Helpful Research Questions

A Big *thank you* to Michael Neel, Vanderbilt University

Connected to a clear problem

- **Does this focus on a bounded topic and/or problem?**

- Research question refinement: After identifying a research topic, you will need to compose your research question(s) and repeatedly refine them.
  - Narrow in on the **focus** of your research

- Your central research question should follow from your problem to keep your work **focused**. If you have multiple questions, they should all clearly relate to this central **focus**.

Feasibility?!?

- **Is this answerable with available data?**
- You must be able to find an answer by **collecting data**. If such data is impossible to access, you will have *to rethink your question and ask something more concrete.*
  - *Selecting a dataset and finalizing your research questions are two iterative steps in the process. DO NOT PERFORM THESE TASKS DISJOINTLY*
- **Is this answerable within practical constraints you face?**
- Make sure you have enough time and resources to do the research required to answer the question. If you think you might struggle to gain access to enough data, consider narrowing down the question to be more specific.

Criteria for answering the question

- **Are criteria for answering the question clear?**
  Avoid subjective words like *good*, *bad*, *better* and *worse*, as these do not give clear criteria for answering the question. If your question is evaluating something, **use terms with more measurable definitions.**
  - X Is X or Y a better policy?
  - + How effective are X and Y policies at reducing rates of Z?

- Unambiguous is the goal
  - Precision
  - Repeatability

Well-defined concepts/constructs

- **Use specific, well-defined concepts/constructs for what you are studying**
  All the terms you use in the research question should have clear meanings. Avoid vague language and broad ideas, and be clear about ***what***, ***who***, ***where*** **and** ***when*** your question addresses.
  - X What effect does social media have on people's minds?
  - + What effect does daily use of Twitter have on the attention span of under-16s?

Avoid Why questions

- *Why* questions are usually too open to serve as good research questions. There are often so many possible causes that a research project cannot give a thorough answer. Try asking *what* or *how* questions instead.
  - NO - Why does X occur?
  - YES What are the main factors contributing to X?
  - YES How is X influenced by Y?

- Do not be afraid to be verbose or "overtly scientific"
  - Name and or list the factors under investigation

Avoid Yes, No questions (or expand)

- Closed *yes/no* questions are too simple to work as good research questions — they don't provide enough scope for investigation and discussion.
  - X Has there been an increase in homelessness in the UK in the past ten years?
  - + How have economic and political factors affected patterns of homelessness in the UK over the past ten years?

Bad Data Science Research Questions

- Avoid questions that have already been answered.
  - If you can answer the question through a Google search or by reading a single book or article, you will likely be able to cover this in your literature review. A good research question demands original data, synthesis of multiple sources, interpretation and/or argument to provide an answer.

- Trivial Questions
  - Questions that can be answered by a simple calculation are NOT data science research questions.
  - EG:
    - Not data science question: What is the mean height for American males between the ages of 25 and 35?
    - Data Science question: Can the height of American males (25-35) be estimated given their occupation, income, and family size?

Always look for similar research
models
approaches
findings

- Has anyone done a similar study? How did they frame their RQs?

Resources

- Scribr:
  - https://www.scribbr.com/research-process/research-questions/
- GMU Writing Center:
  - https://writingcenter.gmu.edu/guides/how-to-write-a-research-question