Psyc 60: Intro to Statistics

Prof. Judith Fan

Spring 2022

Lecture 1: What is statistics? Overview of the course

Why learn statistics in psychology?

How this course will work.

Tell us about yourself.

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does sleep affect how we feel?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How universal is music across cultures?
- How does Netflix know what I want to watch next?

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- And when do people decide to make risky bets?
- How does social media affect our moral behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How wide[illegible]are people's standards of beauty?

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How widely shared are people's standards of beauty?

measure measure

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How widely shared are people's standards of beauty?

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our moods and behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How widely shared are people's standards of beauty?

Big Idea 1: data vs. anecdote

We are better off asking lots of people systematically rather than relying on our own intuition or personal experiences.

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How widely shared are people's standards of beauty?

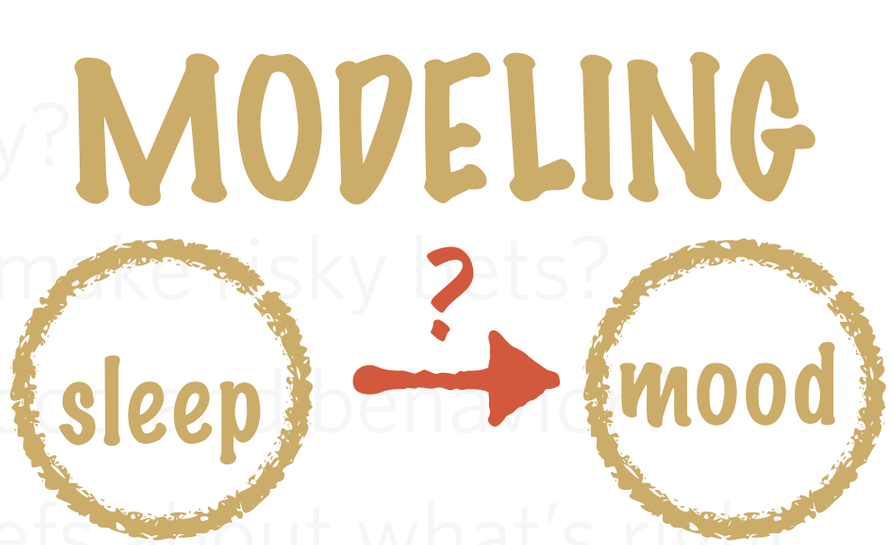
Big Idea 2:
power of sampling

We can learn about people in general without asking everyone.

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

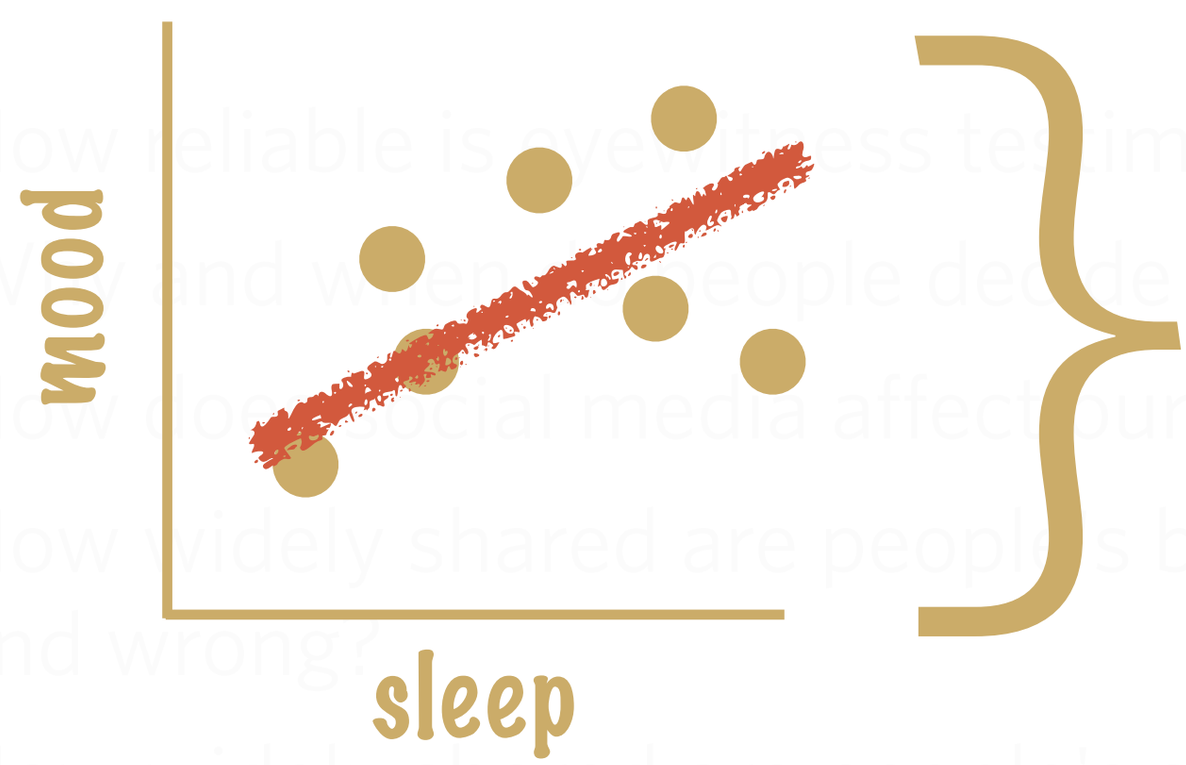
- How does **sleep** affect **how we feel**?



1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How widely shared are people's beliefs about what's right and wrong?
- How widely shared are people's standards of beauty?



