



PS 380 RESEARCH METHODS IN PSYCHOLOGICAL SCIENCE: COLLABORATIVE REPLICATION

IES Abroad Vienna

DESCRIPTION: Inspired by the Collaborative Replications and Education Project (CREP; <https://www.crep-psych.org/>), this course offers students interested in behavioral methods and data analysis a unique opportunity to engage in a direct replication of a highly cited work in psychology. Participation in a replication project allows students to further develop important critical thinking skills and adhere to best-practice and transparent standards of psychological research by gaining practical experience. The study to be replicated will be preselected by the instructor; in general, this will be an online behavioral empirical study implemented in, for example, Qualtrics. Replication involves employing the same methods, data collection procedures, and analyses as the original study. It not only serves as the gold standard for scientific research but also provides valuable training in research skills within a broader educational context. The class will begin by developing students' critical reading skills applied to scientific research reports, evaluating the methodology section of a published paper, and learning about the Replication Crisis and the Credibility Revolution which gave rise to Open Science and Big Team Science Movements. Students must complete the research project following guidelines like those provided by the CREP collaborative. This entails familiarizing themselves with a specific study design, studying the research design, and collecting and analyzing data using appropriate tools. Finally, students will present their research findings in the form of a presentation and brief final report. To support their replication efforts, students will have access to all necessary learning materials, including study stimuli and data analysis code. Students are expected to gain first-hand experience in analyzing the data using popular free statistical software, such as JASP, or Jamovi.

CREDITS: 3 credits

CONTACT HOURS: 45 hours

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: Interest in behavioral methods and data analysis with two semesters of coursework in Psychology or other social sciences, including an introductory statistics class.

ADDITIONAL COST: None, though students must bring a laptop to every class.

METHOD OF PRESENTATION:

The instructor will closely supervise the replication project, guiding students with relevant lectures, workshops, and course materials for each step of the research replication process. This hands-on approach ensures that students are equipped with the necessary resources and guidance to complete their replication project and develop essential critical research skills in the field of psychology. A combination of the following methods will be used during classes: Lectures, experiential learning and discussion in seminar format. Most of the materials used in class, as well as any other relevant materials, will be available for students on the IES Abroad Vienna Moodle platform (<https://moodle.iesabroad.org>). Most activities are paper free. Students' work will be evaluated using different rubrics for different assignments. The rubrics will be made available on Moodle.

REQUIRED WORK AND FORM OF ASSESSMENT:

- Active course participation – 10%
- Research project - 40%
 - Preregistration – 5%
 - Survey implementation – 10%
 - Data collection – 10%
 - Data analysis – 15%
- Oral Presentation – 15%
- Peer review / audit – 10%
- Final paper - 25%



Course Participation

Attendance and active participation in class are expected, as the classes are highly participatory in nature. Students will engage in structured and semi-structured debates, including preparing short presentations on various topics. Note that course participation is not limited to participation in class. You are encouraged to use offline communication platforms, such as Moodle. Participation assessment will be determined through a combination of self- and instructor evaluation. Students are required to provide a brief rationale (3-5 sentences) for their self-assessment first, which the instructor will either accept or adjust for the final grade.

Research Project

The research project is the main assignment of this course. Students will work on a project in a small group (2-3 students) involving study design, implementation, and data analysis while adhering to rigorous scientific standards such as the preregistration of their hypotheses. Pre-registration involves outlining the research plan, specifying hypotheses, methods, and an analysis plan. Following pre-registration, students will conduct a survey using Qualtrics. They will receive a template, which they can customize to fit their specific research question.

Next, students will then monitor the data collection process, addressing any technical issues or participant inquiries to ensure the quality of the collected data. Once data collection is complete, students will analyze the data according to their pre-registered analysis plan. They will critically interpret their findings, discussing the implications and limitations of their results, and receive feedback from the instructor to ensure accurate data interpretation and valid conclusions.

Oral Presentation

Students will work in groups to prepare and present their study design, including the hypotheses and preliminary results. They will be provided with a template and practical guidance on creating a presentation and giving a scientific presentation. The format of this 15-minute talk will be like those typically given at psychology conferences, where students will be asked to explain the contents of their research to their fellow students.

Peer Review / Audit

Students will write two peer reviews. The peer review should include a summary of the paper, highlighting the overall strengths and weaknesses of the submitted work and specific suggestions for improvement. Each peer review must be written in APA style (7th edition) and submitted online, with 500-700 words in length (approximately one page per peer review, excluding references).

