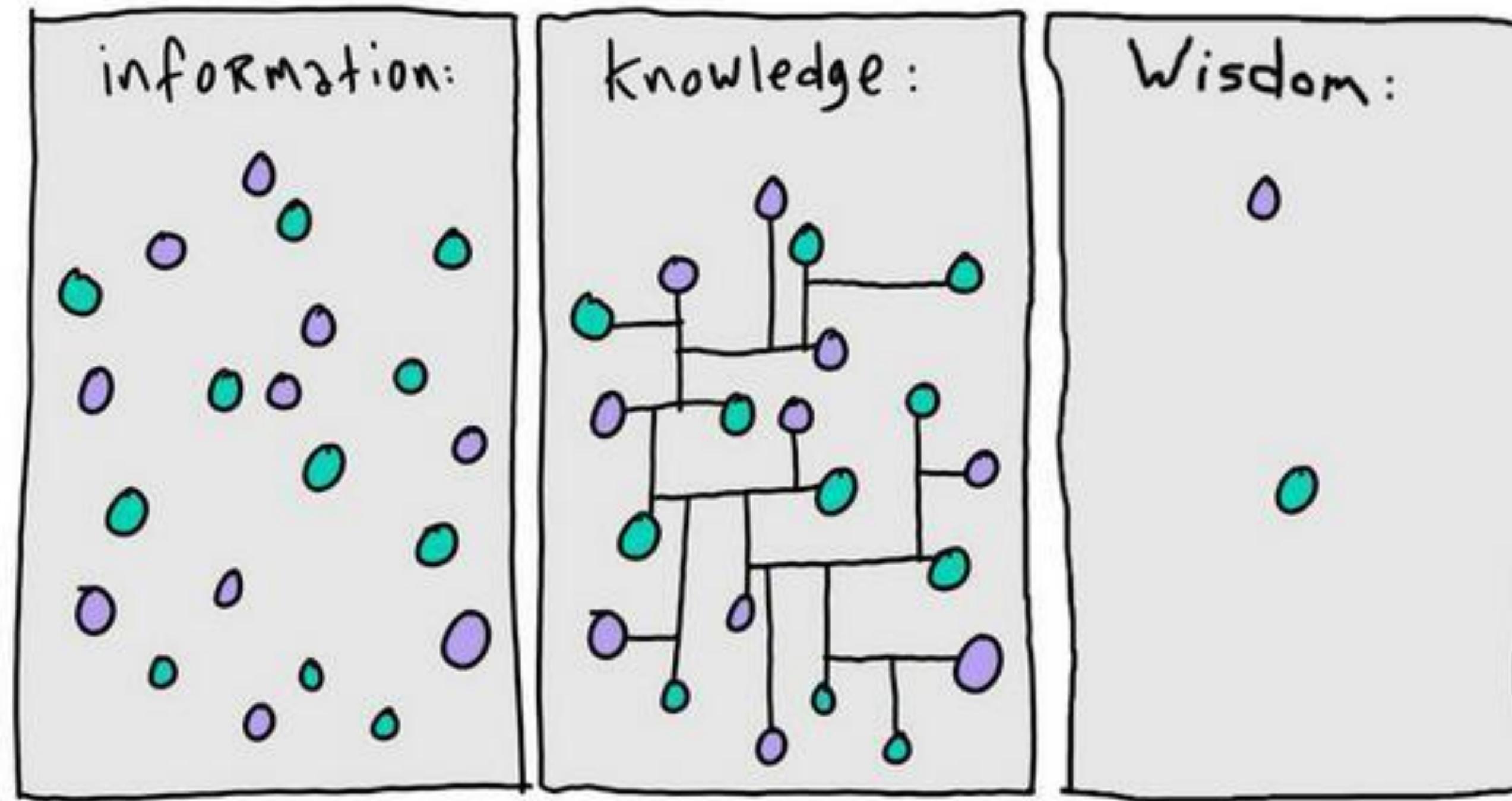
[CC BY-SA Wikipedia](#)

Cumulative research

- “Information avalanche”
- What research findings are there on research question X ?
- What can we learn from the research findings to date?
- Are these research findings of the same qualitative quality?
- Where are the research gaps?
- What is missing?
- By the way, opposite, in the neighbouring house of ‘cumulative research’, lives the ‘replication crisis’

A blackboard covered in mathematical handwriting. At the top right, there's a large circle with a radius labeled 'r=2'. Below it, a shaded rectangle is labeled 'PERIMETER = 5.432.9' and has a side labeled 'V=22'. To the left of the rectangle, there's a formula $D(x) = a + b + 4.31447$. Further down, there's a circle with a shaded area and a formula $c(x,y) \left\{ \begin{array}{l} xy = l \\ cx - cy = 35^2 \\ 2\pi = c \end{array} \right.$. On the right, there's a large bracketed equation involving $x^2 + 34x + 4$. In the center, there's a formula $\text{men} = 384. + n^{30}$. At the bottom left, there's a circle with a radius labeled 'r=9.20' and a formula $\left(\sum N_{50} - x - \frac{1}{2} \right) [964 + xg + p]$. The bottom right corner has a formula $B = 9 + x^2 + y^2$.

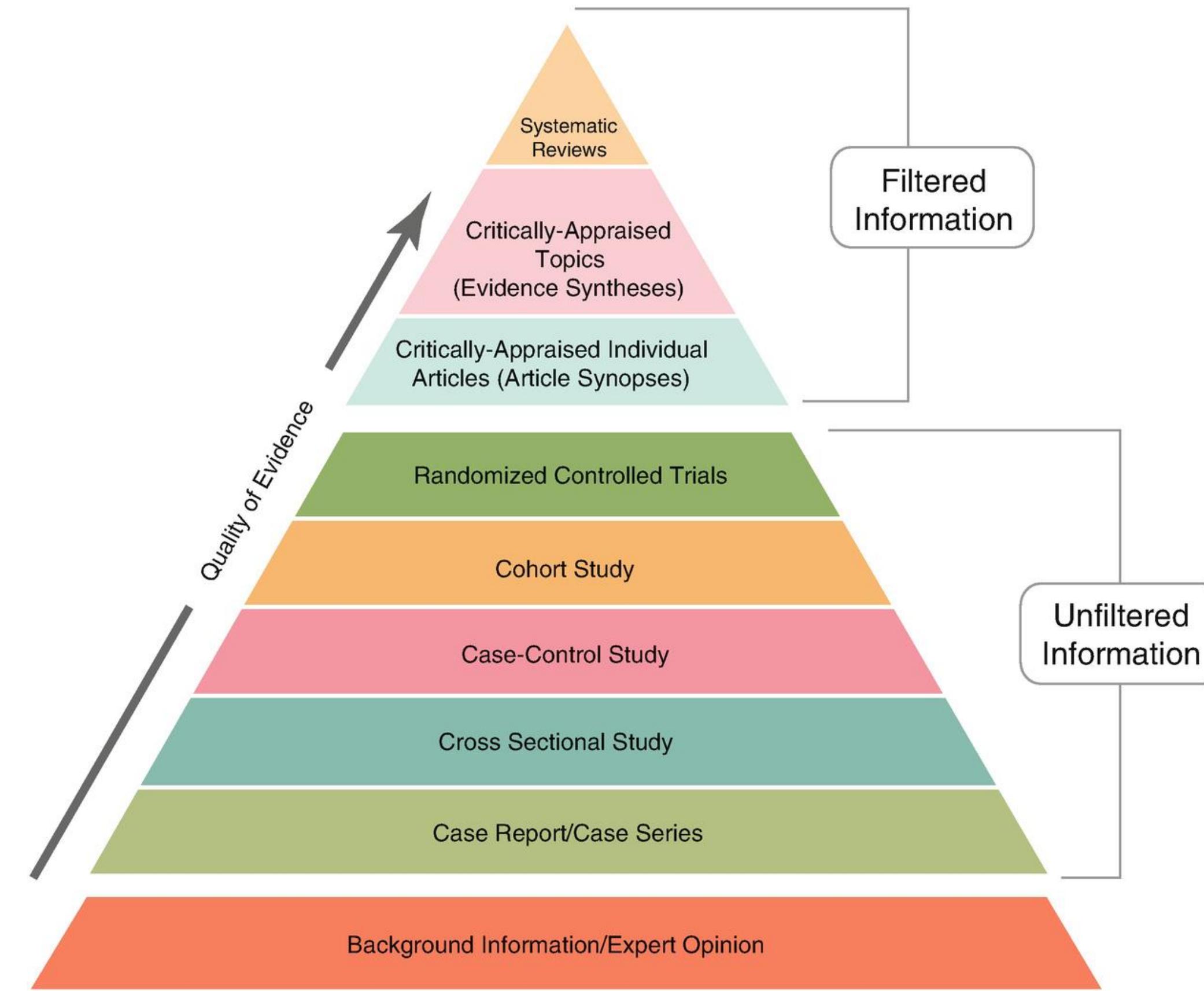
„Information, knowledge, wisdom“



(Source : Marshall 2013)



'Evidence-based' -> Evidence-pyramid



(Source: Desai et al. 2019)

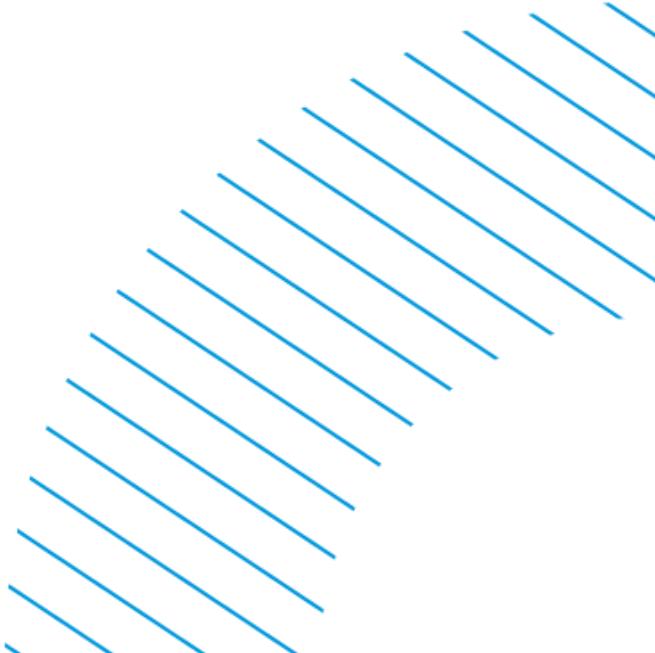


Tools and techniques in comparison

- Central goal: Provide an overview
 - Bibliographies, narrative reviews, vote counting, ...
- What is the problem?
 - Subjective sample, not reproducible, publication bias
 - Dealing with many and heterogeneous findings statistics ‘; cognitive algebra’ such as vote counting as a ‘synthesis procedure’; Low statistical power

What works better?

- Evidence-based maps of the research landscape (evidence maps) (provide an overview)
- Systematic reviews (2 in 1: overview + synthesis) (qualitative or quantitative approach = meta-analysis)



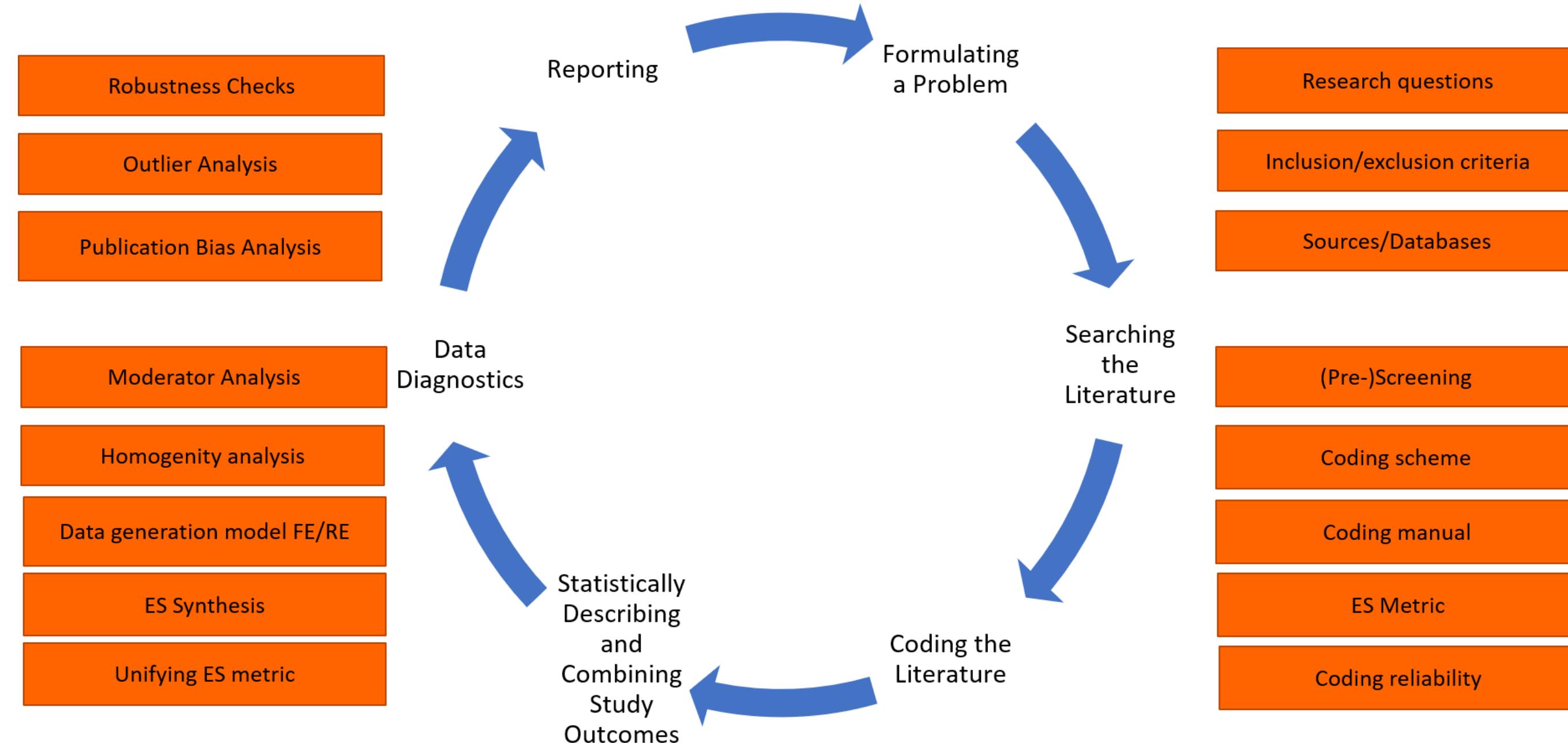
Systematic? Why bother?

Systematic by design

- Follows rigorous methods and protocol -> Is explicit, transparent and replicable

Systematic as in comprehensive

- A population of studies that answer the RQ



Rigorous Methods and Protocol = The Synthesis Life Cycle

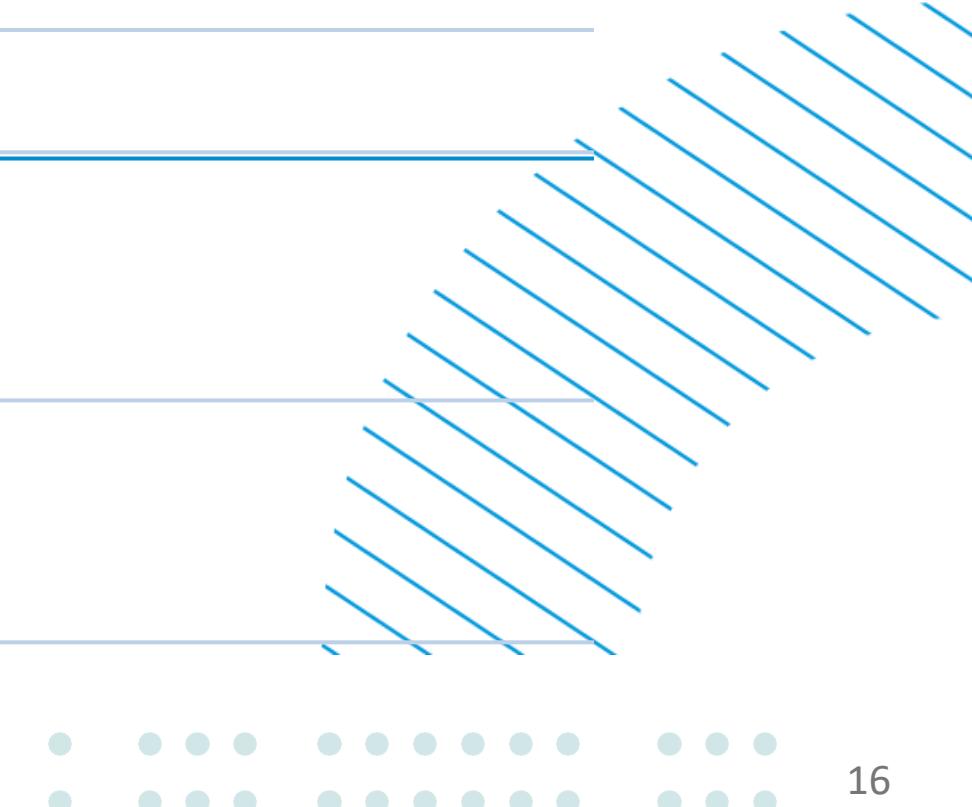
Terminology I

- Evidence (gap) map, systematic review & meta-analysis
 - Commonalities: Systematic, transparent and evaluative approach
- ‘Empirical findings’ ('effect size'): Mean value, mean difference, correlation coefficient, odds ratio, regression coefficient, etc.



Terminology II

Evidence (Gap) Map (E(G)M)	Systematic identification and presentation of all empirical findings on a defined question Question often broadly defined
Systematic review/review paper (SR)	Systematically identify all empirical findings on a defined research question Qualitative appraisal of the empirical findings Summarise the empirical findings (qualitative or quantitative, see meta-analysis) All process steps are transparent and highly standardized
Meta-analysis (MA)	(SR) + Statistical analysis of comparable empirical findings Statistical synthesis, heterogeneity exploration, publication bias analysis, ...



