



EDPSYCH 711-011 – Current Topics in Educational Psychology: Meta-Analysis

Spring 2021, Tues/Thur 9:30 - 10:45 a.m.

All meetings online via Zoom

3 credits¹

Instructor: Dr. James E. Pustejovsky (pronounced “PUHS-tea-UV-ski” or “Pusto” for short)

Pronouns: he/him/his

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Online office hours: Fridays, 12-2 pm and by appointment

Course Description

Meta-analysis is the set of statistical methods and practices for synthesizing evidence collected from multiple sources, such as multiple studies on the same topic. Often conducted as part of a systematic literature review, meta-analyses play an increasingly prominent role in education research, psychology, and many other areas of social and behavior science. This course will introduce the stages of the research synthesis process and the statistical methods used for conducting quantitative syntheses of social-scientific research. The focus of the course is on practical application and interpretation of meta-analytic methods, enriched with discussion of underlying statistical theory. Computational exercises will use the R statistical computing environment. Major topics will include scope of research syntheses, systematic search and screening procedures, effect size calculations, summary meta-analysis, meta-regression, dependent effect sizes, selective reporting and publication bias analysis.

Pre-requisites

- Prior training in regression analysis (such as ED PSYCH 763)

Course Learning Outcomes

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

- Conduct a systematic, replicable search of literature databases for purposes of identifying studies eligible for a meta-analysis.

¹ This class meets for two, 75-minute class periods each week over the Spring semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 3 hours out of the classroom for every class period.

- Extract data and calculate effect sizes, along with associated information, from eligible studies.
- Analyze meta-analytic databases using appropriate statistical techniques.
- Interpret and critically evaluate the results of summary meta-analyses, meta-regression analyses, and publication bias analyses.
- Identify limitations and threats to the validity of meta-analytic findings.

Required Textbook

- Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2019). *The Handbook of Research Synthesis and Meta-Analysis*, 3rd Edition. Russell Sage Foundation.
*This is the definitive desk reference on research synthesis and meta-analysis in the social sciences. It is a great resource and well worth owning if you ever intend to conduct or collaborate on a research synthesis. **The electronic version is available as an Adobe Digital Editions pdf through the UW Madison library.***

Additional Recommended Resources

- Cooper, H. (2015). *Research Synthesis and Meta-Analysis: A Step-by-Step Approach*. SAGE Publications.
This is an excellent guide through the full process of conducting a research synthesis, although it is light on the statistical details.
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2011). *Introduction to Meta-Analysis*. John Wiley & Sons.
This textbook covers basic meta-analysis methods at an introductory level suitable for students without prior statistical training. It includes many worked, numerical examples.
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. SAGE Publications.
This is an older guide to conducting a systematic review and research synthesis. It includes lots of great pragmatic advice, but is short (at times even misguided) about the statistical details.
- Higgins, J.P.T., & Green, S. (Eds.). (2009). *The Cochrane Handbook for Systematic Review of Interventions*. Chichester (UK): John Wiley & Sons. Online version at <https://training.cochrane.org/cochrane-handbook-systematic-reviews-interventions>. *This handbook defines the methods used in systematic reviews and meta-analyses of healthcare interventions conducted under the auspices of the Cochrane Collaboration.*
- Online resources from the Campbell Collaboration:
<https://campbellcollaboration.org/research-resources/training-courses.html>
- *Research Synthesis Methods* is an interdisciplinary journal sponsored by the [Society for Research Synthesis Methodology](#). It is a leading outlet for new methodological developments related to research synthesis and meta-analysis.

Computing

In-class software demonstrations will use the R environment for statistical computing. In principle, you are welcome to complete the problem sets and exam using your choice of software. However, I am unable to provide examples, debugging help, or technical support for any software not demonstrated in class.

There are many freely available resources for learning R. Here are some:

- R: <https://www.r-project.org/>
- RStudio: <https://www.rstudio.com/>
- TryR code school: <http://tryr.codeschool.com>
- YaRrr! The Pirate's Guide to R: <http://nathanieldphillips.com/theiratesguidetor/>
- Princeton R tutorials: <http://data.princeton.edu/R/>
- D-Lab R training: <https://github.com/dlab-berkeley/R-for-Data-Science>

Evaluation

- Problem sets (75%).
- Final exam (25%).

A tentative rubric for assignment of final grades is listed below. *The instructor reserves the right to modify this rubric.* Square brackets correspond to \leq or \geq ; rounded parentheses to $<$ or $>$.

A	[90, 100]	C+	[74, 77)
A-	[87, 90)	C	[70, 74)
B+	[84, 87)	C-	[67, 70)
B	[80, 84)	D	[60, 67)
B-	[77, 80)	F	[0, 60)

Problem sets

- Students will complete problem sets involving analysis of real or simulated data. The exercises will typically involve implementing different analytic methods and interpreting the results. Some exercises will involve reading and interpreting published meta-analyses.
- Problem sets will be submitted and graded through Canvas.

