Psychology of Everyday Life Survey Lab

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🧠 Overview

How do we ask questions *scientifically*? In everyday life, we make all sorts of casual observations about people– "early risers are more productive," "people who exercise are happier," "too much screen time makes you stressed." But are these observations actually *true*? How would we even know?

The difference between casual intuition and scientific inquiry is *precision*. Science requires us to (a) formalize our intuitions into specific, testable predictions, (b) collect data systematically, (c) apply appropriate statistical tests, and (d) interpret the results honestly– even when they surprise us.

In this lab, you'll explore these ideas by designing and carrying out a mini-study of your classmates' everyday habits and attitudes. You'll discover that turning a vague question like "does sleep affect stress?" into a rigorous scientific hypothesis is harder than it sounds– and that the answers are often more nuanced than our intuitions suggest.

🧠 Learning objectives

This laboratory exercise is intended to help you:

- Practice formulating questions in a scientific way
- Practice refining a high-level question into a specific, testable hypothesis
- Understand the difference between scientific and non-scientific ways of asking questions
- Practice collecting data systematically using a survey instrument
- Practice selecting and applying appropriate statistical tests
- Practice interpreting results and drawing conclusions
- Practice collaborating with GenAI to refine an analysis plan and implement it

🧠 Procedure

🧪 Step 1: Take the class survey

Fill out our class's Psychology of Everyday Life survey with honest responses about your daily habits and attitudes. The survey asks about things like:

- How many hours of sleep you typically get
- Your general stress level
- How much time you spend on screens (outside of schoolwork)
- How often you exercise
- How much caffeine you consume
- How happy you generally feel
- How many hours per week you study
- How socially active you are

The survey should take about 10 minutes. Once everyone has submitted their responses, the collected data will be available here.

Important: Do NOT look at the data before completing Steps 2 and 3!

🧪 Step 2: Brainstorm and refine your questions

Before looking at the data, work with your group to brainstorm questions about the relationships between the survey variables. Start with high-level, casual questions– the kinds of things you might say in everyday conversation:

- "Do people who sleep more feel less stressed?"
- "Are people who exercise also happier?"
- "Does screen time affect how well people sleep?"

Now, practice *refining* these into more precise, scientific questions. For each casual question, consider:

- **What exactly are you measuring?** For example, "sleep" could mean hours of sleep, sleep quality, consistency of sleep schedule, etc. Our survey measures hours per night– so your question needs to be about *that specific measure*.
- **What kind of relationship are you predicting?** A positive correlation? A negative correlation? A difference between groups? Be specific.
- **How strong do you expect the relationship to be?** Will it be obvious, or subtle?
- **What might *confound* the relationship?** For example, if exercisers are also happier, is that because exercise causes happiness, or because some third factor (e.g., having more free time) enables both?

With your group, choose 3 questions to investigate. Write each one as a formal, testable hypothesis. For example:

- *Casual*: "Sleep helps with stress"

- *Scientific*: "Students who report sleeping 7 or more hours per night will report significantly lower stress levels (on a 1–10 scale) than students who report sleeping fewer than 7 hours, as measured by an independent-samples t-test."

🧪 Step 3: Plan your statistical tests

For each of your 3 hypotheses, decide (before looking at the data!) which statistical test is most appropriate. Consider:

- Are you comparing two groups (t-test)? More than two groups (ANOVA)?
- Are you looking for a relationship between two continuous variables (correlation)?
- Is one or both of your variables categorical (chi-square test)?
- If you're running multiple tests, do you need to correct for multiple comparisons?
- What would your results look like if your hypothesis is correct? What about if it's wrong?

Write down your planned tests for each hypothesis.

🧪 Step 4: Analyze the data with GenAI

Now you can look at the data! Make a copy of the class dataset and carry out the analyses described in the "Using GenAI" section below.

🧠 Using GenAI in this lab

Generative AI is a core tool for this lab. You'll use it to refine your analysis plan, implement your statistical tests, and sanity-check your results. The goal is to learn how to *collaborate* with AI effectively– treating it as a capable but imperfect research partner.