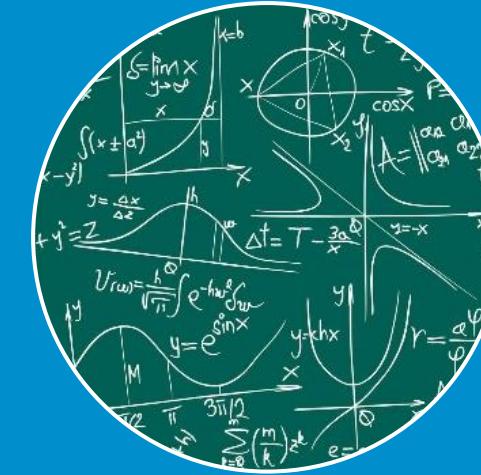
Different Methods - different Aims



Evidence gap map: Showing evidence and gaps

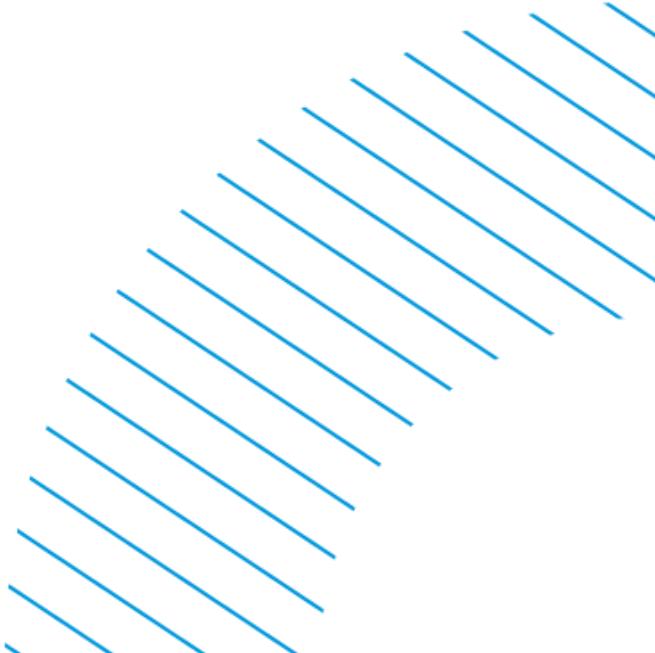


Systematic review:
Summarizing evidence



Meta-
Analysis:
Statistical
Accumulation

Attention in some disciplines they do call also a meta-analysis a systematic review



The world of synthesizing methods

Workflow/ Method	Narrative Review	(Qualitative) Literature Review	Vote Counting	Evidence Gap Map	Systematic Review	Meta- Analysis
Formulate Research Question	-	+	+	+	+	+
Eligibility Screening of Records						
Criteria for Included Studies						
Systematic Search						
Literature Search						
Reporting or Search Strategy	-	-	o	+	+	+
Databases and search terms	-	-	o	+	+	+
Eligibility Screening of Records	-	-	o	+	+	+
Coding of Records in Coding Scheme	-	-	+	-	+	+
Qualitative Description of Results	+	+	+	-	-	o
Quantitative Synthesis of Results	-	-	-	o	-	+
Robustness and Publication Bias Diagnostics	-	-	o	-	o	+

Quality and (external) validity

+ - needs to be included, o - could be included , -- not included

How to choose a synthesizing method?



How specific is my research question?



How many primary studies are approximately available?



How homogeneous are the methodological approaches in the primary studies?



How much time do I have to spend?



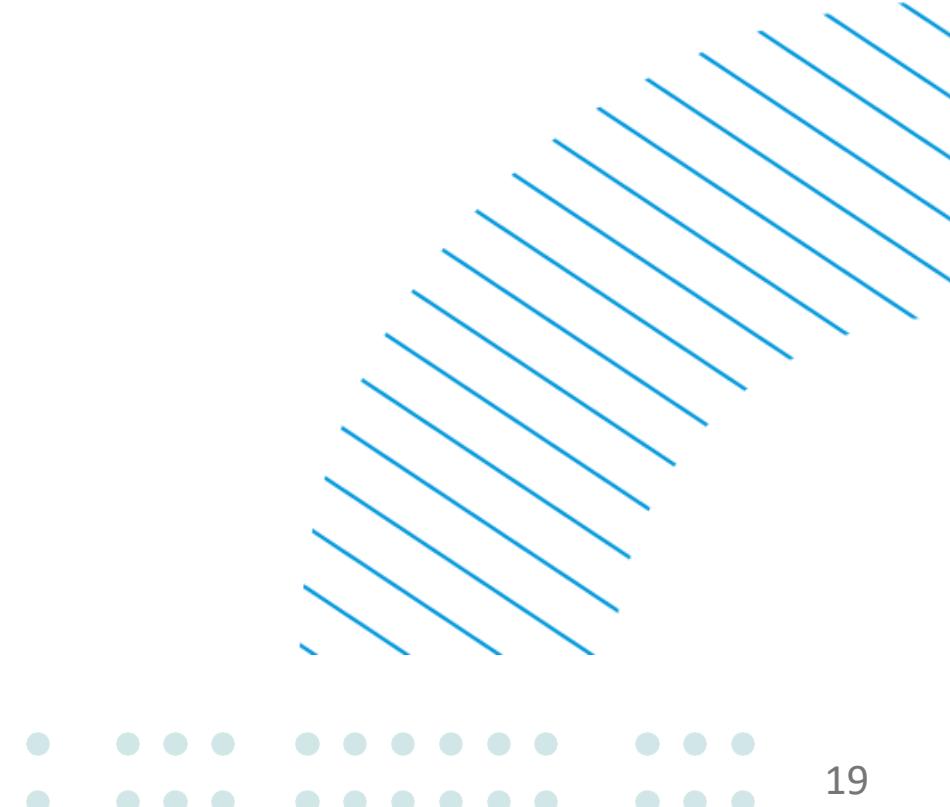
Do I get help from colleagues or assistants?



Source: [https://www.connox.de/kategorien/
accessoires/wanduhren/hay-analog-uhr.html](https://www.connox.de/kategorien/accessoires/wanduhren/hay-analog-uhr.html)

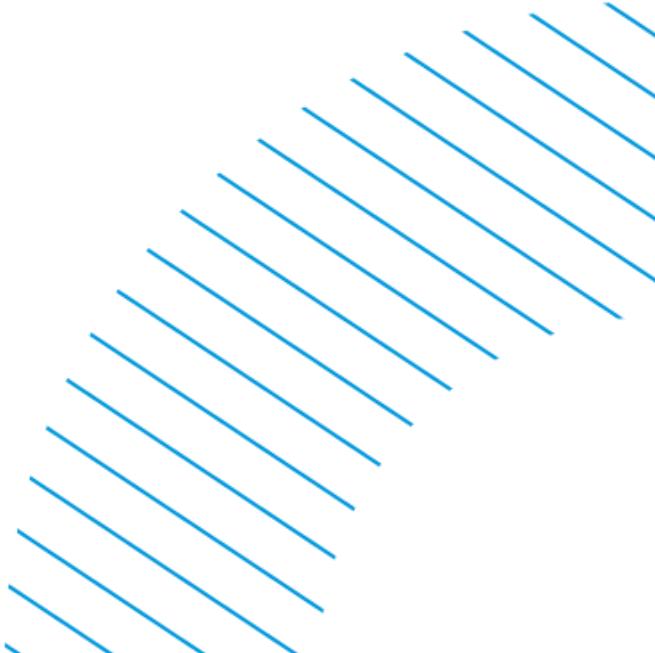


Source: <https://pngimage.net/capacitacion-de-personal-png-3/>



Consider not using a systematic review/ meta-analysis

- If the effectiveness of an intervention is already established (traffic lights prevent accidents)
- If there are already one or more good systematic reviews in the same area or colleagues are working on a systematic review (think about updates)
- If the review question is too vague or too broad
- If the question is too limited in scope or narrowly focused that it might be not useful for researchers, decision makers or funders
- If you have insufficient resources to support a reliable systematic review



How long will it take?



Mean: **1,139 hours** -> 142 working days (Min.216; Max.2,518), (Allen & Olkin 1999)







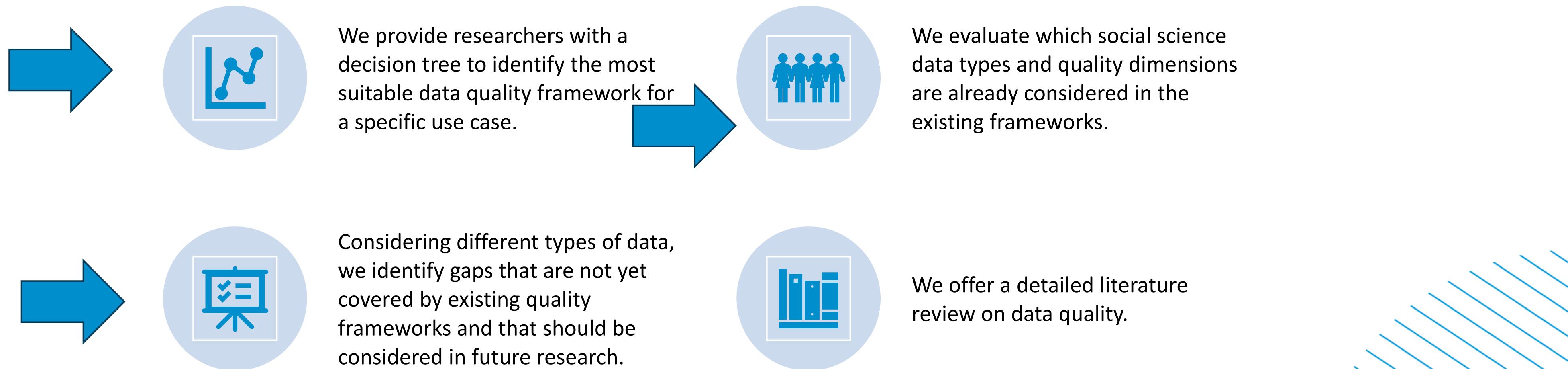
Case Studies

Evidence (Gap) Map

Evidence (Gap) Map

- **Aim?**
 - Identification of evidence (and also research gaps)
- **When?**
 - For new research fields, broad research questions and lack of overview
- **Procedure?**
 - Problem
 - Search
 - Data collection
 - Presentation of results: order (e.g. according to dependent and independent variables/geographically), presentation (e.g. static or interactive, 2/3 D matrix, 5D bubble plot, descriptive report with/without visualisation)
- **Further literature and providers:**
 - Miake-Lye et al. 2016; Saran & White 2018; Snilstveit et al. 2013
 - Various online providers e.g. [3ie](#) or [Campbell Evidence and Gap Maps, Eppi Mapper](#)

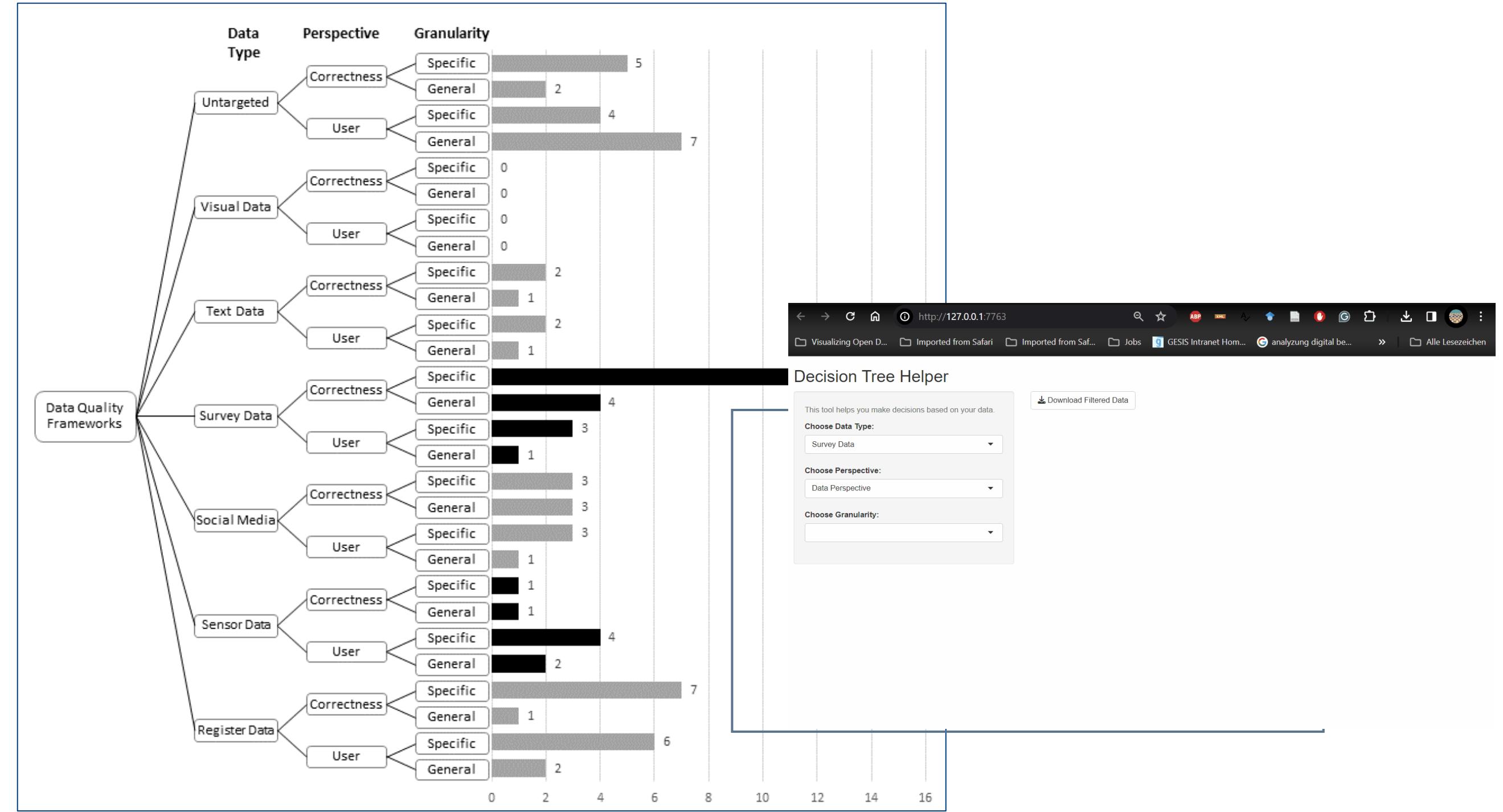
Goals of the evidence gap map systematic review “Assessing Data Quality in the Age of Digital Social Research: A Systematic Review and Evidence Gap Map”



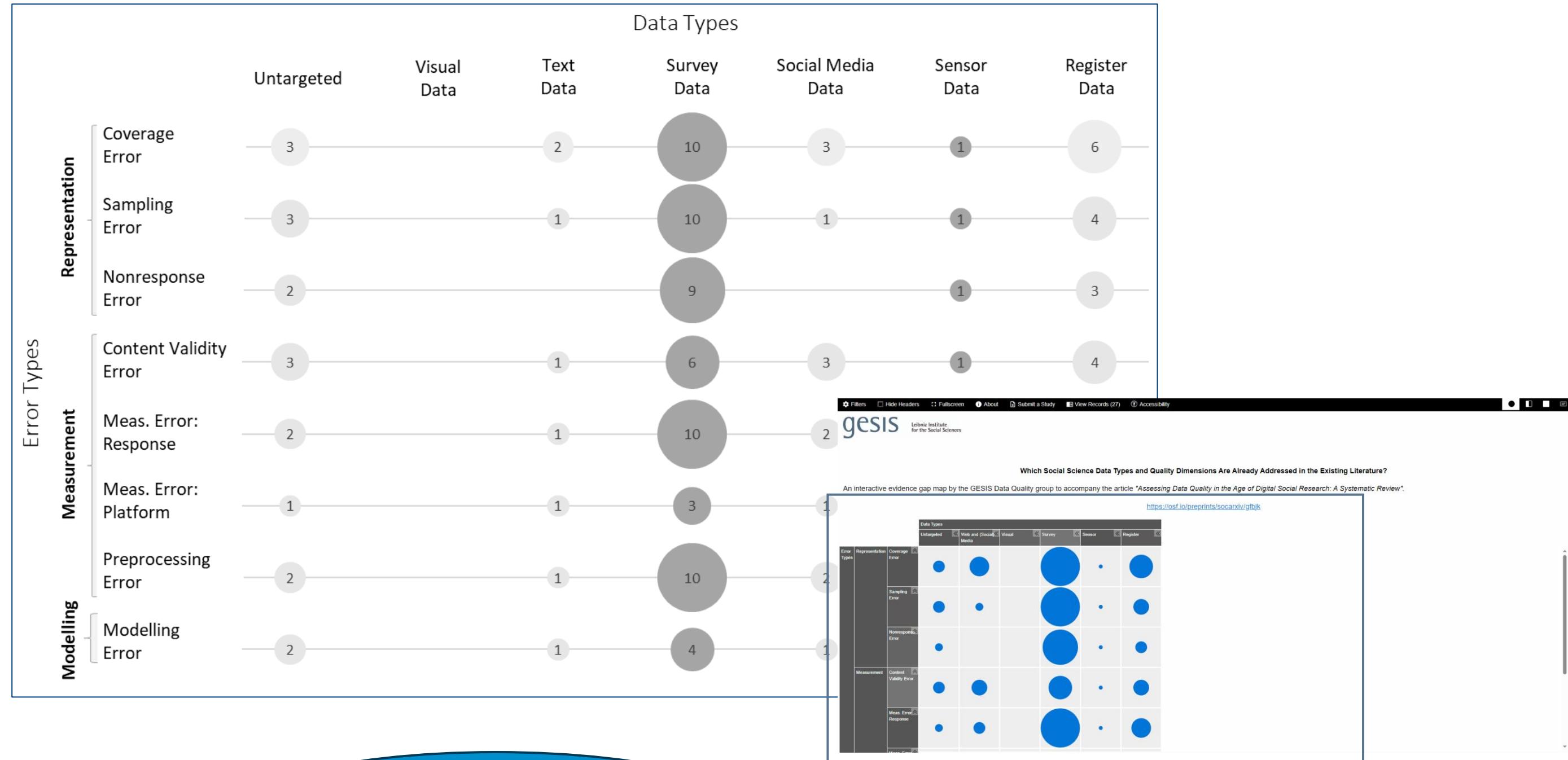
See: Daikeler, J., Fröhling, L., Sen, I., Birkenmaier, L., Gummer, T., Schwalbach, J., Silber, H., Weiß, B., Weller, K., & Lechner, C. (2024). Assessing Data Quality in the Age of Digital Social Research: A Systematic Review. *Social Science Computer Review*, 0(0). <https://doi.org/10.1177/08944393241245395>



Decision Tree (+ interactive tool)



Evidence Gap Map (+ interactive tool)



Tool: [Eppi-Mapper](#)



Systematic review

Systematic review

- **Aim?** Identification and descriptive/ qualitative presentation/ evaluation of the evidence
- **When?** There is too heterogeneous evidence for a meta-analysis and/or the research question is very broadly defined
- Procedure?
 - Problem
 - Search
 - Data collection
 - (Descriptive) or qualitative evaluation & presentation of results
- **Further Literature:**
 - Cooper, Hedges, & Valentine 2019 (PART II, III & IV) , Petticrew & Roberts 2008 (Ch. 1-5), Polanin & Pigott, 2013)

Please indicate how much you agree or disagree with the following statements:

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Itrics is awesome	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cocolate is the best	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gen is important	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
he doesn't pay	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
: my friends	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ing bitten by a k would be fun	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
like my friends	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Case study : Systematic review (<https://tinyurl.com/systrevroberts>)

- “Roberts, C., Gilbert, E., Allum, N., & Eisner, L. (2019). Research synthesis: Satisficing in surveys: A systematic review of the literature. *Public Opinion Quarterly*, 83(3), 598-626.”
- **Definition:** ‘Satisficing’ = endeavour by respondents to generate a satisfactory answer with minimal (cognitive) effort, measurement e.g. by ‘straightlining’.

