

Future of Work Institute – Curtin Business School
FACULTY OF BUSINESS AND LAW



Curtin University

FUTURE OF WORK INSTITUTE

An introduction to the what, why, and how of systematic reviewing

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A global university

Western Australia | Dubai | Malaysia | Mauritius | Singapore

Our experience with systematic reviewing

Dr. Caroline Knight



Ongoing projects:

- Currently working on a work design and leadership MA

Previously:

- Role of work design interventions on performance - SR
- Effectiveness of work engagement interventions – MA and SR x2
- Servant leadership MA
- Leadership, creativity & innovation MA

Dr. Daniel Andrei



• **Ongoing projects:**

- Leadership and work design (MA/ writing-up)
- Work related factors that influence psychological adjustment after retirement (MA/full text coding)
- Work design and ageing/age diverse workforce (SR + Scientific mapping)
- **Previously:** Technology acceptance research in Romania (SR)

What we will cover

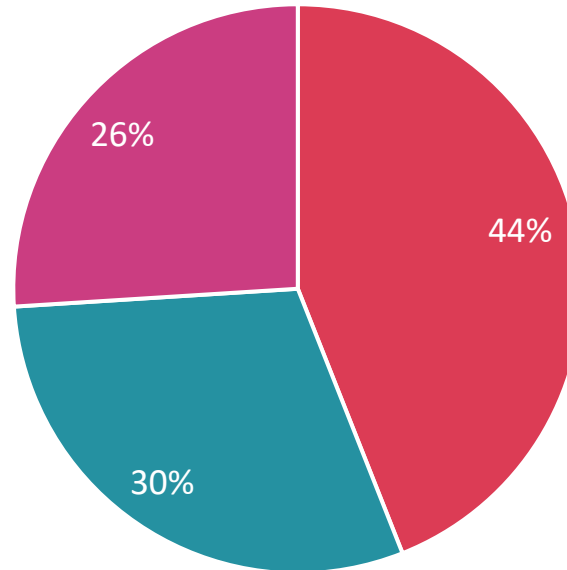
- WHAT: Definition of SRs
- WHY: Purpose and benefits of SRs
- HOW: Steps to conduct an SR
- Examples of different types of SR
- Demonstration of resources
- Q&A

What we will NOT cover

How to do a meta-analysis!

Survey results!

How much expertise do you have in conducting systematic reviews?



- I don't know much about this method - beginner level
- I am aware of this method but haven't yet used it myself
- I have worked a bit with this method myself and used it at least once







N=23

Activity 1

Guess THE SRs!!!!

In small groups discuss the sample of papers provided. If you need to, quickly check other sections of the papers online. Identify which ones are SRs and which ones are not. Why?

Guess the SRs!

TITLE	SR?
How does the use of information communication technology affect individuals? A work design perspective	
When is helping behavior unhelpful? A conceptual analysis and research agenda	
One Hundred Years of Work Design Research: Looking Back and Looking Forward	
A Look Back and a Leap Forward: A Review and Synthesis of the Individual Work Performance Literature	
Algorithms as work designers: How algorithmic management influences the design of jobs	
How work redesign interventions affect performance: An evidence-based model from a systematic review	

WHAT is a Systematic Review?

The Cochrane Collaboration defines an SR as:

*A review of a clearly formulated question that uses **systematic** and **explicit** methods to identify, select, and **critically appraise** relevant research, and to **collect** and **analyse** data from the studies that are included in the review. Statistical methods (**meta-analysis**) **may or may not** be used to analyse and summarise the results of the included studies.*

<https://training.cochrane.org/handbook>



SR vs non-SRs

SRs

- Scope of review identified in advance – often narrow Qs
- Replicable methods - detailed & explicit plan for the search, screening, coding, analysis of papers
- Reduced risk of bias as literature searched systematically
- Critical appraisal of study quality and findings

Non-SRs

- Qualitative, narrative, descriptive
- **Non-replicable** - no systematic search of literature
- **Selection bias** – often focus on subset of studies usually based on availability / researcher interests
- Can be confusing if similar studies have inconsistent results
- E.g. overviews, discussions, critiques, scoping out an area

WHY do an Systematic Review?