MODELING

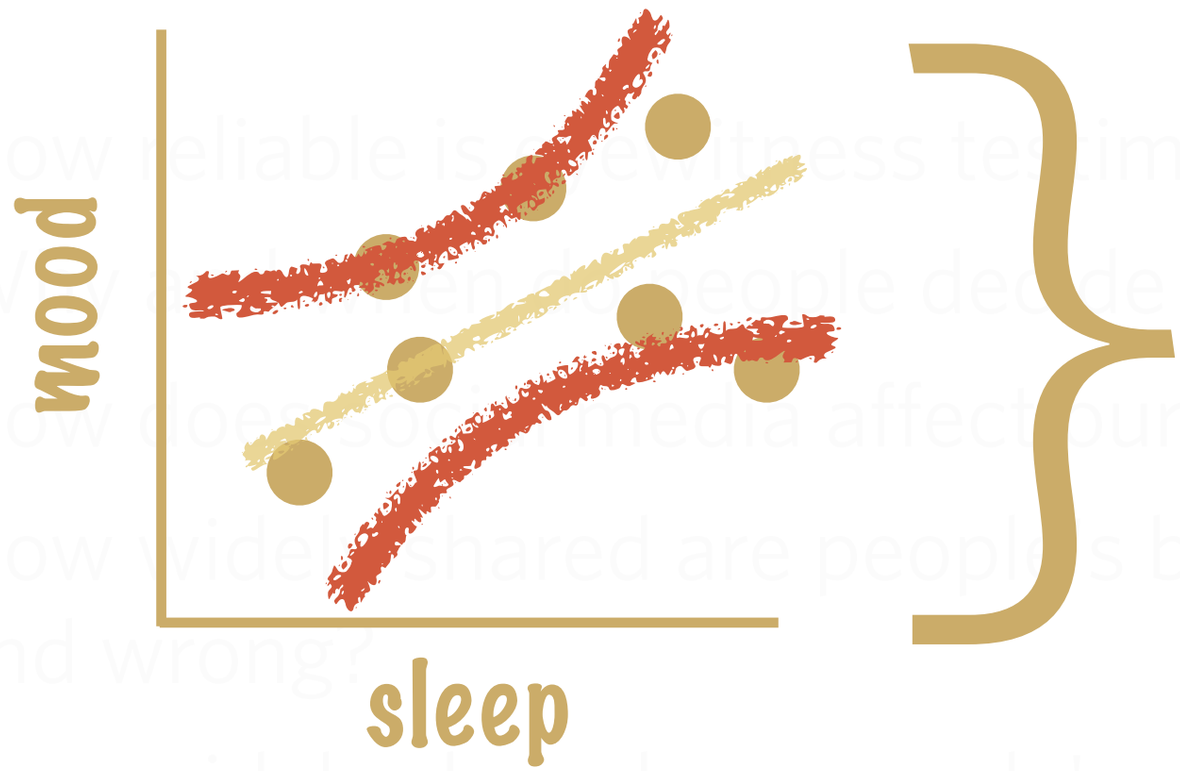
estimation

"How strong is the link?"

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?



MODELING

estimation

"How strong is the link?"

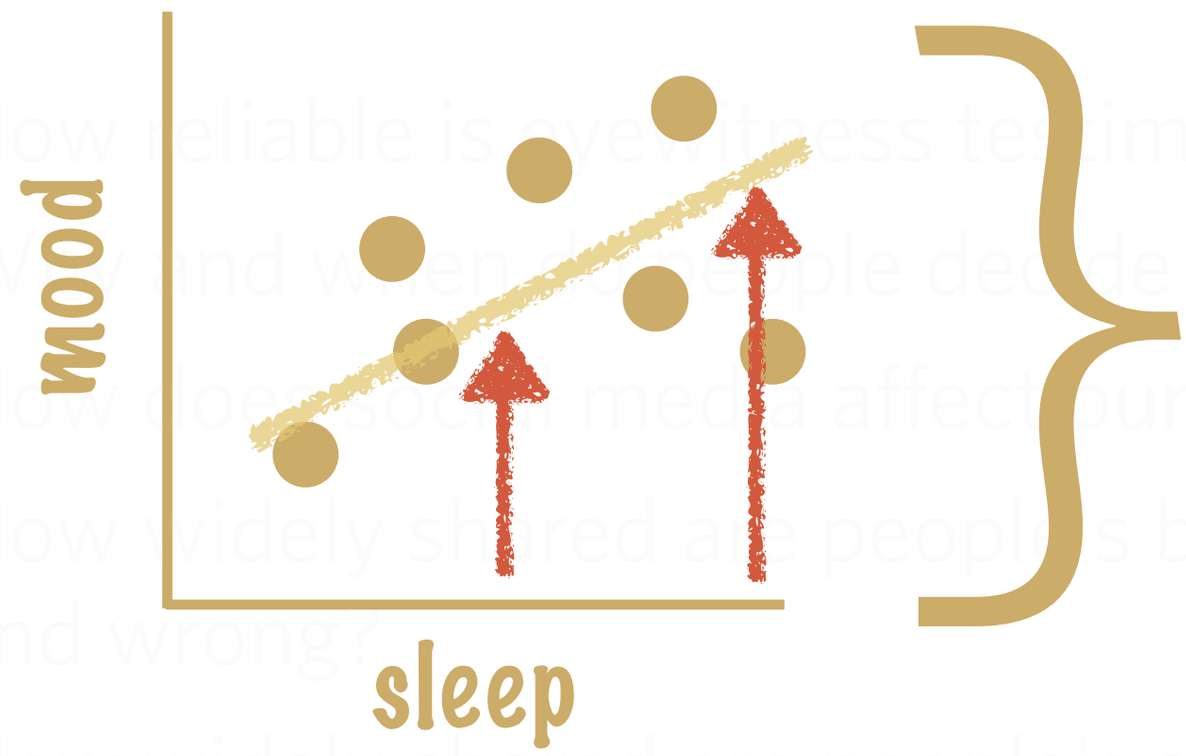
uncertainty

"How sure are we?"

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?



MODELING

estimation

"How strong is the link?"

uncertainty

"How sure are we?"

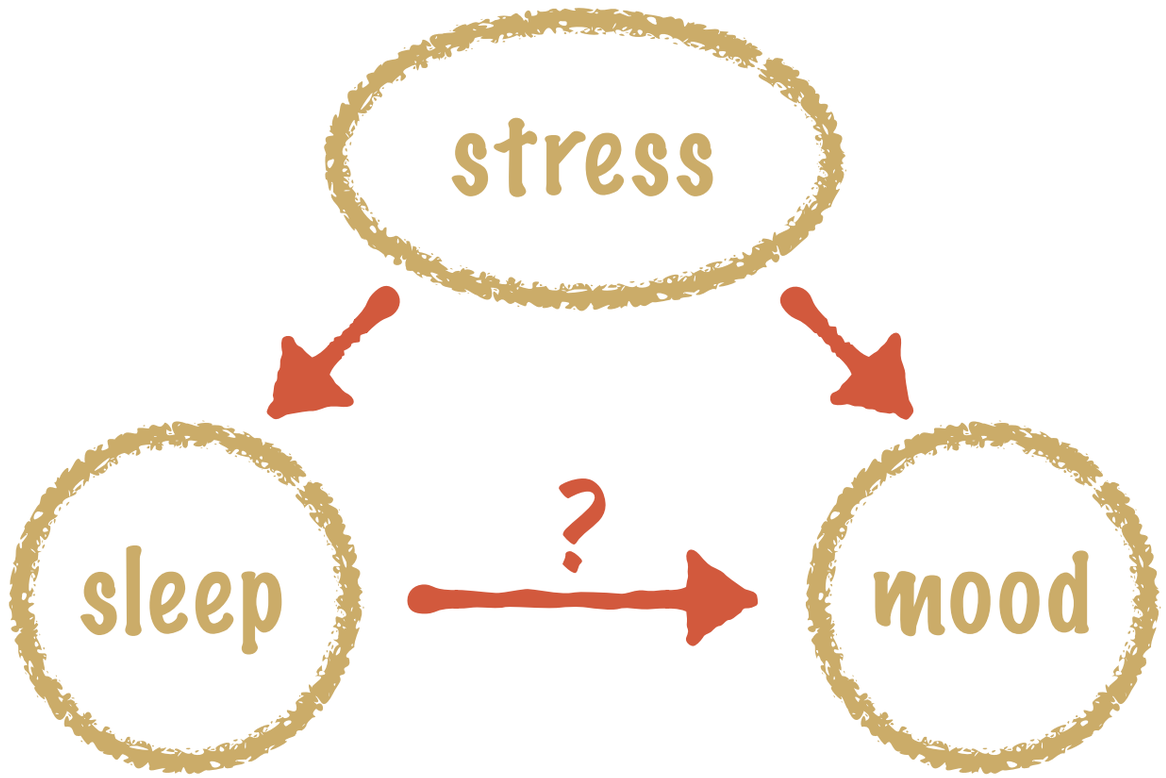
prediction

"What's our best guess?"