🧪 Getting set up

Dartmouth students have free access to several powerful AI tools:

- **Dartmouth Chat** — free for all Dartmouth community members. Includes GPT, Claude, Gemini, and Llama models. Log in with your Dartmouth credentials. This is the easiest starting point.
- **Claude for Education** — free Claude Pro access for Dartmouth students via the Anthropic partnership. Log in with your Dartmouth credentials for the first time.
- **Google Gemini** — free access for 1 year with a .edu email address.

Pick whichever tool you're most comfortable with (or try more than one!).

🧪 The AI-assisted analysis workflow

Follow these steps with your group:

1. Come up with a plan

Start by drafting an analysis plan *on your own* (with your group). Based on your 3 hypotheses from Step 3, sketch out:

- Which statistical tests you'll use for each hypothesis
- What figures or visualizations would help communicate your findings
- What you expect the results to look like if your hypotheses are correct (and if they're wrong)

2. Refine, stress-test, and deepen with AI

Share your analysis plan with a GenAI tool and ask it to help you improve it. Here's the critical thing to watch out for:

GenAI tends to be highly sycophantic– it will very likely agree with whatever plan you suggest, even if your plan is logically flawed or uses the wrong tests. To get genuinely useful feedback, try prompting strategies like:

- *"Play devil's advocate: what's wrong with this analysis plan?"*
- *"What are 3 ways this plan could lead to misleading conclusions?"*
- *"Assume I've made at least one mistake in my plan. Find it."*
- *"If you were reviewing this plan as a skeptical peer reviewer, what would you flag?"*

Use the AI's pushback to strengthen your plan. Did it catch something you missed? Did it suggest a better test or an additional control? If you don't understand the plan or feedback, ask the AI to explain it in more detail.

Also use *human experts*– ask your TA or instructor to review your plan and provide feedback.

3. Outline a robust analysis plan

Based on your AI-refined thinking, write out a final analysis plan. Collaborate with the AI on this– ask it to help you organize the plan clearly:

- For each hypothesis: the exact test, the variables, what you'll report
- Which figures you'll create and what they should show
- Any additional exploratory analyses that might be interesting

4. Implement the plan

Use Google Colaboratory to implement your analysis. You can ask your GenAI tool to help write the code– describe what you need clearly (e.g., "I have a CSV with columns sleep_hours, stress_level, happiness... I want to run a t-test comparing stress between high and low sleepers and make a box plot"). The companion analysis notebook provides templates to get started.

5. Sanity check

This is the most important step. For every result and figure the AI helps you produce, ask yourself:

- **Do the results make sense?** If the AI says the correlation between sleep and stress is r = 0.99, that's probably a bug.
- **Does the code do what you think it should?** Even if you don't know Python, you can ask the AI: *"Explain this code line by line. What is it actually doing?"*
- **Is there evidence of hallucination?** Did the AI reference functions that don't exist, or produce numbers that don't match the data?
- **Try changing something small** (e.g., flip which group is "high" vs. "low") and see if the results change in the direction you'd expect.

6. Refine presentation

Work with the AI to polish your figures and results:

- Ask it to suggest better chart types, color schemes, or labels
- Have it help you write clear figure captions
- Ask for alternative ways to visualize the same finding– which tells the story most effectively?

🧠 Closing discussion points

Think about what you and your classmates have learned from this survey exercise. Consider:

- How did the process of *formalizing* your intuitions change them? Did any of your casual questions turn out to be harder to test than you expected?
- Were there questions you wanted to ask that the survey couldn't answer? What would you need to collect to answer them?
- How does our class sample compare to the general population? What limits our ability to generalize?
- How useful was the AI as a collaborator? Where did it help most? Where did it fall short or lead you astray?
- Think about how the skills you practiced today– formulating hypotheses, choosing appropriate tests, interpreting results with appropriate caution– apply to the *Introduction* section of a scientific paper. A good introduction doesn't just state a question; it explains why the question is interesting, what's already known, and how the current study will add to that knowledge.

Finally, consider the bigger picture: how do you turn high-level *qualitative* questions about people's minds and behaviors into *quantitative*, testable hypotheses? Is there a general strategy, or is every question unique? Can "anything" be studied scientifically, or are there limits to what we can ask?