- To **summarise knowledge** in a topic area while **minimising bias**
- To describe the review process in detail so, in principle, **another person could perform it and arrive at the same results**
- To resolve controversy between conflicting findings
- To improve quality and accountability for practice
- To stimulate development of an **evidence base**

Steps for a Systematic Review

1. Develop the review question a priori
2. Decide inclusion / exclusion criteria
3. Decide search strategy
4. Search for screen & double-code primary studies
5. Extract data
6. Analyse data – qualitatively and / or quantitatively
7. Assess quality of evidence
8. Interpret results
9. Write an article / report

Develop the RQ - PICOS

- **P**opulation - who are you interested in? Who are you *not* interested in? Are only certain settings relevant e.g. workplaces?
- **I**nterventions - which interventions? What *won't* you include? Not always applicable e.g. correlational studies
- **C**omparators - what control or comparison groups? What *won't* you include? Not always applicable e.g. correlational studies
- **O**utcomes - well-being, performance, others? What will you exclude?
- **S**tudy designs - all designs? Just RCTs? Quasi-experiments? Cross-sectional research?

Break out groups

Develop a research question on a topic you are working on
/ are interested in

Apply your research question to the PICOS acronym

Work in twos / threes or alone

P
I
C
O
S

Worked Example – Work redesign interventions

How work redesign interventions affect performance: An evidence-based model from a systematic review

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Curtin University, Australia

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Abstract

It is not yet clear whether work redesigns actually affect individual-, team- or organizational-level performance. In a synthesis of this literature, we conclude there is good overall evidence, with the most promising evidence at the individual level. Specifically, our systematic review assessed whether top-down work redesign interventions affect performance and, if so, why (mechanisms) and when (boundary conditions). We identified 55 heterogeneous work redesign intervention studies, of which 39 reported a positive effect on performance, two reported a negative effect, and 14 reported mixed effects. Of five types of work redesign, the evidence that work characteristics can explain the effect of redesign interventions on performance was most promising for relational interventions, and participative and non-participative job enrichment and enlargement. Autonomous work group and system-wide interventions showed initial evidence. As to 'why' work redesigns enhance performance, we identified change in work motivation, quick response and learning as three core mechanisms. As to 'when', we showed that intervention implementation, intervention context (including alignment of organizational systems, processes and the work redesign) and person factors are key boundary conditions. We synthesize our findings into an integrative multilevel model that can be used to design, implement and evaluate work redesigns aimed at improving performance.

human relations
1–36
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journals.sagepub.com/home/hum


Do top-down work redesign interventions affect performance and, if so, why (mechanisms) and when (boundary conditions)

Breaking the RQ down:

- P employee, worker
- I top-down, manager-led interventions
- C Any or none
- O Performance, productivity
- S Any

Decide inclusion/exclusion criteria

Key : eligibility criteria and search strategy are predetermined, rigorous and transparent.

- I/E criteria based on the research question
- I/E criteria should be piloted and updated when necessary
- Some aspects to consider:

Date	Date restrictions are not usually applied unless updating an existing review or investigating a topic which has only existed in a specific time period.
Geography	Some reviews focus on populations in specific locations such as developing countries or rural communities.
Participants	The review may focus on a specific age group or gender.
Setting	A question may investigate a phenomenon in a specific setting such as experiences in a hospital, online, or at ante natal classes.
Study Design	Specific study design investigate different types of research questions. For example; treatment questions are best answered by clinical or randomised control trials or prognosis question by prospective cohort studies. Thus study design can be used as exclusion/exclusion criteria.
Publication type	Systematic reviews synthesise primary research papers. However it is NOT recommended to exclude other types of publication as relevant and vital information may be missed such as erratum. There are reviews which include only Peer Reviewed publications, but some topics require inclusion of grey literature such as reports and conference papers.
Language	Reviews should aim to be as comprehensive as possible and NOT be restricted by language.

Identify your search strategy

Should balance sensitivity with precision

- What Boolean search strings will you use? What are the key concepts?
- Which databases?
- What additional searches?
 - e.g. specific journals, handsearching key reviews or books, contacting authors, citation searches
- Grey as well as published literature?
 - e.g. websites, reports, unpublished theses, conference proceedings
- Date limit? E.g. post-1990? Why or why not?
- English sources only?