Final Paper

The final paper should adhere to APA style (7th edition) and comprise the following sections: a title page, an abstract, an introduction, a method section, a results section, and a discussion. Throughout the semester, students will receive feedback on their work from the instructor and two of their peers (see peer review assignment). It is imperative that students revise these sections according to the feedback provided. The final paper must be concise and within 1,500-2,000 words in length (approximately four pages, excluding references) and submitted online. Late submissions will not be accepted.

LEARNING OUTCOMES:

By the end of the course, students will be able to:

- Identify and implement aspects of effective project collaboration.
- Follow good scientific practices, including pre-registration, registered reports, big team science, and the use of the Open Science Framework (OSF) for project management.
- Formulate research hypotheses and goals, conduct literature reviews, and design studies with clear documentation.
- Implement studies using online data collection platforms such as Qualtrics and participant recruitment platforms like Prolific.
- Monitor the data collection process.
- Perform data analyses using statistical software such as JASP or JAMOVI.
- Communicate their research effectively through written and oral presentations.
- Write scientific manuscripts in APA style.
- Provide and incorporate peer feedback to improve research quality.

ATTENDANCE POLICY:

IES Abroad Vienna requires attendance at all class sessions. Attendance will be taken every class. Students must attend at least 60% of their class sessions to qualify for a passing grade, regardless of whether their absences have been excused or not. Your attendance is required in person unless otherwise noted in the syllabus. Students are highly encouraged to communicate absences as soon as possible to their professors and for excused absences using the processes described in the absence policy. Please refer to the IES Abroad Vienna Absence Policy for a more precise overview of all attendance policies at IES Abroad Vienna, as well as an overview of possible grade penalties.

ACADEMIC INTEGRITY:

At IES Abroad Vienna, we hold ourselves to the highest standards of honesty and academic integrity. Any form of academic dishonesty undermines the principles of trust and fairness essential to a thriving learning community. As such, plagiarism and cheating are considered serious violations of our code of conduct, and students found engaging in such activities will face swift and severe consequences, ranging from a failing grade on an assignment to an academic review and possible expulsion from the program.

USE OF AI:

Learning to use AI is an emerging skill. This course allows students to explore the use of generative artificial intelligence (GAI) tools such as ChatGPT for all assignments and assessments. However, be aware of the limits of these software systems. All large language models still tend to make up incorrect facts and fake citations. If you provide minimum effort prompts, you will get low quality results. You will need to refine your prompts to get good outcomes. This will take time. It is each student's responsibility to assess the validity and applicability of any GAI output that is submitted; you bear the final responsibility for your work. You may use AI programs, e.g., ChatGPT, to help generate ideas and brainstorm, however you must be aware that this may also stifle your own independent thinking and creativity. Any such use must be appropriately acknowledged and cited. Possible statements for the use of ChatGPT are:

- Producing an outline for a research paper;
- Rewording ideas in more complex or simpler forms of language;
- Reviewing formulations, correcting grammar;
- Producing images using prompts for oral presentation, etc.

If applicable, write a short paragraph at the end of each assignment to explain which AI tool was used and how you used it. Include the prompts you used to get the results. This paragraph is excluded from the word count.

CONTENT:

Week	Content	Assignments and Readings
Week 1	Part 1: Course overview and expectations. Forming research groups	Assignment: • Create an OSF project page for your group.
	Part 2: Good scientific practices • Preregistration, registered reports, big team science, OSF, etc.	Readings: • Forscher, P. S., Wagenmakers, E. J., Coles, N. A., Silan, M. A., Dutra, N., Basnight-Brown, D., & IJzerman, H. (2023). The benefits, barriers,

