Registration of Integrative review of conceptions and facilitators of and barriers to reproducibility of qualitative research

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Metadata

Title: Integrative review of conceptions and facilitators of and barriers to reproducibility of qualitative research

Description

This integrative review takes a targeted approach to reviewing the conceptual framing and definitions of reproducibility with regard to qualitative research, and reviews key facilitators of it, including Open Science practices, and barriers to it. A further aim is to illuminate, based on the results of the study, the relevancy and feasibility of reproducibility to diverse types of qualitative research. An integrative review method, as described by Whittemore and Knafl (2005), Toronto and Remington (2020), and Torraco (2016) is selected for this study because we aim to include both conceptual/theoretical literature and empirical research, and this type of review method accounts for such a duality of literatures. This review will be conducted in a targeted and systematic fashion – with focused search terms limited to title and keywords (where possible) – because it is being carried out as a complement to a much larger, broader reaching systematic scoping review of interventions to support reproducibility and replicability of research conducted simultaneously and collaboratively by the TIER2 and OSIRIS projects (funded by Horizon Europe). This review is limited to English-language publications and includes peer-reviewed as well as grey literature.

Review Methods

Type of review

The proposed review is an integrative review. It has been designed in keeping with the guidance for integrative reviews developed by Whittemore and Knafl (2005) and elaborated by Torraco (2016) and Toronto and Remington (2020). An integrative review is ideal for these purposes because reproducibility and replicability of qualitative research is an emerging topic with a growing body of literature surrounding it that is not uniform in stance nor conclusions. As Torraco observes, conducting an integrative review can lead to "an initial or preliminary conceptualization of the topic rather than a reconceptualization of existing models."

Review stages

As described by Toronto and Remington (2020), this integrative review will be conducted in six stages (developed from Cooper's five-stage integrative review process):

1. Formulation of purpose and questions
2. Systematic search and selection of literature
3. Critical appraisal
4. Analysis and synthesis
5. Discussion and conclusion
6. Dissemination

Stage 1 was carried out during the course of writing this research protocol and is articulated above and below. Stage 2 will be carried out via search in selected published and grey literature databases and online search engines, as well as "snowball" searching and is elaborated in the Search Strategy section of this protocol, and the selection process will be carried out in a pre-defined systematic fashion, as elaborated in the Screening section of this document. Stage 3, critical appraisal of the quality of the literature, will be conducted simultaneously with Stage 4. During these stages data from included literature will be extracted using pre-defined questions, categories and criteria, and the quality of each source appraised, as elaborated in the Extraction section of this protocol. Then, extracted data will be analyzed and synthesized to identify themes, patterns and discrepancies in the data (see Synthesis and Quality Assessment). Next, a discussion of the findings will be formulated and conclusions from them drawn (Stage 5) before a paper reporting on this research is shared as a pre-print and submitted to journal for review and publication (Stage 6).

Current review stage

At time of registration, this review has completed its first stage, formulation of purpose, research questions, and methodological approach, and stage 2 is underway, with the search having been conducted and citations downloaded.

Start date

This review began with Stage 1 in April 2023. Stage 2 began on 13 July 2023.

End date

The review is expected to conclude with formal reporting in a project deliverable by the end of December 2023 and in a published, peer-reviewed journal article in 2024 (pre-print and paper submission in early December 2023).

Background

Reproducibility is considered by many to be a core principle of science (Gundersen 2021), yet what it means, exactly, varies across and even within research disciplines and areas, often overlapping or conflated with the concept of replicability. The terms 'reproducibility' and 'replicability' are often used in conflicting ways, often depending on the extent to which the same or different data and/or methods are applied. For example, sometimes reproducibility refers only to reaching the same results with the same data and analysis, with replication referring to redoing experiments. But other times reproducibility is used more broadly, with replicability the narrower term (Fidler and Wilcox 2021).

Unless otherwise stated, we use “reproducibility” in a broad sense, of reaching similar results when repeating research studies or elements thereof.

