



Feast Centre for Indigenous STBBI Research
Centre du festin traditionnel de recherche autochtone sur les ITSS

The Feast Centre Learning Series: ‘Rigour’ in Research Proposals

This document is an introduction to the concept of rigour as related to crafting a research proposal. The information contained here is not an exhaustive guide, and we encourage you to continue to seek out and engage with academic resources addressing rigour in the ways that it informs and relates to your research practices.

What is ‘rigour’ in research?

Rigour can be “defined as the quality or state of being very exact, careful, or with strict precision” (Merriam-Webster) or the “quality of being thorough and accurate” (OED). It is the “degree to which research methods are scrupulously and meticulously carried out in order to recognize important influences occurring in the process of conducting the research. It is a set of standards investigators use to evaluate the quality, trustworthiness, and value of research” (Liu). Addressing rigour in your research proposal could mean including specific details or steps you as a researcher are taking to ensure and evaluate the quality, trustworthiness, and value of your research for your readers. Some initial questions you can answer in your research proposal are:

- Who is your specific target audience?
- What relationships have you built previous to this research proposal?
- How do you plan to engage with community?
- If you plan to maintain relations after your research concludes, how do you plan to do this?

Writing for Rigour

Wilson and Botham (2021) suggest incorporating as much detail as you can into your research proposal to address scientific rigour. They provide the following example saying, “addressing scientific rigour often requires careful and specific wording: instead of, ‘We will use our new method to anticipate drug effects,’ we would guide a writer to ‘We will calibrate our new method using a landmark dataset, a gold-standard comparison in our field, to benchmark against known effects before anticipating new drug effects. A new method could bias results, but benchmarking the method against a well-regarded dataset of known effects justifies the method’s adequacy for understanding effects of a new drug’” (Wilson and Botham). The more detail you can include in your proposal about how, what where, when, why, and who, the better!

They suggest further that addressing the limitations or boundaries of your research is also a way to increase rigour in your proposal. They say,

Addressing rigour in research proposals is often less about changing scientific choices or overall project design, and more about justifying how experimental-design choices address limitations that could prevent the researcher from answering their question or diminish the knowledge they derive from their experiment. Justifying scientific choices requires deliberate practice to achieve strong, persuasive writing. The grant writer must be aware of and unafraid to share the limitations to their science.

Often, it's difficult to decide which choices require justification. We recommend examining published work and talks to understand limitations and how they were addressed. It might feel daunting to address all possible limitations to a research approach, so start by investigating journal publication requirements for reproducibility and transparency. Many journals have specific requirements about the reporting of protocols, the use of biological samples, the availability of analysis code and other technical details. Journal requirements are designed to overcome field-specific challenges to reproducibility and transparency. Take note of how others justify their choices – you don't have to go as far as explaining whether an experiment needs a control (almost all good experiments have at least one control), but you will probably need to justify how a particular control is well-suited to your research question. (Wilson and Botham)

A review of previously published literature and research can not only inform your research proposal, but it can also provide models of how to address rigour in your own research process and the ways you communicate it.

Rigour in Quantitative Research

Rigour can be assessed by addressing *reliability* and *validity* in your quantitative research proposal. *Reliability* is the quality of consistency in your research. Liu's explains 3 types of reliability in research grounded in the understanding that the reliability of data collected comes from a research measurement, where "the same data would be collected each time in repeated observations of the same phenomenon" under study (1511). He discusses 3 types of reliability you could address as appropriate in your research proposal: Test–retest reliability, "a measure of reliability obtained by administering the same test twice over a period of time to a group of individuals"; Internal consistency "(also called Cronbach's alpha), the consistence of performance among items"; and Intercoder reliability, the consistency of a result of measure across observers," (1512).

Validity is another important aspect of rigour. Liu explains 4 ways to address validity that may be appropriate in a quantitative research proposal. Face validity is "whether a measurement appears to measure what it is supposed to measure. To assess face validity, investigators will invite a panel of experts to review the measurements," predictive validity, "the measurement's

ability to predict expected related outcomes” and is “assessed through examining the correlations between the measurement and a future outcome” (1512). Concurrent validity “indicates how well a measurement instrument compares with previous measurements of validity,” (1512) and Construct Validity which “assesses whether a measurement is consistent with the related theoretical framework (1512). Addressing these aspects in your research proposal will assist in communicating how you are meticulously addressing research methods in your quantitative research proposal.

