PSYCH 201B

Statistical Intuitions for Social Scientists

Welcome!

01/05/2026

Today's Plan: **We won't go the whole time**

1. Introductions (~30m)
2. Course Logistics (~15m)
3. What to expect (~15m)

Today's Plan: **We won't go the whole time**

1. **Introductions (~30m)**
2. Course Logistics (~15m)
3. What to expect (~15m)

1: Meet your Instructional Team

Eshin Jolly, PI (SciMinds)

Background:
Computational Social Neuroscience
PhD & Post-doc @ Dartmouth College
"Naturalistic" experimental designs
fMRI + multi-player online experiments
Interests: Playing/seeing music, sunlight, food
Fun fact: My cat jumped off my 5th floor patio when I first moved to SD, but survived due to her righting reflex and orthopedic surgery

Jane Yang, GR (TA)

Background:
2nd-year PhD in the Visual Learning Lab with Dr. Bria Long; how infants learn from their everyday visual experiences; prior two years post-bac at UT Austin.
Interests: gardening (& battling with gophers), cooking, crossfit
Fun fact: I grew up with a goat who loved guava leaves and a not-so-friendly goose Now I have a bunny, Mochi, who's an almost 5-years-old boy from Texas.

1: Now we'd like to meet you!

Lets go one-by-one (2-3 min) and introduce yourselves

1. Background & research interests
2. Current research project
3. How you felt after finishing 201A
4. How you're feeling about 201B

Today's Plan: **We won't go the whole time**

1. Introductions (~30m)
2. **Course Logistics (~15m)**
3. What to expect (~15m)

2: How we'll learn

- **When & Where**
  - This room always (Crick conference)
  - M/T/W - attendance is expected but we can be accommodating as things come up
  - No scheduled exams of any kind (mid-term or final-exam)
- **Course Website: stat-intuitions.com**
  - Not yet updated (last year's materials)
  - Will be updated by EOW (syllabus, schedule, etc)
  - In general: Mon (lecture), Tue (lab), Wed (hybrid)

2: How we'll learn

- **Communication: Slack**
  - All course announcements, updates, etc
  - You should all be part of the class channel already; reach out to us if you're not
- **Assignments: Github Classroom**
  - How you'll access course materials and submit all the work you'll do
  - If you don't have a github account we'll help you out at lab tomorrow
  - You will not submit anything on Canvas! Instructors will use to input grades only

2: How we'll learn

- **Lectures**
  - Overview slides (20-30m max)
  - Reading discussions
  - Interactive tutorials together
- **Labs**
  - Where you'll build your real Python and statistical chops running Quarto files locally
  - We'll be around for support, but you should work together and help each other out!
- **HWs**
  - Just like labs but you'll complete individually

2: How we'll learn

- **Final Project**
  - We're still finalizing details but our goal it to make this practically useful for you
  - Expect to submit a publication-quality Methods & Results section and Abstract
  - You'll have some options that we'll discuss more as the term progresses:
    - Solo project extending work you did in 201A
    - Group project collaborating via Github
    - Analyze existing real dataset in your lab
    - We simulate a dataset for you

2: Mastery-based Grading

30% - Labs & Engagement

- Full credit for earnestly attempting and submitting all lab assignments on-time; it's ok if you have errors/inaccuracies!
- In-person engagement: lectures & discussions
- Github engagement: issues & PRs with peers/ instructors

2: Mastery-based Grading

40% - HWs

- Scored multi-part questions
  - Did you attempt it?
  - Did you demonstrate understanding?
  - Did you get the expected answer?
- You can update your submission after we review to get points you missed and improve your score!

2: Mastery-based Grading

30% - Final Project

- We'll provide additional details and a rubric
- You'll meet with us to finalize your plan (~week 7)

2: Mastery-based Grading

30% - Labs & Engagement

40% - HWs

30% - Final Project

Questions?