In response to what is viewed as a “reproducibility crisis” within some fields, many consider Open Science to offer solutions by fostering transparency of the research process. There has been, therefore, a normative shift towards evaluation, assessment, and reward in accordance with a demand for reproducibility (though open practices) from researchers by funders, institutes, and publishers (see, e.g., Bissell 2013; Guttinger 2020; Penders, Holbrook, and de Rijcke 2019). Effectively, such a shift changes who gets access to resources that are necessary to conduct certain kinds of research and who is excluded from conducting research. However, research is not one unified entity, but there is a diverse landscape of different kinds of research relying on varying kinds of quality criteria with diverging epistemological and ontological positions, as well as purposes for which the research is conducted. The constellation of these factors affects not only what kind of reproducibility might be relevant, but also whether there is even any relevant place for it at all. Furthermore, no research exists in a vacuum, but each specific study or investigation is situated in some context whether that is political, social, institutional, technological, or financial. This situatedness is of crucial importance because it influences the feasibility of forms of research. Hence, it is not just about whether reproducibility is relevant for a study, but it is also imperative to consider to what degree the implementation of reproducibility depend on, for instance, social, technological and financial local circumstances (Guttinger 2020; Leonelli 2022).

In response to both the perception of a “reproducibility crisis” and recognition that responses to it may foster epistemic injustices, TIER2, a Horizon Europe funded project, aims to “contribute to increasing the re-use and overall quality of research results” while centering epistemic diversity to ensure that definitions of reproducibility (and replicability) and expectations for them reflect the diversity of academic disciplines, research fields, and research practices that constitute scientific research.

We begin this work by developing a conceptual framework for reproducibility across contexts (Task 3.1), which has already highlighted the tensions between quantitatively driven definitions of and expectations for reproducibility and the values, norms, ethics and practices of qualitative research. Building on this, as part of broader work to construct an evidence-base and inventory of reproducibility tools and practices (Task 3.2), we focus in this integrative review on reproducibility as it relates to qualitative research.

Importantly, even qualitative research is not one unified entity, but rather a loose constellation of diverse approaches (Pownall 2022; Pratt, Kaplan, and Whittington 2020) that include established social science methods like ethnography, interviews, focus groups, discourse and content analysis, and case studies, as well as methodological approaches common to humanities including archival and comparative research, among others. Numerous scholars argue that the call for higher appreciation and application of replication and reproducibility stem from and are based on quantitative (post)positivist approaches to research. Applying foreign research quality criteria and practices to communities and approaches has the potential of harming them by pushing more appropriate and already established practices and criteria out as well as putting a burden on them and/or even practically preventing them from conducting their research, due to ethical, practical and epistemic dependencies of qualitative approaches (see e.g., Bazzoli 2022; Bennett 2021). Therefore, prior to a widespread adoption of such practices, we must better understand how ‘reproducibility’ relates to qualitative research approaches and whether they are appropriate and applicable to prevent epistemic injustices (Penders et al. 2019).

There have already been some small reviews uncovering some of the facilitators and barriers to Open Science and kinds of reproducibility and replication in qualitative approaches. Some have attempted to identify or define reproducibility in ways relevant to and feasible for qualitative research (see e.g., Talkad Sukumar et al. 2020; Tuval-Mashiach 2021). Others have conducted investigations into researchers' perceived applicability of reproducibility to qualitative approaches (Reischer and Cowan 2020). However, this literature appears quite scattered and somewhat underappreciated by reform movements. Accordingly, in this study we aim to systematically review the literature to identify, evaluate and synthesize conceptualizations of reproducibility in qualitative research, as well as identify barriers to and enablers of it within this set of research practices. We further aim to provide insight into the relevancy and feasibility of reproducibility, and Open Science practices that support and enable it, in diverse qualitative research approaches.

Primary research question(s)

RQ1: How is reproducibility conceptualized and discussed in relation to qualitative research?

