

PSY 341

Predicting Behavior: Using linear regression analysis in psychological research
Wednesdays, 1:30 p.m. – 3:50 p.m. Old Henderson 106
Fall 2018

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Office hours: Tuesday noon – 1:00 p.m., Friday 10:00 a.m. – 11:00 a.m., or by appointment

COURSE DESCRIPTION

One of the primary goals of the science of psychology is to understand and predict human behavior. Therefore, linear regression is an important statistical tool in psychological research as it allows for the estimation of the relationship between two or more variables and the translation of this relationship into prediction. This seminar will serve as an introduction into the theory, interpretation, and use of simple and multiple linear regression in the context of psychological research.

REQUIRED READING MATERIAL

All reading assignments are available through the course Moodle site (access code: prediction)

ASSIGNMENTS AND GRADING**ATTENDANCE (10% of final course grade)**

As a seminar, this class is founded on discussion among students and you cannot contribute to the class discussion if you do not show up for class. Not including the first day of the semester, there will be 13 class meetings. Students attending 12 or more classes will earn full credit for attendance. Students attending less than 12 classes will lose points towards their attendance grade. If there are extenuating circumstances that prevent you from attending class on a given day, let me know in advance or as soon as possible after the missed class.

WEEKLY DISCUSSION QUESTIONS (10% of final course grade)

You are expected to submit one question or comment about the about each of the assigned readings prior to the start of our class meeting. These questions/comments should be posted on the course Moodle site and are intended to help you think more deeply about the articles and to help me organize our class discussion.

IN CLASS AND HOMEWORK ASSIGNMENTS (20% of final course grade)

The only way to really learn a new statistical technique is practice, practice, practice. In this course, you will have a chance to practice what you learn through in-class and homework assignments. These assignments will incorporate hand calculations, statistical procedures in R, and the creation of professional quality figures in R. Assignments will be announced at the end of each class period and will be due at the start of class the following week.

ARTICLE PRESENTATIONS (10% of final course grade)

On the first day of class you will be assigned a partner. Each pair will then be assigned an article to present to the class later in the semester. You are welcome to use whatever visual/auditory/printed aides you would like to help the class to better understand your article. Although all students are responsible for reading all articles, you should be prepared to serve as the class expert on the article you present (this might entail some outside reading). Presentations should be a maximum of 10 minutes.

DATA COLLECTION PROPOSAL (30% of final course grade)

An important component of understanding statistics is the understanding of study design. In this course, you will be asked to submit a data collection proposal for a novel study that would use linear regression. This proposal will include a brief (1-2 pages) introduction to your research question, a description of your proposed methods (1-2 pages), and expected results (1-2 pages). This proposal will be submitted to me for feedback and then resubmitted with corrections and conclusions (~1 page). More details about the data collection proposal will be provided over the course of the semester.

TAKE-HOME DATA ANALYSIS PROJECT (20% of final course grade)

The final project represents a culmination of the work we will have done over the semester. For this project, you will be provided with a dataset and will be asked to perform statistical analyses, interpret the results of these analyses and create figures in R. Finally, you will be asked to report and summarize your findings to a lay audience. The dataset and specific instructions for this project will be provided to you by December 1st and the project will be due on the final day of class, December 19th.

ADDITIONAL COURSE POLICIES

STUDENTS WITH DISABILITIES

Students with a documented disability who need reasonable academic accommodations should contact me as soon as possible to discuss your needs. I can only accommodate your needs if you allow me sufficient time to prepare. Informing me of a need on the day of an exam or on the date an assignment is due is NOT sufficient. As stated in the college handbook, "Students who claim physical, learning, or psychological disabilities should register with the Disability Support Coordinator at the start of the semester or as soon as the diagnosis is made."

Additional information can be found on the Bard College Learning Commons website (<http://inside.bard.edu/learningcommons/>).

