



Conducting a Systematic Literature Review

Eduardo Figueiredo

<http://www.dcc.ufmg.br/~figueiredo>

[Conducting the Review]

- Conducting a SLR means putting the review protocol into practice
- It includes
 1. Identification of research
 2. Selection of primary studies
 3. Study quality assessment
 4. Data extraction
 5. Data synthesis

[1 - Identification Research]

- It requires specifying a search string and (automatic) applying it to databases
- It may include manual search
 - Manual search can be performed in websites of authors or local events
 - Search for primary studies based on references to and from other studies (snowballing)

[Tuning the Search]

- The search strategy must consider a trade-off between
 - Find all relevant primary studies
 - Not get overwhelmed by false positives
- You should avoid too many false positives and duplicates
 - Remove duplicates and grey literature
- You get a sample of the population

[2 - Selection of Primary Studies]

- Define inclusion and exclusion criteria
 - Criteria should be defined before the search to avoid bias
 - But, they may be adjusted
- To apply the criteria, it is often sufficient to read title and abstract
 - For others, you may read the introduction or methodology

[Judgement of Primary Studies]

- At least two researchers should assess each paper
 - Check for agreement
 - Discuss paper with conflicting views
- You may want to report a measure of agreement (e.g., Cohen Kappa)

[3 - Study Quality Assessment]

- Published studies may report contradictory results
 - It is important to analyze the causes of contradictions
- Quality assessment may lead to some primary studies being excluded (grey literature)
 - Peer review is usually required to assess the quality of studies

Checklist for Quality Assessment

- The most common way of quality assessment is by using a checklist
 - Are experimental procedures clear?
 - Are results sound and consistent?
 - Does the paper compare its results with related literature? etc.
- At least three reviewers are needed to make a valid checklist

[4 - Data Extraction]

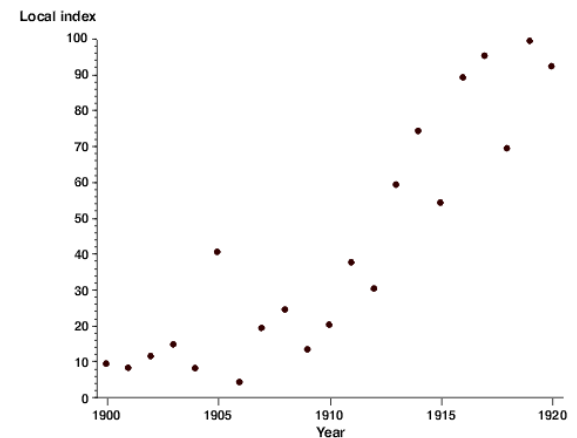
- Once the list of primary studies is decided, data can be extracted
 - A form is often used to organize data
- Data extraction is based on the research questions
- Qualitative descriptions are common
 - It also include analytical synthesis (numerical values), such as number of papers, date, publication venue, etc.

Duplicated Publications

- If a primary study is published in more than one paper (e.g., conf and journal)
 - The longer (usually journal) and more complete description is preferred
 - But, both papers could be used for data extraction
- Supporting technical reports and websites may also serve as data sources

5 - Data Synthesis

- Statistic methods and tools should be used to present the extracted data
- Narrative synthesis tabulates data to answer the research questions
- Scatter plots and box plots can be used to visualize the results



Examples of Synthesis Methods

- Thematic Analysis
 - It aims at identifying, analysing and reporting patterns or themes
- Narrative Synthesis
 - It tells “a story” from evidences of primary studies
- Comparative Analysis
 - It aims to explain relations between primary studies



[Bibliography]

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
 - Section 4.2. Conducting the Review