4 biases to be aware of

1. **Database bias** - No single database is likely to contain all published studies on a given subject
2. **Publication bias** - 'File drawer problem'
 - selective publication of articles that show positive treatment of effects and statistical significance.
 - Therefore include **unpublished** studies
3. **Citation bias** - studies with positive results get cited
4. **English language bias**

Example search string for our example

#1 Population keywords

TS=("occupational") OR TS=("organi\$ation") OR TS=("industrial") OR TS=("employ*")
OR TS=("work*")

AND

#2 Intervention keywords

TOPIC: ("Job redesign") OR TOPIC: ("work redesign") OR TOPIC: ("Team redesign") OR
TOPIC: ("Job enlargement") OR TOPIC: ("Job enrichment") OR TOPIC: ("Job
reorgani\$ation") OR TOPIC: ("Job design") OR TOPIC: ("Work design") OR TOPIC: ("Job
rotation") OR TOPIC: ("Job enrichment") OR TOPIC: ("Team empowerment") OR TOPIC:
("Work empowerment") OR TOPIC: ("Participative redesign") OR TOPIC: ("Participative
work design") OR TOPIC: ("Autonomous work teams") OR TOPIC: ("Autonomous work
groups") OR TOPIC: ("Self-managing teams") OR TOPIC: ("Self managing groups")

AND

#3 Performance outcomes keywords

TOPIC: ("work performance") OR TOPIC: ("performance") OR TOPIC: ("profit*") OR
TOPIC: ("revenue") OR TOPIC: ("financial performance") OR TOPIC: ("financial
outcomes") OR TOPIC: ("return on investment") OR TOPIC: ("return on assets") OR
TOPIC: ("turnover") OR TOPIC: ("retention") OR TOPIC: ("job performance") OR TOPIC:
("adaptivity") OR TOPIC: ("adaptive performance") OR TOPIC: ("proactivity") OR TOPIC:
("proactiv*") OR TOPIC: ("creativity") OR TOPIC: ("innovation") OR TOPIC: ("personal
initiative") OR TOPIC: ("task performance") OR TOPIC: ("contextual performance") OR
TOPIC: ("Occupational safety") OR TOPIC: ("Patient safety") OR TOPIC: ("Patient
outcomes") OR TOPIC: ("Quality of care") OR TOPIC: ("Organi\$ational performance") OR
TOPIC: ("Organi\$ational effectiveness") OR TOPIC: ("Work effectiveness") OR TOPIC:
("Team effectiveness") OR TOPIC: ("Organi\$ational innovation") OR TOPIC:

Tips:

- Think of alternate words and spellings
- Use wildcards, truncation e.g. \$, *
- Check out the search help tips in most databases
- Don't include exclusion terms / search limiters e.g. 'NOT'
- **Use trial and error to adjust your strategy**

Searching

- Literature databases relevant to your field
- As many databases as you have resources for, recommend 3+, more if including unpublished work
- Supplement your search by searching the reference lists of key reviews, forward citation searches
- Search within specific highly relevant journals
- Ask key researchers for unpublished work / post on professional websites (e.g. AOM / SIOP)
- Set database search alerts