	• Introduction to the Replication Crisis	and risks of big-team science. <i>Perspectives on Psychological Science</i>, 18(3), 607-623 (16 pages). https://doi.org/10.1177/17456916221082970 • Korbmacher, M., Azevedo, F., Pennington, C. R., Hartmann, H., Pownall, M., Schmidt, K., ... & Evans, T. (2023). The replication crisis has led to positive structural, procedural, and community changes. <i>Communications Psychology</i>, 1(1), 1-13 (13 pages). https://doi.org/10.1038/s44271-023-00003-2 • Nosek, B. A., Hardwicke, T. E., Moshontz, H., Allard, A., Corker, K. S., Dreber, A., ... & Vazire, S. (2022). Replicability, robustness, and reproducibility in psychological science. <i>Annual Review of Psychology</i>, 73, 719-748 (29 pages). https://doi.org/10.1146/annurev-psych-020821-114157
Week 2	Part 1: Basics of quantitative research design I.	Assignment: • Draft your study hypotheses and goals. • Draft a preregistration and study documentation.
	Part 2: • Conducting a (critical) literature review. Formulation of study hypotheses and goals. Research ethics and IRB protocols • Preregistration and study documentation (e.g., informed consent)	Readings: • Carey, M.A., Steiner, K.L., Petri, W.A., Jr. (2020). Ten simple rules for reading a scientific paper. <i>PLOS Computational Biology</i>, 16(7): e1008032, 1-6 (6 pages). https://doi.org/10.1371/journal.pcbi.1008032 • Lakens, D. (2024). When and how to deviate from a preregistration. <i>Collabra: Psychology</i>, 10(1), 1-13 (13 pages). https://doi.org/10.1525/collabra.117094 • Simmons, J., D Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and how. <i>Journal of Consumer Psychology</i>, 31(1), 151-162 (11 pages). https://doi.org/10.1002/jcpy.1208
Week 3	Part 1: Basics of quantitative research design II.	Assignment: • Implement your study on SosciSurvey.

	Part 2: Introduction to data collection platforms: SosciSurvey and Prolific.	Readings: Rosenthal, R., & Rosnow, R. L. (2008). <i>Essentials of behavioral research: Methods and data analysis</i>. New York: McGraw-Hill.
Week 4	Part 1: Workshop on giving a good oral presentation.	Assignment: - Draft your methods section. - Begin data collection and initial data analysis.
	Part 2: Introduction to data analysis in JASP	Readings: - Loenneker, H., Buchanan, E. M., Martinovici, A., Primbs, M., ... & Kührt, C., Pronizius, E. We don't know what you did last summer. On the importance of transparent reporting of reaction time data pre-processing. <i>Cortex</i>, 172, 14-37 (23 pages). https://doi.org/10.1016/j.cortex.2023.11.012 - Jasp Manual "Statistical Analysis in JASP: A Guide for Student", p. 1-189 (189 pages). The latest version from https://jasp-stats.org/jasp-materials/
Week 5	Part 1: Data collection and analysis in JASP (cont.)	Assignment: Continue data collection and analysis.
	Part 2: Troubleshooting common issues in data collection.	
Week 6	Part 1: Oral presentations 1 / Midterm.	Assignment: Oral presentations of research progress.
	Part 2: Oral presentations 2 / Midterm.	Readings: - Bourne, P.E. (2007). Ten Simple Rules for Making Good Oral Presentations. <i>PLOS Computational Biology</i>, 3(4): e77, 0593-0594 (2 pages). https://doi.org/10.1371/journal.pcbi.0030077 - Naegle, K.M. (2021). Ten simple rules for effective presentation slides. <i>PLOS Computational Biology</i>, 17(12): e1009554, 1-6 (6 pages). https://doi.org/10.1371/journal.pcbi.1009554
Week 7	Part 1: Writing Workshop.	Assignment: Experiment with an AI tool for writing assistance.

		Draft the results section of your manuscript.
	Part 2: Use of AI tools in scientific writing.	Readings: - Mensh, B., & Kording, K. (2017). Ten simple rules for structuring papers. <i>PLOS Computational Biology</i>, 13(9), e1005619, 1-9 (9 pages). https://doi.org/10.1371/journal.pcbi.1005619 - Zhang W (2014) Ten Simple Rules for Writing Research Papers. <i>PLOS Computational Biology</i>, 10(1): e1003453, 1-3 (3 pages). https://doi.org/10.1371/journal.pcbi.1003453
Week 8	Part 1: Writing in APA style.	Assignment: Draft the discussion section of your manuscript.
	Part 2: The writing workshop focused on the discussion section. Interpreting data and drawing conclusions.	Readings: American Psychological Association. (2020). <i>Publication manual of the American Psychological Association 2020: the official guide to APA style (7th ed.)</i>. American Psychological Association.
Week 9	Part 1: Preparing a manuscript for submission to a scientific journal.	Assignment: Submit a complete draft of your manuscript for peer review.
	Part 2: Structure and components of a scientific paper.	
Week 10	Part 1: The peer review process.	Assignment: - Review two peers' manuscripts and provide constructive feedback. - Audit and finalize all study documents.
	Part 2: Auditing study documents (logs, consent forms, questionnaires).	Readings: Bourne, P. E., & Korngreen, A. (2006). Ten simple rules for reviewers. <i>PLOS Computational Biology</i>, 2(9), e110, 0973-0974 (2 pages). https://doi.org/10.1371/journal.pcbi.0020110
Week 11	Part 1: Addressing peer review comments.	Assignment: Submit a revised manuscript addressing peer review comments.

