

Behavioral Science Research Design

26:830:545

Fall, 2023

Professor Kent Harber
Department of Psychology
Room 352, Smith Hall
(973) 353-5440, ext. 229
kharber@psychology.rutgers.edu

Class Meeting: Tuesday and Thursday, 11:30-12:40
Smith Hall, Room 371

Office Hour: Tuesday, 2:00-3:00, and by appointment

Overview: Psychology addresses age-old questions about human nature. Are people capable of altruism? Is personality simply the sum of experience? Does the mind affect the body? Psychology's responses to these questions are not always the most comprehensive or the most original. However, the answers that psychology provides are the most *reliable*. This is because the methods of empirical psychology leads to questions that can be tested and answers that can be replicated. Moreover, the rules and methods of empirical psychology form a universal language that allows researchers from different cultures, nations, and perspectives to engage in each other's work.

This course is designed to supply a working knowledge of research methods by covering the basic skills and principles needed to conduct effective, original, responsible, and reliable social science research. The course approaches research methods from a social psychological perspective. Social psychology research, by necessity, is especially concerned with issues of research ethics, impact and control, design standardization and innovation, and the avoidance of bias. These concerns, and the methods developed to address them, pertain to nearly all the social sciences and should therefore be relevant to most behavioral science students.

Course Objectives: This course has two primary goals:

1. Basic Research Skills: This course covers the basic skills needed to conduct behavioral science research. These skills include hypothesis generation, drafting research plans, creating research procedures, selecting outcome measures, conducting analyses, and writing up results in accordance with American Psychological Association (APA) conventions. In addition, the course addresses the ethical issues and corresponding guidelines that responsible research entails.
2. Intro and Intermediate Statistics. The course will cover basic inferential statistics (t tests, ANOVA, planned contrasts) and measures of association (covariation, correlation, regression, and moderated multiple regression). It does so in an intuitive and compressive manner, so students understand their underlying logic.

Pre-requisites: Graduate standing in psychology or a related field. For undergraduates, completion of Principles of Psychology and introductory statistics and methodology (301 and 302), advanced standing in psychology (junior or senior), GPA of 3.0 or better, and by permission of the instructor.

Learning Outcomes: The course covers the following principles and techniques:

1. The rationale and the history of the empirical approach to human behavior.
2. Ethical issues and guidelines related to human subjects research.
3. Recognizing and addressing challenges to behavioral science research.
4. How to develop *testable* research questions. How to select and measure independent and dependent variables.
5. How to design factorial experiments: The logic of factorial designs, predicting main effects and interactive effects, and distinguishing between mediators and moderators.
6. Review of basic statistical concepts
7. Analysis of factorial designs: The logic and application of the Analysis of Variance (ANOVA) statistic, including its underlying principles and methods of computation (e.g., main effects, interactive effects, simple effects).
8. Introduction to multiple regression and moderated multiple regression
9. Quasi-experiments and correlational studies.
10. The fundamentals of survey research methods.
11. Writing up research, per American Psychological Association (APA) format.

Evaluation Criteria: Course grades will be based on:

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|-------------------|-----|
| Grazing task: | 5% |
| Phil. Sci. debate | 5% |
| Quiz 1 | 5% |
| Quiz 2 | 5% |
| Quiz 3 | 5% |
| Stats Take-Home | 15% |
| Mid-term | 25% |
| Final | 35% |

Late assignments (Grazing task, Stats take home) lose **5 points** for each day late. Exams can be rescheduled if circumstances merit.