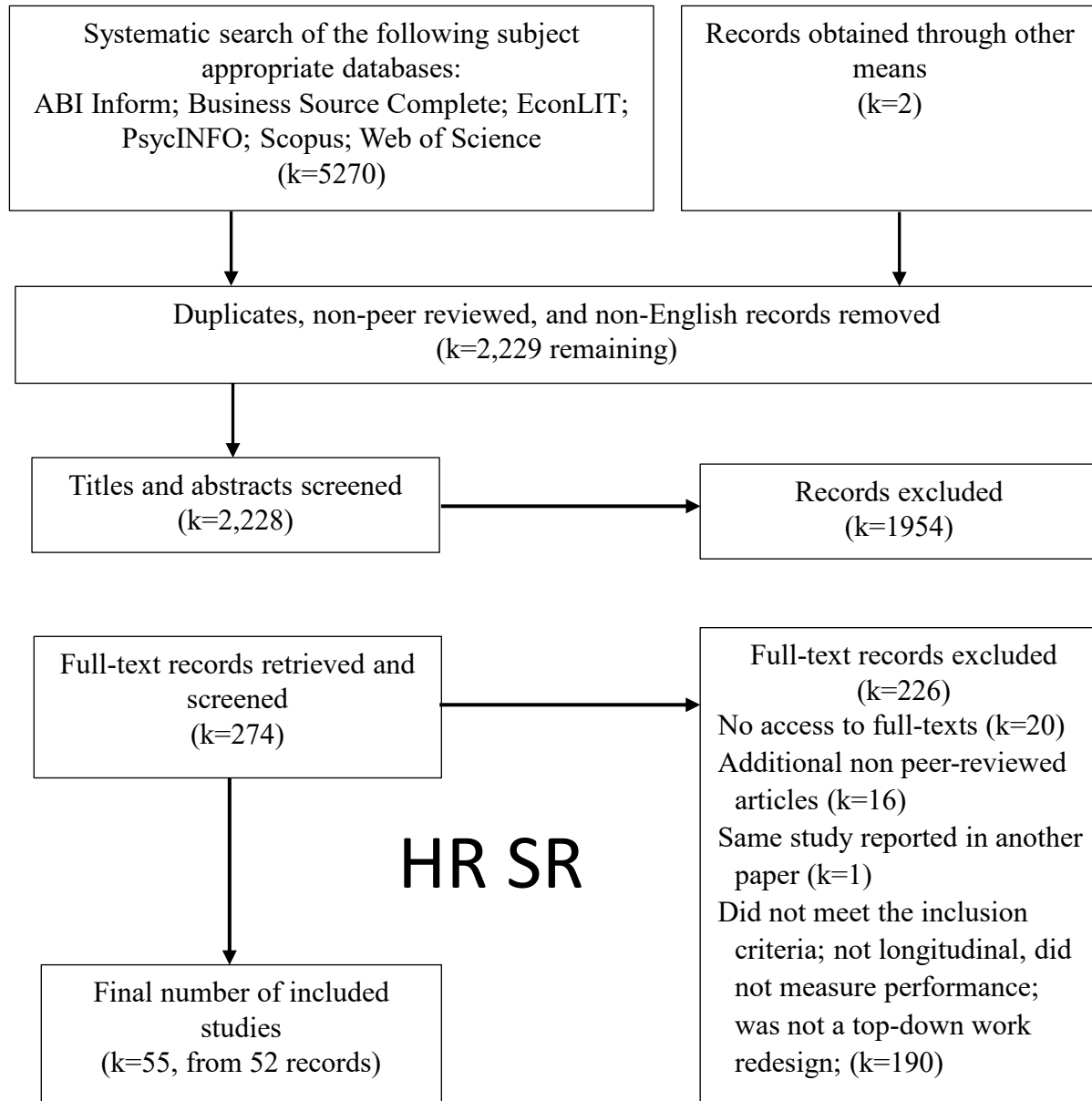
Screening & selecting studies

- Download references into referencing software e.g. EndNote; Mendeley; Zotero.
- Use software to compile and screen / double-screen the records e.g.
 - Excel
 - Covidence*
 - Hubmeta
 - Syras
 - ...and many many others (DistillerSR, EROS, EPPI-Reviewer, MetaGear, Rayyan, RevMan, etc.)

*Quick tour of typical functions <https://www.covidence.org/>



Screening and selecting studies – PRISMA flow diagram



[Download PRISMA templates from:
http://www.prisma-statement.org/](http://www.prisma-statement.org/)

Data extraction – Study characteristics

Characteristics extracted will depend on your RQ!

Download template checklist from: <http://www.prisma-statement.org/>

- Author, year
- Study abstract / aim
- Population & N e.g. children/adults/employees; industry; country
- Study design e.g. RCT, longitudinal, cross-sectional
- Intervention description, if applicable e.g. content, duration, method, mode, timing of delivery, comparison groups
- Method of allocation to study group if applicable
- No. participants in each group at baseline and follow up if applicable
- Outcome variables, including whether objective or subjective
- Inadequately reported or missing data
- Conclusions i.e. what was found? Was the intervention successful?

Quality of a body of evidence

What is 'quality'?

How valid and reliable are your results?

In your breakout groups, discuss:

1. **Why** it is important to assess the quality of your included studies?
2. **How** you can assess the quality of your included studies?