		<small>Publication date: 2015</small>	
11/06/2016	ISI web of knowledge – All databases	'satisfice' AND 'survey' [in 'topic'] Publication date: 2015	1
11/06/2016	ISI web of knowledge – All databases	'satisfice' AND 'Krosnick' [in 'topic'] Publication date: 2015	0
11/06/2016	ISI web of knowledge – All databases	'satisficing' AND 'questionnaire' [in 'topic'] Publication date: 2015	4
11/06/2016	Public Opinion Quarterly search	'Krosnick 1991' [as 'phrase'] Specify Citation Year 2015	9
11/06/2016	Public Opinion Quarterly search	'Krosnick and Alwin 1987' [as 'phrase'] Specify Citation Year 2015	3
11/06/2016	Public Opinion Quarterly search	'satisficing survey' [as 'all'] Specify Citation Year 2015	8
11/06/2016	Public Opinion Quarterly search	'satisficing Krosnick' [as 'all'] Specify Citation Year 2015	7
11/06/2016	Public Opinion Quarterly search	'satisfice survey' [as 'all'] Specify Citation Year 2015	4
11/06/2016	Public Opinion Quarterly search	'satisfice Krosnick' [as 'all'] Specify Citation Year 2015	4
11/06/2016	Public Opinion Quarterly search	'satisficing questionnaire' [as 'all'] Specify Citation Year 2015	7
11/06/2016	IJPOR search	'Krosnick 1991' [as 'phrase']	3

Case study : Systematic review (<https://tinyurl.com/systrevroberts>)

- **Problem:** What forms of 'satisficing' are there and when do they occur?
- **Research**
- **Inclusion/exclusion criteria:** including methodological focus, English-language, journal publication
- **Systematic search:** e.g. 'satisfic*' AND 'survey' [in: topic] in Web of Science, PsychInfo, certain journals...

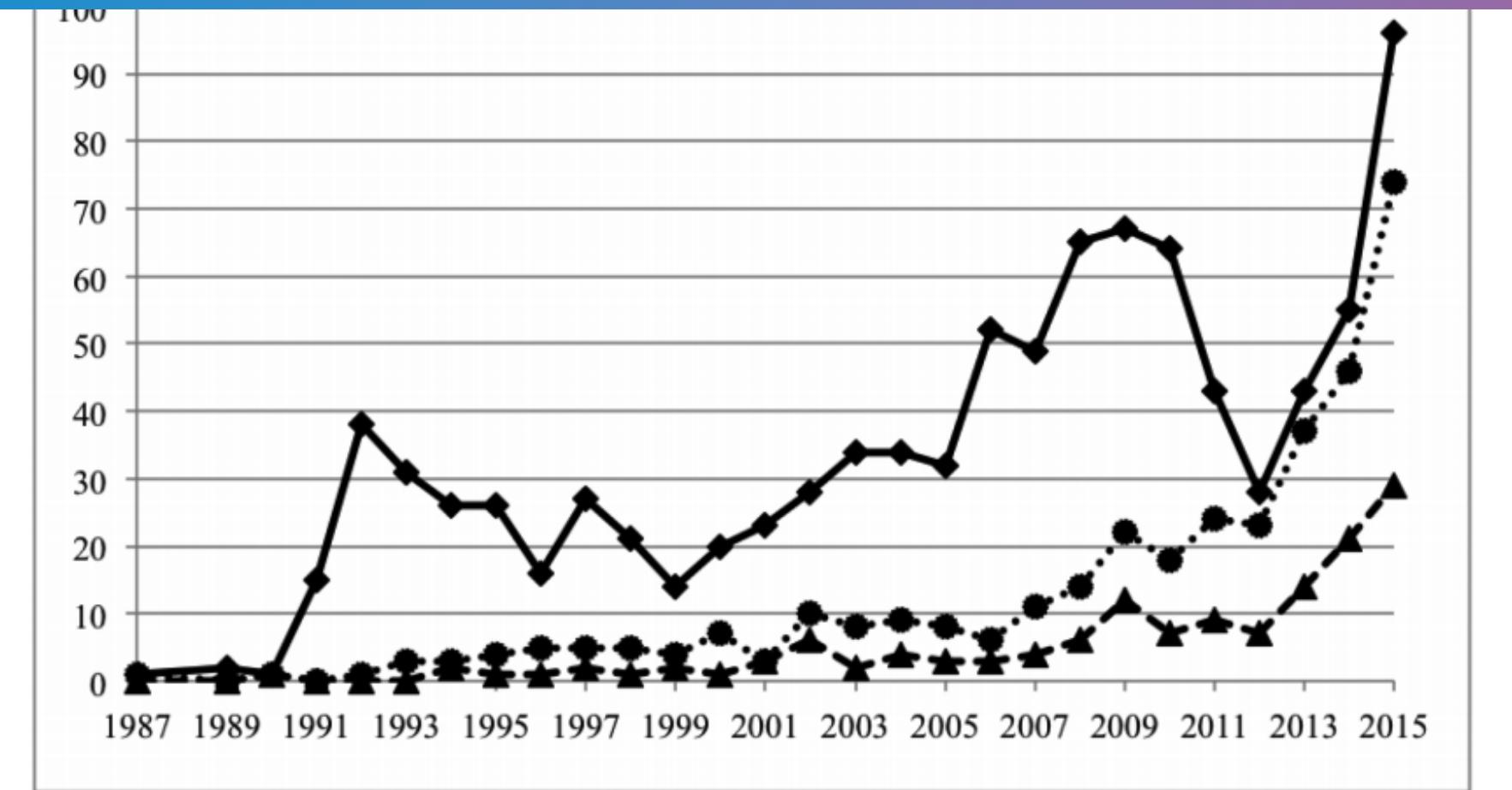
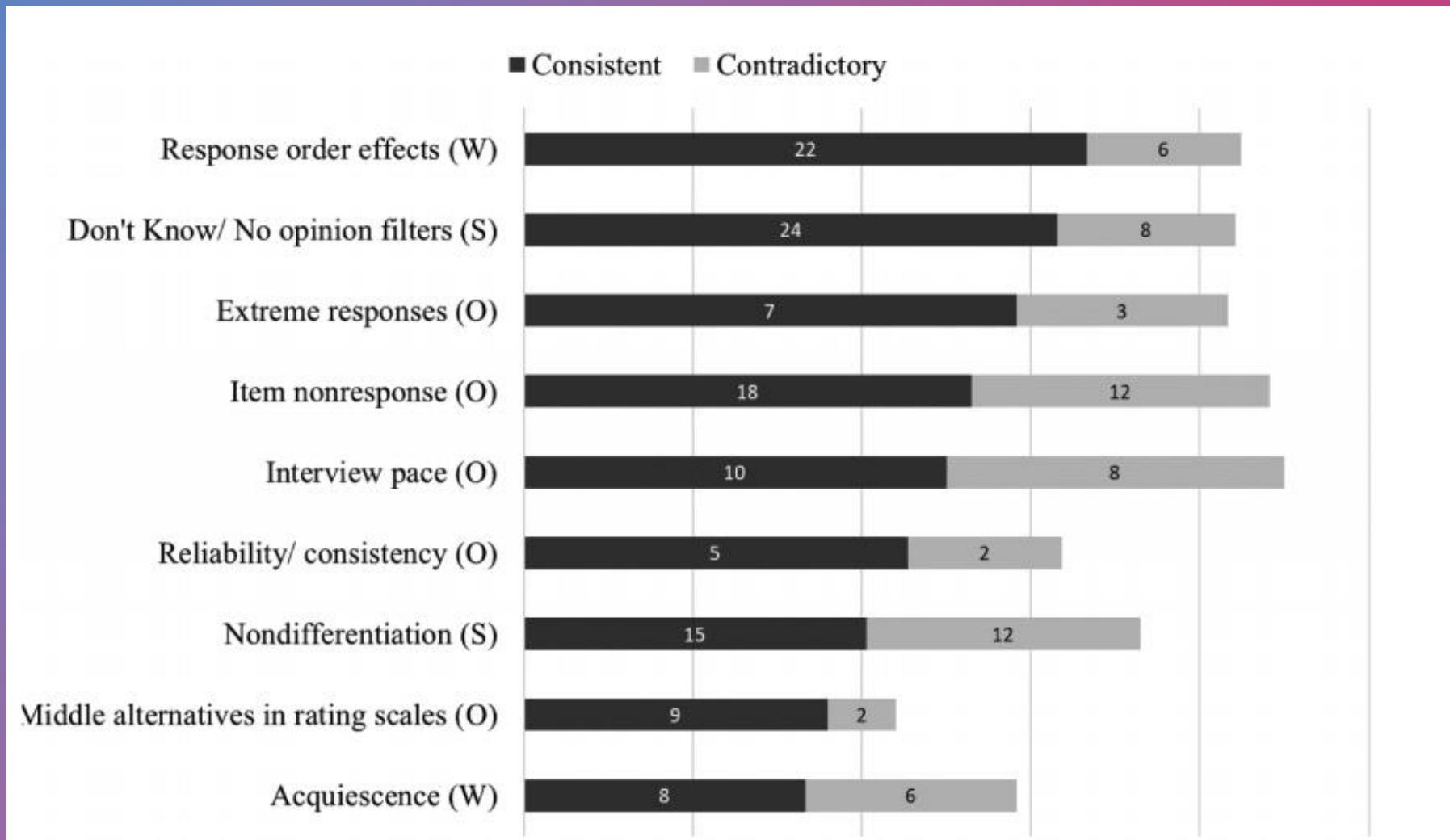


Figure 1. Number of studies published in academic journals, 1987–2015.



Case Study : Systematic review (<https://tinyurl.com/systrevroberts>)

- **Data collection** -> screening and coding: e.g. results, research design, satisficing indicators, are results in line with theory?
- **Evaluation & presentation of results:** Qualitative description of the findings, but also time course, measurement instruments used

A photograph showing a group of four business professionals in a meeting. They are all dressed in dark suits and are focused on a white tablet device held by one of them. A smartphone is also visible on the tablet screen. Several coffee cups are scattered around the table. The scene is set in a bright, modern office environment.

Meta-Analysis

Meta-Analysis

- **Aim?** Quantitative, systematic presentation of empirical evidence on a common question
- Statistically summarizes the distribution of findings
- Describe and clarify heterogeneity of the distribution of findings
- **When?** There are sufficient ($k > 2$) comparable statistical findings on a common question
- **Procedure?**
 - Problem
 - Search
 - Data collection
 - Statistical synthesis/analysis & presentation of results
- **Further literature:** Borenstein, Hedges, Higgins, & Rothstein 2011 (Part 1, 2 & 9); Cooper, Hedges & Valentine 2019 8PART V - VII), Polanin & Pigott 2013; Viechtbauer 2010); Weiß & Wagner 2019



Case study: Meta-Analysis

(<https://tinyurl.com/madaikeler>)

„Daikele, J., Bošnjak, M., & Lozar Manfreda, K. (2020). Web versus other survey modes: an updated and extended meta-analysis comparing response rates. *Journal of Survey Statistics and Methodology*, 8(3), 513-539.“

1. Problem: Is the response rate for web surveys lower, the same or higher than for other survey modes and why is that?

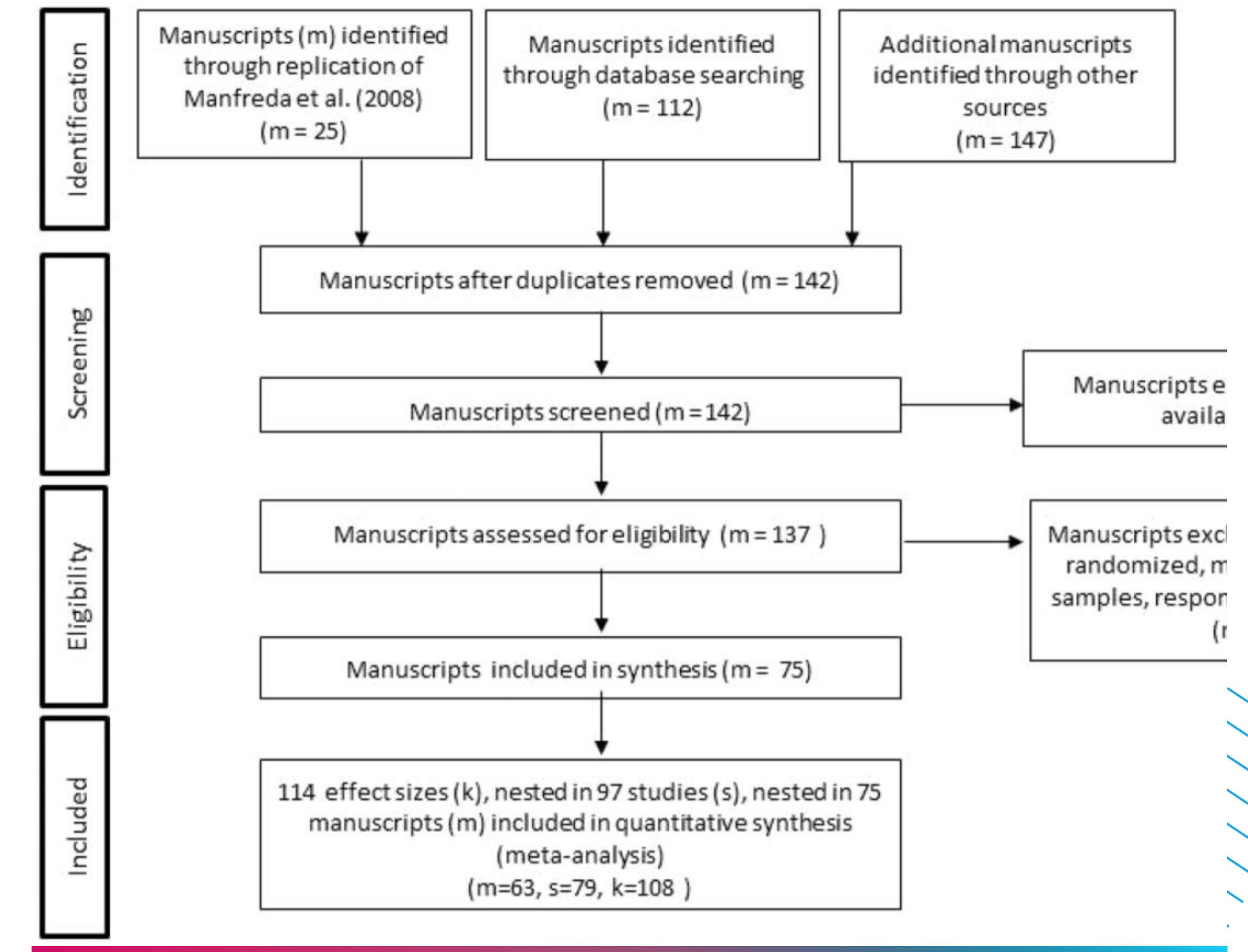


vs.