Behavioral Science Research Design: Weekly Topics and Readings

- Sept. 5 Introduction to the philosophy and logic of experiments.
Kerlinger & Lee, Chapter 1.
- Sept. 7 Research ethics.
Rosenthal & Rosnow, Chapter 3
Bok, Chapter 4.
[Web site: Stanford Prison Study: <http://www.prisonexp.org/>]
Philosophy of Science Debate assigned
- Sept. 12 Generating Research Ideas
Wicker;
Robinson;
Nisbett
Grazing task assigned
- Sept. 14 Philosophy of Science
Popper
Kuhn
Philosophy of Science Debate
- Sept. 19 Science and Society
Pears
Prisoners of Silence Video
- Sept. 21 Problems and Hypotheses
Kerlinger & Lee, Chapter 2
St. Exuperie
Grazing task due
- Sept. 26 Constructs, Variables, and Definitions
Kerlinger & Lee, Chapter 3
- Sept. 28 Moderators and mediators
Baron & Kenny [as background]
Hayes
Quiz 1
- Oct. 3 Independent variables
Aronson, et al., Chapter 7
- Oct. 5 Dependent Variables
Aronson, et al., Chapter 8
- Oct. 10 Experimental designs
Aronson, et al. Chapter 4

- Oct. 12 Challenges of behavioral science research
Aronson, et al., Chapter 2
Lehrer
- Oct. 17 “Research Hygiene”: False positivity and replicability
Munafo, Nosek et al.
Simmons, et al.
Funder, et al. (Recommended, not required)
Wilson, Harris, Wixted (Recommended, not required)
- Oct. 19 Avoiding bias
Aronson, et al., Chapter 9
Twain, “Eve’s Diary”
Harber, et al.
- Oct. 24 Mid-Term**
- Oct. 26 Statistics: Review of Basic Concepts and Measures
- Oct. 31 Measuring Differences Between Groups: T-Tests
Field, Chapter 9
- Nov. 2 One Way ANOVA: I
Keppel, pp. 23-64.
- Nov. 7 One Way ANOVA: II
Keppel, pp. 65-83.
- Nov. 9 Two Way ANOVA: I
Keppel, pp. 167-195
Quiz 2
- Nov. 14 Two Way ANOVA: II
Keppel, pp. 196-205
- Nov. 16 Planned Contrasts, Post Hoc Tests, and Data Management
Rosenthal & Rosnow;
Barhyte & Bacon
- Nov. 21 Covariation, Correlation and Regression (1)
Field, Chapters 6 & 7
- Nov. 23 THANKSGIVING**
- Nov. 28 Regression (2)

- Nov. 30 Moderated Multiple Regression
Aguinis
Take home test assigned
- Dec. 5 Power Analysis
Rosenthal & Rosnow, Chapter 12
- Dec. 7 Designing research questions
Schuman & Presser
Schwartz
Quiz 3
- Dec. 12 Catch-up
Stats take home test due
- Dec. 19 FINAL EXAM [DATE SUBJECT TO CHANGE]**

Course Reader:

All course readings, including the Arons et al. text referenced above, are available on the Behavioral Science Research Design page of my website.

<http://nwpsych.rutgers.edu/~kharber/behavioralscienceresearchdesign/>

Course Reader

- Aguinis, H. (2004). *Regression analysis for categorical moderators*. New York: Guilford
- Albright, L., & Malloy, T. E. (2000). Experimental validity: Brunswik, Campbell, Cronbach, and enduring issues. *Review of General Psychology, 4*, 337-353.
- American Psychological Association (2001). *Publication Manual of the American Psychological Association*. Washington, DC: APA Press
- Aronson, E., Ellsworth, P.C., Carlsmith, J. M., & Gonzales, M. (1990). *Methods of research in social psychology, 2nd edition*. New York: McGraw-Hill.
- Baron, R. M. & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Barhyte, D. & Bacon, L. (1984). Approaches to cleaning data sets: A technical comment. *Nursing Research, 34*, 62-64.
- Bem, D. (1987). Writing the empirical journal article. In M.P. Zanna and J.H. Darley (Eds.) *The compleat academic: A practical guide for the beginning social scientist*. Hillsdale, NJ: Erlbaum.
- Bok, S. (1979). *Lying: Moral choice in public and private life*. New York: Vintage Books. Chapter 4.
- Cantril, H. (1966). *The invasion from Mars*. Princeton, NJ: Princeton University Press. Chapter 3.
- Field, A. (2009). *Discovering statistics using SPSS: Third Edition*. Chapter 9: Comparing two means. Los Angeles, CA: Sage.
- Field, A. (2009). *Discovering statistics using SPSS: Third Edition*. Chapter 6: Correlation. Los Angeles, CA: Sage.
- Field, A. (2009). *Discovering statistics using SPSS: Third Edition*. Chapter 7: Regression. Los Angeles, CA: Sage.
- Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*, 156-168.
- Harber, K.D., Zimbardo, P.G., & Boyd, J.N. Participant self-selection biases as a function of individual differences in time perspective. *Basic and Applied Social Psychology, 25*, 255-264.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408-420.
- Keppel, G. (1973). *Design and analysis of experiments*. New Jersey: Prentice Hall. Chapter 3.
- Kerlinger, F. N. & Lee, H.B. (2000). *The foundations of behavioral research, fourth edition*. Fort Worth: Harcourt Brace. Chapters 1,2, 3.