Quality assessment – GRADE approach

The GRADE approach (CERQual for Qual):

*“...the GRADE approach defines the **quality of a body of evidence** as the **extent** to which one can be **confident** that an **estimate of effect or association is close to the quantity of specific interest**. Quality of a body of evidence involves consideration of within-study risk of bias (methodological quality), directness of evidence, heterogeneity, precision of effect estimates and risk of publication bias...The GRADE system entails an assessment of the quality of a body of evidence for each individual outcome.”*

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

Defining quality according to GRADE

Overall recommendations and evidence statements are developed which are judged according to the GRADE criteria

High quality: Further research is very unlikely to change our confidence in the estimate of effect

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate

Very low quality: Any estimate of effect is very uncertain

QUANT evidence can be downgraded due to:

- Study limitations
- Inconsistency of results
- Indirectness of evidence
- Imprecision
- Reporting bias

QUAL evidence can be downgraded due to:

- Methodological limitations
- Relevance to review question
- Coherence of review finding
- Adequacy of data supporting a review finding

Data extraction - Quality characteristics

- Design
 - Were measures repeated pre & post intervention?
 - Random assignment?
 - Groups thoroughly described?
 - Extent intervention occurred as planned i.e. fidelity
- Sample
 - Representativeness of target population?
 - N appropriate to determine effect?
 - Baseline differences between groups?
 - Response rates and dropouts reported, dropout analysis?
 - Valid and reliable measures?
- Analysis
 - Were appropriate methods used? How has missing data been dealt with?

Data extraction – Example QUANT quality checklist

Annex 2: Quality checklist quantitative evidence of intervention effectiveness

	Criteria	Yes	No	Can't tell
Evaluation design	Participants completed the same set of measures once shortly before participating in the intervention and once again immediately afterwards			
	Participants were randomly assigned to the treatment and control group through the use of methods appropriate for the circumstances and target population OR sufficiently rigorous quasi-experimental methods (regression discontinuity, propensity score matching) were used to generate an appropriately comparable sample through non-random methods.			
	Assignment to the treatment and comparison group was at the appropriate level (e.g., individual, family, school, community).			
	An 'intent-to-treat' design was used, meaning that all participants recruited to the intervention participated in the pre/post measurement, regardless of whether or how much of the intervention they received, even if they dropped out of the intervention (this does not include dropping out of the study- which may then be regarded as missing data).			
	The treatment and comparison conditions are thoroughly described.			
	The extent to which the intervention was delivered with fidelity is clear.			
	The comparison condition provides an appropriate counterfactual to the treatment group.			
Sample	The sample is representative of the intervention's target population in terms of age, demographics and level of need. The sample characteristics are clearly stated.			
	The sample is sufficiently large to test for the desired impact. A minimum of 20 participants have completed the measures at both time points within each study group (e.g., a minimum of 20 participants in pre/ post study not involving a comparison group or a minimum of 20 participants in the treatment group AND comparison group).			
	The study has clear processes for determining and reporting drop-out and dose.			
	A minimum of 35% of the participants completed pre/ post measures. Overall study attrition is not higher than 65%.			
	There is baseline equivalence between the treatment and comparison group participants on key demographic variables of interest to the study and baseline measures of outcomes (when feasible).			

Snape D, Meads C, Bagnall AM, et al. (2016) *What works wellbeing: A guide to our evidence review methods*. What Works Centre for Wellbeing, Centre University of East Anglia Norwich, UK. Available from: <https://whatworkswellbeingfileswordpresscom/2016/02/what-works-wellbeing-methods-guide-july-2016pdf>

See Checklist Annex 2, p.25/6

Data extraction – Example QUAL quality checklist

Annex 3: Quality checklist for qualitative studies (or qualitative components within mixed methods studies)

Drawing on the CASP approach, the following are the minimum criteria for inclusion of qualitative evidence in the review. If the answer to all of these questions is “yes”, the study can be included in the study in the review.

