

Psychology 241: Models of Social Behavior

Project-based seminar

Tuesdays and Thursdays, 2:15 - 4:05

Littlefield 107

Instructors

- Jamil Zaki (420-132), Office hours: Wed 1 - 3, [appointments](#)
- Noah Goodman (420-356), Office hours TBA
- Michael Frank (420-278), Office hours: Mondays 2 - 4, [appointments](#)

Course Description

How do we reason about other people and ourselves? Is human behavior in social situations a set of ad-hoc and irrational responses – or can we understand humans as making rational inferences under uncertainty about the people they are interacting with? This project-based seminar will re-examine classic findings from social psychology and affective science through the lens of rational analysis and probabilistic models. In collaboration with instructors, students will develop projects focused on making testable theoretical models of classic tasks and literatures with the goal of creating a publishable end product. Phenomena under consideration include but are not limited to: cognitive dissonance, attribution theory, mindset theory, stereotyping, and emotion perception.

Teaching Goals

Students will:

- Explore literatures from social psychology and affective science from the perspective of a modeler,
- Learn how to adapt qualitative experimental paradigms to be suitable for quantitative modeling,
- Apply the probabilistic modeling approach to novel social behaviors and assess its applicability, and
- Develop an original project using probabilistic modeling techniques to predict human behavior across a range of conditions.

Prerequisites

Students are strongly encouraged to first take Psych 204 (on probabilistic models). For undergraduates wishing to participate this course is a required pre-requisite, except by special permission of the instructors.

The Project

The goal of this class will be a piece of original research from each group, suitable for presentation at a major conference such as CogSci or SPSP.

We will assemble 4 - 6 groups during the 2nd week of class. Students will fill out a questionnaire ranking their interests in our suggested project topics, as well as their background in modeling and social psychology / affective science. Suggested topics are as follows:

1. Inferences about people in general (mindsets)
2. Inferences about groups (e.g., stereotyping)
3. Inferences about individuals (attribution, fundamental attribution errors)
4. Inferences about self (e.g., stereotype threat)
5. Inferences about emotions (appraisal, misattribution of arousal)
6. Distortion of social inferences in psychopathology.

Project milestones / assignments

Students will take their project through 4 major milestones, one in each ~2 week period of the quarter. Each will be associated with a graded assignment as follows:

- **Background:** Students will choose a set of key readings about your topic and specific project idea, and lead the class in a ~45 minute discussion. Following this, write a background summary (4-6 pages) and introduction to your project.
- **Model:** Each group will create a probabilistic model of their phenomena, as well as describe alternative models and relations to non-formal theories of this phenomenon. Students will take ~45 minutes of class time to present and receive feedback on their operationalization.
- **Operationalization** of your topic: what paradigm, or data source will allow you to connect with quantitative modeling? Students will take ~45 minutes of class time to present and receive feedback on their operationalization.
- **Preliminary Data:** Students will collect behavioral data from MTurk in order to test their model, and analyze their data. Students will take ~45 minutes of class time to present and receive feedback on their initial analyses and results.
- **Final Presentation / Paper:** Students will prepare a relatively formal ~15 minute presentation on their full project for the final class session, and complete a final paper (10-12 pages) describing the entire project.
- **Class / Group Participation:** Students will be responsible for actively participating in class sessions and providing other groups with feedback, and also for being active members of their own project groups. Group members will anonymously evaluate each other to allow us to gauge each member's level of involvement in projects.

Week-by-week schedule

Weeks 1 - 3 will be an intensive introductory short course described here, while later weeks will feature discussions on targeted project areas, led by individual student groups. Weeks 4-10 will comprise students' presentations of various stages of their project, culminating in a final presentation open to all members of the psychology department on the last day of class (6/3).

Week 1 - Bayesian modeling of lay theories (Noah)

Bayesian models have been used very effectively to capture people's knowledge and commonsense reasoning: intuitive theories about the world. The key thread that connects this tradition to the affective and social realm is the central roles of lay theories. This course is about Bayesian models of lay theories.

04/01. Modeling lay theories.

Before class: work through primer on scheme syntax (probmods.org Chapter 12)

Reading: probmods.org, Chapters 1 and 2

- Why Bayesian techniques are good for thinking about theories
- Marr's levels of analysis - Link to David Marr's book, [Vision \(Chapter 1\)](#)
- Intro to generative models and probabilistic inference

04/03. Theories about people.

Before class: do exercises 1 and 2 of Chapter 1, and exercise 3 of Chapter 2.

Readings: probmods.org, Chapters 3 and 5

- Explaining away, with attribution example
- Reasoning about rational behavior of another agent
- The vending machine examples
- Weakening the rationality assumption

Week 2 - Fitting models to data (Mike)

During this week we will discuss why we make models and how to connect models to data. We'll focus on discussing the practical and theoretical issues underlying making the claim that a model provides a formal theory for a particular domain or phenomenon.

[Handout for these two classes](#)

04/08. Why model?

Before class: fill out [this form](#) about project topics

Readings: [Roberts & Pashler \(2000\)](#), [Frank \(2013\)](#), [Wigener \(1960\)](#)

- What makes a model useful?
- Trading off flexibility and fit to data
- The "formal theories" approach

04/10. Case studies of model evaluation

Before class: find a published graph comparing a model to empirical data and send it to Mike. Prize for the best one.

Readings: [Kerman et al. \(2006\)](#), [Pitt & Myung \(2002\)](#), and [this blogpost](#).

- Putting a model through its paces by analyzing (A) the individual case study, (B) the range of phenomena, and (C) a variety of models
- Visualizations for these: (A) idiosyncratic model plot, (B) model vs. data, (C) parameter plots, (D) model comparison
- Fit statistics: simple r , MSE, etc.
- Longer-form exposition of what a project is, plus info about forming groups

Week 3 - Lay theories: the phenomena (Jamil)

During this week, we will leverage what we have learned about modeling more generally to consider classic topics from social psychology through a new lens. We will begin with inferences about others, and move (on Thurs) to inferences individuals make about themselves.

04/15. Theories about the self

Readings: [Dweck and Leggett. 1988](#); [Schachter & Singer. 1962](#); Optional: Abramson, Seligman, & Teasdale, 1978

Additional supplemental reading: [Funder. 1987](#)

Inspiration for modeling: [application of Bayesian techniques to learned helplessness](#).

04/17. Theories about other people

Readings: [Kelley. 1973](#); [Gopnik & Wellman. 1992](#); optional: [Epley & Waytz. 2009](#)

Week 4: Student Presentations

04/22. Background: Groups 1 & 2

04/24. Background: Groups 3 & 4

Week 5: Student Presentations

04/29. Operationalization 1: Groups 1 & 2

05/01. Operationalization 1: Groups 1 & 2

Week 6: Student Presentations

05/06. Models round 1: Groups 1 & 2

05/08. Models round 1: Groups 3 & 4

Week 7: Student Presentations

05/13. Models round 2: Groups 1 & 2

05/15. Models round 2: Groups 3 & 4

Week 8: Student Presentations

05/20. Data / simulations round 1: Groups 1 & 2

05/22. Data / simulations round 1: Groups 1 & 2

Week 9: Student Presentations

05/27. Data / simulations round 2: Groups 1 & 2

05/29. Data / simulations round 2: Groups 1 & 2

Week 10: Final Presentations

06/03. Final Presentations: Groups 1-6