

Research Methods in English Linguistics: Designing experiments and analyzing data with R

Instructor: Hyunah Ahn (prosodygal@snu.ac.kr)
Class Room: 3-313
Class Hours: R 1:30-4:20pm
Office Hours: By appointment

Last Updated: August 6, 2020

COURSE DESCRIPTIONS

This course aims to introduce experimental methods to graduate students in the field of linguistics and applied linguistics alike with no previous experience in programming and statistics. Each session will be mainly composed of lecture, presentation, and statistics workshop. In each session an experimental method will be introduced by the instructor via a lecture, and a sample research article will be presented by a student for the method introduced in the previous session. The statistics workshop will walk students through the process of analyzing experimental data using R step by step.

In this class, all enrollees will be required to conduct a small-scale experiment (either self-paced reading or reaction time measurement), statistically analyze collected data through their own experiments, and report the results both in a oral presentation and in a research paper. Everyone will be provided with ample guidance throughout the process. Contact the instructor ahead of time (or earlier at the beginning of the semester) if you have a research topic in mind.

LEARNING OBJECTIVES

At the end of the semester, students will be able to...

- Critically review research studies involving experimental methods and statistical analyses
- Form falsifiable hypotheses via a proper operationalization of constructs in question
- Design experiments that can reliably test the hypotheses
- Statistically analyze collected data using R
- Report the results of their project both orally and in writing

REFERENCES

Textbooks

Crawley, Michael J. (2015). *Statistics: An introduction using R*. West Sussex, UK: Wiley.

De Groot, Annette M. B., & Hagoort, Peter (2017). *Research Methods in Psycholinguistics and the Neurobiology of Language: A Practical Guide*. Hoboken, NJ: Wiley.

Supplementary Materials

Crawley, Michael J. (2013). *The R book*. West Sussex, UK: Wiley.

REQUIREMENTS

Attendance & Participation			10%
Article presentation			10%
Assignments	One-sentence research topic	2%	30%
	500-word abstract on a research article	8%	
	Comments & questions on research articles	10%	
	R homework assignments	10%	
Project	Research questions	10%	50%
	Experimental design	10%	
	Statistical analysis	10%	
	Final presentation	10%	
	Final paper	10%	

Attendance & Participation

Each session is packed with information and skipping a session will make it very difficult for you to catch up in the next session. All students are expected to actively participate in all class discussions and activities.

Article presentation

There are a total of 10 underlined articles in the schedule. Students should give a presentation on one of the articles (or two depending on the enrollment) for 20 minutes and lead discussions for the remainder of the hour.

Assignments

A One-sentence description of final research project: All enrollees should submit a one-sentence description of the topic of their final research project. The deadline for this assignment is **8PM on Wednesday, September 25, 2019**, but if you have a specific linguistic phenomenon or a research question in mind, please consult the instructor as early as possible.

A 500-word abstract: Once everyone is assigned a research article to present, a 500-word conference abstract style summary of the article should be submitted by **Wednesday, October 9, 2019**. The specific format of the abstract will be discussed earlier in the semester.

Comments and questions on reading: Each of the ten underlined research articles in the schedule will be discussed in class after a 20-minute presentation. Each participant should

read the article carefully and post comments and/or questions on eTL by **8PM on the night before class**.

R homework assignments: Starting from the second week, a homework assignment on R scripts will be given for the following week. The homework assignments should be submitted by **8PM on Wednesday in the following week**.

Project

Research Questions: Research questions will be discussed both before the project begins (at the time one-sentence descriptions are submitted) and when the project is written up in a research paper format. Specific research questions that are relevant to issues in the literature should be written in an easy-to-understand manner.

Experimental design: The research questions formed should be linked to falsifiable hypotheses and properly operationalized constructs. The hypotheses and constructs should be tested via carefully devised experimental items and tasks. Data should be collected from at least 8 individuals.

Statistical analysis: Collected data should be analyzed using a statistical model of choice. Towards the end of the semester, the third session of each meeting will be dedicated to analyzing one's own data under the instructor's guidance.

Final presentation: The result of the project should be presented in a conference presentation style. Each team (or individual) will be given 20 minutes to present the outcome of their project, and a 10-minute Q & A session will follow.

Final paper: A research paper of no shorter than 3000 words (including the title, author name(s), subheadings, figure and table titles, end notes, and references) should include Intro, Background, Method, Results, Discussion (and Conclusion) and must be submitted by **11:59PM on Thursday, December 19, 2019**.