RQ2: Which factors and practices enable, and which undermine, the potential reproducibility of qualitative research?

Expectations / hypotheses

In relation to RQ1, we expect, based on familiarity with recent relevant published literature, that reproducibility will not be conceptualized as universally relevant to qualitative research, and that it will be conceptualized and discussed primarily as inappropriately applied to qualitative research, but also relevant and appropriate, at least to some degree, for some qualitative methods and types of data. We further expect that related values, including transparency and accountability, will be discussed in relation to reproducibility, and that these will be given more prominence and importance within the literature.

In relation to RQ2, we expect that selected Open Science practices, like open data, open methods, pre-registration, and pre-printing will be identified and discussed as enabling practices of transparency, accountability and reproducibility. We further expect that social and cultural factors, including the research culture of a field or discipline, the availability and quality of training and support services, research infrastructures, ethical issues, research collaborations, the quality of supervision and mentorship, and perceptions of and biases against qualitative research will emerge as factors that either enable or inhibit the use of open practices in and the reproducibility of qualitative research.

Software

- ASySD citation deduplication tool: for de-duplicating citations prior to screening
- SyRF (Systematic Review Facility): online platform for screening and data extraction
- Zotero: bibliographic software tool used to collect available full-texts for included sources, and used to export PDFs to SyRF for full-text screening and data extraction
- openalexR package, using dedicated function for snowball searches (*oa_snowball*)
- NVivo qualitative data analysis software (or something comparable): for coding and analyzing extracted data

Funding

TIER2 receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101094817. Funds provided to the QualiFAIR hub by University of Oslo, (hub-node funds for IT in research (2021-23, with extension until 2024)) also support this project.

Conflicts of interest

There are no known conflicts of interest.

Overlapping authorships

We do not expect any overlapping authorships, given the focus of the review and the publishing history of the team, however, should this occur, a reviewer who encounters their own paper within the review process will be able to skip it in the SyRF system, so that a different reviewer, unaffiliated with the paper, will be able to review it.

Search strategy

Databases

Databases used will include Scopus, Web of Science (Core Collection), Dimensions, PubMed, APA PsychInfo and JSTOR.

Interfaces

The interfaces used will include those listed as databases.

Grey literature

The search for grey literature will be carried out in the databases listed above (to search for pre-prints), as well as in the following:

- CORDIS
- EU Publications Office https://op.europa.eu/en/home
- Science Europe
- EUA
- National Academy of Sciences
- JISC
- Centre for Open Science
- OSF Preprint Archive
- Open Research Funders Group
- UKRI
- UNESCO
- Google

Inclusion and exclusion criteria

Inclusion criteria for this study are defined by the research questions, and facilitate a search focused on literature that discusses the intersection of reproducibility with qualitative research/methods. We include the concept of “mixed methods” to capture literature that bridges qualitative and quantitative methods. Additionally, we include literature that addresses transparency and accountability in relation to qualitative research/methods, as these terms appear to be conceptually linked to discussions of

reproducibility of qualitative research, and we suspect that some relevant literature may focus on these concepts rather than reproducibility, specifically.

To capture discussions and evidence of the use of Open Science practices to support reproducibility of qualitative research, we focus our search on those practices that are known to be in use and/or possible for qualitative research, including Open Science generally, open data, open methods, and pre-registration. We do not include in our search Open Science practices that are not known to be relevant to fostering the reproducibility of qualitative research, namely open code/software/tools, open evaluation, and Open Access publishing.

We limit our search to English-language texts due to the language capacities of our research team and impose no fixed time span on the publication date of literature included.