Case study: Meta-Analysis (<https://tinyurl.com/madaikeler>)

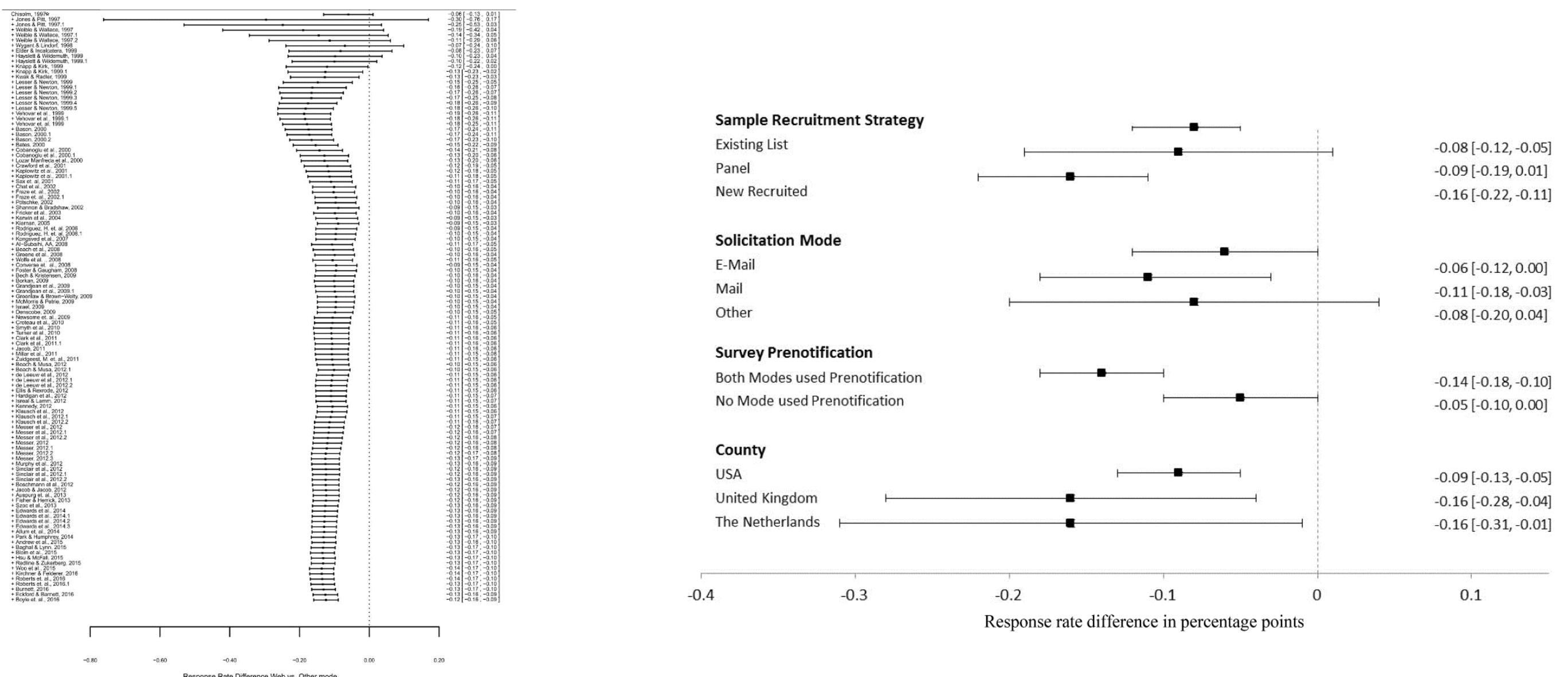
- 2nd & 3rd research (inclusion/exclusion criteria, systematic search), data collection (screening and coding)



Case Study: Meta-Analysis

(<https://tinyurl.com/madaikeler>)

4. Evaluation & presentation of results: ‘Meta-analysis’ part -> main effect and moderators



Web surveys receive 12% lower response rates than their comparison modes.

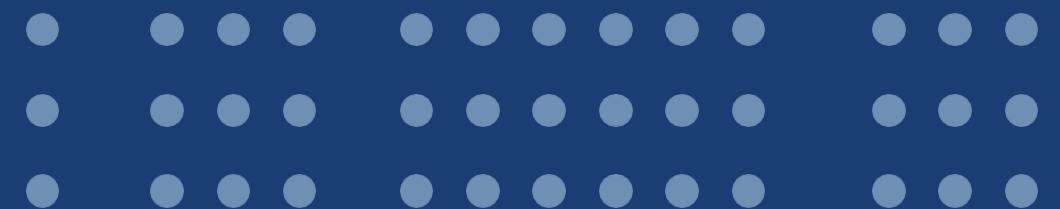
Moderators that influence this effect e.g. the country of the survey.







Some new cool tools improving your life



„Chat GPT write me a
search string!“



Please write me a search string I can use at Web of Science to find literature on experimental mode comparisions of web surveys with any other survey mode. They need to report a response rate comparision.

Search strings with Chat GPT



To find literature on experimental mode comparisons of web surveys with other survey modes that report response rate comparisons, you can use the following search string in Web of Science:

```
arduino  
"web survey*" AND ("experimental" OR "experiment") AND ("survey mode*" OR "d
```

<https://chat.openai.com/share/70b47205-76e1-44af-b9cf-42c5fb6d03f>

This search string incorporates several relevant keywords and phrases to help narrow down your search. Here's a breakdown of each component:

- `"**web survey***"`: Looks for articles that mention web surveys, including variations such as web survey, web surveys, web-based survey, etc.
- `AND`: Narrows down the search results by including articles that satisfy all the specified criteria.
- `("experimental" OR "experiment")`: Looks for articles that involve experiments or experimental designs.
- `AND`: Further narrows down the search results by including articles that satisfy all the specified criteria.
- `("survey mode*" OR "data collection mode*")`: Searches for articles that discuss different survey modes or data collection modes, including variations such as survey mode, survey modes, data collection mode, data collection modes, etc.
- `AND`: Continues narrowing down the search results by including articles that satisfy all the specified criteria.

Search strings with Chat GPT – fine tuning

"web survey*" AND ("experimental" OR "experiment")
AND ("survey mode*" OR "data collection mode*") AND
("response rate" OR "response compar*" OR
"nonresponse" OR "non-response")



please include also synonyms for web surveys

The screenshot shows a Chat GPT interface. A user message at the top right says "please include also synonyms for web surveys". Below it, a response from Chat GPT includes a green icon of a brain-like shape. The text says "Certainly! Here's an updated search string that includes synonyms for web surveys:" followed by a code block containing the search string: ("web survey*" OR "internet survey*" OR "online survey*" OR "e-survey*" OR "web-based survey*" OR "web questionnaire*" OR "web-based questionnaire*"). There is a "Copy code" button next to the code block.

In this modified search string, I've included additional synonyms for web surveys. Here's a breakdown of the updated components:

- `(` ("web survey*" OR "internet survey*" OR "online survey*" OR "e-survey*" OR "web-based survey*" OR "web questionnaire*" OR "web-based questionnaire*") `): Searches for articles that mention any of these terms, encompassing a range of synonyms for web surveys.
- `AND`: Narrows down the search results by including articles that satisfy all the specified criteria.
- `(` ("experimental" OR "experiment") `): Looks for articles that involve experiments or experimental designs.
- `AND`: Further narrows down the search results by including articles that satisfy all the specified criteria.
- `(` ("survey mode*" OR "data co. `): Finanzierter von der Europäischen Union NextGenerationEU`): Searches for articles that discuss

Search strings with Chat GPT – 2nd trial

("web survey*" OR "internet survey*" OR "online survey*" OR "e-survey*" OR "web-based survey*" OR "web questionnaire*" OR "web-based questionnaire") AND ("experimental" OR "experiment") AND ("survey mode*" OR "data collection mode") AND ("response rate" OR "response compar*" OR "nonresponse" OR "non-response")

```
arduino
"web survey*" AND ("experimental" OR "experiment") AND ("survey mode*" OR "data collection mode") AND ("response rate" OR "response compar*" OR "nonresponse" OR "non-response")
```

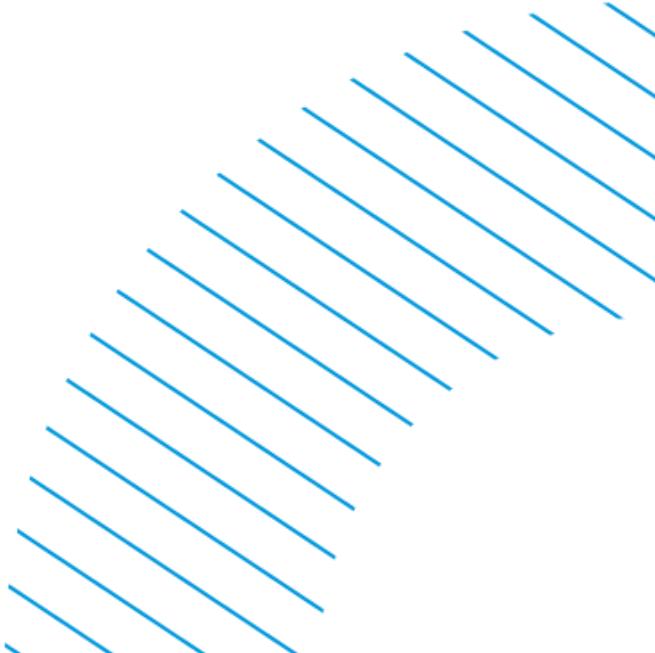
This search string incorporates several relevant keywords and phrases to help narrow down your search. Here's a breakdown of each component:

- ` "web survey*"` : Looks for articles that mention web surveys, including variations such as web survey, web surveys, web-based survey, etc.
- ` AND ` : Narrows down the search results by including articles that satisfy all the specified criteria.
- ` ("experimental" OR "experiment") ` : Looks for articles that involve experiments or experimental designs.
- ` AND ` : Further narrows down the search results by including articles that satisfy all the specified criteria.
- ` ("survey mode*" OR "data collection mode") ` : Searches for articles that discuss different survey modes or data collection modes, including variations such as survey mode, survey modes, data collection mode, data collection modes, etc.
- ` AND ` : Continues narrowing down the search results by including articles that satisfy all the specified criteria.
- ` ("response rate" OR "response compar*" OR "nonresponse" OR "non-response") ` : Looks for articles that report on response rates, compare response rates, or discuss nonresponse in the context of survey modes.

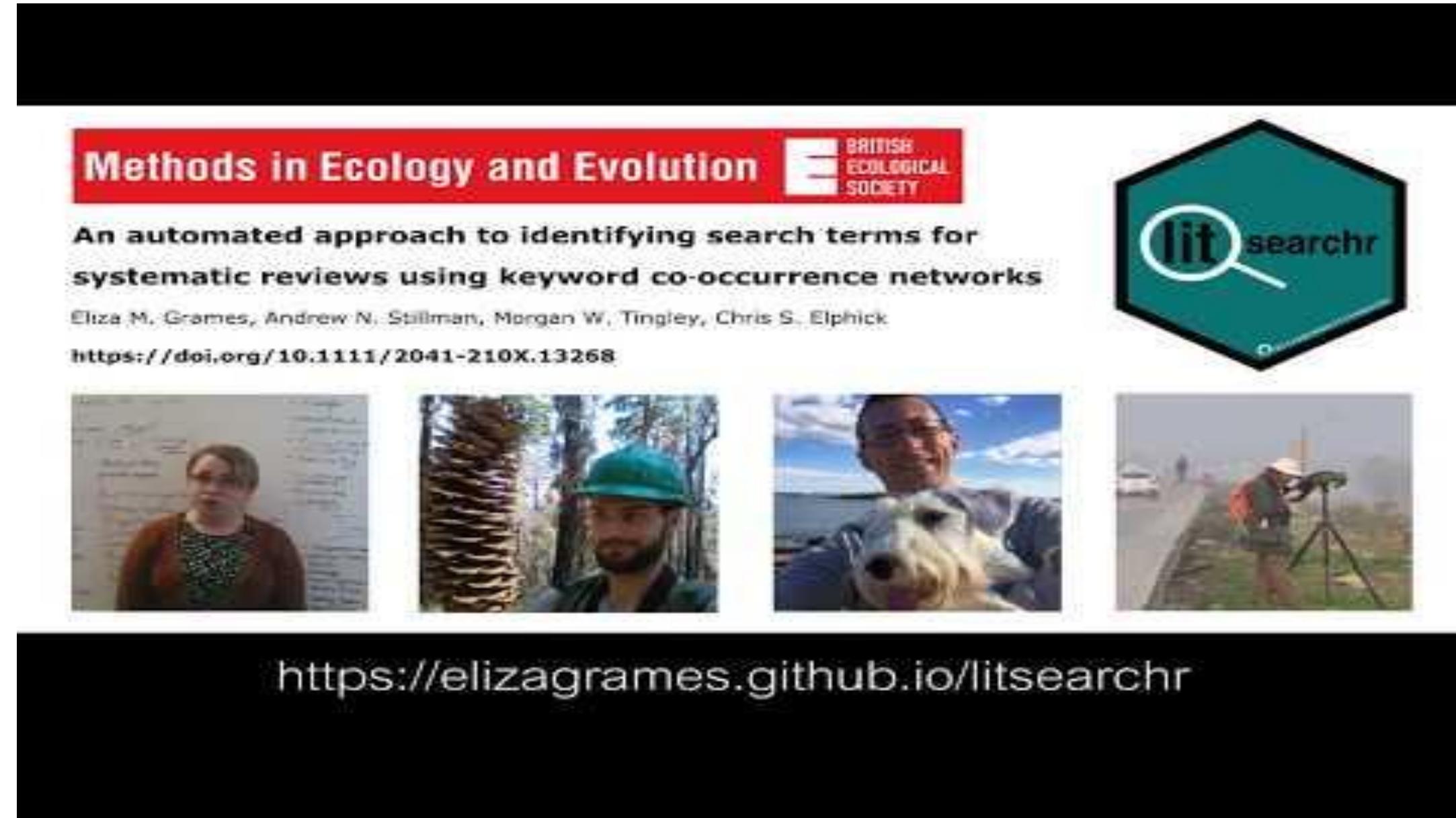
By using this search string, you should be able to retrieve relevant literature that meets your criteria for experimental mode comparisons of web surveys with other survey modes, including reporting on response rate comparisons.

Grames, E. M., Stillman, A. N., Tingley, M. W., & Elphick, C. S. (2019). An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks. *Methods in Ecology and Evolution*, 10(10), 1645-1654.

Do it more the classical way in R



How it works



The screenshot shows a research article from the journal **Methods in Ecology and Evolution**, published by the **BRITISH ECOLOGICAL SOCIETY**. The article title is **An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks**. The authors are Eliza M. Grames, Andrew N. Stillman, Morgan W. Tingley, and Chris S. Elphick. The DOI is <https://doi.org/10.1111/2041-210X.13268>.

Below the article summary, there are four small images: a woman in a brown sweater, a man in a green hard hat in a forest, a person holding a white dog, and a person using binoculars.

At the bottom of the screenshot, the URL <https://elizagrames.github.io/litsearchr> is displayed.



The logo for litsearchr is a teal hexagon containing a white magnifying glass icon and the word "litsearchr".



What litsearchr does

Litsearchr package for R is designed to partially automate search term selection

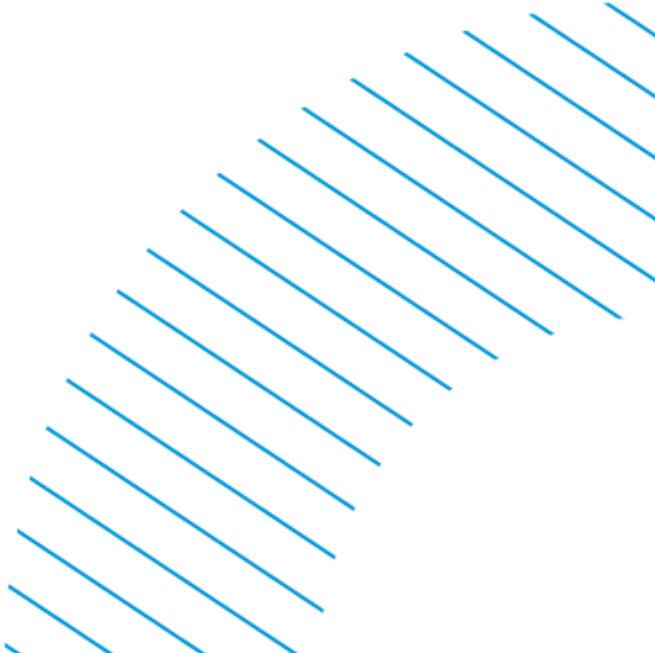
Uses the Rapid Automatic Keyword Extraction algorithm

Identifies potential keywords from a sample of titles and abstracts and combines them with author- and database-tagged keywords to create a pool of possible keywords relevant to a field of study

Important keywords in a field are identified from their importance in a keyword co-occurrence network