Final exam

- The final exam will be cumulative, covering all topics addressed during the semester.
- The exam will be distributed by Friday, April 30, 2021 and will be due by Thursday, May 6th.

- *Each student must complete the exam individually*, without talking to other students regarding the exam material.
- Dedicated on-campus spaces with high-speed internet are available for students to reserve for any exam taken during the semester. Computers can also be requested.

Attendance

Students are responsible for all of the material presented during class meetings. Attendance is not required.

Academic Integrity Statement

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison. Students are expected to maintain absolute integrity and a high standard of individual honor in scholastic work. Assignments and projects must be completed with the utmost honesty, which includes acknowledging the contributions of other sources to your scholastic efforts; avoiding plagiarism; and completing assignments independently unless expressly authorized otherwise. *Homework assignments or projects containing any plagiarized material will not be accepted.* Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of academic misconduct, which may result in disciplinary action. Examples of disciplinary action include, but are not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion.

Accommodations for Students with Disabilities Statement

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. (See: McBurney Disability Resource Center)

Privacy of Student Information & Digital Tools: Teaching & Learning Analytics & Proctoring Statement

The privacy and security of faculty, staff and students' personal information is a top priority for UW-Madison. The university carefully reviews and vets all campus-supported digital tools used to support teaching and learning, to help support success through learning analytics, and to enable proctoring capabilities. UW-Madison takes necessary steps to ensure that the providers of

such tools prioritize proper handling of sensitive data in alignment with FERPA, industry standards and best practices.

Under the Family Educational Rights and Privacy Act (FERPA which protects the privacy of student education records), student consent is not required for the university to share with school officials those student education records necessary for carrying out those university functions in which they have legitimate educational interest. 34 CFR 99.31(a)(1)(i)(B). FERPA specifically allows universities to designate vendors such as digital tool providers as school officials, and accordingly to share with them personally identifiable information from student education records if they perform appropriate services for the university and are subject to all applicable requirements governing the use, disclosure and protection of student data.

Privacy of Student Records & the Use of Audio Recorded Lectures

See information about [privacy of student records and the usage of audio-recorded lectures](#).

Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

Course Evaluations

Students will be provided with an opportunity to evaluate this course and your learning experience. Student participation is an integral component of this course, and your confidential feedback is important to me. I strongly encourage you to participate in the course evaluation.

UW-Madison now uses an online course evaluation survey tool, [AEFIS](#). In most instances, you will receive an official email two weeks prior to the end of the semester when your course evaluation is available. You will receive a link to log into the course evaluation with your NetID where you can complete the evaluation and submit it, anonymously.

Students' Rules, Rights & Responsibilities

During the global COVID-19 pandemic, we must prioritize our collective health and safety to keep ourselves, our campus, and our community safe. As a university community, we must work together to prevent the spread of the virus and to promote the collective health and welfare of our campus and surrounding community.

UW-Madison Badger Pledge

Campus Guidance on the use of Face Coverings

Face coverings must be correctly worn on campus at all times and in all places (both outside and inside), except by students in their assigned residence hall rooms; by employees when alone in a private, unshared lab or office; when traveling alone in a private vehicle; and when exercising outside in a way that maintains 6 feet of distance from other people.

Students with disabilities or medical conditions who are unable to wear a face covering should contact the McBurney Disability Resource Center or their Access Consultant if they are already affiliated. Students requesting an accommodation unrelated to disability or medical condition, should contact the Dean of Students Office.

Students who choose not to wear a face covering may not attend in-person classes, unless they are approved for an accommodation or exemption. All other students not wearing a face covering will be asked to put one on or leave the classroom. Students who refuse to wear face coverings appropriately or adhere to other stated requirements will be reported to the Office of Student Conduct and Community Standards and will not be allowed to return to the classroom until they agree to comply with the face covering policy. An instructor may cancel or suspend a course in-person meeting if a person is in the classroom without an approved face covering in position over their nose and mouth and refuses to immediately comply.

Quarantine or Isolation Due to COVID-19

Student should continually monitor themselves for COVID-19 symptoms and get tested for the virus if they have symptoms or have been in close contact with someone with COVID-19. Student should reach out to instructors as soon as possible if they become ill or need to isolate or quarantine, in order to make alternate plans for how to proceed with the course. Students are strongly encouraged to communicate with their Instructor concerning their illness and the anticipated extent of their absence from the course (either in-person or remote). The instructor will work with the student to provide alternative ways to complete the course work.

Diversity & Inclusion Statement

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

Academic Calendar & Religious Observances

See: <https://secfac.wisc.edu/academic-calendar/#religious-observances>