LING/PSYC 40310 Introduction to Experimental Methods **Fall 2022**

Instructor: Monica Do {monicado@uchicago.edu}

Class Meetings	Office Hours
Time: Tues/Thurs 2:00-3:20pm **Location:** Harper Memorial (HM) 151	**Time:** Thursday, 1:00-2:00pm **Location:** Rosenwald 229C

Course Description: The goal of this course is to provide students with hands-on experience in experiment design, data collection, and basic data analysis. Students will learn the basic principles of experimental design as well as how to analyze data for some commonly used experimental paradigms in language research. Skills acquired in this course will allow students to explore more advanced statistical and experimental methods in the future.

Course Materials

- **Laptops:** Should be brought to every class.
- **Textbook:** https://learningstatisticswithr.com/lsr-0.6.pdf (Danielle Navarro)
- **Canvas:** All materials will be posted on Canvas, including
    - Labs (R Scripts)
    - Supplemental Resources
    - Homework Assignments

Course Requirements/Evaluation

- Course participation: 10%
- Homework: 10 assignments, 7% each (70% total)
- Final Project: 20%

Homework: The most important thing for learning statistics in R is to practice with R. For this reason, homework is assigned routinely throughout the course. Homework assignments are due one week from the assignment date. While collaboration is encouraged each student is expected to do and turn in their own work. Each assignment should be submitted as a .Rmd file to Canvas.

Late Assignments: Each student may skip one HW assignment, no questions asked. Otherwise, students will be deducted 1 point for each class period that their HW is late. For example, if an assignment is due on a Wednesday night, but is not turned in until after the following Wednesday class, you will be deducted 2 points. If there are additional extenuating circumstances, let me know and we can try to figure something out.

Final Project (Baby Replication Experiment): The final project for this course will require students to replicate one experiment similar to the data sets covered in class. Students will be provided with the materials (i.e., the stimuli) for the experiment. They will then build a web-based version of the experiment that can be deployed in PCIbex, run the experiment with a small set of pilot participants (~8 people), and analyze the results from that experiment.

Students will not need to submit a full research paper. Instead, they will submit a brief research report, resembling the "Methods" and "Results" sections of a journal article. In addition, students will provide the data set, an Rmarkdown script containing the analyses, and a rendered

HTML file sharing and explaining the steps of the analysis (this can be very similar to the Rmarkdown script).

DATE	TOPICS & READINGS	HOMEWORK ASSIGNED	HOMEWORK DUE
Week 1			
9/27	Lab 1 • Experiment Design, Part 1 • Intro to R Studio	HW 1: Intro to R	
9/29	Lab 2 • Intro to Data • Intro to Tidyverse • Readings: Navarro Ch. 3, 4.2	HW 2: Intro to Tidy	
WEEK 2			
10/4	Lab 3 • Descriptive Stats • Readings: Navarro Ch. 5	HW 3: Complete PCIbex Basic Tutorial	HW 1
10/6	Lab 4 • Visualizing Data • Readings: Navarro Ch. 6	HW 4: Descriptive Stats & Visualization	HW 2
Week 3			
10/11	Lab 5 • Experiment Design, Part 2 • Readings: Navarro Ch. 2	HW 5: Plan of Analysis for Baby Replication experiment	HW 3
10/13	Lab 6 • Latin Square • How to set up a csv Table of Items	HW 6: Complete PCIbex Advanced tutorial	HW 4
Week 4			
10/18	Lab 7 • Outliers	HW 7: Outliers	HW 5
10/20	Lab 8 • Probability inferences • Estimating Parameters • Readings: Navarro Ch. 9 & 10	HW 8: Prob & Parameters	HW 6
Week 5			
10/25	Lab 9, pt. 1 • Hypothesis testing: Continuous Data • Readings: Navarro Ch. 11, 13	Start scripting your Baby Replication!	HW 7
10/27	Lab 9, pt 2 • Hypothesis testing: Categorical data • Readings: Navarro Ch. 12	HW 9: Hypothesis Testing	HW 8

Week 6			
11/1	Lab 10, pt. 1 • One-way ANOVA, pt. 1 • Readings: Navarro Ch. 14		
11/3	Lab 10, pt. 2 • One-way ANOVA, pt. 2	HW 10: one-way ANOVAs	HW 9
Week 7			
11/8	Lab 11, pt. 1 • Factorial ANOVA, pt. 1 • Readings: Navarro Ch. 16		
11/10	Lab 11, pt. 2 • Factorial ANOVA, pt. 2	HW 11: Factorial ANOVAs	HW 10
Week 8			
11/15	Lab 12, pt. 1 • Simple Linear Regression • Readings: Navarro Ch. 15	Begin data collection for Baby Replication!	
11/17	Lab 12, pt. 2 • Multiple Linear Regression		HW 11
Week 9: Thanksgiving Break 11/21-11/25			
11/29	Lab 12, pt. 3 • Logistic Regression	No HW for Lab 12 – Your Final Projects should demonstrate mastery of regression models	
12/1	TBD: Final Project Workshop? Final project results presentations? Course Make-ups?		

You final project is due to me by 11:59pm Monday, December 12, 2022!!!