Keywords are grouped into concept groups manually

Litsearchr writes Boolean searches in up to 53 languages



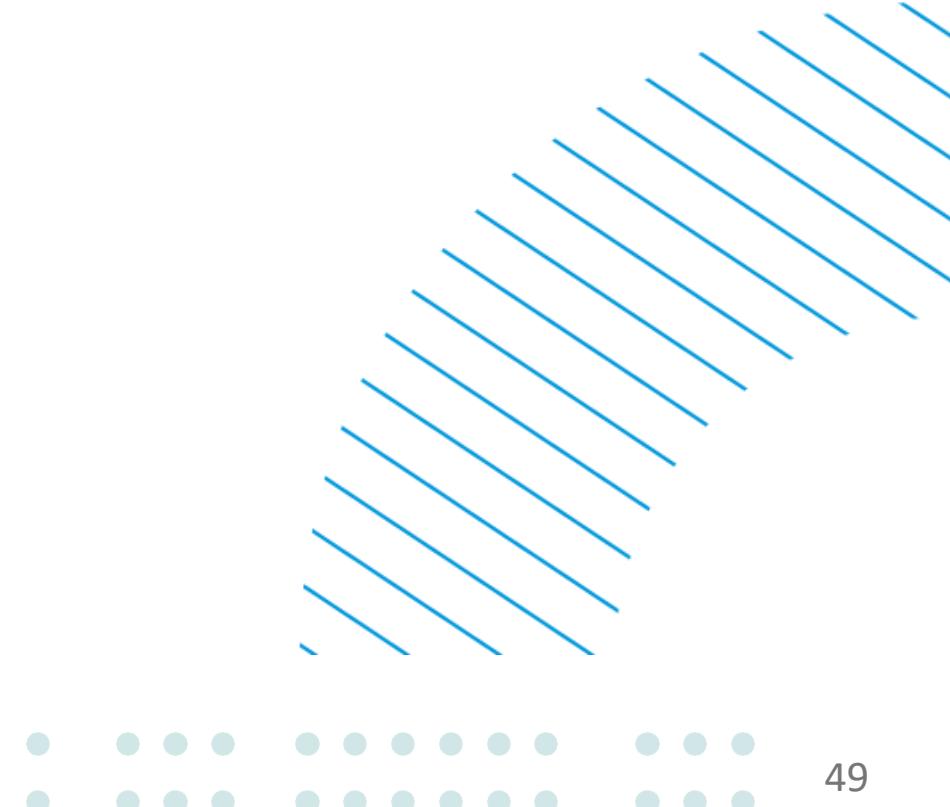
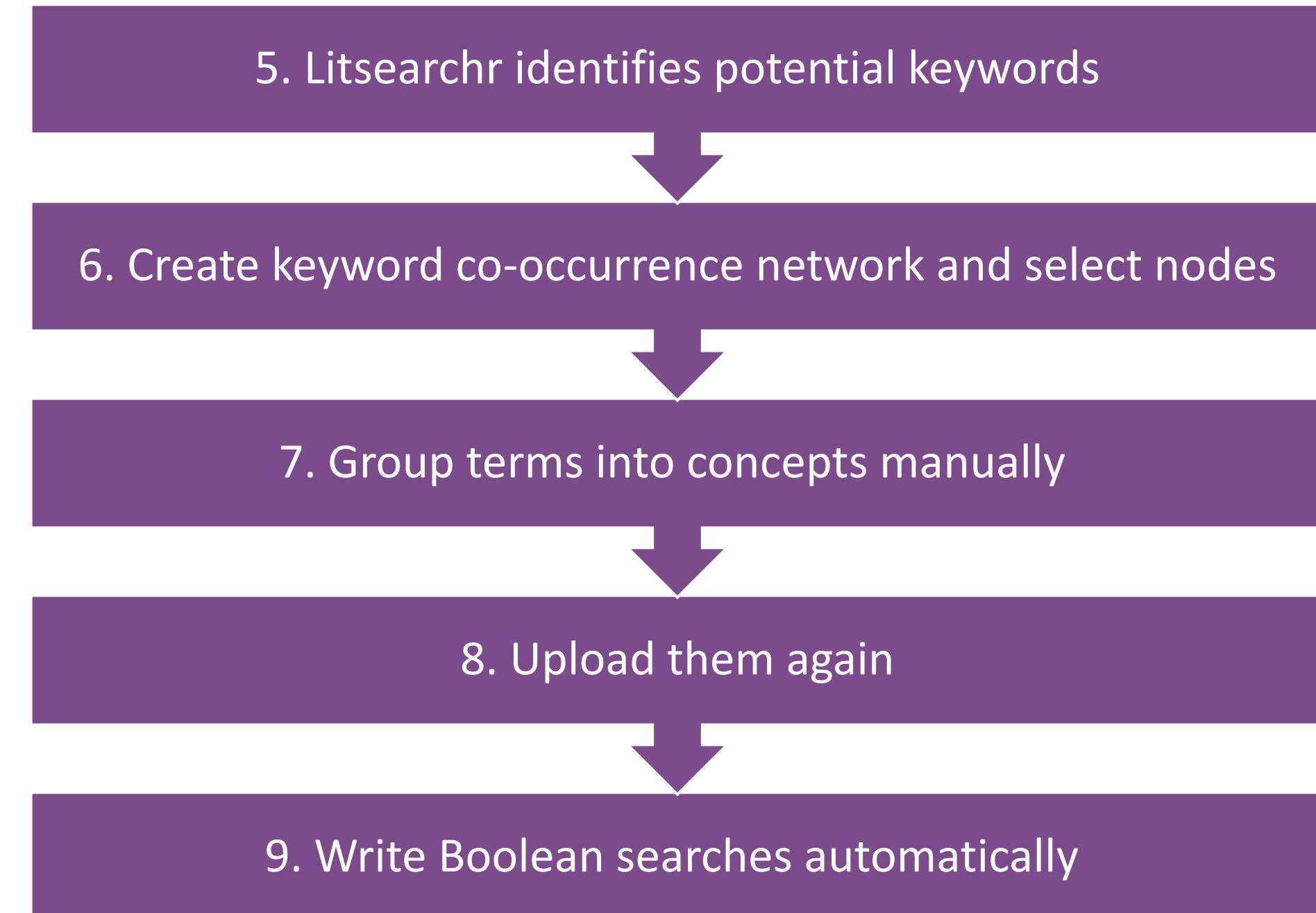
Litsearchr: Step-by-step I

TUTORIAL: https://luketudge.github.io/litsearchr-tutorial/litsearchr_tutorial.html

1. Conduct and import the naive search, e.g.,
Web of Science: web mode AND response rate and (survey OR questionnaire)
2. Download results (> 500 results) as,
e.g., .txt, .csv, or .xls-file
3. Install package litsearchr via website
(<https://elizagrames.github.io/litsearchr/>)
and load it
4. Upload your search result and remove duplicates



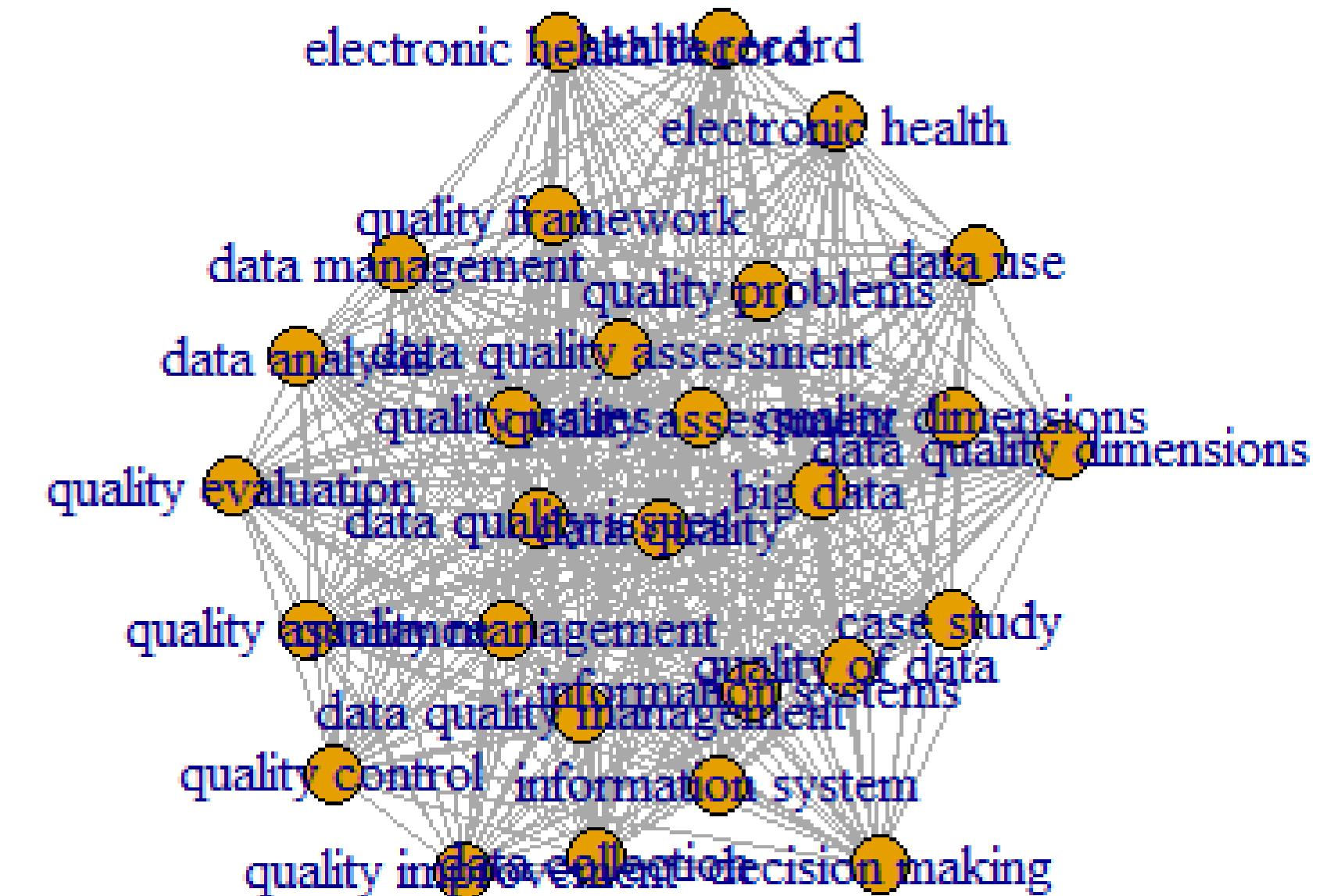
Litsearchr: Step-by-step II



LitsearchR example „DQ R

litsearchr package (*Grames et al. 2019*)

- Training search (“data quality” OR “error” “bias”) AND (“framework” OR “concept” “perspective”) in engines: Web of Science Ebsco
 - Import training search result
 - Extract keywords, titles and abstracts
 - Get potential search terms
 - Remove duplicates
 - Group potential terms manually
 - Search string will automatically be created



You don't like R? Take the new Shiny app

Perform a naive search

Download approx. 100 search results

Take the Shiny app

<https://elizagrames.shinyapps.io/litsearchr/>

litsearchr
Select search terms
Write Boolean searches
Check search comprehensiveness

Bibliographic data
Keywords
Network
Search terms

Show 25 entries

author	year
Tingley, M.W. and Stillman, A.N. and Wilkerson, R.L. and Sawyer, S.C. and Siegel, R.B.	2020
Marcot, B.G. and Lorenz, T.J. and Fischer, P. and Weinstein, B.G. and Cowell, S.	2019
Groff, T.C. and Lorenz, T.J. and Crespo, R. and Iezhova, T. and Valkiūnas, G. and Sehgal, R.N.M.	2019
White, A.M. and Tarbill, G.L. and Wilkerson, R.L. and Siegel, R.B.	2019
Matseur, E.A. and Millspaugh, J.J. and Thompson, F.R. and Dickerson, B.E. and Rumble, M.A.	2019
Craig, C. and Mazerolle, M.J. and Taylor, P.D. and Tremblay, J.A. and Villard, M.-A.	2019
Stillman, A.N. and Siegel, R.B. and Wilkerson, R.L. and Johnson, M. and Tingley, M.W.	2019
Stillman, A.N. and Siegel, R.B. and Wilkerson, R.L. and Johnson, M. and Howell, C.A. and Tingley, M.W.	2019
Tingley, M.W. and Stillman, A.N. and Wilkerson, R.L. and Howell, C.A. and Sawyer, S.C. and Siegel, R.B.	2018
Matseur, E.A. and Thompson, F.R., III and Dickerson, B.E. and Rumble, M.A. and Millspaugh, J.J.	2018
Tarbill, G.L. and White, A.M. and Manley, P.N.	2018
Latif, O.S. and Booth, V.A. and Haas, J.P. and Dudley, L.C.	2018

1. Upload bibliographic data

Bibliographic data upload

If you just want to see how the app works, you can use this example bibliographic data on black-backed woodpeckers in post-fire forests.

2. Extract keywords

Minimum frequency

Minimum n-gram length

Language

Depending on the number of articles, extracting keywords can take some time.

3. Keyword co-occurrence network

Minimum number of occurrences

Snowballing is easy too...

... with Citationchaser



Haddaway, N. R., Grainger, M. J., & Gray, C. T. (2022). Citationchaser: A tool for transparent and efficient forward and backward citation chasing in systematic searching. *Research Synthesis Methods*, 13(4), 533-545.
<https://estech.shinyapps.io/citationchaser/>



Citationchaser

1. Forward citation chasing = looking for all records citing one or more articles of known relevance
2. Backward citation chasing = looking for all records referenced in one or more articles
3. Automates process of identifying potentially relevant records that should be included in a review
 - Uses Lens.org API/database (PubMed, PubMed Central, CrossRef, Microsoft Academic Graph, CORE) for list of referenced and citing records
4. Download list of input, referenced and citing records in RIS format for easy upload into citation program
5. Citation network visualization

citationchaser Home Article input References Citations Analysis Network

Citations of your articles (forward citation chasing)

Once you have loaded your input articles, you can search for all articles that cite them.

[Search for all citing articles in Lens.org](#) [Reset](#)

Your 33 articles were cited a total of 11,197 times. This corresponds to 9,582 unique article IDs. Your RIS file is ready for download and contains 9,582 records exported from Lens.org.

[Download an RIS file of citing articles \(including abstracts\)](#)

authors	year	title
Kumar, Rajeev Ranjan; Alok, Kumar	2020	Adoption of electric vehicle: A literature review and prospects for sustainability
Merkl-Davies, Doris M.; Brennan, Niamh	2011	A conceptual framework of impression management: new insights from psychology, sociology, and critical perspectives
Nadkarni, Swen; Prügl, Reinhard	2020	Digital transformation: a review, synthesis and opportunities for future research
Brown, Trevor C.; O'Kane, Paula; Mazumdar, Bishakha; McCracken, Martin	2018	Performance Management: A Scoping Review of the Literature and an Agenda for Future Research:
Banerjee-Batist, Rimjhim; Reio, Thomas G.; Rocco, Tonette S.	2018	Mentoring Functions and Outcomes: An Integrative Literature Review of Sociocultural Factors and Individual Differences:
Wilson, Fiona	2021	Learning with the devil: mentoring and advocates
Patriotta, Gerardo	2020	Writing impactful review articles
Ge, Bingbing; Campopiano, Giovanna	2021	Knowledge management in family business succession: current trends and future directions
McNulty, Yvonne; Selmer, Jan	2017	Research Handbook of Expatriates - Research Handbook of Expatriates
Akgün, Ali E.; Keskin, Halit; Fidan, Selahaddin Samil	2021	The influence of Alasdair MacIntyre's "After Virtue" book on business ethics studies: A citation concept analysis
Ruban, Dmitry A.	2020	Unawareness and Theorizing in Modern Geology: Two Examples Based on Citation Analysis
Pillay, Manikam	2017	Resilience Engineering: An Integrative Review of Fundamental Concepts and Directions for Future Research in Safety Management
Block, Joern; Fisch, Christian	2019	Extending the focus of management review quarterly: one year later
Rahimi, Somaye; Khorasani, Abasalt; Rezaei-Zadeh, Morteza; Waterworth, John	2021	The virtual human resource development (VHRD) approach: an integrative literature review
Katebi, Ali; HajiZadeh, Mohammad Hossain; Bordbar, Ali; Salehi, Amir Masoud	2021	The Relationship Between "Job Satisfaction" and "Job Performance": A Meta-analysis

Meet research rabbit :

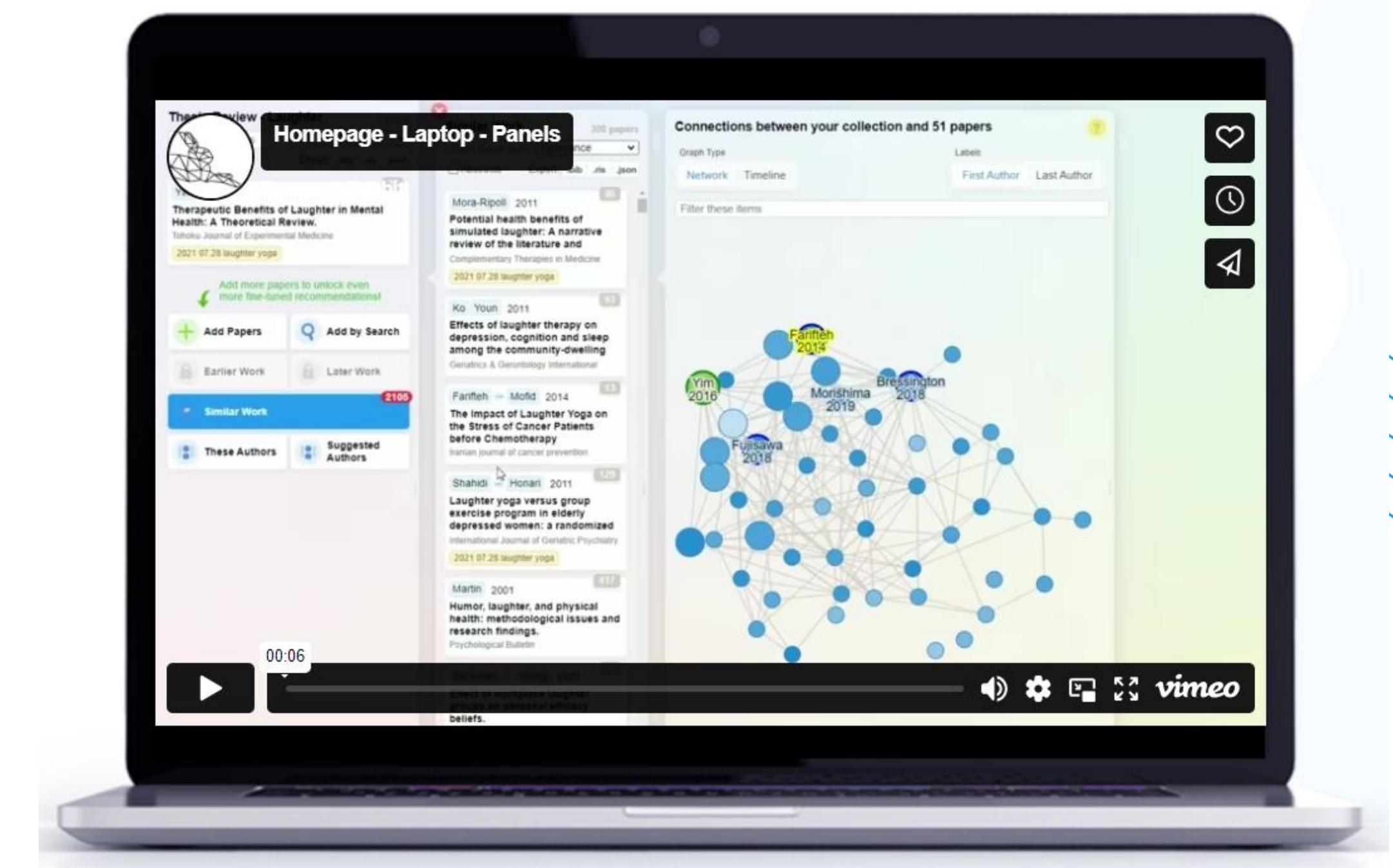
<https://www.researchrabit.ai/>

- 1 Never miss a thing
- 2 Visualise papers
- 3 Discover author networks
- 4 Share your collections

Reimagine Research

We're rethinking everything:
literature search, alerts, and more

[Sign up](#)