Rigour and Qualitative Research

To strengthen rigour in your qualitative research proposal, you can address researcher subjectivity and detail how and why your research design and method are appropriate to answer your research questions. Cypress states that rigour

has also been used to express attributes related to the qualitative research process. Per Morse et al (2002), without rigor, research is worthless, becomes fiction, and loses its use. The authors further defined rigor as the strength of the research design and the appropriateness of the method to answer the questions. It is expected that qualitative studies be conducted with extreme rigor because of the potential of subjectivity that is inherent in this type of research.” (Cypress).

Addressing researcher subjectivity in your research proposal is an integral part of research for and by Indigenous peoples, using Indigenous research methods and techniques drawn from Indigenous knowledges and ways of being (Evans, et al 2009). Indigenous researcher Shawn Wilson asserts, "Indigenous research methodology means talking about relational accountability. As a researcher you are answering to all your relations when you are doing research." (Wilson, p. 177). Include details that situate yourself in your work and the research in your proposal such as:

- Where are you from, who are you accountable to, and what are your biases?
- What cultural protocols are you following to ensure research is done respectfully and responsibly while following community traditions?
- How are you ensuring collaborative research with rather than on Indigenous peoples?
- Who you are researching and how will that community benefit from this research project?
- How transparent will your research be to that community and where are you connecting with community in the research process?

Answering these types of questions and also detailing how you are addressing consent and ownership around research data and materials as well as compensation for collaboration and consultation will assist to address rigour in your research proposal.

For further reading, Guba (1981) proposed a four criteria model to evaluate rigour in qualitative research: credibility, transferability, dependability, and confirmability, which may also be a

helpful way to address qualitative research rigour. Additionally, Liu details many strategies you can utilize in outlining rigour in your research proposal such as achieving credibility through prolonged community engagement, addressing your methods of collecting “thick descriptive data” during the data collection stages, or discussing your strategies to document your research data (1513).

Rigour and Indigenous Community Engagement

Addressing ethical research engagement protocols in your research proposal will strengthen your research rigour. As noted by Given,

Indigenous peoples and communities in a number of countries have developed protocols for ethical review and oversight of research involving their members or conducted on their territories. Government agencies in some countries, including Canada, the United States, New Zealand, and Australia, have instituted Indigenous-specific guidelines that complement and supplement ethical guidelines of general application.

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Ethical guidelines for research involving Indigenous peoples or communities typically recommend or require engagement of community representatives in reviewing research proposals in addition to institutional ethics review. Community review may be as straightforward as approval of a researcher who is known to be trustworthy or as complex as a formal agreement setting out goals, methods, review, and dissemination of results and the risks and benefits anticipated for both the community and researchers in the project. Key issues addressed by such engagement are ensuring respect, relevance, and rigor. (Given)

Addressing the complexity of rigour from an Indigenous research methodology may mean thinking outside the box. As noted by Given,

Rigor in research involving humans surely means producing results that faithfully reflect lived reality that has validity or truth value for both the Indigenous and scholarly communities. People who perceive research as irrelevant or disrespectful are unlikely to volunteer participation or provide reliable information. A dual test of the validity of results is implied in participatory research, although the degree of influence that the community exercises may vary a great deal. Methods for validating research findings might not even figure in ethics protocols. Nevertheless, it is a criterion that community research bodies are imposing with increasing frequency. Indigenous concepts of rigor may conflict with scientific emphasis on objectivity in data collection or generalizations based on statistical formulas, whereas qualitative and participatory methods appear to attract confidence from Indigenous participants. (Given)

Addressing Rigour in Different Stages of Research Planning

Rigour can be addressed at each stage of research including “methodology selections to data collections, data analysis, and data interpretations and presentations. At each research stage, a structured and controlled manner of planning, conducting, and analyzing the study has to be followed to make sure that the study is rigorous” (Liu, 1511). Asking yourself questions when writing research proposals helps to frame your scientific choices. You can explain your choices, by asking questions that address specific details and limitations in your proposal.

The following suggestions can help guide writing a rigorous research proposal at different stages.

1. Research topic

“Identifying and developing a research topic is comprised of two major tasks: formulating a research question and developing a conceptual framework to support the study. Formulating a research question is often stimulated by real-life observations, experiences, or events in the researcher’s local setting that reflect a perplexing problem begging for systematic inquiry. The research question begins as a problem statement or set of propositions that describe the relationship among certain concepts, behaviors, or experiences” (Johnson).