Continued on the next page

READING MATERIALS

- Ahn, H. (2017). The prosodic resolution of syntactic/semantic ambiguity: An exemplar-based approach. *Language Research*
- Ahn, H. (In press). From Interlanguage grammar to target grammar: L2 processing of definiteness as uniqueness. *Second Language Research*. doi:10.1177/0267658319868003
- Ahn, H. & Song, M.J. (In preparation). The role of definiteness in predictive L2 processing: An eye-tracking study. *To be made available on eTL soon*
- Borragan, M., de Bruin, A., Havas, V., de Diego Balaguer, R., Dimitrova Vulchanova, M., Vulchanov, V., & Duñabeitia, J. A. (2019). Differences in word learning: Bilingualism or linguistic experience? *bioRxiv*. doi:10.1101/551408
- Ito, A., Pickering, M. J., & Corley, M. (2018). Investigating the time-course of phonological prediction in native and non-native speakers of English: A visual world eye-tracking study. *Journal of Memory and Language*, *98*, 1-11. doi:10.1016/j.jml.2017.09.002
- Jaeger, T. F. (2008). Categorical Data Analysis: Away from ANOVAs (transformation or not) and towards Logit Mixed Models. *Journal of Memory and Language*, *59*(4), 434-446. doi:10.1016/j.jml.2007.11.007
- Liu, M., Konig, P., & Mueller, J. L. (2019). Novel ERP Evidence for Processing Differences Between Negative and Positive Polarity Items in German. *Frontiers in Psychology*, *10*, 1-14. doi:10.3389/fpsyg.2019.00376
- Richardson, D. C., & Spivey, M. J. (2008). Eye Tracking: Characteristics and methods / Research areas and applications. In G. Wnek & G. Bowlin (Eds.), *Encyclopedia of Biomaterials and Biomedical Engineering*. New York: CRC Press.
- Sabourin, L., & Vinerte, S. (2018). Cognitive control among immersed bilinguals: Considering differences in linguistic and non-linguistic processing. *Bilingualism: Language and Cognition*, *22*(3), 590-605. doi:10.1017/s1366728918000524
- Sikos, L., Tomlinson, S. B., Heins, C., & Grodner, D. J. (2019). What do you know? ERP evidence for immediate use of common ground during online reference resolution. *Cognition*, *182*, 275-285. doi:10.1016/j.cognition.2018.10.013
- Swets, B., Desmet, T., Clifton, C., & Ferreira, F. (2008). Underspecification of syntactic ambiguities: Evidence from self-paced reading. *Memory & Cognition*, *36*(1), 201-216. doi:10.3758/mc.36.1.201
- VanPatten, B., & Smith, M. (2018). Word-order typology and the acquisition of case marking: A self-paced reading study in Latin as a second language. *Second Language Research*, *35*(3), 397-420. doi:10.1177/0267658318785652
- Zhan, L., Zhou, P., & Crain, S. (2018). Using the visual-world paradigm to explore the meaning of conditionals in natural language. *Language, Cognition and Neuroscience*, *33*(8), 1049-1062. doi:10.1080/23273798.2018.1448935

TENTATIVE SCHEDULE

Dates	1:30-2:20pm Presentations	2:30-3:20pm Lecture	3:30-4:20pm Statistics
9/6	[Welcome!]	[Course Overview]	Fundamentals
9/12	Ahn & Song (In preparation)	VWP eye-tracking	Data frames
9/19	Eye-tracking while reading	[Experimental design]	Central tendency
9/26	<u>Ferreira & Clifton (1986)</u>	Self-Paced Reading	Variance
10/3	<u>Ahn (In press)</u>	Reaction Time studies 1	Single samples
10/10	<u>Borragan et al. (2019)</u>	[Creating stimuli]	Two samples
10/17	<u>Swets et al. (2008)</u>	Reaction Time Studies 2	Regression 1
10/24	<u>Sabourin & Vinerte (2019)</u>	[Scripting an experiment]	Regression 2
10/31	<u>VanPatten & Smith (2018)</u>	Event-Related Potentials	ANOVA
11/7	<u>Liu et al. (2019)</u>	[Running an experiment]	ANCOVA
11/14	<u>Ito et al. (2018)</u>	<u>Zhan et al. (2018)</u>	Multiple regression
11/21	<u>Sikos et al. (2019)</u>	[Analyzing data 1]	[Mixed effects models]
11/28		[Analyzing data 2]	
12/5		[Project workshop]	
12/12		[Mini-Conference]	

Notes

- (1) Underlined articles are to be presented by students.
- (2) The sessions on September 12 and 19 will be rescheduled (possibly to Tuesdays of the corresponding weeks) to observe a 15-week semester policy.
- (3) Sessions within [] require no reading ahead of session.