Practical Strategies and Guidelines for Conducting Literature Reviews in Research

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Overview

• Background: Purposes and Types of Literature Reviews
• Cooper’s Step-by-Step Process for Research Synthesis
• Practical Strategies for Each Step*
• Concluding Comments

*Emphasis will be on ways to efficiently and effectively carry out literature reviews when the review is not an end in itself (e.g., meta-analysis), but rather is designed to inform primary research (e.g., grant proposal, study design and write-up)
Background

• Purposes of Literature Reviews
  – Advance knowledge base in a given area through systematic synthesis of existing findings
  • Can reveal findings not evident from separate consideration of individual studies. Why?
    – ↑ statistical power via accumulation of samples across studies
    – see influence of factors (methods, intervention, etc.) that may seldom if ever vary within a study
Background (cont’d)

– Inform practice guidelines (e.g., U.S. Preventive Services Task Force) and policy/funding decisions
– Identify limitations and gaps in research literature (e.g., lack of random assignment evaluations of an intervention)
– Inform conduct of primary studies
  • Development of questions/hypotheses and methodology
  • Discussion/interpretation of results
Background (cont’d)

- Major Types of Literature Reviews
  - Systematic
    - Explicitly defined, objective and transparent approach (e.g., study eligibility criteria) to facilitate critique and, if desired, replication
    - Even for purposes where literature review is not an end in itself being “systematic” is highly desirable
  - Specific types of reviews
    - Meta-analysis (quantitative synthesis of findings)
    - Narrative (qualitative synthesis of findings)
    - Others (e.g., meta-synthesis [qualitative research], theoretical [non-empirical literature], reviews of reviews!)
Background (cont’d)

- Limitations and Controversy
  - “Apples and oranges” problem (study differences too great to permit informative synthesis)
  - “Garbage in / garbage out” problem (lack of good input)
  - Sloppy thinking problem (inferring too much)
  - Selected ways of minimizing problems
    - Avoid overly broad review topics
    - Take study quality into account
    - Triangulate across review approaches
    - View review findings as hypotheses to be tested under more controlled conditions
Cooper’s Step-by-Step Approach

- 7 Steps as detailed on subsequent slides
- The steps parallel / have analogues to those involved in conducting primary research (e.g., instead of gathering information from persons/organizations, focus is on extracting info from studies as “subjects”)
Step 1: Formulate the Problem

- Key Question to Answer: *What is the question or topic of interest?*
- Importance:
  - *Focuses review efforts (which can be time-intensive) for greater efficiency*
  - *Helps avoid missed sub-questions/sub-topics of interest*
  - *Helpful for later reporting of review findings*
Step 1: Formulate the Problem (cont’d)

• Tips
  – Define key constructs/variables of interest as clearly as possible
  – What relations among constructs/variables are of interest?
    • Consider sketching out a conceptual path model to help with this
  – Balance breadth and depth/specificity
Step 1: Formulate the Problem (cont’d)

• Examples
  – **Poor**: Is youth mentoring effective?
  – **Better**: Are youth mentoring *programs* effective for promoting *social, emotional, behavioral, and academic* outcomes for *school-age* youth? *What characteristics of programs, youth, and/or mentors predict differences in effectiveness?*

*Using definition from DuBois et al. (2011)*
Step 2: Searching the Literature

- Key Questions to Answer: *What are the characteristics of studies that would be relevant to question or topic of interest? What studies of this type exist?*

- Importance:
  - *Inclusion criteria help focus the literature search and add methodological rigor/transparency*
  - *A well-conducted search for studies will reduce the risk of missing key research and also allow review’s conclusions to be viewed as more credible*
Step 2: Searching the Literature (cont’d)

• Tips
  – Develop inclusion criteria that address both substantive fit and methodological quality of studies
  – Use multiple search strategies that have potential to be complementary in studies identified. Cooper recommends at a minimum:
    • Reference data bases (e.g. PubMed, Google Scholar)
    • Perusal of relevant journals
    • Examination of references in retrieved studies
    • Personal contacts with active researchers in the area
Step 2: Searching the Literature (cont’d)

- Pay particular attention to existing reviews that search may locate
- Take note of literature that does not meet inclusion criteria but may be of interest for other reasons
- For reference databases, develop well-defined search strategies
  - Include synonyms of key terms
  - Search relevant record fields (title, abstract) not only database-assigned keywords
  - Screen titles and abstracts for relevance before reviewing full articles
  - Strive for balance in terms of protecting against missed studies vs. inefficiency of needing to review too many search results
Step 2: Searching the Literature (cont’d)

- Examples
  - Poor:
    - Any empirical evaluations of youth mentoring programs
    - Search PsycINFO ("youth mentoring" and "programs" and "evaluations")
Step 2: Searching the Literature (cont’d)

- **Better:**
  - Quasi-experimental or experimental evaluations of youth mentoring programs
  - Search multiple reference data bases using synonymous search terms
    - \((mentor^* \text{ or } budd^* \text{ or } big \text{ brother}^* \text{ or } big \text{ sister}^* \text{ or } role \text{ model}^* \text{ or } mentee^* \text{ or } protégé^* \text{ or } lay^* \text{ or } coach^* \text{ or } leader^* \text{ or } apprentice^*)
    - \(\text{AND} \ (intervention^* \text{ or } program^* \text{ or } evaluation^*)\)
    - \(\text{AND} \ (ME=(Empirical \text{ Study or Literature Review})\)
    - \(\text{AND} \ (youth \text{ or } child^* \text{ or } adolescent^* \text{ or } young \text{ or } student^* \text{ or } teen^*)\)
  - Also post query to youth mentoring listserv, review references of retrieved studies, peruse last 5 years of *Mentoring & Tutoring*
Steps 3 & 4: Gathering Information from Studies / Evaluating Study Quality

• Key Question to Answer: What information, including indicators of methodological quality, should be taken note of for each study?