1 *Why learn statistics in psychology?*

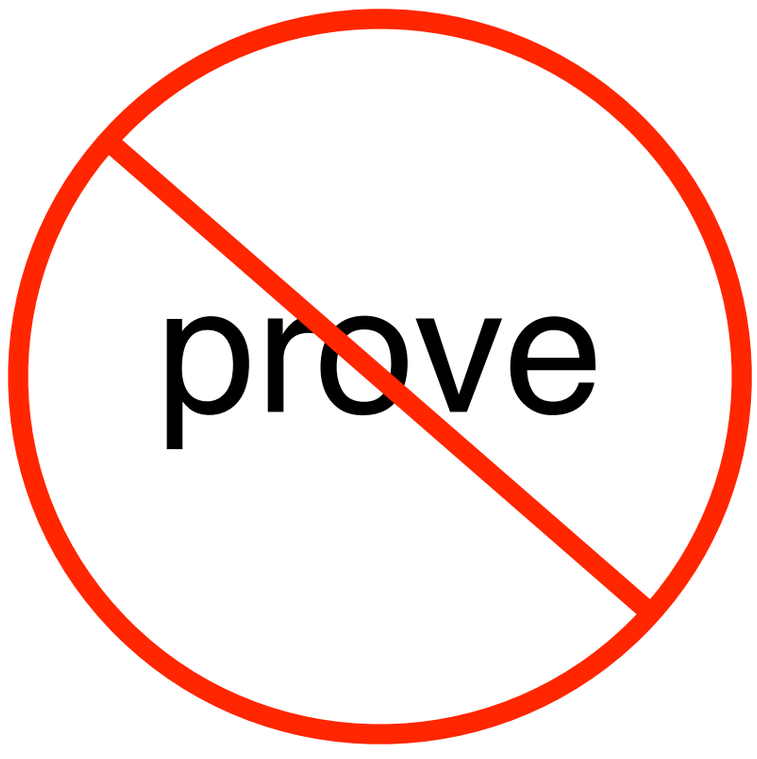
The same reasons to be interested in psychology.

- How does **sleep** affect **how we feel**?



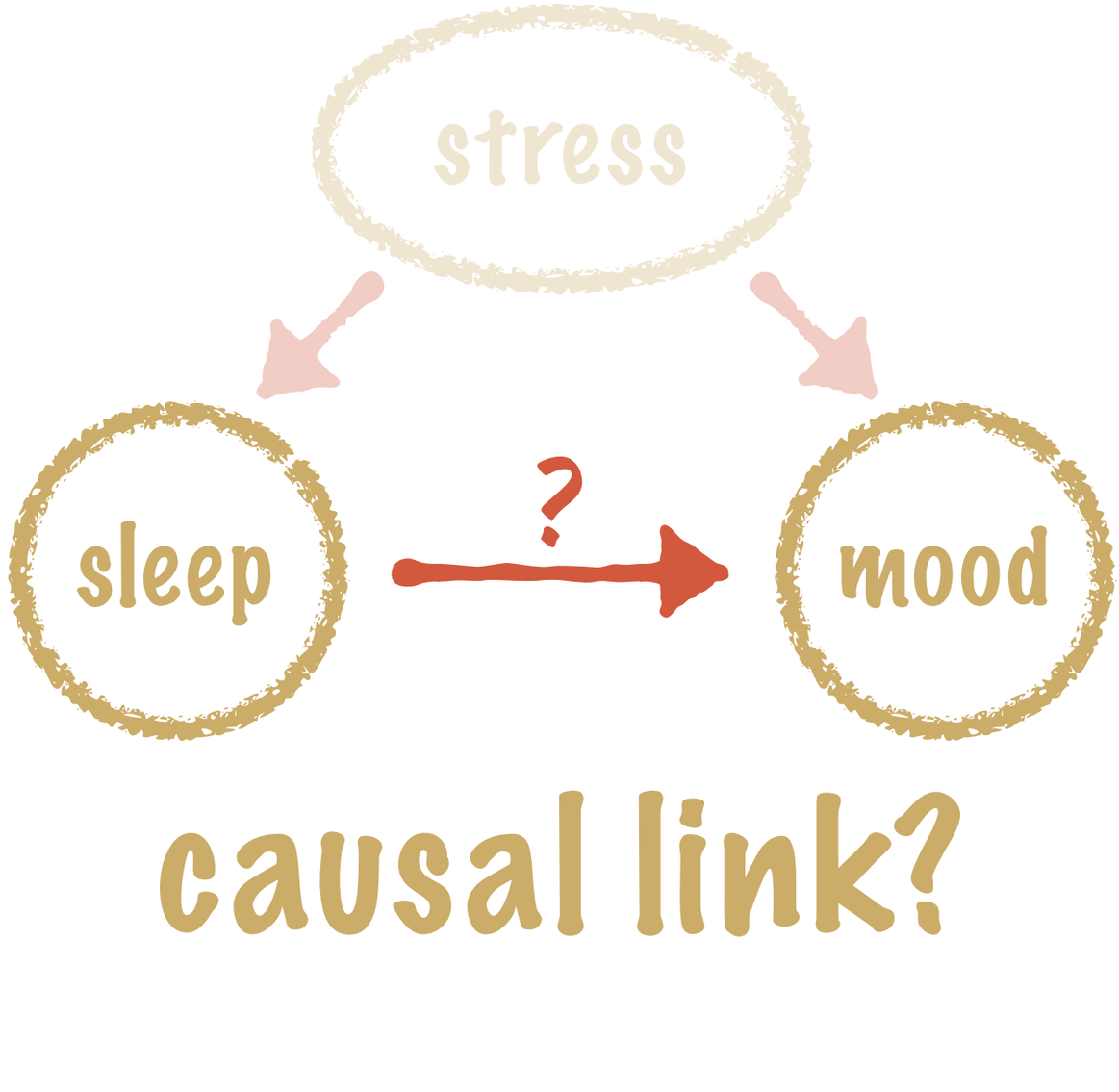
1 *Why learn statistics in psychology?*

How could we establish with more certainty that getting more sleep can improve your mood?