Query strings

Scopus: ABS ((("reproducib*" OR "replica*" OR "open data" OR "data sharing" OR "data availability" OR "open science" OR "openness" OR "accountab*" OR "preregistration" OR "pre-registration" OR "transparen*") AND ("qualitative research" OR "qualitative methods" OR "mixed methods"))) AND (LIMIT-TO (LANGUAGE , "English"))

Web of Science Core Collection: (TI=((("reproducib*" OR "replica*" OR "open data" OR “data sharing” OR “data availability” OR "open science" OR "accountab*" OR "preregistration" OR "pre-registration" OR "transparen*") AND ("qualitative research" OR "qualitative methods" OR "mixed methods"))) OR AK=((("reproducib*" OR "replica*" OR "open data" OR “data sharing” OR “data availability” OR "open science" OR "accountab*" OR "preregistration" OR "pre-registration" OR "transparen*") AND ("qualitative research" OR "qualitative methods" OR "mixed methods")))) AND (LA==("ENGLISH"))

Dimensions: *(("reproducib*" OR "replica*" OR "open data"* OR “data sharing” OR “data availability” *OR "open science" OR “openness” OR "accountab*" OR "preregistration" OR "pre-registration" OR "transparen*") AND ("qualitative research" OR "qualitative methods" OR "mixed methods")), Article*

JSTOR1: (((((((ti:"reproducib*") OR (ti:"replica*")) OR (ti:""open data"")) OR (ti:""data sharing"")) OR (ti:""open science"")) OR (ti:"openness")) AND (ti:"qualitative"))

JSTOR2: (((((((ti:"reproducib*") OR (ti:"replica*")) OR (ti:""open data"")) OR (ti:""data sharing"")) OR (ti:""open science"")) OR (ti:"openness")) AND (ti:"mixed methods"))

JSTOR3: ((((((ti:""data availability"") OR (ti:"accountab*")) OR (ti:"preregistration")) OR (ti:"pre-registration")) OR (ti:"transparen*")) AND (ti:"qualitative"))

JSTOR4: ((((((ti:""data availability"") OR (ti:"accountab*")) OR (ti:"preregistration")) OR (ti:"pre-registration")) OR (ti:"transparen*")) AND (ti:"mixed methods"))

PubMed: (("reproducib*"[Title/Abstract] OR "replica*"[Title/Abstract] OR "open data"[Title/Abstract] OR "data sharing"[Title/Abstract] OR "data availability"[Title/Abstract] OR "open science"[Title/Abstract] OR "openness"[Title/Abstract] OR "accountab*"[Title/Abstract] OR "preregistration"[Title/Abstract] OR "pre-registration"[Title/Abstract] OR "transparen*"[Title/Abstract]) AND "english"[Language] AND (("qualitative research"[Title/Abstract] OR "qualitative methods"[Title/Abstract] OR "mixed methods"[Title/Abstract]) AND "english"[Language])) AND (english[Filter])

APA PsycInfo (step-wise search):

1. ("reproducib*" or "replica*" or "open data" or "data sharing" or "data availability" or "open science" or "openness" or "accountab*" or "preregistration" or "pre-registration" or "transparen*").id,ti.

2. ("qualitative research" or "qualitative methods" or "mixed methods").id,ti.

3. 1 and 2

Search validation procedure

We conducted a search validation procedure prior to starting stage 2 of this review. We piloted our search in Scopus to check whether known key papers were present within the search results. We also tested and developed each database search string to ensure maximal inclusion of relevant results and minimal inclusion of irrelevant ones, adjusting the search string as required.

Other search strategies

Both ascendancy and descendancy approaches will be deployed on all literature that passes through to the full-text screening phase. Specifically, we will query the OpenAlex API with the DOIs from articles that were included in the full-text screening phase to find all articles citing included sources, as well as all articles referenced by the included sources. This means that sources without a DOI will not be included for further searches. We will use the openalexR package (Aria and Lee 2023) to conduct this search. The package provides a dedicated function for snowball searches (*oa_snowball*).

After retrieving all cited and citing articles, we will compute two indices: (1) the number of included sources that cite an article retrieved by ascendancy and descendancy search, and (2) the number of references made to included sources by an article retrieved by ascendancy and descendancy search. Using both indices to identify articles that are highly connected to the included sources, we will select a subset of the newly retrieved articles for screening of titles and abstracts.