- Kuhn, T.S. (1962). *The structure of scientific revolutions*. Chapters 4, 6, 7, 8. Chicago, IL: Chicago University Press.
- Lehrer, J. (Dec. 13, 2010). The truth wears off. *New Yorker*.
- Nisbett, R.E. (1990). The anti-creativity letters: Advice from a senior tempter to a junior tempter. *American Psychologist*, *45*, 1078-1082.
- Pears, I. (1998). *An instance of the fingerpost*. New York: Penguin Putnam.
- Pennebaker, J. & Harber, K. (1993). A social stage model of collective coping: The Loma Prieta Earthquake and the Persian Gulf War. *Journal of Social Issues*, *49*, 125-145.
- Popper, K.R. (1959). *The logic of scientific discovery*. Chapter 1, pp. 27-48. London, UK: Routledge.
- Rosenthal, R., & Rosnow, R.L. (1985). *Contrast analysis: Focused comparisons in the analysis of variance*. Chapters 1 and 2. Cambridge University Press.
- Rosenthal, R., & Rosnow, R.L. (2008). *Essentials of behavioral research*, 3rd Ed. Chapter 3: Ethical considerations, dilemmas, and guidelines (pp. 61-83).
- Rosenthal, R., & Rosnow, R.L. (2008). *Essentials of behavioral research*, 3rd Ed. Chapter 12: Statistical power and effect size (pp. 354-369).
- Schuman, H., & Presser, S. (1996). *Questions and answers in attitude surveys*. Thousand Oaks: Sage Publications. Chapters 1-4.
- Schwartz, N. (1999). How the questions shape the answers. *American Psychologist*, *54*, 93-105.
- Saint-Exupery, A. (1939). *Wind, Sand and Stars*, New York: Reynal & Hitchcock. pp. 136-138.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*(11), 1359-1366.
- Twain, M. (1974). *Letters from the Earth*. From "Eve's Diary".
- Weinberg, G.H. & Schumaker, J.A. (1974). *Statistics: An intuitive approach*. Monterey, CA: Brooks/Cole.
- Wicker, A.W. (1985). Getting out of our conceptual ruts: Strategies for expanding conceptual frameworks. *American Psychologist*, *53*, 300-314.
- Wilson, B. M., Harris, C. R., & Wixted, J. T. (2022). Theoretical false positive psychology. *Psychonomic Bulletin & Review*, *29*, 1751-1775.

Recommended Readings

- Aguinis, H. (2004). *Regression analyses for categorical variables*. New York: Guilford.
- Aiken, L.S., & West, S.G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks: Sage.
- American Psychological Association (2009). *Publication manual of the American Psychological Association, 6th Edition*. Washington, DC: American Psychological Association.
- Field, A. (2009). *Discovering statistics using SPSS, Third edition*. Los Angeles, CA: Sage.
- Henry, G.T. (1995). *Graphing data: Techniques for display and analysis*. Thousand Oaks: Sage
- Keppel, G. (1991). *Design and analysis: A researcher's handbook. Third edition*. Upper Saddle River, NJ: Prentice-Hall.
- Sternberg, R.J. (1989). *The psychologist's companion: A guide to scientific writing for students and researchers*. New York: Cambridge University Press.
- Zanna, M.P. and Darley, J.H. (1987). *The compleat academic: A practical guide for the beginning social scientist*. Hillsdale, NJ: Erlbaum.