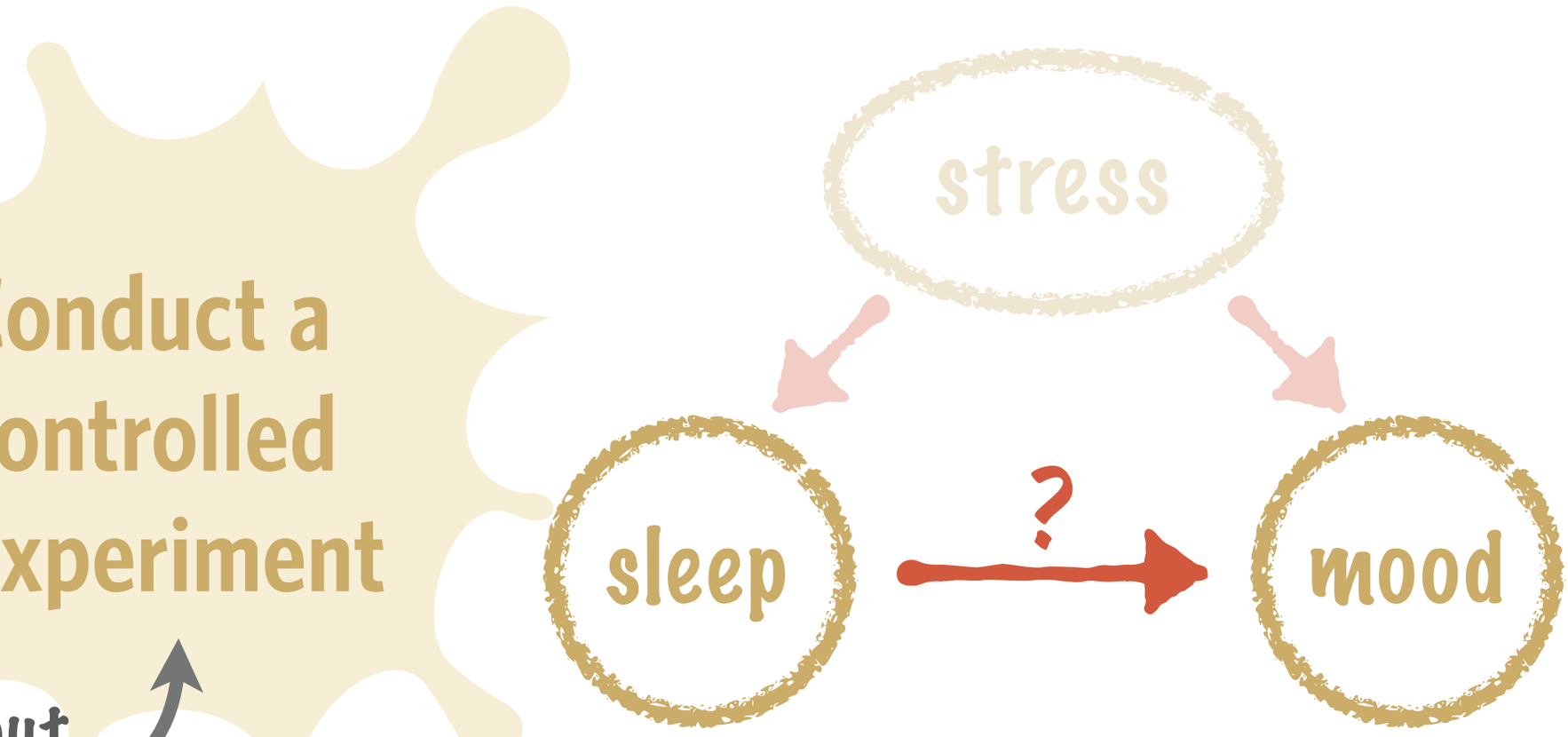
1 *Why learn statistics in psychology?*

How could we establish with more certainty that getting more sleep can improve your mood?



1 *Why learn statistics in psychology?*

How could we **establish with more certainty** that getting more sleep can improve your mood?



Conduct a controlled experiment

Learn more about these in PSYC 70

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does sleep affect how we feel?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How universal is music across cultures?
- How does Netflix know what I want to watch next?

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does sleep affect how we feel?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- **How does social media affect our mood and behavior?**
- How universal is music across cultures?
- How does Netflix know what I want to watch next?

CrossMark
click for updates

Experimental evidence of massive-scale emotional contagion through social networks

Adam D. I. Kramer[a,1], Jamie E. Guillory[b], and Jeffrey T. Hancock[c,d]

[a]Core Data Science Team, Facebook, Inc., Menlo Park, CA 94025; [b]Center for Tobacco Control Research and Education, University of California, San Francisco, CA 94143; and Departments of [c]Communication and [d]Information Scie

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and appr

Emotional states can be transferred to others via emoti contagion, leading people to experience the same emot without their awareness. Emotional contagion is well establis in laboratory experiments, with people transferring positive negative emotions to others. Data from a large real-world s network, collected over a 20-y period suggests that longer-las moods (e.g., depression, happiness) can be transferred thro networks [Fowler JH, Christakis NA (2008) *BMJ* 337:a2338] though the results are controversial. In an experiment with pe who use Facebook, we test whether emotional contagion oc outside of in-person interaction between individuals by redu the amount of emotional content in the News Feed. When pos expressions were reduced, people produced fewer positive p and more negative posts; when negative expressions were duced, the opposite pattern occurred. These results indicate emotions expressed by others on Facebook influence our emotions, constituting experimental evidence for massive-s contagion via social networks. This work also suggests tha contrast to prevailing assumptions, in-person interaction and verbal cues are not strictly necessary for emotional contagion, that the observation of others' positive experiences constit a positive experience for people.