ACADEMIC INTEGRITY

All students are assumed to have read the Bard College Handbook and are familiar with the school's policies regarding Plagiarism and Academic Dishonesty. Violations of these policies are taken extremely seriously and one violation will result in a failing grade for the course and a referral to the Dean of Students for further action. Specific violations include (but are not limited to): Use of prohibited assistance during assignments, sharing or writing assignments, and plagiarism (which includes **both** the use of **words** and **ideas** without attribution)

COURSE TOPICS AND READING LIST

Class 1: September 5th: Welcome to Predicting Behavior!

Class 2: September 12th: The Regression Line Using Least Squares Estimation

Leslie, S.-J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science*, 347, 262-265.

Marcus, G., & Davis, E. (2014, April 7). Eight (No, Nine!) Problems with Big Data. *The New York Times*, p. A23.

Due: Weekly discussion question #1

Class 3: September 19th Introduction to R software

Richmond, A. S., Berglund, M. B., Epelbaum, V. B., & Klein, E. M. (2015). $a + (b1) \text{ Professor Student Rapport} + (b2) \text{ Humor} + (b3) \text{ Student Engagement} = (Y) \text{ Student ratings of instructors}$. *Teaching of Psychology*, 42, 119-125.

Due: Weekly discussion question #2

Class 4: September 26th: Evaluating Model Performance: Goodness of Fit

Hinduja, S., & Patchin, J. W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research*, 14, 206-221.

Due: Weekly discussion question #3

Class 5: October 3rd: Evaluating Model Performance: Slope and Intercept

Keizer, A., Smeets, M. A. M., Dijkerman, H. C., van Elburg, A., & Postma, A. (2012). Aberrant somatosensory perception in Anorexia Nervosa. *Psychiatry Research*, 200, 530-537.

Due: Weekly discussion question #4

Class 6: October 10th: Multiple Regression Analysis

Rodriguez, F., Kataoka, S., Rivas, M. J., Kadandale, P., Nili, A., & Warschauer, M. (2018). Do spacing and self-testing predict learning outcomes. *Active Learning in Higher Education*.

Due: Weekly discussion question #5

Class 7: October 17th: Hierarchical Linear Regression Analysis

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625-638.

Due: Weekly discussion question #6

Class 8: October 24th: Linear Regression with Categorical Variables (Dummy Coding)

Lee, J. C., Hall, D. L., & Wood, W. (2018). Experiential or material purchases? Social class determines purchase happiness. *Psychological Science, 29*, 1031-1039.

Due: Weekly discussion question #7

Class 9: October 31: Linear Regression in SPSS (or how to help your friends with sproj).

Lian, A. (2018). "Boys Will be Boys": Examining the relationship between men's conformity to masculine norms and perceptions of psychological abuse. *Bard College Senior Projects Spring 2018*.

Due: Data analysis proposal

Class 10: November 7th: The Logic of Mediation Analysis

Durante, K. M., & Arsena, A. R. (2014). Playing the field: The effect of fertility on women's desire for variety. *Journal of Consumer Research, 41*, 1372-1391.

Due: Weekly discussion question #8

Class 11: November 14th: Logistic Regression

Carmichael, S. J., Ma., C., Tinker, S., & Shaw, G. M. (2017). Maternal stressors and social support and risks of delivering babies with gastroschisis or hypospadias. *American Journal of Epidemiology*, 185, 1240-1246.

Due: Weekly discussion question #9

Class 12: November 28th: Assumptions of Regression and Diagnostics

Rohrer, J. M., Richter, D., Brümer, M., Wagner, G. G., & Schmukle, S. C. (2018). Successfully striving for happiness: Socially engaged pursuits predict increases in life satisfaction. *Psychological Science*, 29, 1291-1298.

Due: Data analysis proposal revision

December 5th: NO CLASS (Advising Day)**Class 13: December 12th: Recap/Project Discussion**

van Horen, F., van der Wal, A., Grinstein, A. (2018). Green, greener, greenest: Ca competition increase sustainable behavior? *Journal of Environmental Psychology*, 59, 16-25.

Due: Weekly discussion question #10

Class 14: December 19th

Due: Take-Home Data Analysis Project