Search expiration and repetition

Given that this topic is receiving increasing attention in the literature at the moment, we will repeat the search to include any new results (both peer-reviewed and grey-literature) in the middle of year 2025, prior to the end of the TIER2 project at the close of 2025.

Search strategy justification

Our intent was to limit our searches of published literature databases to title and keywords, but we found this strategy to be flawed in some cases due to the use of system-imposed keywords in some databases, and a lack of author keywords. This resulted, for example, in Scopus of many irrelevant results being returned because of the common use of both ‘reproducibility’ and ‘qualitative research’ as system keywords used to describe the research itself. Therefore, we use an abstract search in Scopus and limit our results based on relevance.

Similarly, Dimensions does not allow for keyword search, so we run our search on full article content. PubMed also does not allow for keyword search, so there we execute the search on title and abstract.

We found by piloting our search in JSTOR that a keyword search was not an option and an abstract search returns far too many results for the scope of our study (hundreds of thousands), so in this database we elect to search by title only.

The decisions we took in developing each search string and strategy were aimed at capturing relevant literature while reducing the amount of irrelevant literature captured by the source.

Screening

Screening stages

During Stage 2 of this review process, all collected peer-reviewed literature will be first be subjected to a de-duplication process using Automated Systematic Search Deduplicator application (ASySD), which will remove any duplicates that are returned from different databases (Hair et al. 2021).

Following this, the review process (for both peer-reviewed and grey literature) will be carried out within the SyRF platform. Therein, titles and abstracts will be dual blind screened for relevance, with liberal inclusion criteria applied (anything that may be relevant is included). Where a split occurs, a third screener will cast the deciding vote.

Next, ascendant and descendant searches will be conducted based on included peer-reviewed literature (described above). Depending on the amount of material returned, a selection process may be applied to only select the most relevant literature (also described above). The literature returned through this process will then be subject to the same process already described for stage 2: deduplication, then dual screening of titles and abstracts.

Following the screening procedure in SyRF, screening decisions will be exported into Excel, and all included sources will be imported (as DOIs) into Zotero. We will then use Zotero to retrieve and store all available full texts, and then import full texts as PDFs to the SyRF platform. Therefore, only included sources with available full texts will proceed to the data extraction stage of this research.

Screened fields / blinding

Just the title and abstract fields will be visible during title and abstract screening. Publication year, journal title, and authors will be blinded during both processes to eliminate any unconscious bias on the part of reviewers.

Used exclusion criteria

Exclusion criteria during title and abstract screening:

1. The title and abstract do not indicate a focus on reproducibility/replicability, transparency or accountability of qualitative research.
    a. Reproducibility, replicability, transparency or accountability are mentioned in the abstract (e.g., in the context of the methods of the work in question) but not as concepts discussed in relation to qualitative research.
2. The title and abstract do not indicate a focus on Open Science practices as they pertain to qualitative research.
    a. Open Science practices are mentioned in the abstract (e.g., as in use in the work reported in the text) but not discussed in relation to usage within qualitative research.

If both criteria are met, the source is excluded. If just one criterion is met, the source is included.

Screener instructions

For title and abstract screening, instructions will be as follows:

Please indicate whether the title and abstract indicate that the source should be included or excluded based on the following criteria:

Inclusion criteria: The title and abstract indicate that the text discusses the intersection of reproducibility/replicability with qualitative research/methods, including mixed methods; or that the text discusses accountability and or transparency in relation to qualitative research/methods, including mixed methods; or that the text discusses Open Science practices, namely open data, preregistration, and open methods, as they relate to qualitative research/methods, including mixed methods.

Exclusion criteria: The title and abstract do not indicate a focus on reproducibility/replicability, transparency or accountability of qualitative research; the title and abstract do not indicate a focus on Open Science practices as they pertain to qualitative research. If both criteria are met, the source is excluded.