computer-mediated communication | social media | big data

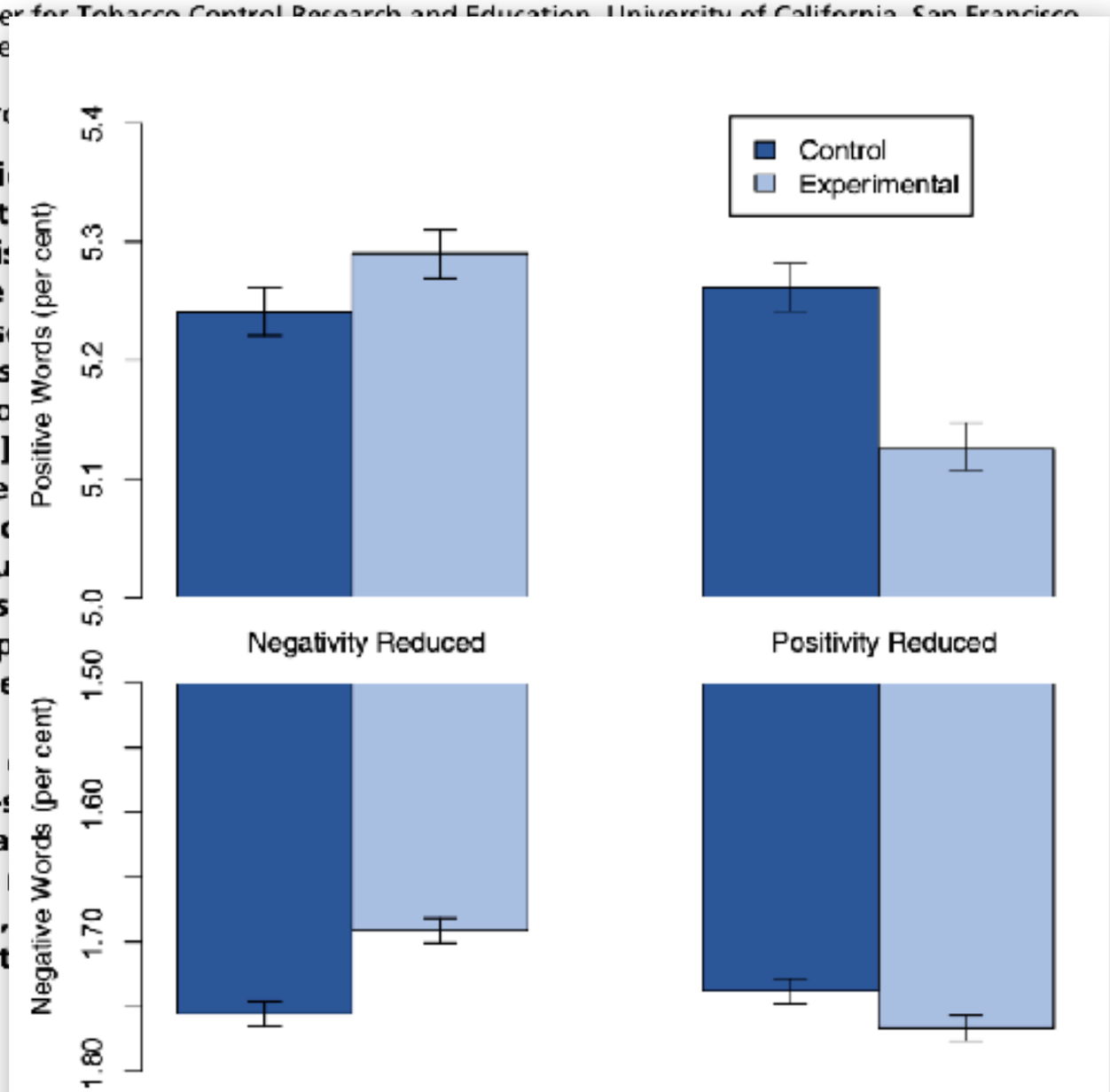


Fig. 1. Mean number of positive (*Upper*) and negative (*Lower*) emotion words (percent) generated people, by condition. Bars represent standard errors.

Emotional states can be transferred to others via emoti
contagion, leading them to experience the same emotion
those around them. Emotional contagion is well established in
to verbal affective expressions leads to similar verbal expressions.

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does sleep affect how we feel?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- **How universal is music across cultures?**
- How does Netflix know what I want to watch next?

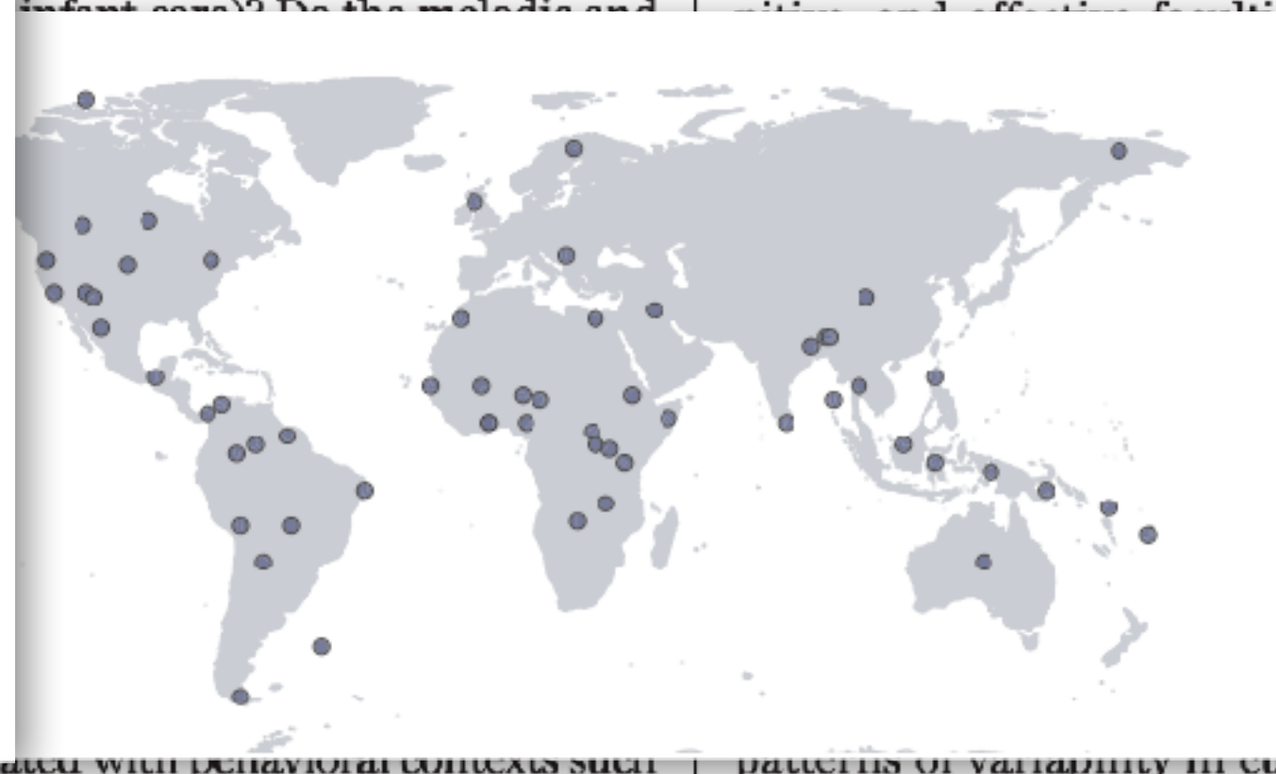
RESEARCH ARTICLE SUMMARY

PSYCHOLOGY OF MUSIC

Universality and diversity in human song

Samuel A. Mehr*, Manvir Singh*, Dean Knox, Daniel M. Ketter, Daniel Pickens-Jones, S. Atwood, Christopher Lucas, Nori Jacoby, Alena A. Egner, Erin J. Hopkins, Rhea M. Howard, Joshua K. Hartshorne, Mariela V. Jennings, Jan Simson, Constance M. Bainbridge, Steven Pinker, Timothy J. O'Donnell, Max M. Krasnow, Luke Glowacki*

associated with song, and how do
nong societies? Are the musical
song indicative of its behavioral



lodic and rhythmic bigrams fall
distributions; and that tonality
perhaps universal.

CONCLUSION: Music is in fact un
in every society (both with and
varies more within than betw
regularly supports certain ty
ior, and has acoustic features th
atically related to the goals an
singers and listeners. But mus
biological response with a sing
adaptive function: It is produce
diverse behavioral contexts th
mality, arousal, and religiosi
appear to be tied to specific p

1 *Why learn statistics in psychology?*

The same reasons to be interested in psychology.