Study inclusion checklist (screening questions)			
	Yes	No	Can't tell
<p>1. Is a qualitative methodology appropriate?</p> <p><i>Consider:</i></p> <p>Does the research seek to interpret or illuminate the actions and/or subjective experiences of research participants?</p> <p>Is qualitative research the right methodology for addressing the research goal?</p>			
<p>2. Is the research design appropriate for addressing the aims of the research?</p> <p><i>Consider:</i></p> <p>Has the researcher justified the research design (e.g. have they discussed how they decided which method to use)?</p>			
<p>3. Is there a clear statement of findings?</p> <p><i>Consider:</i></p> <p>Are the findings made explicit?</p> <p>Is there adequate discussion of the evidence both for and against the researcher's arguments?</p> <p>Has the researcher discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)?</p> <p>Are the findings discussed in relation to the original research question?</p>			

Snape D, Meads C, Bagnall AM, et al. (2016) *What works wellbeing: A guide to our evidence review methods*. What Works Centre for Wellbeing, Centre University of East Anglia Norwich, UK. Available from: <https://whatworkswellbeingfileswordpresscom/2016/02/what-works-wellbeing-methods-guide-july-2016pdf>

See Checklist Annex 2, p.27/8

Synthesise your data

When you have your study and quality characteristics coded you can start synthesising your data!

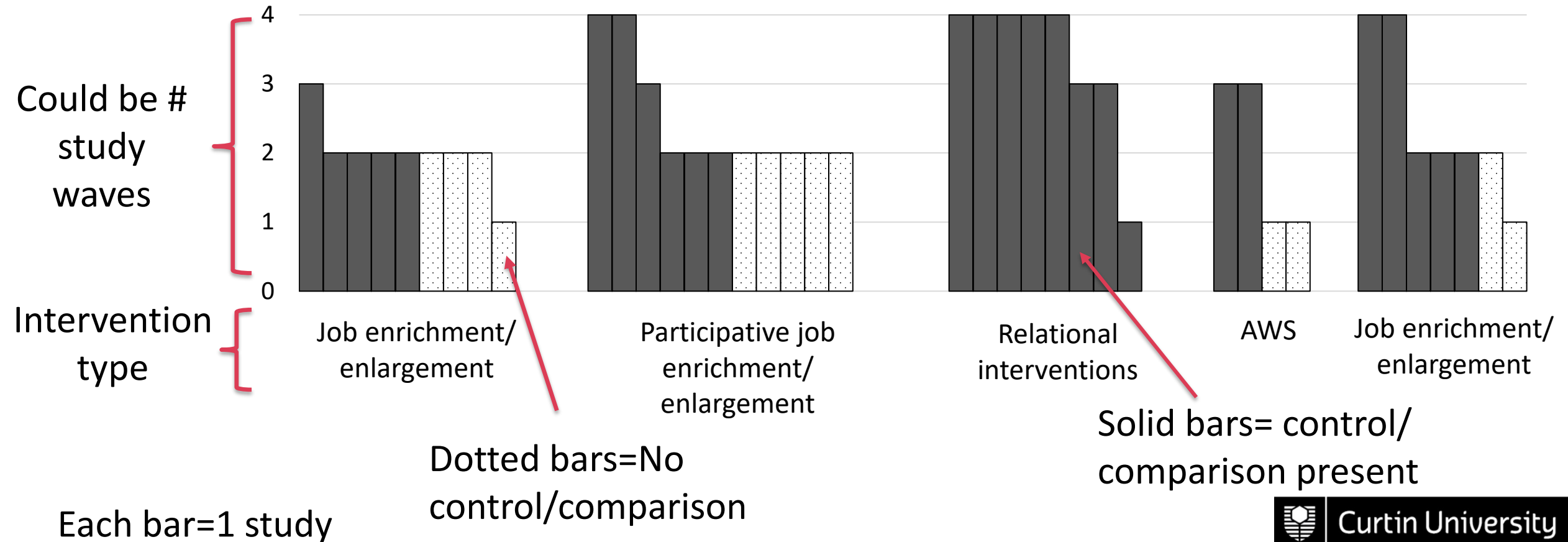
- Categorise and sort your data
- Look for themes and trends
- Create harvest plots
- Create evidence summary tables of your overall conclusions using the GRADE approach
- Grade the quality of each evidence statement

You don't **HAVE** to use the above approaches but they help make your methods explicit and replicable

Qualitative data synthesis – Harvest plots

Top-down WD interventions reporting a positive effect on performance (k=39)

Note: Bars and axes can represent whatever you want them to!