When a text is marked for exclusion, please describe how it fails to meet inclusion criteria.

Screening reliability

Title and abstracts will be dual screened by two independent reviewers working separately in a cloud-based screening platform. The platform, SyRF, continues to randomly present entries for review until each source has been reviewed to agreement (at least twice and at most, three times).

Screening reconciliation procedure

SyRF is trained to recognize when agreement has been reached for each entry. Entries that are not an agreed decision after dual review will be advanced to a tie-break review round by a third reviewer. The decision of the third reviewer therefore decides if an entry is excluded.

Sampling and sample size

All sources initially identified for screening will be screened.

Data management and sharing

The full search results, screener decisions from the screening process and all screener answers to questions will be exported from SyRF into Excel and archived on Zenodo, along with other project data.

Extraction

Data extraction and simultaneous quality appraisal of the sources will be conducted by a single screener during one phase, which correspond to Stage 3 (critical appraisal) and the first part of Stage 4 (analysis and synthesis) of Torraco's 6-stage integrative review process.

Entities to extract

Data to be extracted include the type of text (theoretical/conceptual, methodological paper/guidance, empirical study or literature review); the nature of and focus of the text (a theoretical/conceptual essay about..., a literature review of..., if an empirical study about...); the research design and/or methods; whether and how the text conceptualizes or defines reproducibility/replicability in relation to qualitative research; whether and how the text discusses Open Science practices in the context of qualitative research and which practices it discusses; the key findings, arguments or conclusions of the text; as well as the research discipline/field, methods, and type of data under discussion in the text.

Additionally, during this process reviewers will be asked to assess the quality of the source and to exclude it based on above stated exclusion criteria, in the event that it was erroneously included through to this phase.

Extraction stages

Extraction will be done in one stage by a single human reviewer.

Extractor instructions

For quality appraisal and data extraction, instructions will be as follows:

Please read the full text and respond to the following questions to complete the processes of data extraction and quality appraisal for this text. If after completing this process it appears that this text should have been excluded from the study, please mark it for exclusion.

- Describe the type of text (theoretical/conceptual, review/meta-analysis, methodological paper/guidance, or empirical study)
- Describe the nature of and focus of the text (a theoretical/conceptual essay about..., a literature review of..., if an empirical study about...)
    - *Provide a brief description of the text, e.g., "a conceptual essay about reproducibility of qualitative research" or "a methodological paper focused on interview data sharing".*
- Describe the research design and research methods used, if relevant.
    - *Provide a brief description of the research design and methods used, as much as possible, e.g., "an interview-based qualitative study of how qualitative researchers manage research data with the aim of sharing it".*
- Does this text conceptualize or define reproducibility/replicability in relation to qualitative research?
    - How does this text conceptualize or define reproducibility/replicability in relation to or in the context of qualitative research?
        - *Briefly relate or quote the definition or conceptualization of reproducibility and/or replicability offered within the text.*
- Does this text discuss Open Science practices in the context of qualitative research?
    - Which Open Sciences practices does it discuss? Check all that apply and note that other open science practices are out of scope. (open data, open methods, preregistration, open science general, other open science practices)
    - What does the text say about these open science practices in the context of qualitative research?
        - *Describe what the text says about the Open Science practices discussed, e.g., "the text is pro-qualitative data sharing and offers guidance on how to do it" or "the text offers an in-depth discussion of the ethics of qualitative data sharing and recommends cautiously pursuing Open Data practices within qualitative research."*
- What are the key findings, arguments or conclusions of the text?
    - *Describe the key findings, arguments or conclusions of the text such that we understand its key contributions/view point when we analyze these data.*
- Research discipline/field in focus (or general)

    - *State whether a specific research discipline or field is in focus in the source, or whether it is general in nature.*
- Research method(s) in focus (or general)
    - *Select the research methods in focus in the source (Interviews, Focus groups, Ethnography, Content or discourse analysis, Case study, Observation, Archival research, Other (describe))*
- Type of data (if data is mentioned)
    - *Please select all types of data in focus in the article (Audio or video data, Textual data, Visual data, Documents as data, Other (describe)).*
- Does this text meet quality assessment criteria?
    - If not, what are your concerns about the quality of this text?
- Option to mark if this text should be excluded because it does not meet our study criteria
    - The source does not have a focus on reproducibility/replicability, transparency or accountability of qualitative research; nor a focus on Open Science practices as they pertain to qualitative research. If both criteria are met, the source is excluded.