Today's Plan: **We won't go the whole time**

1. Introductions (~30m)
2. Course Logistics (~15m)
3. **What to expect (~15m)**

3: Course Goals

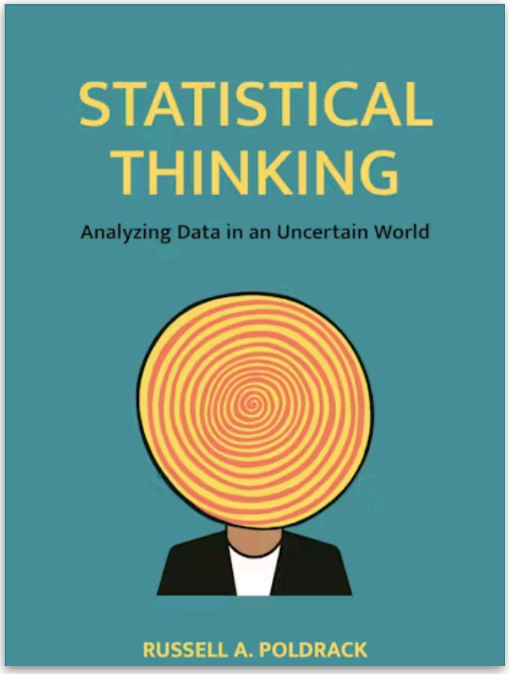
By the end of the term I want you to feel **empowered** and **formidable** in your Python, analytic, and statistical skills!

3: (a) Developing statistical intuitions

"**Statistical thinking** will one day be as necessary for efficient citizenship as the ability to read and write."

~ Samuel S. Wilks, 1951

of χ^2 and the log-likelihood ratio!



Statistical Thinking: *Analyzing Data in an Uncertain World*

Russell Poldrack

An essential introduction to statistics for students of psychology and the social sciences

