Lab 5

week 5 of class, week 6 of semester

Overview info

Lecture topic: intro to experimental design

Lab learning objectives: By the end of the lab, students will be able to:

- Generate a complete A and L from QuALMRI for their own individual question

Due today: Assignment 4: Lit Review Writeup
Assigned today: Assignment 5: First draft of research project proposal

Lesson outline

Housekeeping 1 (00:10 - 00:20; 10 minutes)
Goal: Review common successes and pitfalls from Assignment 3 (with grades)
What to do:

- Walk students through common errors (and a few consistent successes that you're proud of) in Assignment 3
- Point out mistake areas that you will expect students to be able to do properly in subsequent assignments

Housekeeping 2 (00:20 - 00:30; 10 minutes)
Goal: Review common successes and pitfalls from Assignment 4 (just turned in)
What to do:

- Poll students on pitfalls (such as the ones below) they may have run into while working on Assignment 4
    - Citation/APA formatting trouble?
    - How to pick which papers are most relevant to your question?
    - How to pick what to summarize from papers?
    - How to weave paper summaries together into a consistent logical stream?
    - Whatever else comes up from student comments
- Solicit comments from students & seed a small back-and-forth between them, especially if they mention similar experiences

Generating a testable hypothesis from a question (00:30 - 00:50; 20 minutes)
Goal: Demonstrate & practice logic-ing from a specific research question to a fully testable hypothesis
What to do:

- Solicit volunteers to share their diffuse + specific questions and talk through possible hypotheses & logic
    - Encourage students to volunteer by reminding them that volunteering means putting themselves out there, BUT also means they get really helpful feedback that they can directly apply in assignment 5
    - To avoid falling too much into self-selection bias, select **one** student randomly from all students who are willing to volunteer (random.org works, or base::sample() in R)
    - For selected student, prompt them to talk through the below. Feel free to prompt them for additional details or clarification when necessary. Avoid giving your own suggested answers unless the student seems really stuck. (10 min)
        - how did their diffuse question lead to their specific question?
        - what types of research did they use to guide their narrowing-down from their diffuse to specific question?
        - Off the top of their head, what hypotheses would you consider based on that question?
        - What could an IV and DV be to test their question? How would these variables be operationalized? (Prompt for as much specificity here as you deem necessary)
        - What is their hypothesized relationship between the IV and DV?
            - Prompt for an "If my hypothesis is true, then…" statement
            - (Monica likes doing this) Ask student to practice drawing fake graph of hypothesized results on whiteboard. Walk them through the steps if they seem rusty
    - If time, pick a second student and repeat.
- Pair students off to generate testable hypotheses per the previous exercise (10 min)
    - If possible, review students' Assignment 4 submissions quickly before class and pre-select pairs/threes based on topic similarity
    - Each person in the pair, for their individual question, should be able to have one testable main and one alternative hypothesis that answers their specific research question, with properly operationalized IV and DV
    - Circle the room to check in on pairs and advise if necessary

Work time (00:50 - 02:00; until end)
Goal: By the end of lab, students should have a plan for their proposed study methods
What to do:

- Keep students in their pairs/threes, but draw attention back to the group for a moment
- Direct students to open the Assignment 5 instructions sheet on Canvas
    - Note again that for most students, the specific research question they used for Assignment 4 will be the research question they ultimately write their study proposal about, but if they feel like changing their question they can. However, if they change their question they will need to re-do their lit review
    - Answer other questions students have about the assignment instructions

- Instruct students in their pairs/threes to brainstorm (together) and start writing up outlines of the rest of their proposal, especially methods (in parallel)
- Circle the room, checking in with students. Try to informally “approve” students’ plans for as much of their proposals as possible, but at least the methods if time restricts and they can’t outline their whole proposal. **Check in with as many students as possible before the end of lab.**

Things to keep in mind:

- (repeated from Lab 4 outline) Students may at this point be concerned about choosing a topic that will lead to a project proposal that’s feasible to run as a survey study on group project data collection day. Advise them that the more important thing for Assignment 5 (at least the first draft) is that they write well about something they’re interested in, irrespective of whether their planned study is feasible to run. If they want their study to be feasible, let them know of the general constraints (~7 min data collection time, only in college students, no crazy manipulations), advise students individually if they are really interested in feasibility, and remind students when appropriate that you will help them work through low-level feasibility concerns between their first draft and final draft submission. Some students will not care about feasibility and that’s fine as long as they can properly write up their ideas.