Introduction to Synthesis Reviews

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Agenda

• Why synthesis reviews?
• Types of synthesis reviews
• General steps in the synthesis review process
• *Systematic searching*
• Resources
Why do we need synthesis reviews?
Red Wine: Good or Bad?

Do wind turbines cause health problems?

The Benefits of the French Immersion Program

Just say ‘non’: The problem with French immersion

Learning Styles as a Myth
Synthesis ….  

“…the contextualization and integration of research findings of individual research studies within the larger body of knowledge on the topic. A synthesis must be reproducible and transparent in its methods, using quantitative and/or qualitative methods” (CIHR).
Systematic Review
Rapid Review
Realist Review
Meta-analysis
Scoping Review
Mixed Methods Review
Types of Synthesis Reviews


  • Table 1: Categories of Research Synthesis Methodology (pg. 176)
  • Additional File 1: Selected Types of Research Synthesis (pg. 198-215)
## Compare: Systematic Review & Literature Review

<table>
<thead>
<tr>
<th></th>
<th>Systematic Review</th>
<th>Literature Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
<td>Focused on a single question</td>
<td>Not necessarily focused on a single question but may describe an overview</td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>A peer review protocol or plan is included</td>
<td>No protocol is included</td>
</tr>
<tr>
<td><strong>Background</strong></td>
<td>Both provide summaries of the available literature on a topic</td>
<td></td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>Clear objectives are identified</td>
<td>Objectives may or may not be identified</td>
</tr>
<tr>
<td><strong>Inclusion &amp; exclusion criteria</strong></td>
<td>Criteria stated before review is conducted</td>
<td>Criteria not specified</td>
</tr>
<tr>
<td><strong>Search strategy</strong></td>
<td>Comprehensive search conducted in a systematic way</td>
<td>Strategy not explicitly stated</td>
</tr>
<tr>
<td><strong>Process of selecting articles</strong></td>
<td>Usually clear and explicit</td>
<td>Not described in a literature review</td>
</tr>
<tr>
<td><strong>Process of evaluating articles</strong></td>
<td>Comprehensive evaluation of study quality</td>
<td>Evaluation of study quality may or may not be included</td>
</tr>
<tr>
<td><strong>Results and data synthesis</strong></td>
<td>Clear summaries based on high quality evidence</td>
<td>Summary based on studies where the quality of articles may not be specified. May also be influenced by reviewer’s theories, needs and beliefs.</td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>Written by an expert or group of experts with a detailed and well-grounded knowledge of the issues.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Curtin University Library. [Systematic reviews: What is a systematic review](https://www.curtin.edu.au/library/research-methods/systematic-reviews-what-is-a-systematic-review). Table adapted from the [University of Newcastle Australia Library](https://www.newcastle.edu.au/library/research-methods/systematic-reviews-what-is-a-systematic-review).
Important considerations ....

Various factors will drive your decision on SR type, e.g.:
  • Research question
  • Purpose
  • Resources (time, personnel, etc.)

Regardless of the SR:
  • investigate the methodology;
  • plan, plan, plan;
  • understand which standards and guidelines you are to adhere to.
General Steps in a Synthesis Review
Research Question → Literature Search

Study Selection → Appraisal

Extract & Synthesize → Write up results
Steps in the Systematic Review Process

Figure 1: Existing methods for systematic reviews follow these steps with some variations (page 2).
(image removed due to copyright)

Systematic Searching
Research Question → Literature Search → Study Selection → Appraisal → Extract & Synthesize → Write up results
Planning your search

Formulating your research question ...

- Very important step
- Takes time
- Agreement amongst team members

- **Mnemonic tools** for formulating question and search concepts, e.g.:
  - PICO: Population, Intervention, Comparator, Outcomes
  - SPICE: Setting (*where* / *context*), Perspective (*for whom*), Intervention / Exposure / Interest (*what*), Comparison (*what else*), Evaluation (*how well or what result*)
  - SPIDER: Sample, Phenomenon of interest, Design, Evaluation, Research Type
Planning your search

Search for existing / similar synthesis reviews:

• Purpose: To ensure a similar review has not already been registered or completed.

• Tools: Cochrane Database of Systematic Reviews (includes Cochrane reviews and protocols), MedLine, PsycINFO, Google Scholar, etc.

• Tip: Review similar reviews, note search strategies, databases, searched, etc.
Planning your search

Brainstorm a general concept chart

• Identify key concepts, associated terminology, useful synonyms, etc.