• Importance:
  – Focuses study review efforts (which can be time-intensive) for greater efficiency
  – Helps avoid needing to go back over studies multiple times, further increasing efficiency
  – Provides organizational framework for later synthesis and reporting of review findings
Steps 3 & 4: Gathering Information from Studies and Evaluating Study Quality (cont’d)

- **Tips**
  - Record both substantive and methodological information about studies
  - Focus on information directly relevant to review question/topic
  - For more in-depth reviews, consider coding study quality using a formal system, such as the DIAD (see Valentine & Cooper, 2008)
  - Focus on study findings, distinct from author conclusions!
  - Code information about effect size, not only statistical significance
  - Utilize a structured coding form to record information, which includes operational definitions of key variables coded as well as spaces for notes
Steps 3 & 4: Gathering Information from Studies / Evaluating Study Quality (cont’d)

• Examples
  – **Poor**:
    • Take free-form notes regarding study characteristics that seem important and all study findings
    • Distinguish only between significant and non-significant results
Steps 3 & 4: Gathering Information from Studies / Evaluating Study Quality (cont’d)

- **Better:**
  - Focus on coding those findings that address effectiveness of youth mentoring intervention being evaluated
  - Code characteristics of the youth mentoring programs evaluated that theory/research suggest may influence effectiveness
  - Code info on study design, sample size and participant characteristics, measures, and analytic approach, noting threats to both internal and external validity
  - Use a structured coding guide to record info (see example)
Steps 5 & 6: Analyzing & Integrating Study Findings / Interpreting the Evidence

- Key Question to Answer: *What are the most salient trends or other noteworthy aspects of study findings?*
- Importance:
  - *Facilitates comparison and contrast of findings across studies*
  - *Facilitates efficient summarization of review findings at point of write-up*
Steps 5 & 6: Analyzing & Integrating Study Findings / Interpreting the Evidence (cont’d)

• Tips
  – Compile a tabular summary of key study features and findings (see example)
  – Identify trends in findings across studies
    • Avoid simple “vote count” approach (# of significant and non-significant findings as these can be very misleading)
    • If possible, consider combining effect sizes (see Cooper, 2010) or at least giving greater weight informally to larger sample studies all else being equal
    • Give greater weight to studies that are more “on point” and of higher methodological quality (“best evidence” approach)
  – Look for disconfirming evidence
Steps 5 & 6: Analyzing & Integrating Study Findings / Interpreting the Evidence (cont’d)

• Examples
  – Poor:
    • Tally up # of studies reporting evidence of statistically significant impacts of the youth mentoring program on one or more youth outcomes
Steps 5 & 6: Analyzing & Integrating Study Findings / Interpreting the Evidence (cont’d)

- Better:
  - Prepare informative table of study characteristics and findings
  - Tally up #s of youth mentoring evaluations reporting small, medium, and large effects on different categories of outcomes
  - Further divide tallies by methodological (e.g., randomized control vs. quasi-experimental, sample size) and substantive (e.g., provision of training to mentors) factors to identify possible influences on (“moderators”) findings
  - Flag studies that are particularly “on point” and of highest quality (e.g., multi-site randomized trial of Big Brothers Big Sisters program with multiple sources of data on outcomes)
Steps 7: Presenting the Results

• Key Question to Answer: What are substantive conclusions that are supported by available research? What hypotheses or interesting questions have not been adequately tested (but ideally are hinted at by available evidence)?

• Importance:
  – Facilitates effective communication of review findings to different audiences (e.g., journal or grant reviewers)
  – Provides direction for next steps in research on the topic (including your own)
Steps 7: Presenting the Results (cont’d)

• **Tips**
  - Highlight key conclusions (italics, headers, etc.), with attention to magnitude not only the presence of different relationships of interest
  - Share tabular summary of individual studies and their findings if space permits
  - Discuss the relative strength of evidence supporting different conclusions
  - Position findings in context of research on related topics (see example)
  - Distinguish evidence that comes directly from primary studies and conclusions that are synthesis-generated
  - Highlight limitations in available evidence (disconfirming findings, non-experimental manipulation of key variables, sample characteristics, etc.) and associated directions for future research
Steps 7: Presenting the Results (cont’d)

• Examples
  – Poor:
    • General conclusion that youth mentoring programs “work”
    • Lack of consideration of limitations of primary studies reviewed or of the review itself (e.g., search strategy)
    • No indication of how findings compare to those in related areas (e.g., after-school programs, tutoring)
Steps 7: Presenting the Results (cont’d)

– Better (see “Summary” in DuBois et al., 2011):
  • Conclusion that youth mentoring programs as a whole have been effective in promoting social, emotional, academic, and behavioral outcomes
  • Magnitude of effects broadly comparable to those found for other community-based youth programs
  • Key limitations include lack of evidence of effects on several policy-relevant outcomes (e.g., obesity) and lack of long-term follow-up studies
  • Need research addressing these limitations as well as studies of cost-benefit and comparative effectiveness of different program models and practices
Concluding Comments

• Conducting and effectively presenting a sound literature review within the context of designing and conducting primary research studies is essential to the scientific enterprise of cumulative knowledge building.

• An effective review will increase likelihood of funding, generate new ideas and directions for investigation, and improve the quality (and likelihood) of peer-reviewed publication of primary research.
Concluding Comments

• Standards for literature reviews, even when they are not the end in themselves, are advancing and it is important to keep ahead of the curve.

• Aside from immediate dividends, time invested in conducting systemic literature reviews for primary research can be leveraged to conduct “stand alone” research syntheses on the same or related topics.
References