The following quality assessment criteria will be used to evaluate each source, based on its type.

1. For theoretical/conceptual sources:
    a. Is there a clear question or problem articulated?
    b. Does the source answer this question or discuss the problem in a theoretically informed way?
    c. Is the source engaged with the state of the art in its area?
    d. Are the conclusions reached reasonable, given the proffered evidence?
    e. Do you have concerns about the research integrity of this work?
2. For empirical sources and literature reviews:
    a. Is the study design clearly identified?
    b. Is a research question clearly articulated?
    c. Is the design appropriate to the area of study?
    d. Are the methods appropriate or answering the research question?
    e. Is the sample size adequate for drawing conclusions?
    f. Is data saturation discussed and reached?
    g. Is the data analysis method identified?
    h. Are all possible confounding factors/variables accounted for?
    i. Are the findings reported in relation to existing state of the art?
    j. Are the findings applicable to other groups or contexts?
    k. Do you have concerns about the research integrity of this work?
3. For methodological papers/guidance:
    a. Is the aim of the source clearly identified?
    b. If appropriate, is a research question or problem clearly identified?
    c. Is the source engaged with the state of the art?
    d. Does the source offer clear and useful instruction and guidance?
    e. Can the instruction or guidance be carried out by the average researcher in the relevant field or area?
    f. Are there noticeable flaws or blind spots in the instruction or guidance?

g. Do you have concerns about the academic integrity of this work?

These quality assessment criteria were developed based on existing criteria for evaluating research, found here:

1. https://www.cincinnatichildrens.org/-/media/Cincinnati-Childrens/Home/service/j/anderson-center/evidence-based-care/legend/EvidenceAppraisalForm-Meaning-QualitativeStudy.pdf
2. https://blog.efpsa.org/2011/08/01/how-to-critically-evaluate-the-quality-of-a-research-article/

Extraction reliability

Data extraction will be carried out by one reviewer per source.

Data management and sharing

Extraction data, including all reviewer decisions and responses to questions/prompts will be shared in either a CSV or XLSX format in the Zenodo repository, along with other shared data from this study.

Synthesis and Quality Assessment

Planned data transformations

It is not expected that data transformation will be necessary.

Missing data

Missing data will not be an issue, given the aims of this study.

Synthesis plan

Extracted data will be qualitatively analyzed and synthesized to identify themes, patterns and discrepancies in the data as they respond to the research questions. Extracted data will be exported from the SyRF platform in an Excel format and then imported into NVivo qualitative data analysis software (or a similar software) to facilitate coding of the extracted data and analysis of it. The coding process will begin by first organizing the data in response to the research questions, and then further coding it to identify variations in how the data respond to these research questions. The focus of this coding process will be to identify patterns in themes in how the data respond to the research questions, and to identify discrepancies, debates and outliers within the data.

Coding will be carried out collaboratively by a minimum of two researchers, with researchers assigned to code data relevant to specific research questions. After a first phase of coding, a collaborative data analysis process will be carried out whereby researchers will review each other's work, discuss any inconsistencies in the coding approach, and resolve any internal conflicts, with a second phase of coding taking place as necessary.

Coded data will then be collated to formulate responses to the research questions.

Publication bias analyses

We intend to report on all trends identified in the data and are not conducting any statistical analyses on our data, therefore we do not expect publication bias to occur.

Synthesis data management and sharing

Coded data and the code structure, along with any notes that inform the creation of the code structure, will be shared along with other project data and archived on Zenodo.