• Use existing reviews to help build this chart

• Review with your research team / supervisor, etc.
Sample concept chart from a realist review

<table>
<thead>
<tr>
<th>Concept A: Bullying</th>
<th>Concept B: Workplace</th>
<th>Concept C: Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullying</td>
<td>Work</td>
<td>Intervention</td>
</tr>
<tr>
<td>Bully</td>
<td>Workplace</td>
<td>Interventions</td>
</tr>
<tr>
<td>Bullied</td>
<td>Worker</td>
<td>Intervene</td>
</tr>
<tr>
<td>Mobbing</td>
<td>Working</td>
<td>Program</td>
</tr>
<tr>
<td>Harassment</td>
<td>Organisation</td>
<td>Programs</td>
</tr>
<tr>
<td>Negative acts</td>
<td>Organisations</td>
<td>Programme</td>
</tr>
<tr>
<td>Negative behaviour</td>
<td>Organisational</td>
<td>Programmes</td>
</tr>
<tr>
<td>Negative behavior</td>
<td>Organization</td>
<td>Scheme</td>
</tr>
<tr>
<td>Abusive supervisor</td>
<td>Organizations</td>
<td>Schemes</td>
</tr>
<tr>
<td>Workplace violence</td>
<td>Occupational</td>
<td>Initiative</td>
</tr>
<tr>
<td>Horizontal violence</td>
<td>Employment</td>
<td>Initiatives</td>
</tr>
<tr>
<td>Lateral violence</td>
<td>Occupations</td>
<td>Participatory</td>
</tr>
<tr>
<td>Vertical violence</td>
<td>Employed</td>
<td>Interactive</td>
</tr>
<tr>
<td>Workplace conflict</td>
<td>Employee</td>
<td>bottom up</td>
</tr>
<tr>
<td>Dignity at work</td>
<td>Employees</td>
<td>cultural change</td>
</tr>
<tr>
<td>Violence</td>
<td>Staff</td>
<td>social learning</td>
</tr>
<tr>
<td>Hostile</td>
<td>Private sector</td>
<td>Communicative</td>
</tr>
<tr>
<td>Workplace bullying</td>
<td>Public sector</td>
<td>Theory</td>
</tr>
<tr>
<td>Bullying in the workplace</td>
<td>Industry</td>
<td>Theoretical</td>
</tr>
<tr>
<td>Aggression</td>
<td>Industrial</td>
<td>Evaluate</td>
</tr>
<tr>
<td>Aggressive</td>
<td>Company</td>
<td>Program evaluation</td>
</tr>
<tr>
<td>Abuse</td>
<td>companies</td>
<td>Programme evaluation</td>
</tr>
<tr>
<td>Abusive</td>
<td>Personnel</td>
<td>Program implementation</td>
</tr>
<tr>
<td>Intimidate</td>
<td>Colleague</td>
<td>Programme implementation</td>
</tr>
<tr>
<td>Intimidation</td>
<td>Manager</td>
<td>Evaluation research</td>
</tr>
<tr>
<td>Incivility</td>
<td>Management</td>
<td>Prevent</td>
</tr>
<tr>
<td>Mistreatment</td>
<td>Co-worker</td>
<td>Prevention</td>
</tr>
<tr>
<td></td>
<td>Organizational behavior</td>
<td>Strategy</td>
</tr>
<tr>
<td></td>
<td>Organizational behaviour</td>
<td>Strategies</td>
</tr>
<tr>
<td></td>
<td>Organizational culture</td>
<td>Policy</td>
</tr>
<tr>
<td></td>
<td>Organizational climate</td>
<td>Policies</td>
</tr>
<tr>
<td></td>
<td>Working conditions</td>
<td>Deter</td>
</tr>
<tr>
<td></td>
<td>Work environment</td>
<td>Deterrent</td>
</tr>
<tr>
<td></td>
<td>Human resources</td>
<td>Assess</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Appraisal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Educational program</td>
</tr>
</tbody>
</table>
Planning your search

Flip your concept chart into a search strategy, using:

• Truncation (*)

• """around phrases

• OR between similar concepts

• AND between unique concepts
### Sample search strategy

<table>
<thead>
<tr>
<th>Concept A: Bullying</th>
<th>Concept B: Workplace</th>
<th>Concept C: Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull* OR Mobbing OR Harass* OR “Negative acts” OR “Negative behaviour” OR “Abusive supervision” OR “Workplace violence” OR “Horizontal violence” OR “Lateral violence” OR “Vertical violence” OR “Workplace conflict” OR “Dignity at work” OR Violence OR Hostil* OR “Workplace bullying” OR “Bullying in the workplace” OR Aggress* OR Abus* OR Intimidat* OR Incivility OR Mistreatment</td>
<td>Work* OR Organisat* OR Occupation* OR Employ* OR Staff OR “Private sector” OR “Public sector” OR “Industry” OR Company OR Companies OR Personnel OR Colleague* OR Manager* OR Management OR Co-worker* OR Organisational behav* OR Organisational culture OR Organisational climate OR “Working conditions” OR “Work environment” OR Human resources</td>
<td>Interv* OR Program* OR Scheme* OR Initiative* OR Participatory OR Interactive OR “bottom up” OR “cultural change” OR “social learning” OR Communicative OR Theory OR Theoretical OR Evaluat* OR “Program evaluation” OR “Programme evaluation” OR “Programme implementation” OR “Evaluation research” OR Prevent* OR Strategy* OR Policy OR Policies OR Deter OR Deter* OR Assess* OR Appraisal OR Outcome* OR “Educational program”</td>
</tr>
</tbody>
</table>