- How does sleep affect how we feel?
- How reliable is eyewitness testimony?
- Why and when do people decide to make risky bets?
- How does social media affect our mood and behavior?
- How universal is music across cultures?
- **How does Netflix know what I want to watch next?**


NETFLIX
NARCOS


NETFLIX
MARVEL
DAREDEVIL


GOTHAM


ARROW


KILL BILL
VOLUME 2


prime


PAYCHECK


PULP FICTION


KILLING SEASON


GREASE

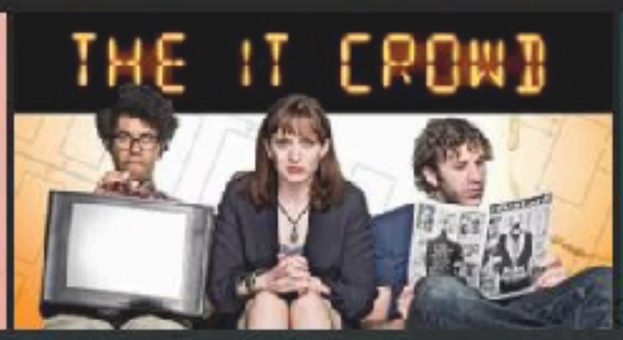

JOHN TRAVOLTA
Urban Cowboy


PULP FICTION


BROOKLYN NINE-NINE


NETFLIX
BLOODLINE


JANE THE VIRGIN


THE IT CROWD


NETFLIX

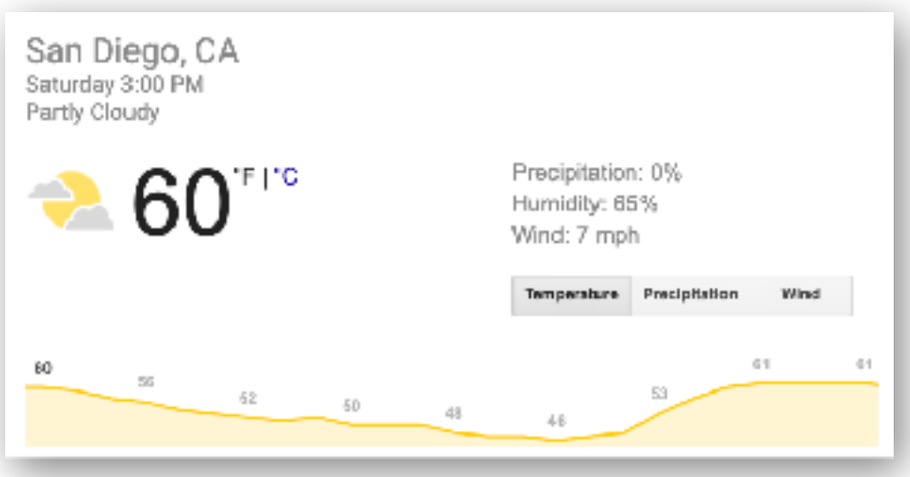
1 *Why learn statistics in psychology?*

Statistics is a fundamental part of modern life.

spam filtering

CDC vaccine rec.

weather forecasts



face tagging

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

-H.G. Wells *(by way of Samuel S. Wilks)*

Lecture 1: What is statistics? Overview of the course

Why learn statistics in psychology?

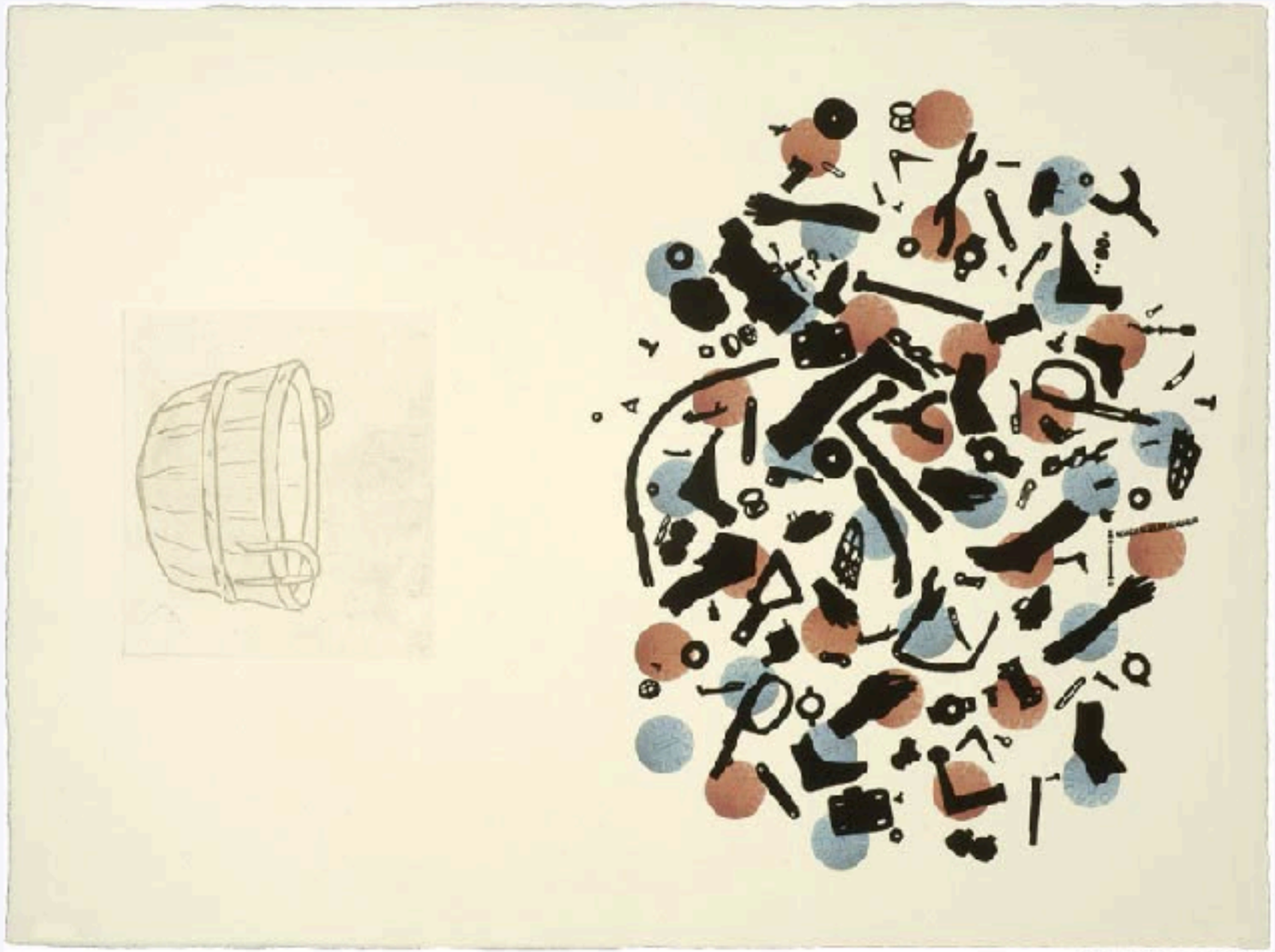
How this course will work.