References

Bazzoli, Andrea. 2022. "Open Science and Epistemic Pluralism: A Tale of Many Perils and Some Opportunities." *Industrial and Organizational Psychology* 15(4):525–28. doi: 10.1017/iop.2022.67.

Bennett, Elizabeth A. 2021. "Open Science From a Qualitative, Feminist Perspective: Epistemological Dogmas and a Call for Critical Examination." *Psychology of Women Quarterly* 45(4):448–56. doi: 10.1177/03616843211036460.

Bissell, Mina. 2013. "Reproducibility: The Risks of the Replication Drive." *Nature* 503(7476):333–34. doi: 10.1038/503333a.

Fidler, Fiona, and John Wilcox. 2021. "Reproducibility of Scientific Results." in *The Stanford Encyclopedia of Philosophy*, edited by E. N. Zalta. Metaphysics Research Lab, Stanford University.

Gundersen, Odd Erik. 2021. "The Fundamental Principles of Reproducibility." *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 379(2197):20200210. doi: 10.1098/rsta.2020.0210.

Guttinger, Stephan. 2020. "The Limits of Replicability." *European Journal for Philosophy of Science* 10(2):10. doi: 10.1007/s13194-019-0269-1.

Hair, Kaitlyn, Zsanett Bahor, Malcolm Macleod, Jing Liao, and Emily S. Sena. 2021. "The Automated Systematic Search Deduplicator (ASySD): A Rapid, Open-Source, Interoperable Tool to Remove Duplicate Citations in Biomedical Systematic Reviews." 2021.05.04.442412.

Leonelli, Sabina. 2022. "Open Science and Epistemic Diversity: Friends or Foes?" *Philosophy of Science* 1–21. doi: 10.1017/psa.2022.45.

Penders, Bart, J. Britt Holbrook, and Sarah de Rijcke. 2019. "Rinse and Repeat: Understanding the Value of Replication across Different Ways of Knowing." *Publications* 7(3):52. doi: 10.3390/publications7030052.

Pownall, Madeleine. 2022. *Is Replication Possible for Qualitative Research? preprint*. PsyArXiv. doi: 10.31234/osf.io/dwxeg.

Pratt, Michael G., Sarah Kaplan, and Richard Whittington. 2020. "Editorial Essay: The Tumult over Transparency: Decoupling Transparency from Replication in Establishing Trustworthy Qualitative Research." *Administrative Science Quarterly* 65(1):1–19. doi: 10.1177/0001839219887663.

Reischer, Hollen N., and Henry R. Cowan. 2020. "Quantity Over Quality? Reproducible Psychological Science from a Mixed Methods Perspective" edited by S. Vazire and S. Vazire. *Collabra: Psychology* 6(1):26. doi: 10.1525/collabra.284.

Talkad Sukumar, Poorna, Ignacio Avellino, Christian Remy, Michael A. Devito, Tawanna R. Dillahunt, Joanna McGrenere, and Max L. Wilson. 2020. “Transparency in Qualitative Research: Increasing Fairness in the CHI Review Process.” in *Conference on Human Factors in Computing Systems - Proceedings*.

Toronto, Coleen E., and Ruth Remington, eds. 2020. *A Step-by-Step Guide to Conducting an Integrative Review*. Cham: Springer International Publishing.

Torraco, Richard J. 2016. “Writing Integrative Literature Reviews: Using the Past and Present to Explore the Future.” *Human Resource Development Review* 15(4):404–28. doi: 10.1177/1534484316671606.

Tuval-Mashiach, Rivka. 2021. “Is Replication Relevant for Qualitative Research?” *Qualitative Psychology* 8(3):365–77. doi: 10.1037/qup0000217.

Whittemore, Robin, and Kathleen Knafl. 2005. “The Integrative Review: Updated Methodology.” *Journal of Advanced Nursing* 52(5):546–53. doi: 10.1111/j.1365-2648.2005.03621.x.