**Search #1:** Bull* OR Mobbing OR Harass* OR “Negative acts” OR “Negative behaviour” OR “Abusive supervision” OR “Workplace violence” OR “Horizontal violence” OR “Lateral violence” OR “Vertical violence” OR “Workplace conflict” OR “Dignity at work” OR Violence OR Hostil* OR “Workplace bullying” OR “Bullying in the workplace” OR Agress* OR Abus* OR Intimidat* OR Incivility OR Mistreatment

**Search #2:** Work* OR Organisat* OR Occupation* OR Employ* OR Staff OR “Private sector” OR “Public sector” OR “Industry” OR Company OR Companies OR Personnel OR Colleague* OR Manager* OR Management OR Co-worker* OR Organisational behav* OR Organisational culture OR Organisational climate OR “Working conditions” OR “Work environment” OR Human resources

**Search #3:** Interv* OR Program* OR Scheme* OR Initiative* OR Participatory OR Interactive OR “bottom up” OR “cultural change” OR “social learning” OR Communicative OR Theory OR Theoretical OR Evaluat* OR “Program evaluation” OR “Programme evaluation” OR “Programme implementation” OR “Evaluation research” OR Prevent* OR Strategy* OR Policy OR Policies OR Deter OR Deter* OR Assess* OR Appraisal OR Outcome* OR “Educational program”

**Search #4:** #1 AND #2 AND #3
Pilot your search

Select a core database and test your search strategy.

Review the results of the search and reflect on the results. Some critical questions to ask include:

• are the results applicable?
• are key studies, authors, and journals being retrieved?
• are extraneous or non-relevant concepts appearing in the results? If so, can these concepts be isolated by index terms in order to remove the appropriate wording from the search strategy?
• is there an insurmountable number of references being retrieved? Can the search be more focused or further narrowed?
• alternatively, are there too few results and can the search be broadened?
• Consult a subject matter expert for feedback. One approach is to ask the expert for a set of articles (ex: 10 articles) published in variety of different journals. Review your search results and ensure these articles have been retrieved. If not, why not?
Pilot your search

Validate the search: Peer Review of Electronic Searches Strategies (PRESS) is a checklist approach to evaluating the integrity of the searching process in a synthesis review.


Revise your search strategy based on your pilot search.
Planning your search

Where are you going to search?

- Depends on your review type and research question
- Consult with a librarian to discuss which databases are most appropriate
Running your searches

Once you are satisfied with your core search strategy:

Customize / translate your core concept chart to where you are searching. Develop a concept chart for each database.
  * Depending on the database, use a combination of keywords / natural language and controlled vocabulary / subject headings > explore the thesaurus
  * Example (see Additional File 1)

Run your search and save the search.

Export citations to a predetermine citation management software.
  * Some databases have character limits in the search boxes as well as limits to the number of citations you can export at one time. ‘Chunk’ search and export as needed.

Document the process.
Running your searches

Document, Document, Document:

• Create a document for each search and include the following information: database name, date of search, database coverage dates, database interface, number of references retrieved and exported, complete search strategy, username and password of saved search, any additional information.
• Document decisions made along the way (why did we decide to exclude search topic x).
• **Transparency and reproducibility**
• Need this information for publications (Methods section, Study flow diagram, Appendix / Additional Files)

Citation management software:

• Determine which citation manager your team will be using before you start the project.
Searching beyond databases ....

Grey literature searching

• Clinical trial registries
• Dissertations / theses
• Government information
• Policy statements
• Technical reports
• Conference proceedings

Citation tracking

• Search "backwards" by reviewing the bibliographies of relevant articles to spot studies that may have been missed in your search
• Search "forwards" by finding citations to relevant articles in Google Scholar, Web of Science, and Scopus.
Steps in the Systematic Review Process

Figure 1: *Existing methods for systematic reviews follow these steps with some variations* (page 2).
(image removed due to copyright)

Resources

U of S, Lit Reviews in the Health Sciences: http://libguides.usask.ca/reviews

CIHR, Synthesis Resources: http://www.cihr-irsc.gc.ca/e/36331.html

Univ of Ottawa Library, Systematic Reviews: http://uottawa.libguides.com/systematicreview/home
Upcoming webinar series: *Raising the evidence bar: Scientific literature & literature synthesis*

January 30: Supporting the use of synthesized research evidence in health policymaking

February 6: Living systematic reviews

February 13: High jump or decathlon? Working out the appropriate review type for your research project

February 20: Literature searches: Success factors for first time reviewers

February 27: Health Evidence™: Helping public health use best evidence in practice

To register > [http://scpors.ca/evidence/](http://scpors.ca/evidence/)