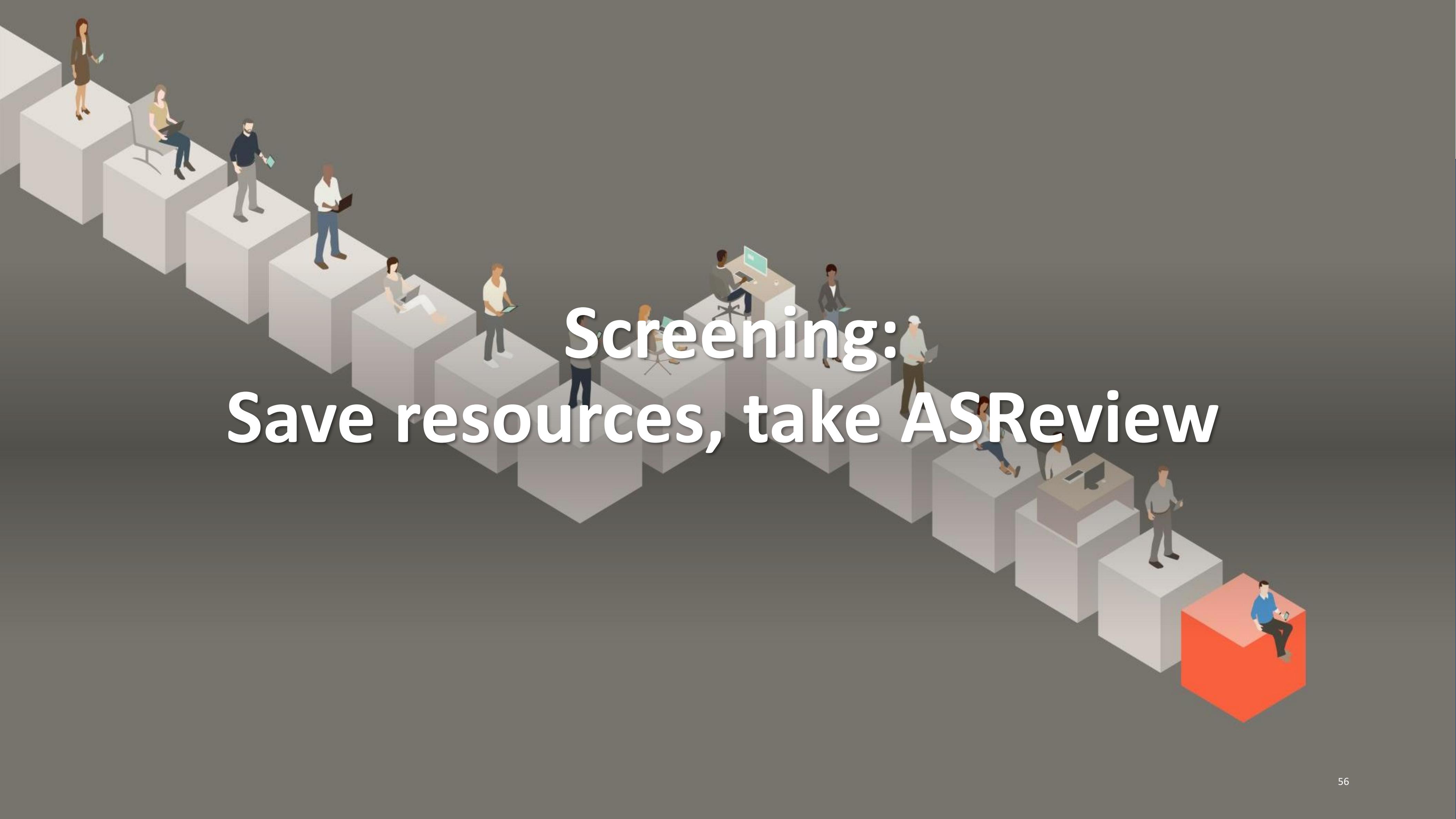


EPPI-Reviewer

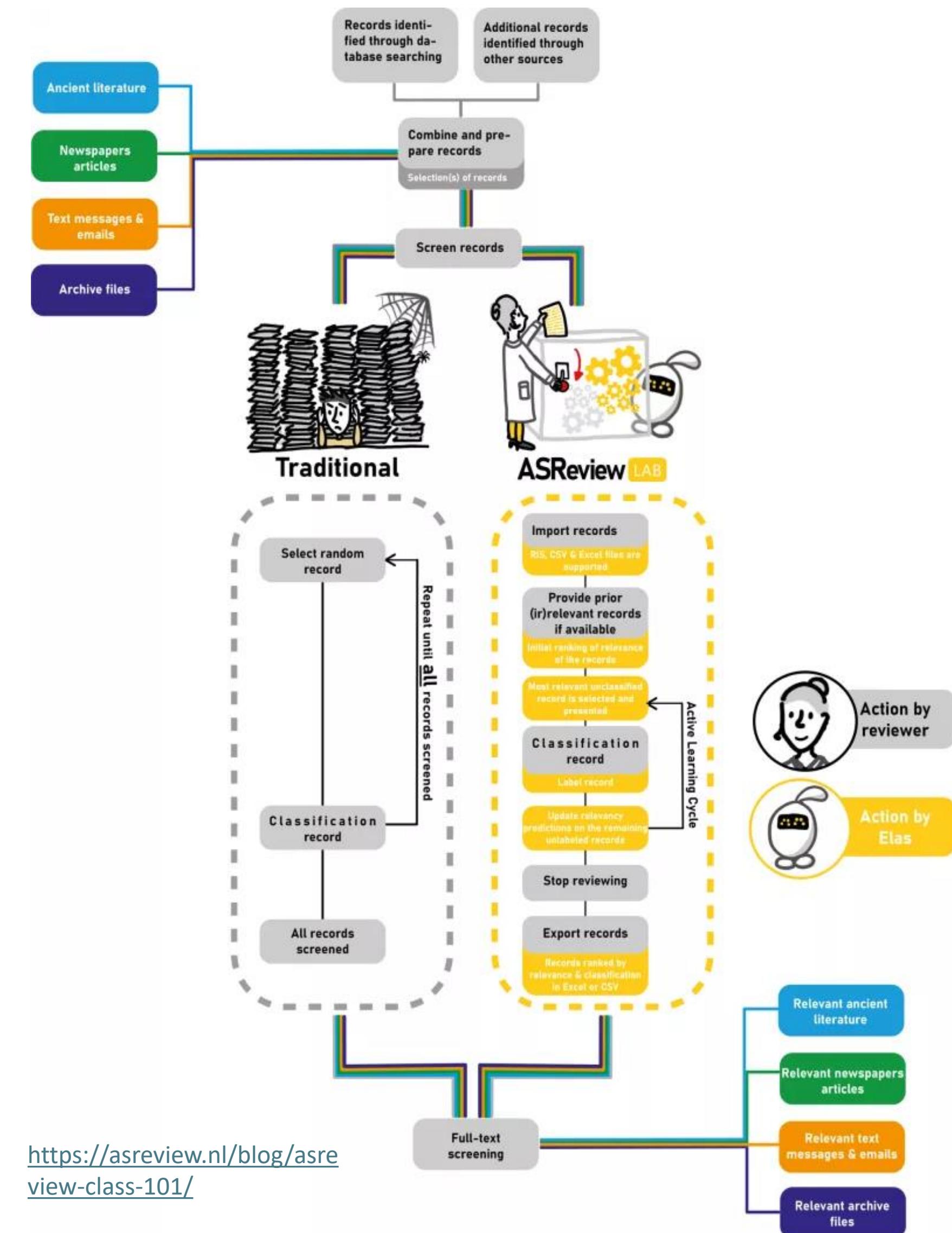
EPPI-Reviewer: systematic review software

The screenshot shows the EPPI-Reviewer website. At the top left is the EPPI-Reviewer logo with a blue circular icon and the text "EPPI Reviewer". Below it is a "Login" button. The top navigation bar includes links for "EPPI Centre home", "Contact", "Search...", "HOME", "HELP", "EPPI-MAPPER", "RIS EXPORT", "ABOUT", and "ACCOUNT MANAGER". A decorative background graphic features a grey circular pattern of dots. On the left, under "Getting Started", there's a call-to-action box: "Start using EPPI-Reviewer today! Sign up for a free one month trial!" and another box: "Please see [About our fees](#) and [About support](#) for further information.". Below this is a note about support: "EPPI-Reviewer subscriptions include full support via email, and we aim to respond within one working day. (We are happy to assist with the software itself and how best to use it when conducting your reviews. Contact [EPPI Support](#) for all queries.)". At the bottom left is the Cochrane logo with the text: "NOTE: Cochrane / Campbell reviewers can use their Archie credentials to access EPPI Reviewer at no charge. (EPPI-Reviewer is part of the developing Cochrane information infrastructure, being a recommended Review Production Tool). For further information click [here](#)."

- **Handles Large Reviews:** Manages databases with over a million items for any review type.
- **Streamlined Screening & Coding:** Includes tools like "Quick Question" reports and Excel exports.
- **Integrates with Research Tools:** Links to OpenAlex and Zotero for easy reference management.
- **Accessible Anywhere:** Web-based, works on any device—no installation needed.



Screening: Save resources, take ASReview



<https://asreview.nl/blog/asreview-class-101/>

ASReview



<https://www.youtube.com/watch?v=k-a2SCq-LtA>





ASReview – Intro & how it works

-  Developed at Utrecht University
-  Helps to get an overview of the most relevant records as efficiently as possible in a transparent process
-  Allows multiple machine learning models (+ exploration and simulation modes for easier comparison of algorithms)
-  Easily extensible (new models, data, extensions)
-  Local installation possible
-  Free and open source
-  Connects with citation management programs



<https://www.youtube.com/watch?v=gBmDJ1pdPRO&t=88s>

ASReview – Create project

- Create project

Create a new project

Saved X

1 Project information 2 Data 3 Model 4 Warm up

Project information

Mode: Oracle
Review your dataset with interactive artificial intelligence (AI)

Title (required): MA course

Author(s): Jessica

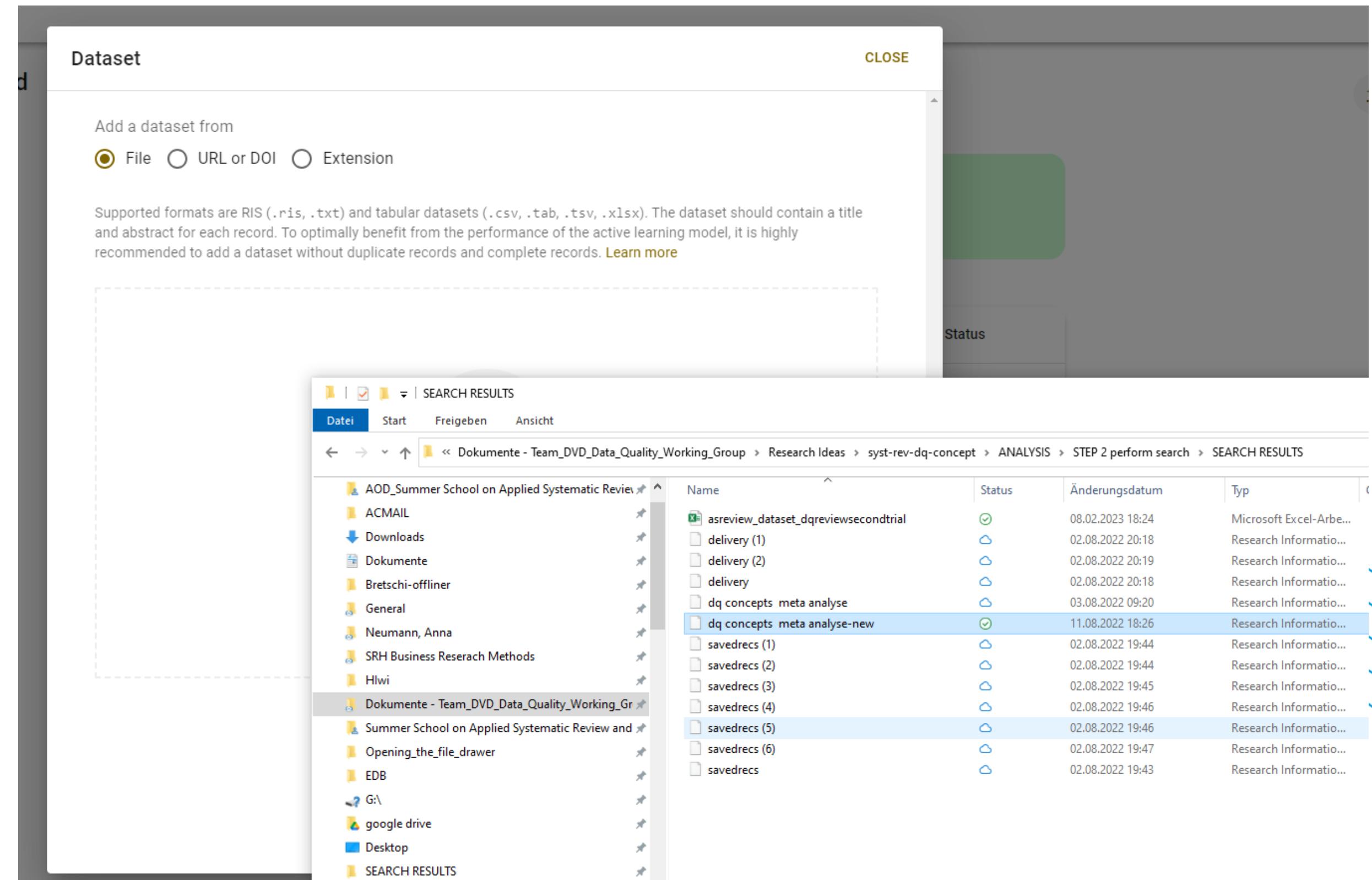
Description: This is how it works!

NEXT

+ CREATE

ASReview – Choose dataset

Choose dataset, here .ris
created via Zotero



ASReview – Add priors

Add prior knowledge

Prior knowledge

← survey error CLOSE

Relevant (3) Irrelevant (1) All

Epidemiologists and health geographers routinely use small-area survey estimates as covariates to model areal and even individual health outcomes. American Community Survey (ACS) estimates are accompanied by standard errors (SEs), but it is not yet... [read more](#)

Total Twitter Error: Decomposing Public Opinion Measurement on Twitter from a Total Survey Error Perspective

No abstract available

Is this record relevant? **YES** **NO**

Total survey error: Past, present, and future

No abstract available

Is this record relevant? **YES** **NO**

Total survey error: a paradigm for survey methodology

No abstract available

Is this record relevant? **YES** **NO**

Total Survey Error: Adapting the Paradigm for Big Data

No abstract available

Is this record relevant? **YES** **NO**

Create a new project



Data

A dataset contains textual records (e.g., abstracts of scientific papers, newspaper articles) that you want to label in interaction with the AI. Prior knowledge is required to warm up the AI.

Dataset *dq_concepts_meta_analyse-new* added

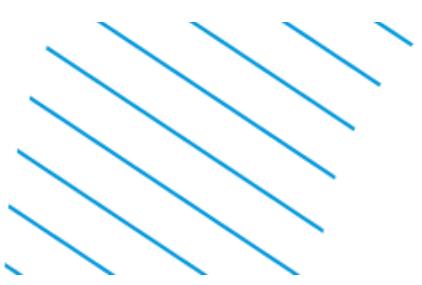
Contains 8258 records with approximate 526 duplicates

Add prior knowledge

Label at least 1 relevant and 1 irrelevant record to warm up the AI

EDIT

ADD



ASReview – Model parameters

Select algorithm (Oracle,
Exploration or Simulation
mode)

Create a new project Saved 

Project information ✓ Data ✓ **Model** 3 Warm up 4

Model
 An active learning model consists of a feature extraction technique, a classifier, a query strategy, and a balance strategy. The default setup (TF-IDF, Naive Bayes, Maximum, Dynamic resampling) overall has fast and excellent performance. [Learn more](#)

i Some combinations take a long time to warm up. Some classifiers and feature extraction techniques require additional dependencies.

Feature extraction technique: TF-IDF

Classifier: Naive Bayes

Query strategy: Maximum

Balance strategy: Dynamic resampling (Double)

BACK **NEXT**

ASReview – let the show begin

Classify papers

Screenshot of the ASReview interface showing a paper being reviewed.

The browser address bar shows: `localhost:5000/projects/ma-course-/review`

The page title is **SReview LAB**.

The left sidebar menu includes:

- projects
- project
- se
- .analytics
- review** (highlighted)
- history
- xport
- details
- donate
- community
- settings
- help

The main content area displays a book summary for "Total Survey Error in Practice".

Total Survey Error in Practice

Featuring a timely presentation of total survey error (TSE), this edited volume introduces valuable tools for understanding and improving survey data quality in the context of evolving large-scale data sets. This book provides an overview of the framework and current TSE research as related to survey design, data collection, estimation, and analysis. It reveals that survey data affects many public policy and business decisions and thus focuses on the framework for understanding and improving survey data quality. The book also addresses issues with data quality in official statistics and in public opinion, and market research as these fields continue to evolve, leading to larger and messier data sets. This challenges survey organizations to find ways to collect and process data more efficiently without sacrificing quality. The volume consists of the most up-to-date research and reporting from over 70 contributors representing the best and researchers from a range of fields. The chapters are broken out into five main sections: The Concept of Total Survey Error, The TSE Paradigm, Implications for Survey Design, Data Collection and Data Processing Applications, Evaluation and Improvement, and Estimation and Analysis. Each chapter introduces and examines multiple error sources, such as sampling error, measurement error, and nonresponse error, which often offer the greatest risks to data quality, encouraging readers not to lose sight of the less commonly studied error sources, such as coverage error, processing error, and specification error. The book also notes the relationships between errors and the ways in which efforts to reduce one type can increase another, resulting in an estimate with larger total error. This book:

- Features various error sources and their effects, illustrating the complex relationships between them, in 25 high-quality chapters on the most up-to-date research in the field.
- Provides comprehensive reviews of the literature on error sources as well as data collection approaches and methods to reduce their effects.
- Presents examples of recent international events that demonstrate the effects of survey error, the importance of survey data quality, and the real-world issues that arise from these errors.
- Spans the total survey error paradigm (design, data collection, evaluation and analysis) to address key data quality issues in official statistics and survey research.

Total Survey Error in Practice is a reference for survey researchers and students, as well as for practitioners in research areas that include social science, public opinion, public policy, and business. It can also be used as a supplementary material for a graduate-level course in survey research methods.