	Part 2: Finalizing the manuscript for submission.	Readings: Noble, W. S. (2017). Ten simple rules for writing a response to reviewers. <i>PLOS Computational Biology</i>, 13(10), e1005730, 1-4 (4 pages). https://doi.org/10.1371/journal.pcbi.1005730
Week 12	Part 1: Course wrap-up and reflection 1.	Assignment: Reflect on your learning experience in the course.
	Part 2: Course wrap-up and reflection 2.	

COURSE-RELATED TRIPS:

None

REQUIRED READINGS:

- American Psychological Association. (2020). *Publication manual of the American Psychological Association 2020: the official guide to APA style (7th ed.)*. American Psychological Association.
- Bourne, P.E. (2007). Ten Simple Rules for Making Good Oral Presentations. *PLOS Computational Biology*, 3(4): e77, 0593-0594. <https://doi.org/10.1371/journal.pcbi.0030077>
- Bourne, P. E., & Korngreen, A. (2006). Ten simple rules for reviewers. *PLOS Computational Biology*, 2(9), e110, 0973-0974. <https://doi.org/10.1371/journal.pcbi.0020110>
- Carey, M.A., Steiner, K.L., Petri, W.A., Jr. (2020). Ten simple rules for reading a scientific paper. *PLOS Computational Biology*, 16(7): e1008032, 1-6. <https://doi.org/10.1371/journal.pcbi.1008032>
- Forscher, P. S., Wagenmakers, E. J., Coles, N. A., Silan, M. A., Dutra, N., Basnight-Brown, D., & Ilzerman, H. (2023). The benefits, barriers, and risks of big-team science. *Perspectives on Psychological Science*, 18(3), 607-623. <https://doi.org/10.1177/17456916221082970>
- Jasp Manual "Statistical Analysis in JASP: A Guide for Student", p. 1-189. The latest version from <https://jasp-stats.org/jasp-materials/>
- Korbmacher, M., Azevedo, F., Pennington, C. R., Hartmann, H., Pownall, M., Schmidt, K., ... & Evans, T. (2023). The replication crisis has led to positive structural, procedural, and community changes. *Communications Psychology*, 1(1), 1-13. <https://doi.org/10.1038/s44271-023-00003-2>
- Lakens, D. (2024). When and How to Deviate from a Preregistration. *Collabra: Psychology*, 10(1), 1-13. <https://doi.org/10.1525/collabra.117094>
- Loenneker, H., Buchanan, E. M., Martinovici, A., Primbs, M., ... & Kühr, C., Pronizius, E. We don't know what you did last summer. On the importance of transparent reporting of reaction time data pre-processing. *Cortex*, 172, 14-37 <https://doi.org/10.1016/j.cortex.2023.11.012>
- Mensh, B., & Kording, K. (2017). Ten simple rules for structuring papers. *PLOS Computational Biology*, 13(9), e1005619, 1-9. <https://doi.org/10.1371/journal.pcbi.1005619>
- Naegle, K.M. (2021). Ten simple rules for effective presentation slides. *PLOS Computational Biology*, 17(12): e1009554, 1-6. <https://doi.org/10.1371/journal.pcbi.1009554>
- Noble, W. S. (2017). Ten simple rules for writing a response to reviewers. *PLOS Computational Biology*, 13(10), e1005730, 1-4. <https://doi.org/10.1371/journal.pcbi.1005730>
- Nosek, B. A., Hardwicke, T. E., Moshontz, H., Allard, A., Corker, K. S., Dreber, A., ... & Vazire, S. (2022). Replicability, robustness, and reproducibility in psychological science. *Annual Review of Psychology*, 73, 719-748. <https://doi.org/10.1146/annurev-psych-020821-114157>

- Rosenthal, R., & Rosnow, R. L. (2008). *Essentials of behavioral research: Methods and data analysis*. New York: McGraw-Hill.
- Simmons, J. D., Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and how. *Journal of Consumer Psychology*, 31(1), 151-162. <https://doi.org/10.1002/jcpy.1208>
- Zhang W (2014) Ten Simple Rules for Writing Research Papers. *PLOS Computational Biology*, 10(1): e1003453, 1-3. <https://doi.org/10.1371/journal.pcbi.1003453>