Accommodation and Support Statement

Rutgers University-Newark (RU-N) is committed to the creation of an inclusive and safe learning environment for all students and the University as a whole. RU-N has identified the following resources to further its mission of access and support:

For Individuals Experiencing Disability: The Office of Disability Services (ODS) works with students with medical, physical, and/or mental conditions who encounter disabling barriers to determine reasonable and appropriate accommodations for access. Students who have completed the process with ODS and have approved accommodations are provided a Letter of Accommodation (LOA) specific to each course. To initiate accommodations for their course students must both provide the LOA and have a conversation with the course instructor about the accommodations. This should occur as early in the semester as possible. More information can be found at the RU-N ODS website (ods.newark.rutgers.edu). Contact ODS at (973) 353-5375 or via email at ods@newark.rutgers.edu.

For Individuals who are Pregnant: The Office of Title IX and ADA Compliance is available to assist with any concerns or potential accommodations related to pregnancy. Students may contact the Office of Title IX and ADA Compliance at (973) 353-5063 or via email at TitleIX@newark.rutgers.edu.

For Short-term Absence Verification: The Office of the Dean of Students can help with absences related to religious observance, emergency or unavoidable conflict (illness, personal or family emergency, etc.). Students should refer to University Policy 10.2.7 for information about expectations and responsibilities. The Office of the Dean of Students can be contacted by calling (973) 353-5063 or emailing deanofstudents@newark.rutgers.edu.

For Individuals with temporary conditions/injuries: The Office of the Dean of Students can assist students who are experiencing a temporary condition or injury (broken or sprained limbs, concussions, recovery from surgery, etc.). Students experiencing a temporary condition or injury should submit a request using the following link: <https://temporaryconditions.rutgers.edu>.

For Gender or Sex-Based Discrimination or Harassment: The Office of Title IX and ADA Compliance can assist students who are experiencing any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking. Students can report an incident to the Office of Title IX and ADA Compliance by calling (973) 353-1906 or emailing TitleIX@newark.rutgers.edu. Incidents may also be reported by using the following link: tinyurl.com/RUNReportingForm. For more information, students should refer to the University's Title IX Policy and Grievance Procedures located at <https://uec.rutgers.edu/wp-content/uploads/60-1-33-current-1.pdf>

For support related to Interpersonal Violence: The Office for Violence Prevention and Victim Assistance (VPVA) can provide any student with confidential support. VPVA is a confidential resource and does not have a reporting obligation to Title IX. Students can contact the office by calling (973) 353-1918 or emailing run.vpva@rutgers.edu. VPVA also maintains a confidential text-based helpline available to students; students can text (973) 339-0734 for support. Students do not need to be a victim/survivor of violence to receive assistance; any student can receive services, information, and support.

For Crisis and Concerns: The Campus Awareness Response and Education (CARE) Team works with students in crisis to develop a plan of support plan and address personal situations that might impact their academic performance. Connect with the CARE Team by using the following link: tinyurl.com/RUNCARE or emailing careteam@rutgers.edu.

For Psychological Support (Stress, Mood, Family Issues, Substance Use concerns and other personal challenges): The Rutgers University-Newark Counseling Center provides individual therapy and support groups for students dealing with psychological issues. To schedule an appointment, email counseling@newark.rutgers.edu or call (973) 353-5805.

Additional support is available to any RU-N student through Uwill services:

- Umatch: Teletherapy with flexible scheduling, starting with a free account.
- Uhelp: Crisis support at 833-646-1526 (available 24/7/365).
- Urise: Wellness-based video collection with a free account.

Access Uwill@RUN at <https://my.rutgers.edu> using your netid. Services are confidential and free.

For emergencies, call 911 or Rutgers University Police Department at (973) 353-511