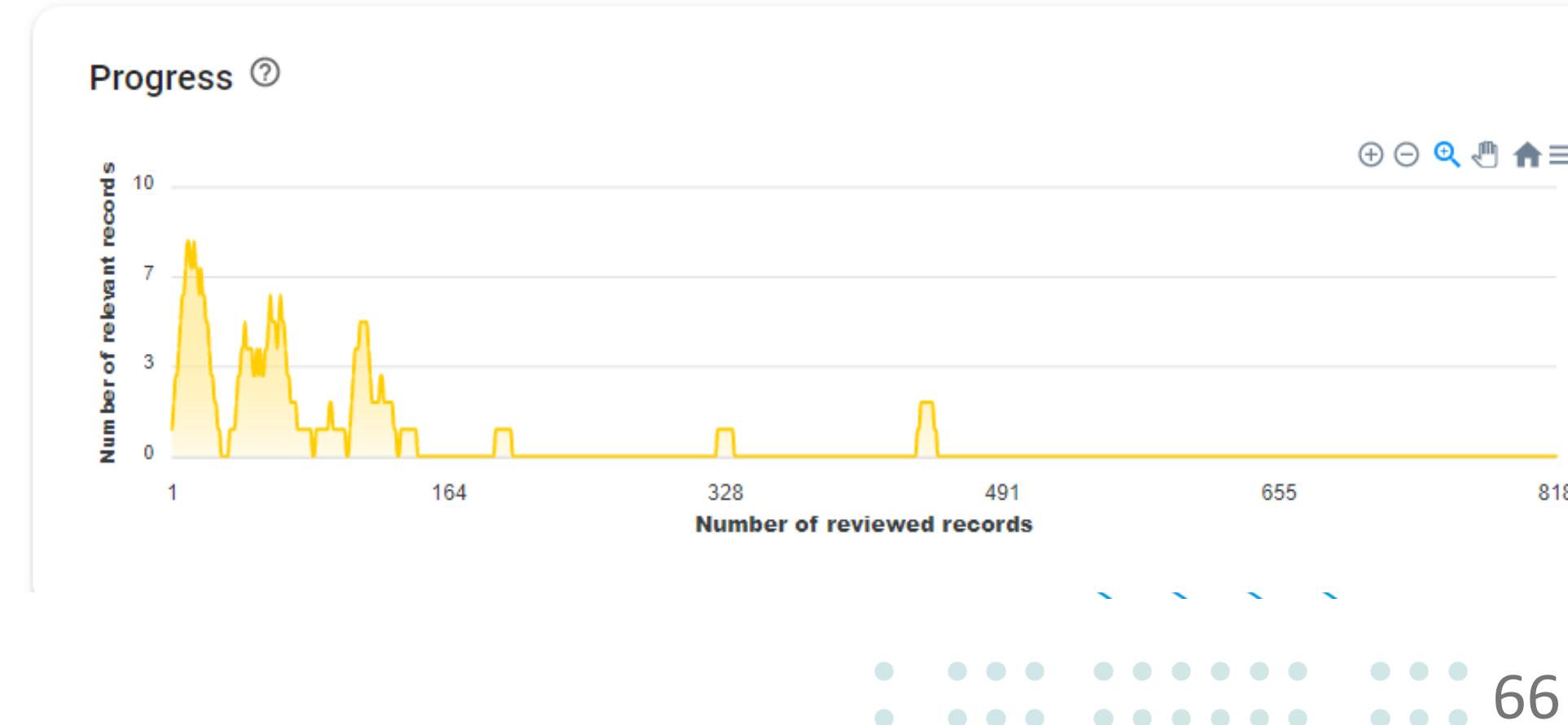
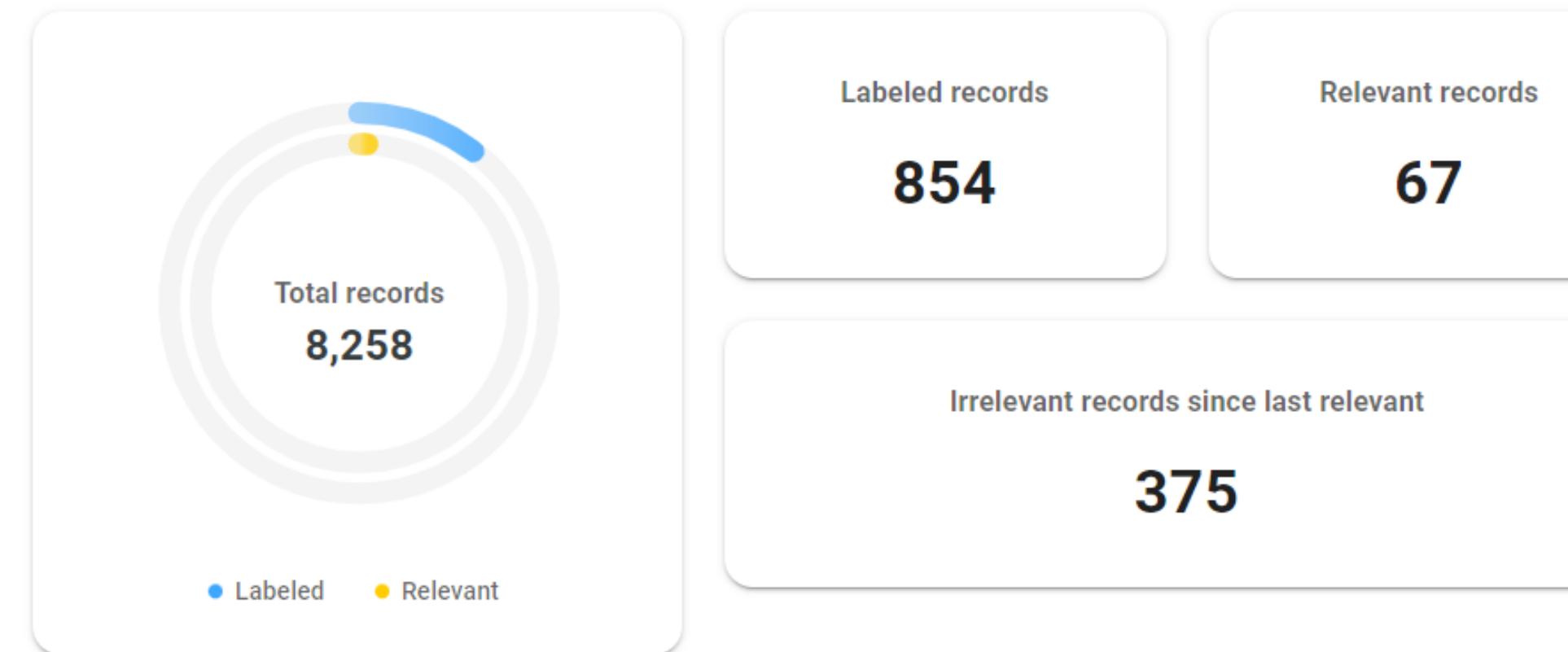
At the bottom right, there is a circular interface with two buttons: **IRRELEVANT** (grey) and **RELEVANT** (dark grey). A yellow arrow points from the **RELEVANT** button back towards the top right corner of the screen.

ASReview – Dashboard

Make sure to choose a strategy or stopping rule before you start screening:

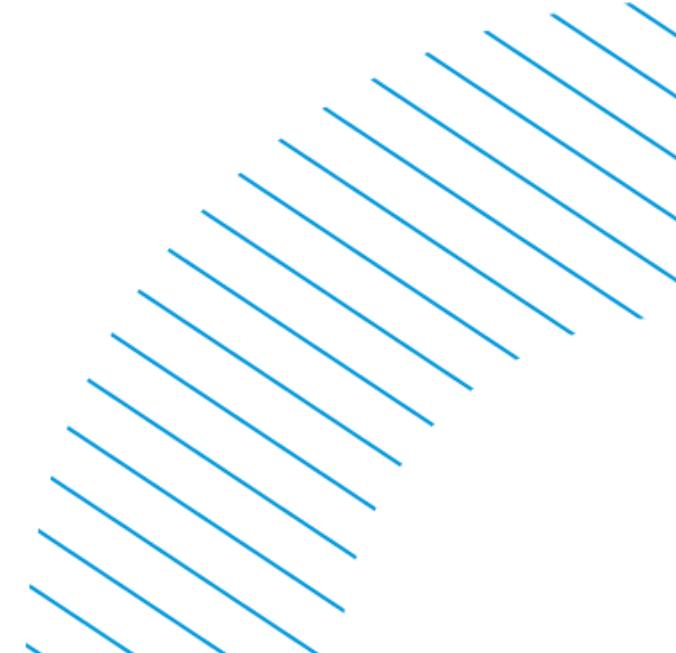
1. Predetermined: Screen only X% of all records (here 45%);
2. Data-driven: Stop after finding X irrelevant papers in a row;
3. Time-based: Stop after X hours

Extract results = title, abstract and hyperlink to full text via .csv file



Try ChatPDF for coding tasks 😊

<https://dissertationbydesign.com/how-to-use-chatpdf-to-quickly-summarize-and-extract-information-from-research-articles/>



Cool new developments to save time I

Metaverse

Evidence synthesis workflows for R

Grey Literature Reporter

Chrome plugin for grey literature searching

EviAtlas

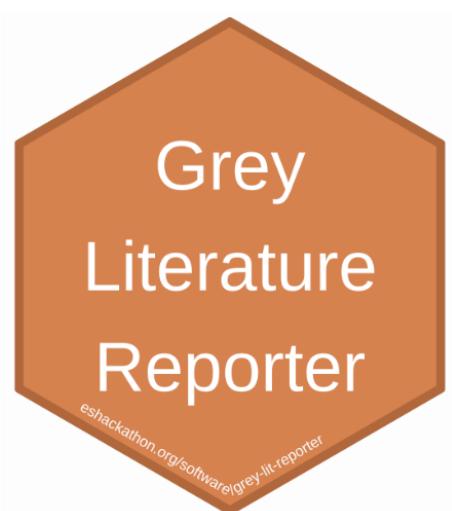
R tool for exploring systematic map databases

Citationchaser

See previous slides

PRISMA2020

R package and ShinyApp for making PRISMA2020 flow diagrams



<https://www.eshackathon.org/>



Cool new developments to save time II

Synthesisr

Import, assemble, and deduplicate bibliographic data stored as RIS or BibTex formatted text files

Revtools

Article screening for evidence synthesis using manual or visual methods

TopicTagger

Tag documents with meta-data and based on user-defined ontologies or topic groups

MetaDigitise

High-throughput, reproducible extraction of data from figures

Robvis

Create publication quality risk-of-bias assessment figures.

Evidence Synthesis Hackathon

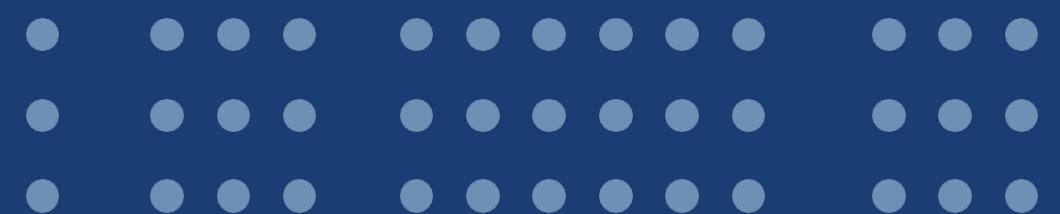
A series to discuss and develop new Open Source technologies for evidence synthesis applications



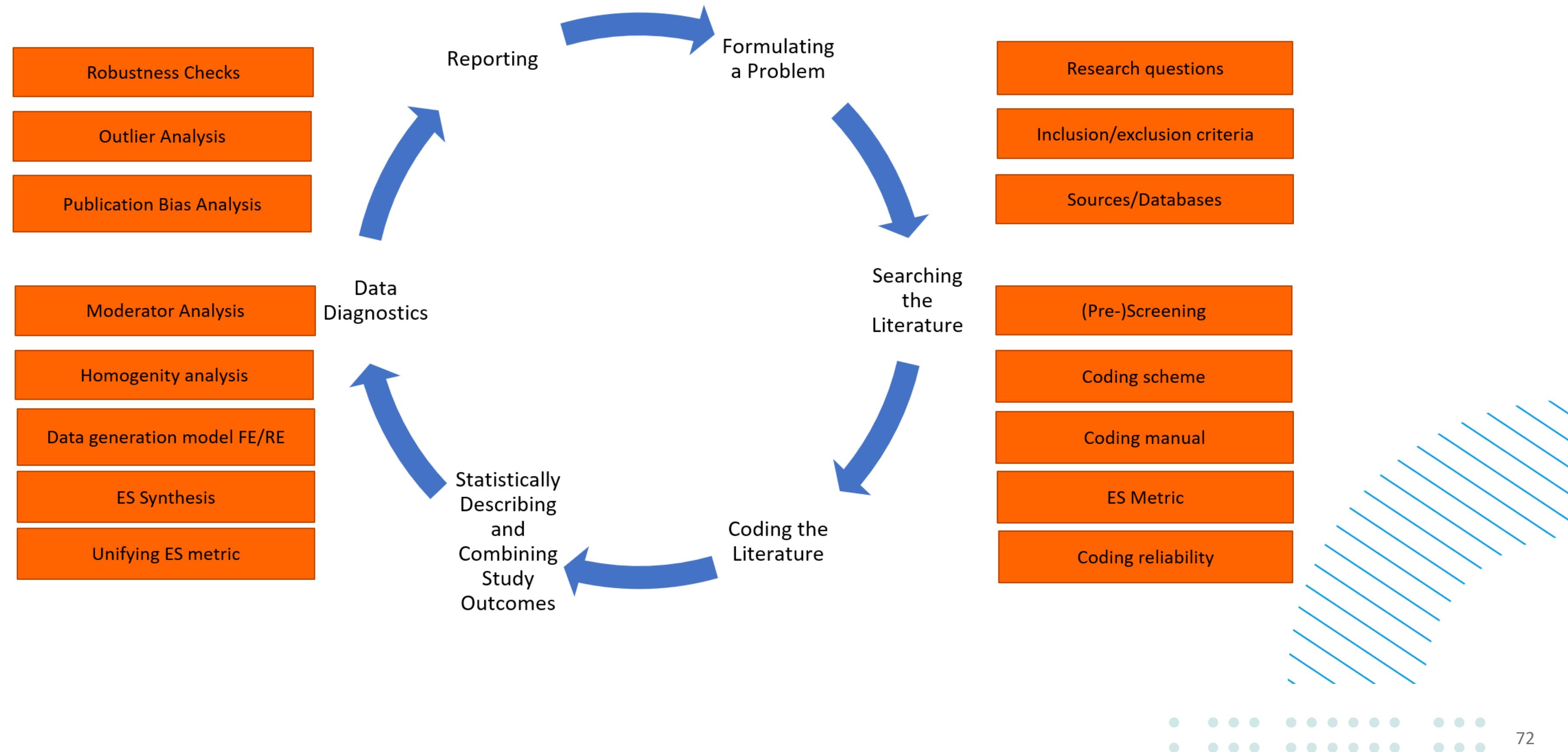




How to review an evidence based method paper?



Rigorous methods and protocol = The synthesis life cycle



Meta-Analysis Reporting Standards (MARS)

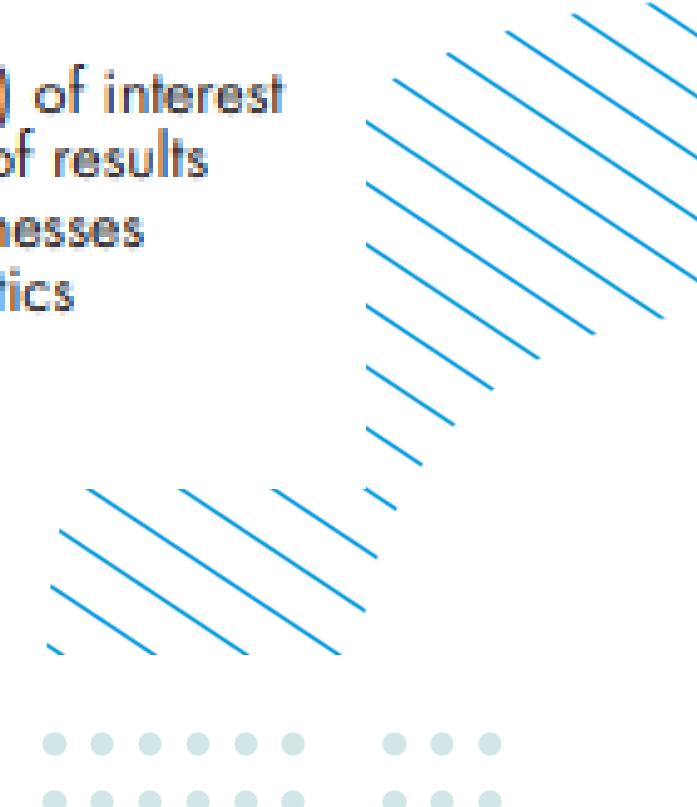
- The American Psychological Association (APA) has published reporting standards (APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008)
- The advantages:
 - Available for free
 - Easy to understand
 - Ensure integrity and replicability
 - Provide useful hints



MARS: Intro

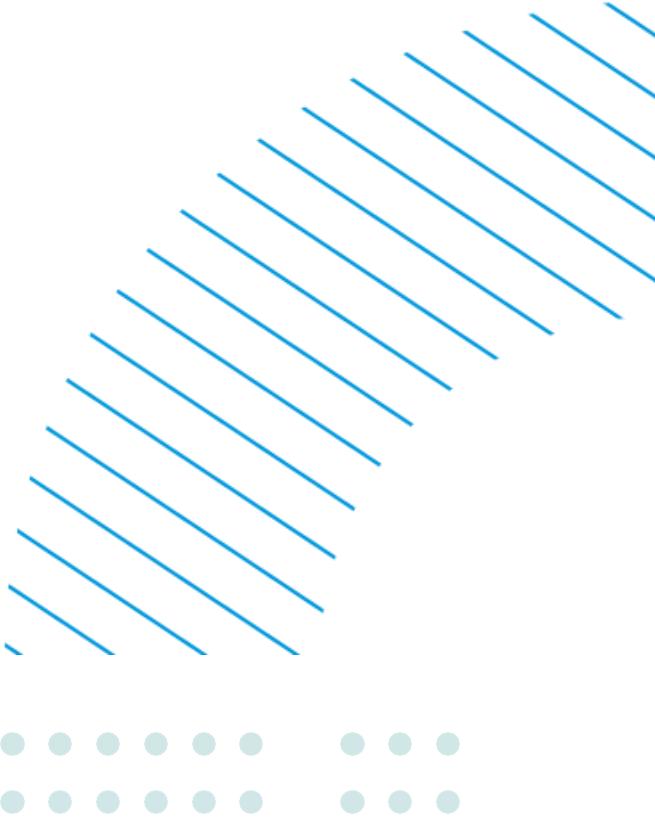
Paper section and topic	Description
Title	Make it clear that the report describes a research synthesis and include "meta-analysis," if applicable Footnote funding source(s)
Abstract	The problem or relation(s) under investigation Study eligibility criteria Type(s) of participants included in primary studies Meta-analysis methods (indicating whether a fixed or random model was used) Main results (including the more important effect sizes and any important moderators of these effect sizes) Conclusions (including limitations) Implications for theory, policy, and/or practice
Introduction	Clear statement of the question or relation(s) under investigation: Historical background Theoretical, policy, and/or practical issues related to the question or relation(s) of interest Rationale for the selection and coding of potential moderators and mediators of results Types of study designs used in the primary research, their strengths and weaknesses Types of predictor and outcome measures used, their psychometric characteristics Populations to which the question or relation is relevant Hypotheses, if any

... .