RECOMMENDED READINGS:

- Baumgartner, H. A., Alessandrini, N., Byers-Heinlein, K., Frank, M. C., Hamlin, J. K., Soderstrom, M., ... & Coles, N. A. (2023). How to build up big team science: A practical guide for large-scale collaborations. *Royal Society Open Science*, 10(6), 230235, 1-17. <https://doi.org/10.1098/rsos.230235>
- Camerer, C. F., Dreber, A., Holzmeister, F., Ho, T. H., Huber, J., Johannesson, M., ... & Wu, H. (2018). Evaluating the replicability of social science experiments in Nature and Science between 2010 and 2015. *Nature Human Behaviour*, 2(9), 637-644. <https://doi.org/10.1038/s41562-018-0399-z>
- Chambers, C. D., & Tzavella, L. (2022). The past, present and future of Registered Reports. *Nature Human Behaviour*, 6(1), 29-42. <https://doi.org/10.1038/s41562-021-01193-7>
- Clark, C. J., Jussim, L., Frey, K., Stevens, S. T., Al-Gharbi, M., Aquino, K., ... & von Hippel, W. (2023). Prosocial motives underlie scientific censorship by scientists: A perspective and research agenda. *Proceedings of the National Academy of Sciences*, 120(48), e2301642120, 1-9. <https://doi.org/10.1073/pnas.2301642120>
- Lakens, D. (2019). The value of preregistration for psychological science: A conceptual analysis. *心理学評論*, 62(3), 221-230. https://doi.org/10.24602/sjpr.62.3_221
- Lortie, C. J. (2017). Ten simple rules for short and swift presentations. *PLOS Computational Biology*, 13(3), e1005373, 1-6. <https://doi.org/10.1371/journal.pcbi.1005373>
- ManyBabies Consortium. (2020). Quantifying sources of variability in infancy research using the infant-directed-speech preference. *Advances in Methods and Practices in Psychological Science*, 3(1), 24-52. <https://doi.org/10.1177/2515245919900809>
- Moshontz, H., Campbell, L., Ebersole, C. R., Ilzerman, H., Urry, H. L., Forscher, P. S., ... & Chartier, C. R. (2018). The Psychological Science Accelerator: Advancing psychology through a distributed collaborative network. *Advances in Methods and Practices in Psychological Science*, 1(4), 501-515. <https://doi.org/10.1177/2515245918797607>
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716, 1-9. <https://doi.org/10.1126/science.aac4716>
- Phillips, N. D. (2017). Yarr! The pirate's guide to R.
- Pownall, M., Azevedo, F., König, L. M., Slack, H. R., Evans, T. R., Flack, Z., ... & FORRT. (2023). Teaching open and reproducible scholarship: a critical review of the evidence base for current pedagogical methods and their outcomes. *Royal Society Open Science*, 10(5), 221-255. <https://doi.org/10.1098/rsos.221255>
- Kolstoe, S. E., & Pugh, J. (2023) The trinity of good research: Distinguishing between research integrity, ethics, and governance. *Accountability in Research*, 1-20. <https://doi.org/10.1080/08989621.2023.2239712>
- Smith, E., Williams-Jones, B., Master, Z., Larivière, V., Sugimoto, C. R., Paul-Hus, A., ... & Resnik, D. B. (2020). Misconduct and misbehavior related to authorship disagreements in collaborative science. *Science and Engineering Ethics*, 26, 1967–1993. <https://doi.org/10.1007/s11948-019-00112-4>
- Wagge, J. R., Brandt, M. J., Lazarevic, L. B., Legate, N., Christopherson, C., Wiggins, B., & Grahe, J. E. (2019). Publishing research with undergraduate students via replication work: The collaborative replications and education project. *Frontiers in Psychology*, 10, 247-250. <https://doi.org/10.3389/fpsyg.2019.00247>
- Wagge, J. R., Hurst, M. A., Brandt, M. J., Lazarevic, L. B., Legate, N., & Grahe, J. E. (2023). Teaching Research in Principle and in Practice: What Do Psychology Instructors Think of Research Projects in Their Courses?. *Psychology Learning & Teaching*, 22(1), 4-19. <https://doi.org/10.1177/14757257221101942>