Tell us about yourself.

cognitive tools lab

reverse engineering the human cognitive toolkit

- News
- About
- People
- Research
- Publications
- Prospective Lab Members

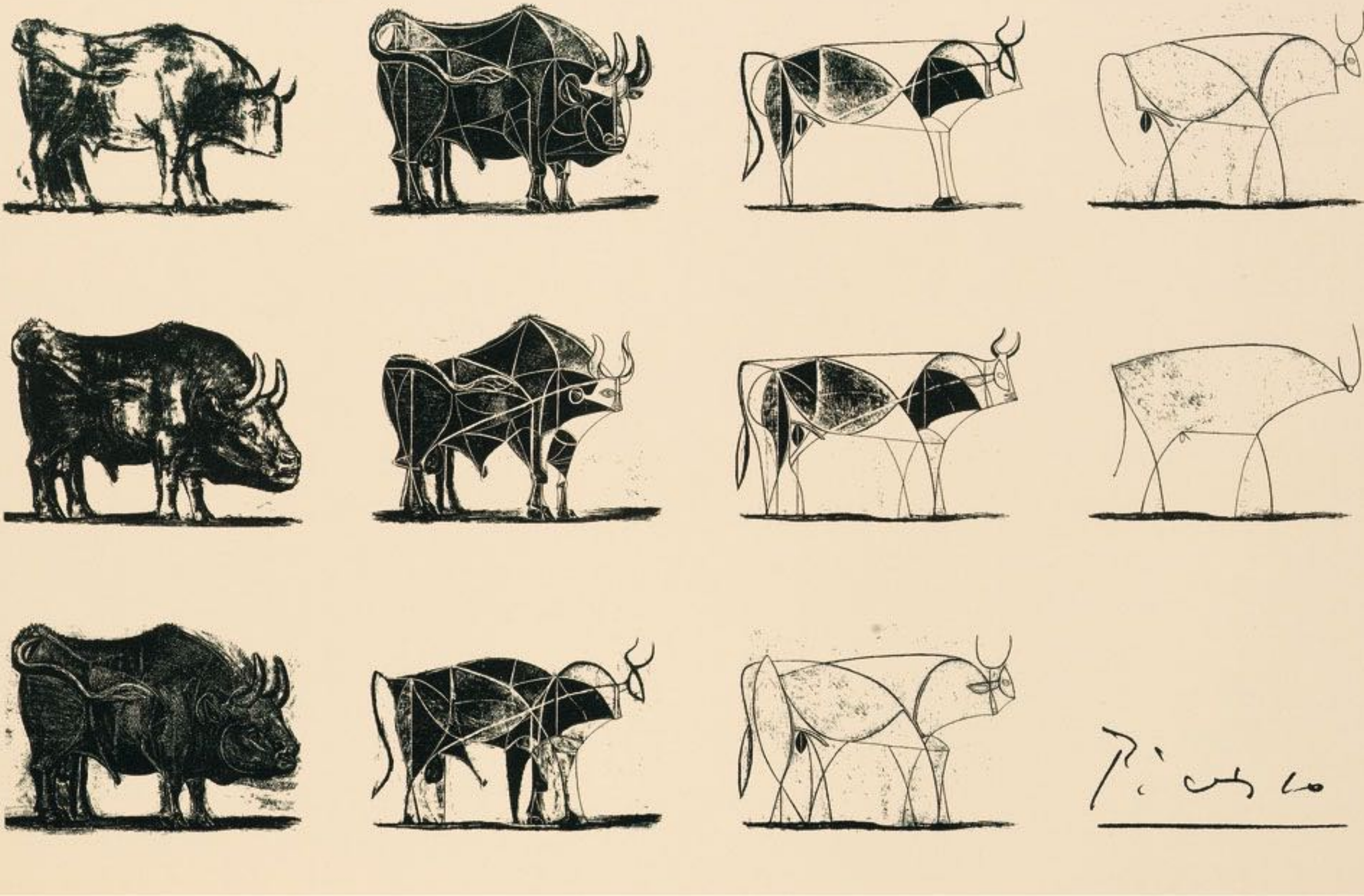


art credit: Lisa Bulawsky

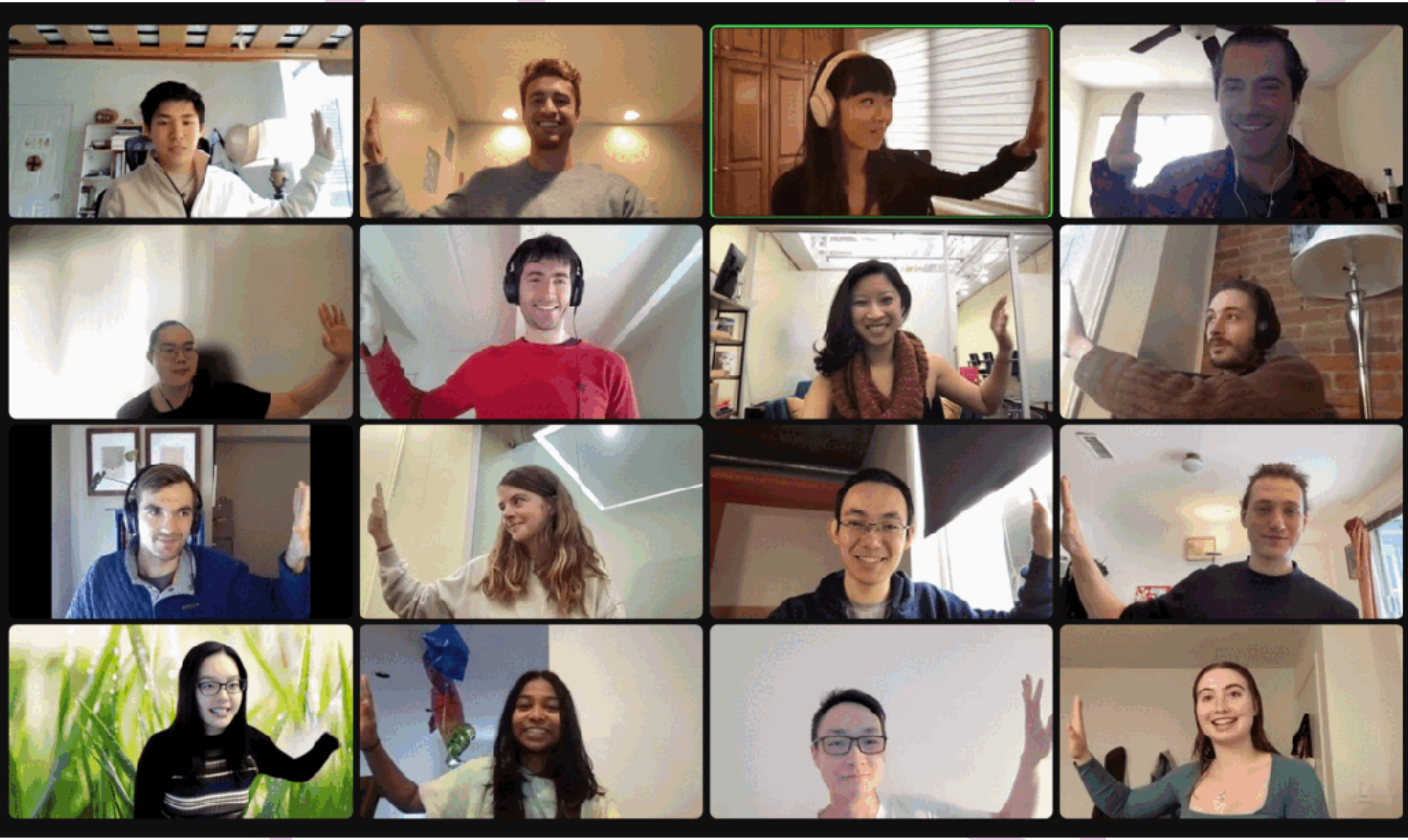
© 2019 cognitive tools lab Jekyll Themes

https://cogtoolslab.github.io/

Picasso's Bull Series (1945)



cognitive tools lab @ uc san diego



2 *How this course will work.*

Meet the PSYC 60 Teaching Team:

- Instructor: Prof. Judith Fan (she/her)
- Teaching Assistants (TAs)
  - Amy Fox
  - Holly Huey
  - Simran Barnwal
  - Zoe Tait
  - Vryan Feliciano
  - Lea Bronnimann
  - Justin Yang

2 *How this course will work.*

Core learning goals:

- **Statistical literacy:** The ability to dissect and understand statistical claims in scientific research and popular media

- **Statistical ability:** The skills necessary to apply statistical analysis methods to real data

- **Statistical curiosity:** The interest in further developing their statistical skills and knowledge, and the confidence in their ability to do so

2 *How this course will work.*

My instructional philosophy:

- Emphasize conceptual understanding over rote memorization.
- Reward deep thinking over simply getting the right answer.
- Prioritize hands-on activities over listening to me talk.
- Give you authentic experience with modern statistical tools.
- Continually improve this course over time.

2 *How this course will work.*

Tools we will use in this class.

- **Course website:** Find full syllabus at: https://psyc60.github.io
- **Canvas:** For releasing quizzes & submitting assignments
- **R:** a programming language for doing statistics
- **Jupyter notebooks:** a browser-based docs for writing code and seeing what your code does
- **Slack:** forum for asking & answering each other's questions; communicating with your TA

2 *How this course will work.*

My expectations & your responsibilities:

- **Show up.** This means attending lectures, sections, and the final project showcase.
- **Try.** This means engaging sincerely with the material, especially when it's hard. Do your best to figure things out on your own (e.g., Googling it, or checking the syllabus) before going to someone else for help.
    - **PSYC 60 will be challenging and will require a large time investment (~6-8 hours a week).** Please budget time in your schedule accordingly.
- **But ask for help when you need it.** Come to office hours, post questions on Slack.
- **Be professional.** Be respectful, courteous, and thoughtful when communicating with one another in class, on Slack, and with members of the teaching team.

2 *How this course will work.*

Speaking of showing up & trying:

- **Attendance is expected** at all lectures & sections to participate in classroom activities. "Lecture" is a misnomer in this class — you'll be spending this time mostly on hands-on collaborative activities with your classmates. "Discussion section" is where you will be working towards various milestones for your final project. Missing lecture/section a couple times won't *necessarily* hurt your grade, but it could if you make a habit of it.
- **Participation is encouraged.** Since you won't be listening to me talk at you most of the time, please do your best to participate in group activities & discussions.
  - *Tell us about your technology situation in today's end-of-class survey.*

2 *How this course will work.*

Speaking of showing up & trying:

- **Lectures will not be recorded/podcasted.** The reason for this is that there are no traditional lectures in this course. At the beginning of class I will typically review upcoming deadlines & make some general announcements, but all of this information is always available on the course website and will be broadcast over Canvas announcements.
- **There is no Zoom link to join lecture/section remotely.** All lectures and sections will be held in-person this quarter. Some OH will be hybrid (in-person and Zoom), though.

2 *How this course will work.*

Interaction with instructional team:

- **Office hours.** My OH are from 11-12PM on Thursday mornings after class. Check course website for your TA's OH.
- **Slack.** Ask & answer each other's questions.
- **Section.** Talk to your TA during section & their OH.
- **Email.** Reach out to us via **Slack** ONLY. Please do not contact any instructor/TA via their personal email address or on Canvas with course questions (you aren't guaranteed to receive a reply).

2 *How this course will work.*

Assessment and grading

- Grades will be determined as follows:
  - CourseKata modules (40%): embedded exercises in free, online textbook.
  - Final project (28%): work towards project milestones with your project group throughout the quarter.
  - Labs (20%): 5 labs, broken down into 2-3 sections each.
  - Quizzes (10%): 5 practice quizzes and 5 real quizzes.
  - SONA participation (2%): 3 credit hours.

2 *How this course will work.*

Questions?

- Spend the next 5 minutes reading the syllabus at **https://psyc60.github.io/** and discussing any questions you have with the other members of your breakout room.

- Jot down any questions you have and share them in the survey distributed at the end of class.

2 *How this course will work.*

What is R?

A computer programming language and software environment for doing statistics.

What are Jupyter notebooks?

A browser-based environment that makes it nicer to use R without having to install any new software on your computer.

Why R & Jupyter?

Work more directly & flexibly with raw data; learn a crucial & marketable skill; gain deeper understanding of statistics; it is free to use & open-source.

2 *How this course will work.*

Using R & Jupyter in this course.

These software tools are made available to you free of charge (they are 100% free for everyone). To make it easier, we're accessing them through DataHub.

What if I have no programming experience?

That is okay! You will get plenty of structured practice on CourseKata, in the labs, and through your final project.

Why do I have to learn programming?

It will help you think about and work with data much more flexibly. It will also give you a highly marketable skill you can brag about to future employers.

Lecture 1: What is statistics? Overview of the course

Why learn statistics in psychology?

How this course will work.

Tell us about yourself.

Student Background Survey

The purpose of this survey is for the teaching team to get to know you, how you think about learning, and relevant aspects of your circumstances that may affect your learning experience in this course.

CONTRIBUTE TO EDUCATIONAL RESEARCH!

Before you begin, please note that as a student in this course you are being invited to take part in an educational research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to review the "Consent Form" linked in the survey.

If you have any questions, please reach out to your TA via Slack.

rof. Judith Fan

ring 2022

UC San Diego, La Jolla, CA

Student Background Survey

During Week 1, please complete the linked background survey. The purpose of this survey is for the teaching team to get to know you, how you think about learning, and relevant aspects of your circumstances that may affect your learning experience in this course.

Feedback

We welcome student feedback regarding the course at any point. Please feel free to send your TA a Slack message, or leave anonymous feedback for the teaching team by using our online form.

Acknowledgements

Many thanks to Prof. Ji Son, Prof. James Stigler, everyone in the UCLA Teaching and Learning Lab, Prof. Russ Poldrack and Prof. Tobias Gerstenberg for generously sharing their instructional materials.

On this page

PSYC 60 Spring 2022 | Student Background Survey

WELCOME
Welcome to PSYC 60! The purpose of this survey is for the teaching team to get to know you, how you think about learning, and relevant aspects of your circumstances that may affect your learning experience in this course.

CONSENT TO PARTICIPATE IN EDUCATIONAL RESEARCH
Before you begin, please note that as a student in this course you are being invited to take part in an educational research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to review the following "Consent Form" linked here: https://drive.google.com/file/d/1BmgvxVuLI8XxpjzPVa6Tv4m2sR7JJw_e/view?usp=sharing. If you have any questions, please reach out to your TA via Slack. If you are not sure who your TA is, please check the course website: https://psyc60.github.io/.

jefan@ucsd.edu Switch account

* Required

Recap

Lecture 1: What is statistics? Overview of the course

Why learn statistics in psychology?

Essential for doing psychology.

How this course will work.

Show up, participate, learn new skills.

Tell us about yourself.

Nice to meet you.