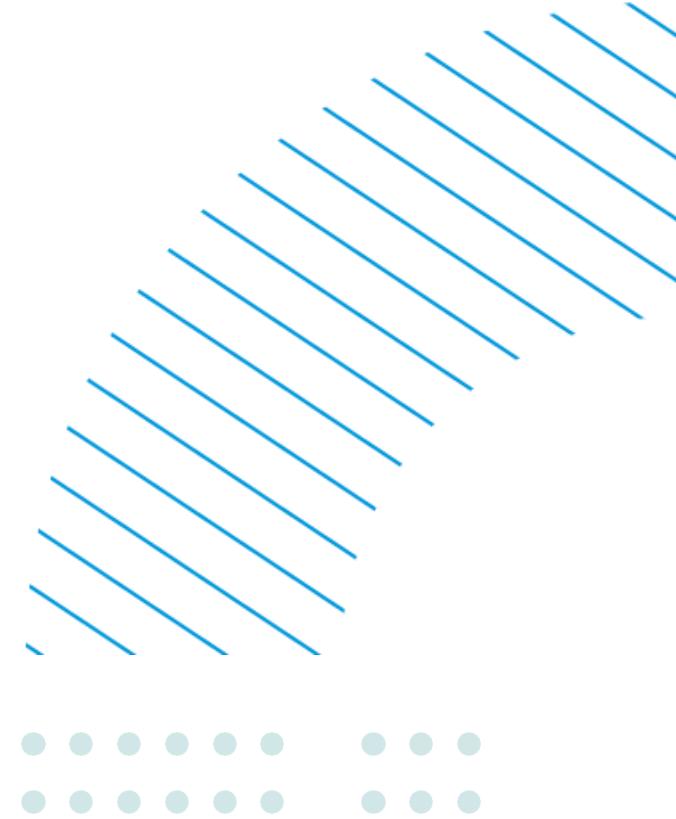
MARS: Methodology

Paper section and topic	Description
Method	
Inclusion and exclusion criteria	<p>Operational characteristics of independent (predictor) and dependent (outcome) variable(s)</p> <p>Eligible participant populations</p> <p>Eligible research design features (e.g., random assignment only, minimal sample size)</p> <p>Time period in which studies needed to be conducted</p> <p>Geographical and/or cultural restrictions</p>
Moderator and mediator analyses	Definition of all coding categories used to test moderators or mediators of the relation(s) of interest
Search strategies	<p>Reference and citation databases searched</p> <p>Registries (including prospective registries) searched:</p> <ul style="list-style-type: none"> Keywords used to enter databases and registries Search software used and version <p>Time period in which studies needed to be conducted, if applicable</p> <p>Other efforts to retrieve all available studies:</p> <ul style="list-style-type: none"> Listservs queried Contacts made with authors (and how authors were chosen) Reference lists of reports examined
Coding procedures	<p>Method of addressing reports in languages other than English</p> <p>Process for determining study eligibility:</p> <ul style="list-style-type: none"> Aspects of reports were examined (i.e., title, abstract, and/or full text) Number and qualifications of relevance judges Indication of agreement <ul style="list-style-type: none"> How disagreements were resolved <p>Treatment of unpublished studies</p> <p>Number and qualifications of coders (e.g., level of expertise in the area, training)</p> <p>Intercoder reliability or agreement</p> <p>Whether each report was coded by more than one coder and if so, how disagreements were resolved</p> <p>Assessment of study quality:</p> <ul style="list-style-type: none"> If a quality scale was employed, a description of criteria and the procedures for application If study design features were coded, what these were



MARS: Analysis

Paper section and topic	Description
Statistical methods	<p>Effect size metric(s): Effect sizes calculating formulas (e.g., M_s and SD_s, use of univariate F to r transform) Corrections made to effect sizes (e.g., small sample bias, correction for unequal n_s) Effect size averaging and/or weighting method(s) How effect size confidence intervals (or standard errors) were calculated How effect size credibility intervals were calculated, if used How studies with more than one effect size were handled Whether fixed and/or random effects models were used and the model choice justification How heterogeneity in effect sizes was assessed or estimated M_s and SD_s for measurement artifacts, if construct-level relationships were the focus Tests and any adjustments for data censoring (e.g., publication bias, selective reporting) Tests for statistical outliers Statistical power of the meta-analysis Statistical programs or software packages used to conduct statistical analyses</p>



MARS: Findings

Paper section and topic	Description
Results	<p>Number of citations examined for relevance</p> <p>List of citations included in the synthesis</p> <p>Number of citations relevant on many but not all inclusion criteria excluded from the meta-analysis</p> <p>Number of exclusions for each exclusion criterion (e.g., effect size could not be calculated), with examples</p> <p>Table giving descriptive information for each included study, including effect size and sample size</p> <p>Assessment of study quality, if any</p> <p>Tables and/or graphic summaries:</p> <ul style="list-style-type: none"> Overall characteristics of the database (e.g., number of studies with different research designs) Overall effect size estimates, including measures of uncertainty (e.g., confidence and/or credibility intervals) <p>Results of moderator and mediator analyses (analyses of subsets of studies):</p> <ul style="list-style-type: none"> Number of studies and total sample sizes for each moderator analysis Assessment of interrelations among variables used for moderator and mediator analyses <p>Assessment of bias including possible data censoring</p>
Discussion	<p>Statement of major findings</p> <p>Consideration of alternative explanations for observed results:</p> <ul style="list-style-type: none"> Impact of data censoring <p>Generalizability of conclusions:</p> <ul style="list-style-type: none"> Relevant populations Treatment variations Dependent (outcome) variables Research designs <p>General limitations (including assessment of the quality of studies included)</p> <p>Implications and interpretation for theory, policy, or practice</p> <p>Guidelines for future research</p>





Some last toughts...



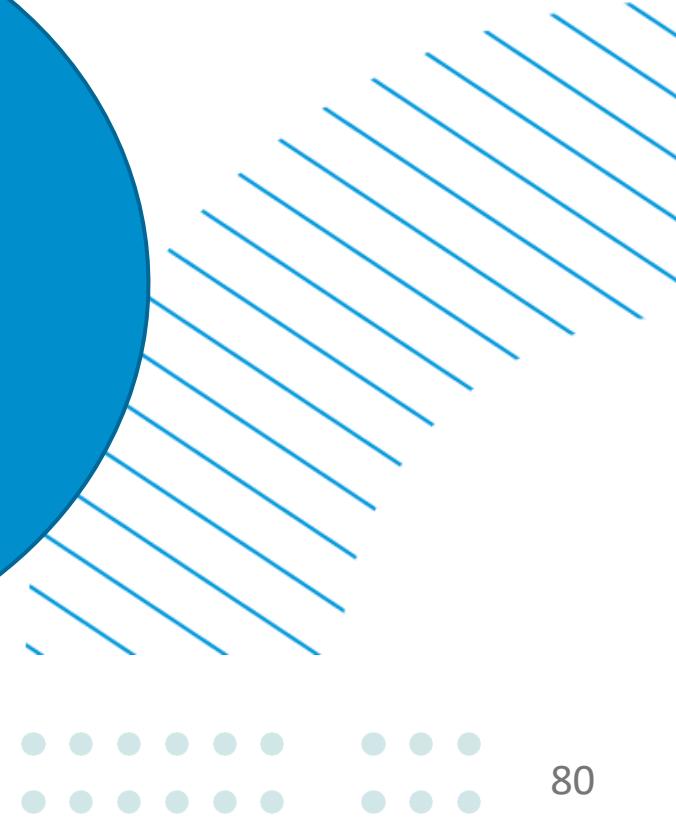
What your reviewer might criticize on your method and how you can prevent it

1. A SR/MA is just a form of wage management process. You put lots of waste together and produce even more waste.

2. A SR/MA compares apples with oranges and cannot result in a reasonable finding.

3. A SR/MA misses all the unpublished studies (file drawer problem).

4. All studies with multivariate outcomes cannot be included, this results in a biased result.



Reviewer response “Garbage in, garbage out” and comparing apples with oranges



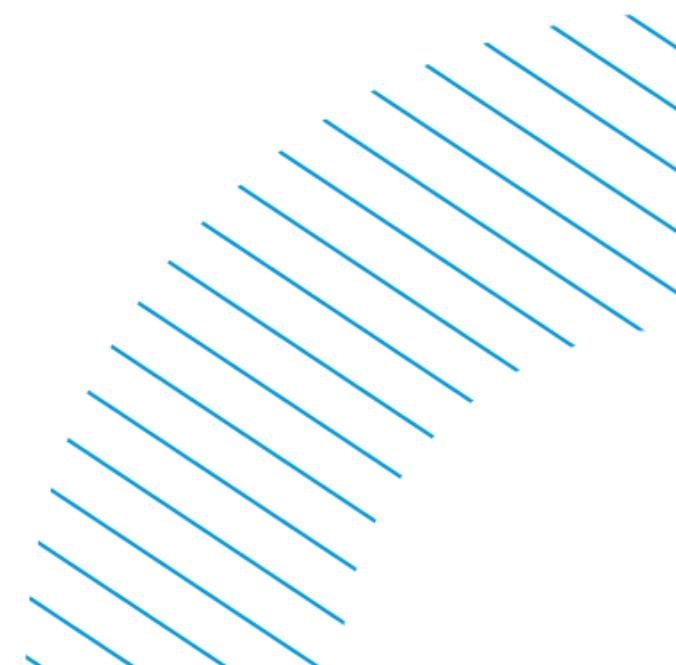
1. Garbage in, garbage out

- ...refers to the notion that if a meta-analysis includes many low quality studies , then fundamental errors in the primary studies will be carried over to the meta-analysis
- ...can be prevented by setting strict inclusion criteria (e.g., RCT vs. non-RCT studies), by systematically examine the study quality and look for differences in outcomes in moderator analysis and subgroup analysis.

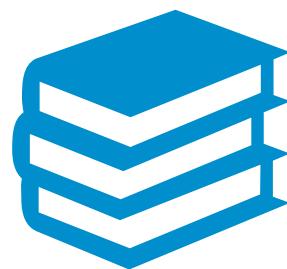


2. Compare apples with oranges

- ...refers to the notion that studies with different purposes are compared
- ...can be addressed by interest in “fruit salad”, i.e. interested in a general/broader concept and examining the heterogeneity of the “fruit salad” by moderators.



Reviewer response “publication bias” and “synthesizing multivariate outcomes”



1. Publication bias

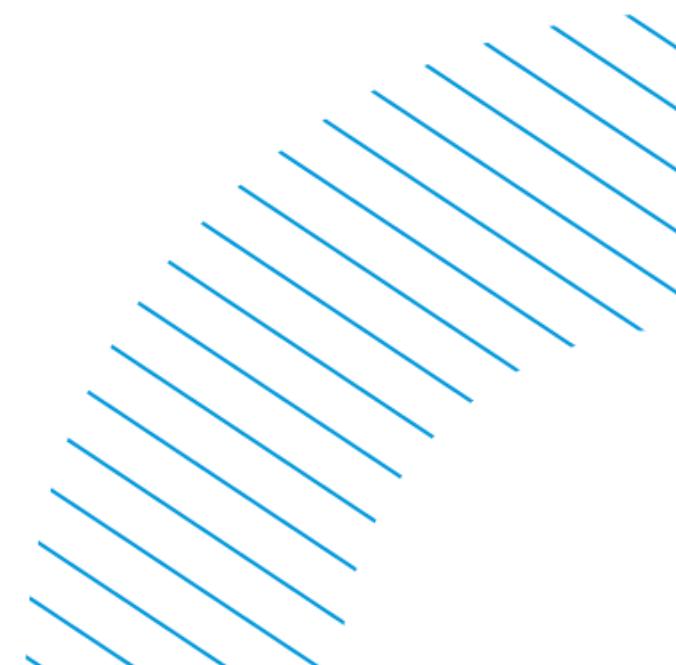
- ...refers to the notion that the SR/MA misses to include evidence.
- ...can be addressed by grey literature search and methods to address the publication bias problem such as funnel plots and this problem affects every type of review or even research.



2. Synthesizing multivariate outcomes

- ...refers to the problem that most meta-analysis utilize bivariate outcome statistics.
- ...can be addressed by the systematic review part and other approaches to fix this problem (e.g. IPD meta-analysis and Bayesian approaches – see Kuiper et al. 2013)

Learn more in Borenstein et al., 2009, pp.377



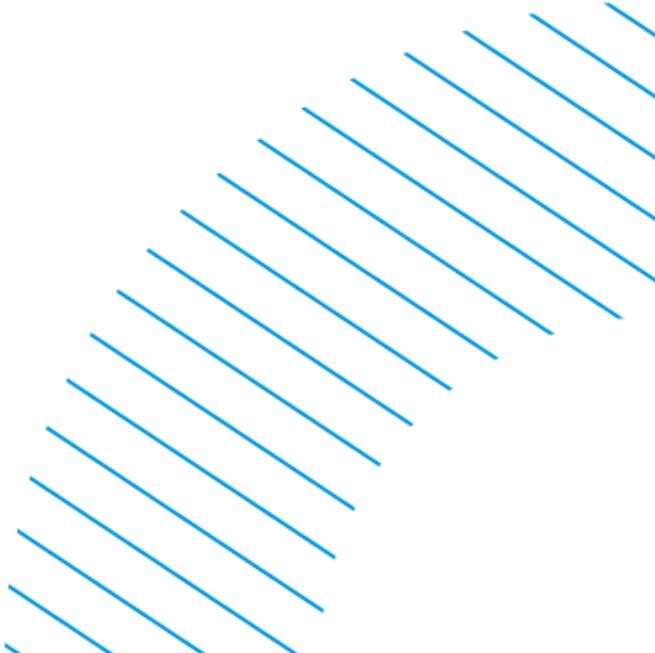
Summary

Goals:

- Evidence (gap) map: Presentation of evidence and, if applicable, research gaps
 - Systematic review: Qualitative synthesis and description of results
 - Meta-analysis: Quantitative synthesis and description of results
- common Ensure a systematic approach and transparency through documentation

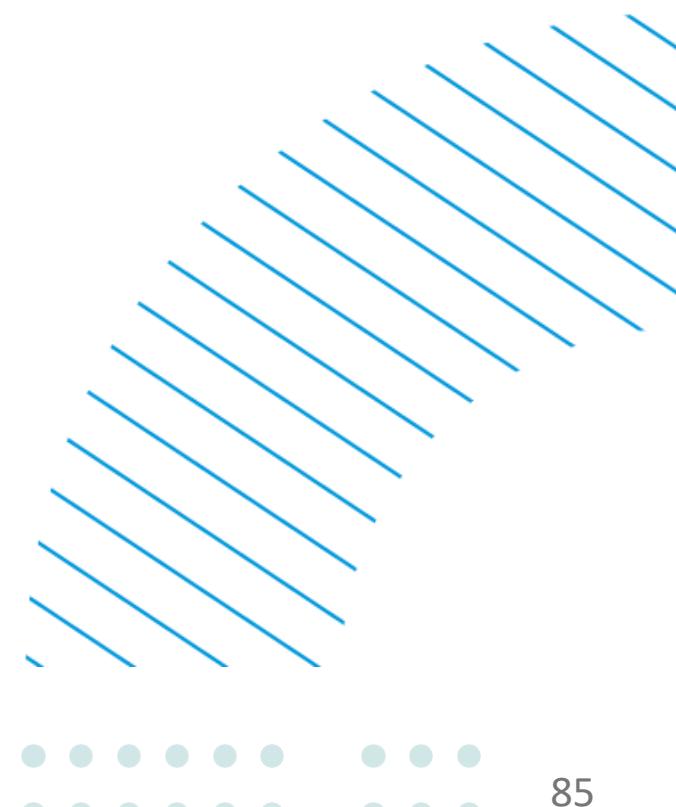
Are you planning a specific project? Our references can help! If you have any further questions, please get in touch : jessica.daikele@gesis.org





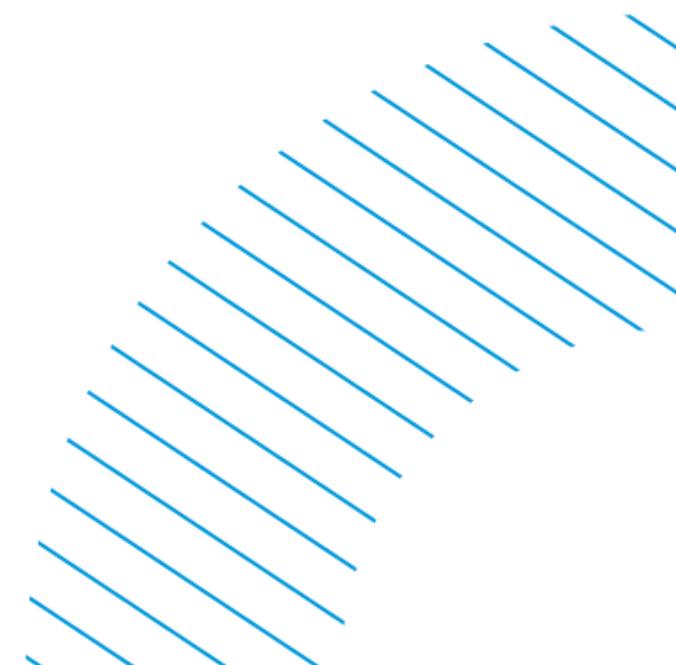
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Thank you for your attention.