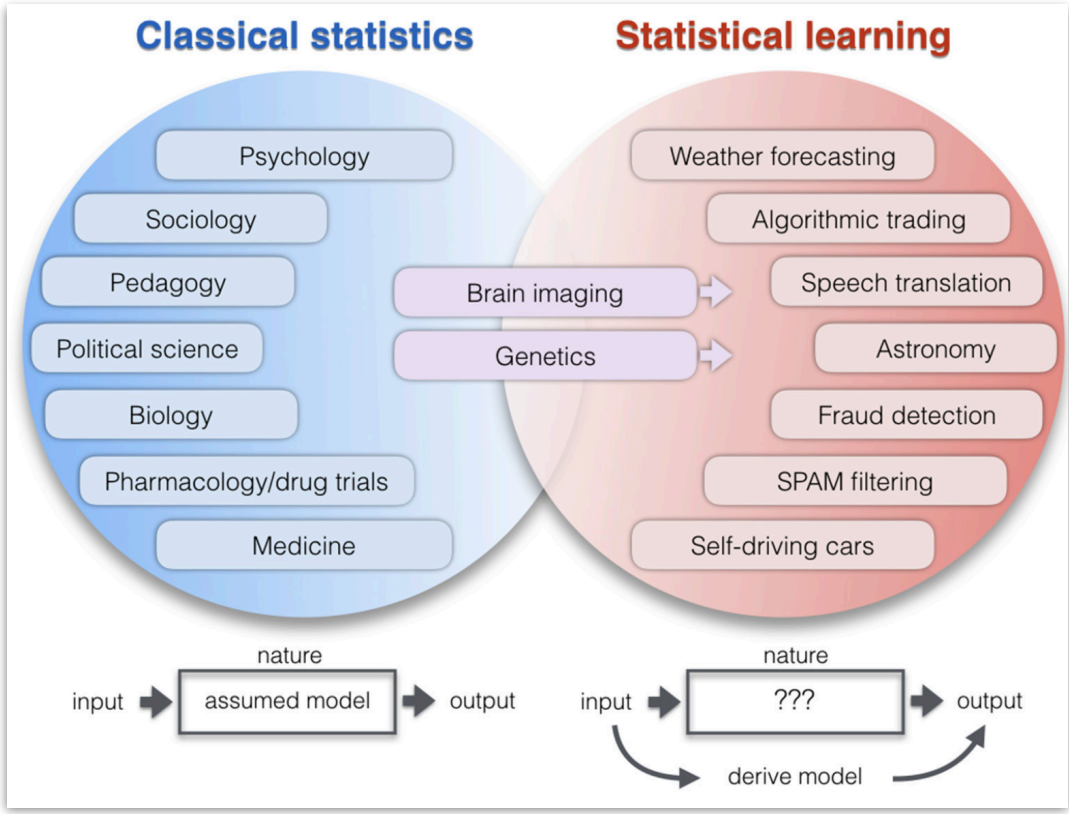
3: (b) Bridging cultural differences

Statistical Science
2001, Vol. 16, No. 3, 199–231

Statistical Modeling: The Two Cultures

Leo Breiman

Abstract. There are two cultures in the use of statistical modeling to reach conclusions from data. One assumes that the data are generated by a given stochastic data model. The other uses algorithmic models and treats the data mechanism as unknown. The statistical community has been committed to the almost exclusive use of data models. This commitment has led to irrelevant theory, questionable conclusions, and has kept statisticians from working on a large range of interesting current problems. Algorithmic modeling, both in theory and practice, has developed rapidly in fields outside statistics. It can be used both on large complex data sets and as a more accurate and informative alternative to data modeling on smaller data sets. If our goal as a field is to use data to solve problems, then we need to move away from exclusive dependence on data models and adopt a more diverse set of tools.



3: (c) Programming as theory-building

A program (Python/R) is simply a *hypothesis* made *executable*

Programming doesn't just implement an idea — it forces your understanding to become *precise* enough to fail when it makes contact with the real-world

PETER NAUR, PROGRAMMING AS THEORY BUILDING

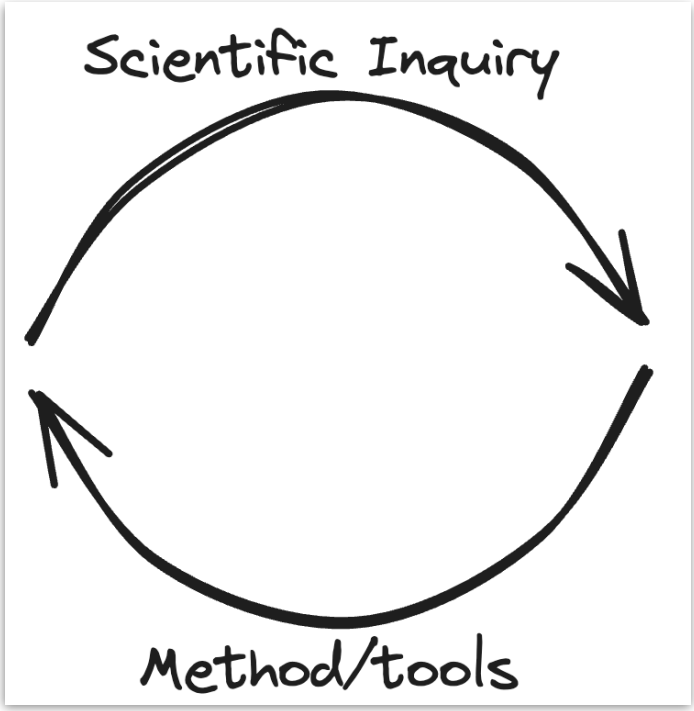
Peter Naur, widely known as one of the authors of the programming language syntax notation "Backus-Naur Form" (BNF), wrote "Programming as Theory Building" in 1985. It was reprinted in his collection of works, *Computing: A Human Activity* (Naur 1992).

This article is, to my mind, the most accurate account of what goes on in designing and coding a program. I refer to it regularly when discussing how much documentation to create, how to pass along tacit knowledge, and the value of the XP's metaphor-setting exercise. It also provides a way to examine a methodol-

"PROGRAMMING AS THEORY BUILDING"

Introduction

The present discussion is a contribution to the understanding of what programming is. It suggests that programming properly should be regarded as an activity by which the programmers form or achieve a certain kind of insight, a theory, of the matters at hand. This suggestion is in contrast to what appears to be a more common notion, that programming should be regarded as a production of a program and certain other texts.



3: What to expect

- **First few weeks**
  - We'll go slowly in the beginning
  - Lots of Python basics, tutorials, resources
  - We'll do our best to extend your R knowledge
  - Things will be frustrating - that's ok!
  - I promise what take you *hours* early in the course will take you *minutes* later!
- **Feedback**
  - Your feedback is incredibly important to us: Slack, Github, Email, Course surveys (later)

See you tomorrow @2pm for Lab 1 (setup & orientation)

We'll stick around for questions

1. Make sure you're setup on **Slack**
   - We'll post any additional info before lab tomorrow there (e.g. links)
2. Make sure to bring your **laptop**
   - Don't worry about your previous setup or the fundamentals workshop before 201a
   - We'll setup everything fresh and make sure everything works without interfering with your existing tools