Example of an evidence summary table

Table 3: Summary of evidence statements and supporting evidence

No.	Evidence statement (performance)	Quality rating	Summary supporting statements
1	There is strong evidence that top-down, organisational-led work redesigns are effective for increasing performance, and the evidence is most consistent for participative and non-participative job enrichment and enlargement interventions, and relational interventions.	Promising	<ul style="list-style-type: none">• Vast majority of our studies demonstrated a positive effect (k=39; 71%)• 26 studies involved methodologically more rigorous designs (i.e. randomised or non-randomised but controlled), increasing confidence in the results• Sample sizes were adequate to large in most studies• A minority of studies demonstrated inconsistent effects on performance, downgrading our rating from 'strong' to 'promising'
2	There is promising evidence that perceptions of changes in work characteristics mediate between top-down work redesigns and performance	Promising	<ul style="list-style-type: none">• 22 studies measured and reported positive effects on work design and performance (52% of all studies which measured both work design and performance)• T15 involved methodologically more rigorous designs



Q & A

1. "What's the most efficient/least painful way of conducting one?"
2. "- different types (if they exist) - quality/breadth standards (formal or informal) at different journals; how to write about review findings in a concise and clear way (especially when the findings are complex/detailed!)"
3. "What is the difference between a meta analysis, systematic review, literature review, scoping review?"

4. “I would like to hear your thoughts on transparency and accountability in terms of setting the search criteria: How to be as thorough and all encompassing as possible, yet keeping the amount of work under control, while not allowing ourselves to tweak the criteria (too) easily just to make life easier when it suits us.”

5. “Where to find whether a systematic review has been done before or has been working on? How to register a systematic review?”

6. “In terms of numbers, what's considered a good range that is not too big or too small for reviewing?”

Thank you!

Please complete the feedback survey 😊



Resources

Systematic review guides / resources

- <https://training.cochrane.org/handbook/current> – for the medical sciences but very applicable and MA sections very useful
- <https://campbellcollaboration.org/> - for the social sciences
- Snape D, Meads C, Bagnall A. M. et al. (2016) *What works wellbeing: A guide to our evidence review methods*. What Works Centre for Wellbeing, Centre University of East Anglia Norwich, UK. Available from: <https://whatworkswellbeingfileswordpresscom/2016/02/what-works-wellbeing-methods-guide-july-2016pdf>
- Shamseer L, Moher D, Clarke M, et al. (2015) Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: Elaboration and explanation. *British Medical Journal* 349: g7647.
- <http://www.prisma-statement.org/>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32.

Generating evidence statements and quality assessment of the evidence

Quant:

- <https://training.cochrane.org/grade-approach>
- <https://www.gradeworkinggroup.org/>

Qual:

- <https://www.cerqual.org/>
- Example: <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001895>

Resources

Examples of systematic reviews using harvest plots

- Daniels, K., Gedikli, C., Watson, D., Semkina, A., & Vaughn, O. (2017). Job design, employment practices and well-being: A systematic review of intervention studies. *Ergonomics*, 60(9), 1177-1196. <https://doi.org/10.1080/00140139.2017.1303085>
- Knight, C., & Parker, S. K. (2019). How work redesign interventions affect performance: An evidence-based model from a systematic review. *Human Relations*, 74(1) 69=104. DOI: 10.1177/0018726719865604
- Ogilvie, D., D. Fayter, M. Petticrew, A. Sowden, S. Thomas, M. Whitehead, and G. Worthy. 2008. "The Harvest Plot: A Method for Synthesising Evidence about the Differential Effects of Interventions." *BMC Medical Research Methodology* 8. doi:10.1186/1471-2288-8-8.

Examples of other systematic reviews using other analysis approaches

- Carpini, J. A., Parker, S. K., & Griffin, M. A. (2017). A look back and a leap forward: A review and synthesis of the individual work performance literature. *Academy of Management Annals*, 11(2), 825-885. <https://doi.org/10.5465/annals.2015.0151>
- Knight, C., Patterson, M., & Dawson, J. (2017). Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *Journal of organizational behavior*, 38(6), 792-812. DOI: 10.1002/job.2167
- Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology*, 102(3), 403=420. <http://dx.doi.org/10.1037/apl0000106>