From Topic to Question

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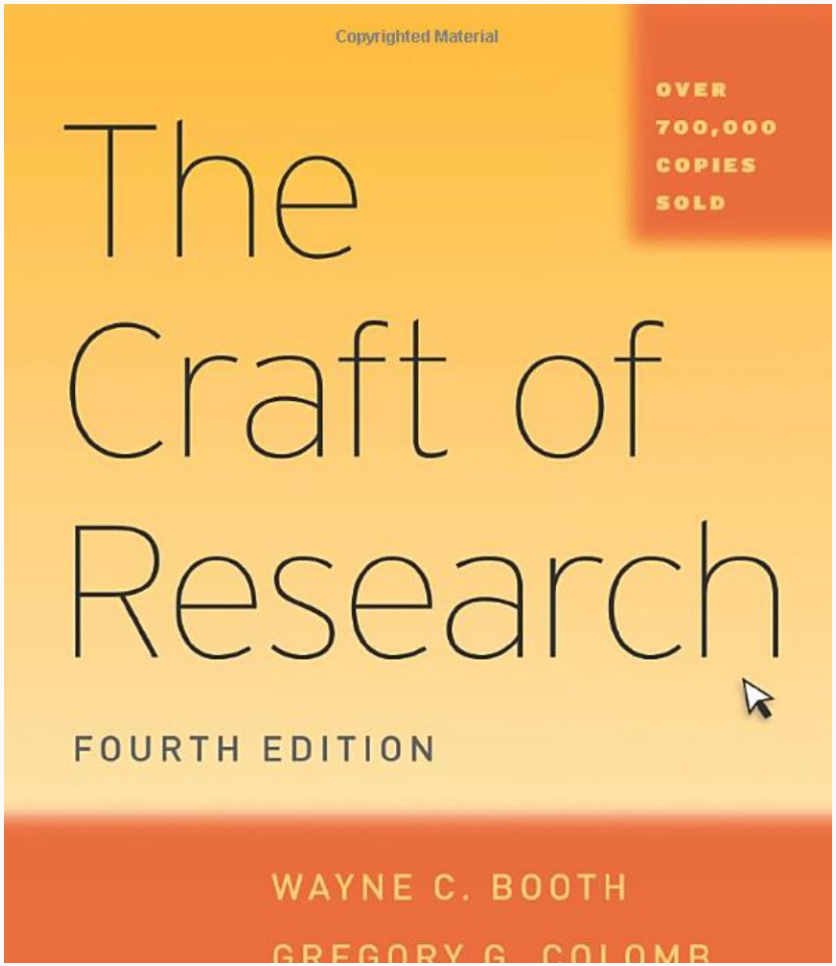
Agenda

- From Topic to Question (1.25 hours)
- Break (0.25 hours)
- Git & Github (1 hour)

From Topic to Question

How do you take a broad topic, and narrow it down to an answerable question?



From Topic to Question

Ask a **question** that solves a **problem** that you can convince readers to care about.

Possible question types:

- **Disagreement**: Some people think X, but other people think Y. What's right?
- **Structure and Composition**: What patterns exist? What typologies?
- **Claim**: Unmeasured claim about how things work.
- **Optimization**: Can we do this better?

From Topic to Question

Avoid questions that are. . .

- Settled fact (you could look them up)
- Unanswerable with data
- Answers are dead ends

Is your question answerable with data?

Think about your question and your final product. Will it answer the question? What will skeptics say?

- Is your question too broad to have an "answer"?
- What would the ideal dataset look like?
- What will a skeptic say?
- State a possible finding: "I find that an increase of X is correlated with an increase of Y..."

What kind of question do you have?

From Hofman, J.M., Watts, D.J., Athey, S. et al. Integrating explanation and prediction in computational social science. Nature 595, 181–188 (2021).

Table 1 | A schematic for organizing empirical modelling along two dimensions, representing the different levels of emphasis placed on prediction and explanation

	No intervention or distributional changes	Under interventions or distributional changes
Focus on specific features or effects	Quadrant 1: Descriptive modelling Describe situations in the past or present (but neither causal nor predictive)	Quadrant 2: Explanatory modelling Estimate effects of changing a situation (but many effects are small)
Focus on predicting outcomes	Quadrant 3: Predictive modelling Forecast outcomes for similar situations in the future (but can break under changes)	Quadrant 4: Integrative modelling Predict outcomes and estimate effects in as yet unseen situations

Some strategies for questions

- Read an existing paper/project and...
  - Read their extension questions.
  - Ask if there's a spatial extension.
    - Use spatial boundaries?
    - Add distance?
    - Map residuals?
- Talk to a subject matter expert and see if there are open optimization problems.

From Topic to Question

Ask your question in the following form...

1. Name your topic: "I am studying _____."
2. Add your question: "I want to know _____ because _____."
   a. This is a (prediction, feature) question that assumes (no intervention, yes intervention).
3. Add an example finding: "A possible finding is _____. My data is capable of showing that because _____."
4. Implication: "A hypothetical way my result will be used is _____."

Think, Pair, Share

1. 10 min: Individually write your question in the form of the prior slide.
2. 30 min: In groups, share your question and proposal. Group members, critically ask:
   a. Is this question answerable with data?
   b. Would the proposed analysis convince a skeptic?
   c. Would the result be useable?
3. Come back, share out results.

Assignments

- 1/28 (next week): GitHub Repo with raw data. We will be *Virtual*.
- 2/4: Data Summary Analysis and 10-minute presentations (with 5-minute question).
- 2/11: Project Proposal 1, 2nd set of presentations.
- 2/25: Midpoint work in progress report & presentations.