

Quantitative Methods in Linguistics

LING 147, Fall 2025

Teaching Team Information

Jonathan Paramore (Instructor)

Email: jcparamo@ucsc.edu

Office: Stevenson Academic Building, Rm. 257 (Linguistics Dept.)

Office hours: Fridays, 11:00am - 12:00pm or by appointment

Time and Place

Lectures: Tues & Thurs, 3:20 - 4:55pm, Cowell Acad 222

Sections:

B: Wednesdays 1:20-2:25pm Cowel Acad 216 Paramore

Fall classes: Thurs, Sept 25th - Fri, Dec 5th

Final Project: final poster submission due Thurs Dec. 12th 11:59pm
(no late projects accepted!!!)

Course Description and Learning Outcomes

This course introduces quantitative methods for linguistics. It focuses on categorical data and continuous data, using the R programming language to organize data and conduct statistical tests. Students learn the basics of probability, statistics, and experimental design, and use R to apply them to linguistic data sets. Prerequisite(s): LING 53 and LING 101, LING 111, or LING 112.

- Experimental Design
- Probability and Statistics
- R programming language
- Data analysis

This course contributes to one program learning outcome of the linguistics and language studies majors:

1. **Analytical thinking**

Students will formulate testable hypotheses, and present them clearly and completely. Students will accurately and insightfully use relevant evidence to evaluate hypotheses and determine routes for future investigation.

The following learning outcomes are particular to this course:

2. **Probability and Statistics**

Students will learn basic concepts in probability and statistics for analyzing categorical and continuous data.

3. **Experimental design**

Students will learn appropriate methods for gathering quantitative data and how such data can be used to inform linguistic theories.

4. **R**

Students will gain a basic familiarity with the R programming language for data manipulation, visualization, and statistical testing

Requirements

Readings: There is no textbook for this course. Instead there will be weekly readings available on our Canvas website as well as suggested media content. You should *complete the reading and watch the videos before the start of class by the date listed* on the schedule below. These resources are optional but will reinforce concepts covered in class that are crucial for succeeding on quizzes and in the course in general.

Stats Quizzes: There will be 6 ‘probability & statistics’ quizzes which will be administered randomly in lectures and sections. These are spot-checks on the mathematical concepts we are covering in the course.

R Quizzes: There will be 6 ‘R’ quizzes which will be administered randomly in lectures and sections. These are spot-checks on the R programming concepts we are covering in the course.

Homework: These will be due roughly every other week and are aimed at giving you a chance to implement the topics covered in the class. You may work on these in groups or consult with your classmates (and are encouraged to do so!), but the write-ups must be done individually and submitted via Canvas.

Experiment Participation: You must participate in one experiment during the course of the quarter to get an understanding of how linguistic research is conducted. All experiments are less than an hour, most will be conducted remotely. You can sign up for an account and for the experiments [here](#). The slots fill up fast towards the end of the quarter, so please schedule in advance! If you do not feel comfortable participating in an experiment, please see the instructor for an alternative that is equal in time/effort commitment.

Final Project: This assignment is broken down into several parts, culminating in a academic poster submission of an experiment design and pilot study. Your design should be practical and something you can gather data for from at least 1-2 participants. You are encouraged to do this in small groups.

- Topic and hypothesis (5%)
- Experiment design and measurements (12%)
- Pilot study results and next steps (8%)
- Presentation (5%)
- Completed poster submission (10%)

Grading Policy: The two lowest quiz grades will be dropped. Neither Stats nor R quizzes can be made up without prior email-written approval from the instructor *before* the quiz takes place, so *go to class and sections!* Homework should be turned in by 11:59pm on the due date given. Assignments will be graded within roughly 48 hours of this due date, and any assignments turned in after grading has taken place will not be accepted, unless prior email-written approval is given. Late final projects will not be accepted, unless prior email-written approval is given.

Final Grade Breakdown:

Requirement	% of final grade
Stats Quizzes (6 x 3% ea.)	18%
R Quizzes (6 x 3% ea.)	18%
Homeworks (4 x 5% ea.)	20%
Final Project	40%
Experiment Participation	4%

Academic Honesty

UCSC does not tolerate plagiarism. For details, see:

- [What is plagiarism?](#)
- [Guide to citing sources](#)

Student Resources

Slug Support: For psychological or financial support, visit [Slug Support](#).

Students with Disabilities: Contact the Disability Resource Center ([DRC](#)) for assistance by phone at 831-459-2089 or by email at drc@ucsc.edu. If you are student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course.

Title IX: Confidential support for sexual harassment or violence is available at the CARE Office: (831) 502-2273. More information about Title IX provisions can be found [here](#).

Course Schedule (Subject to Frequent Updates)

Week 0: (no sections)

Thu 09/25 No Class (AMP at UC Berkeley)

Week 1: Course overview and intro. to data analysis/collection

Tue 09/30 Overview; scientific method; research ethics

Thu 10/02 Lx design, Data types & structures

Week 2: Describing Data

Tue 10/07 Categorical variables and their relations
Thu 10/09 Quantitative variables: shape and center **HW 1 DUE**

Week 3: Describing Quantitative Data

Tue 10/14 Quantitative variables: spread
Thu 10/16 Scatterplots and correlation

Week 4: Confidence Intervals

Tue 10/21 Confidence Intervals I
Thu 10/23 Confidence Intervals II **HW 2 DUE**

Week 5: Hypothesis Tests

Tue 10/28 Hypothesis Testing I
Thu 10/30 Hypothesis Testing II

Week 6: Inference

Tue 11/04 Inference for categorical variables
Thu 11/06 Inference for quantitative variables **HW 3 DUE**

Week 7: Inference continued

Tue 11/11 No class (Veterans Day)
Thu 11/13 TBD

Week 8: Tests for categorical predictors

Tue 11/18 Chi-Square Tests
Thu 11/20 ANOVA **HW 4 DUE**

Week 9: Linear Regression (no sections)

Tue 11/25 Simple linear regression **Exp. Particip. DUE**
Thu 11/27 No class (Thanksgiving)

Week 10: Multiple Regression & Final Projects

Tue 12/02 Multiple Regression
Thu 12/04 Final Project Presentations **Digital Poster DUE**

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¹Potential Reading Sources: Lock et al. (2013); Bonett (2021); Navarro (2011); Chodroff (2022); Winter (2019)

References

- Bonett, D. (2021). Statistical methods for psychologists: Introduction to statistical inference and experimental design. <https://dgbonett.sites.ucsc.edu/statistical-methods-for-psychologists/>.
- Chodroff, E. (2022). R for linguists. <https://eleanorchodroff.com/r-for-linguists/basics-of-r.html> introduction-to-r-and-rstudio.
- Lock, R. H., Lock, P. F., Morgan, K. L., Lock, E. F., and Lock, D. F. (2013). *Statistics: unlocking the power of data*. John Wiley & Sons, inc.
- Navarro, D. (2011). *Learning statistics with R: A tutorial for psychology students and other beginners*. Creative Commons BY-SA.
- Winter, B. (2019). *Statistics for linguists: An introduction using R*. Routledge.