“Generating and refining a qualitative research question requires thorough, systematic, and iterative review of the literature, and the use of those results to establish a clear context and foundation for the question and study design. Using an iterative approach, relevant concepts, principles, theories or models, and prior evidence are identified to establish what is known, and more importantly, what is not known. The iterative process contributes to forming a better research question, the criteria for which can be abbreviated by the acronym FINER, ie, feasible, interesting, novel, ethical, and relevant, that is answerable and researchable, in terms of research focus, context specificity, and the availability of time, logistics, and resources to carry out the study. Developing a FINER research question is critical to study rigor and quality and should not be rushed, as all other aspects of research design depend on the focus and clarity of the research question(s) guiding the study.¹⁵ Agee provides clear and worthwhile additional guidance for developing qualitative research questions” (Johnson).

2. Addressing researcher reflexivity

“Reflexivity, the idea that a researcher’s preconceptions and biases can influence decisions and actions throughout qualitative research activities, is a critical aspect of rigor even at the earliest stages of the study. A researcher’s background, beliefs, and experiences may affect any aspect of the research from choosing which specific question to investigate through determining how to present the results. Therefore, even at this early stage, the potential effect of researcher bias and any ethical considerations should be acknowledged and addressed. That is, how will the question’s influence on

study design affect participants' lives, position the researcher in relationship with others, or require specific methods for addressing potential areas of research bias and ethical considerations?" (Johnson).

3. Developing a theoretical/conceptual framework

"A conceptual framework is then actively constructed to provide a logical and convincing argument for the research. The framework defines and justifies the research question, the methodology selected to answer that question, and the perspectives from which interpretation of results and conclusions will be made. Developing a well-integrated conceptual framework is essential to establishing a research topic based upon a thorough and integrated review of relevant literature ...Key concepts, principles, assumptions, best practices, and theories are identified, defined, and integrated in ways that clearly demonstrate the problem statement and corresponding research question are answerable, researchable, and important to advancing thinking and practice" (Johnson).

4. Research Methods

"What is the most appropriate methodological tools for the research question or hypothesis: a qualitative approach or a quantitative one? Which specific method to use: experiments, surveys, interviews, field studies, case studies, content analysis, or a combination of different methods? Can this methodological tool meet the project's objectives?" (Liu, 1511).

5. Sample selection

"Rigor will be reflected in how attentive the investigators are to selecting a sample. The investigator needs to consider the advantages and limitations of various sampling strategies and choose a strategy and a sample size that meet research goals. If the research is a quantitative study, investigators would want to select a sample that can maximize the generalizability of the study. If the research is qualitative, investigators would try to identify the most interesting cases and maximize the chance of identifying the full range of phenomenon of interest. Besides finding representative respondents, the investigators would need to make other sampling decisions as well, including the following: When to conduct the study? Which season or which time of the day? At what locations? For how long? For example, if the research question is how many coffees do college students drink per week, then the answers to the question will vary depending on when in the semester the researcher conducts the study. The researcher can anticipate different answers at the beginning of the semester than immediately before final examinations" (Liu, 1511).

6. Data collection

“When a data analysis stage starts, investigators will decide on analytic techniques. For a quantitative study, investigators need to ask themselves the following questions: How general or specific do we need to analyze the data? How statistically significant? How will the analytic techniques help to interpret the results? For a qualitative research, investigators need to consider how to ensure the discovery of all salient themes and topics and maximize the potential for finding relationships among themes and topics. During the final stage of writing and presenting the results, rigor requires investigators to strictly adhere to the data” (Liu, 1512).

7. Research Limitations

Limitations can be addressed by asking yourself the following questions in your proposal: “What are the essential weaknesses or limitations in your science? Every scientific method has limits. Often, these limits are methodological or field-specific,” “Which methods will you use, or are you already using, to address these limitations? These may be standard methods in your research group, but it's important to highlight them as such for a reviewer,” “What makes these methods adequate? Justify your choices by confirming how the field has tested or accepted these methods for overcoming limitations” (Wilson and Botham).

Resources and Further Reading

Cypress, Brigitte S. EdD, RN, CCRN. Rigor or Reliability and Validity in Qualitative Research: Perspectives, Strategies, Reconceptualization, and Recommendations. *Dimensions of Critical Care Nursing*: 7/8 2017 - Volume 36 - Issue 4 - p 253-263, doi: 10.1097/DCC.0000000000000253

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