**Advanced Research Methods In Meta-Analysis**MEJO 890
University of North Carolina at Chapel Hill

Fall 2019

Fridays 12:30 – 3:15 p.m.

340A Carroll Hall

|  |  |
| --- | --- |
| **Seth M. Noar, Ph.D.** | **Office Hours:** |
| Professor | 382 Carroll Hall |
| School of Media & Journalism Phone: 919-962-4075Email: noar@unc.edu | M/W 2:00PM-3:30PMand by appointment |

***Course Objectives*:**

*Advanced Research Methods in Meta-Analysis* is designed to give graduate students a detailed treatment of quantitative research synthesis techniques (systematic reviews and meta-analysis). Meta-analysis is concerned with providing an accurate estimate of a given effect – whether it is a correlation between variables or a treatment effect resulting from an intervention. Meta-analysis is also concerned with understanding moderators of effects, which help us to understand *under what conditions* effects are most likely to be strong or weak. Meta-analysis is applied in many fields, including communication, journalism, advertising, and the health sciences.

In this course, students will learn:

* An understanding of advanced methods of research synthesis
* How to become a critical consumer of systematic reviews and meta-analyses
* How do conduct a systematic review and meta-analysis

Students will conceptualize and carry out their own meta-analysis during the course, conducting each step in the process. This includes defining the research question, setting boundaries for the literature search, locating published (and unpublished) studies, developing a coding protocol and coding studies, retrieving and calculating effect sizes, analyzing the dataset, and writing up the study for publication. Because of the time restrictions of a one-semester course, some steps may be carried out only in part (e.g., partial systematic literature search). Students will learn how to compute effect sizes and analyze the meta-analytic dataset, and the final paper will be a full write-up of the meta-analysis. In past iterations of this course, some students have gone on to publish their meta-analysis in a peer-reviewed journal.

***Readings***

We will use the Lipsey and Wilson book as our main text. Other readings will be posted on the course Sakai website.

1. Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage Publications.

2. Additional readings (listed at the end of the syllabus)

***Course Requirements and Grading***

Grades will be based on the following:

|  |  |
| --- | --- |
| **Meta-Analysis Critique** Paper Presentation | **25%**1510 |
| **Meta-Analysis Project** Conceptualization Literature Search Plan Coding Form Analysis Final Paper Presentation | **75%**5510103015 |

All students should come to the seminar prepared to discuss the day’s readings. Assignments should be turned in on time. You cannot fully participate if you are not in class. Please stay in communication with me if you have a conflict.

**Grading for the class will be determined as follows**:

**H** Student reads and critically engages with all of the assigned material. Participation in discussion and written assignments exhibit the ability not only to apply the material, but also to extrapolate ideas, expand into new areas, and contribute to the body of scholarship in the area. Reserved for truly extraordinary work.

**P** Student usually reads and engages critically with the assigned material. Able to apply material and extrapolate ideas. Consistently good work done on time.

**L** Student reads and engages critically with only some of the assigned material. Able to apply the material and extrapolate ideas in only some instances.

**F** Student occasionally misses class, does not always read the material, fails to critically engage with it, and is unable or unwilling to apply the material.

***Course Philosophy***

This is a methods course in which class discussion and engagement are vital parts of the learning process. Although some general material will be presented, this course is *not* structured as a lecture-style statistics course. Rather, it is a course where we learn from reading, discussing of core class material, and engagement in an individualized meta-analysis project that each student pursues.

Students are expected to have a high level of commitment to this course. This can be demonstrated by doing the readings in advance of class, participating in class when appropriate, and overall putting in effort. It is vital that students come to class each day with a background of the topic for that day (which you will get from the readings). Students with less of a background in statistics/methodology may want to do extra preparation before class, as needed.

***Meta-Analysis Critique***

 You will choose a published meta-analysis in an area of interest to you and write a 2-3 page (double-spaced) critique of the meta-analysis. The critique should include an analysis of the conceptualization of the research area and rationale for the meta-analysis; inclusion and exclusion criteria; choice of published only versus unpublished work; coding of studies; choice of effect size indicator; analysis of data (overall effects, moderators); writing up and presentation of study results; and anything else that you think is worth noting. One goal of this assignment is for you to critically examine a meta-analysis of interest to you. A second goal is for us as a class to be exposed to examples - perhaps both good and bad - of published meta-analyses. This written assignment is worth 15% and a 10-15 minute presentation of the meta-analysis critique is worth 10%.

***Research Proposal and Presentation***

***Meta-Analysis Project***

You will complete a meta-analysis project that will be broken into shorter assignments and will culminate in a final paper. The individual assignments are as follows:

*Conceptualization*: Briefly describe the research area and your proposed meta-analysis, including: your research question; rationale for the meta-analysis; any prior meta-analyses or systematic reviews in the area; independent and dependent variables; inclusion/exclusion criteria; and evidence that there is a research literature upon which to conduct a meta-analysis in this area.

*Literature Search Plan*: Describe your plan for searching the literature, including all search methods that will be used; databases that will be searched using study-relevant keywords; and any plans to search the grey/unpublished literature. Be sure to justify your choices.

*Coding Form*: Develop a draft coding form for your meta-analysis. Consider variables both to describe the studies as well as those that may be used in moderator analyses. Be sure to include all variables that are important for your meta-analysis. Consider participant, theoretical, intervention, study design, and methodological variables.

*Analysis*: Run your meta-analysis and write up the results. Be sure to include details about effect size computation, weighted mean effect size, heterogeneity (*Q* and I2), and moderator analyses, if applicable. If possible, include a forest plot with your results, and consider whether to conduct additional analyses such as publication bias analyses.

*Final paper*: Your final paper should be a full write-up of your meta-analysis, similar to what you would see in the published literature. It should be approximately 20 double-spaced pages with 12-point (Times New Roman or similar) font. The final paper should include 1) *Literature review* – provide a literature review of the area which culminates in a strong rationale for the current meta-analysis (5-7 pages); 2) *Methods* – search strategy, inclusion/exclusion criteria, article coding information, and effect size/analysis details. Decisions made in these areas should be justified (3-5 pages); 3) *Results* - include at least 10 studies that met inclusion criteria and were coded, effect sizes extracted, and the dataset analyzed. Describe what you have found in terms of overall effect size and heterogeneity, as well as which moderators you examined or plan to examine (2 pages); 4) *Discussion* - indicate what you found or expect to find (with the final set of studies), what the results mean to the area of research, and limitations of your meta-analysis (2-3 pages); 5) *References* – list all references cited in the paper (3-5 pages); 6) *Table* - list each study that met inclusion criteria along with key information that was coded, including effect size (2-3 pages); 7) *Appendix* - include a copy of your coding form and a list of all references to studies in the meta-analysis.

Your grade on this project will be determined based upon the overall quality of the project, which includes: 1) conceptualization of the project; 2) how well decisions were carefully thought out and justified in the paper; 3) use of appropriate meta-analytic procedures; 4) quality of the meta-analysis and the writing in your final paper; and 5) grammar, spelling, and consistent use of reference style (e.g., APA). The final written paper is worth 30% of your grade. The assignments leading up to the final paper will help ensure that you are on track and receive feedback on key steps along the way, and are: conceptualization (5%), literature search plan (5%), coding form (10%), and analysis (10%).

***Meta-Analysis Presentation***

You will give a 15 minute presentation of your meta-analytic project. Use the page guidelines above as a guide for how long each section should be. For example, you should spend significant time describing the literature that provides a basis for your project, the methods that were used, and how you arrived at particular decisions. Less time can be spent on results and implications. Use of a visual medium such as Microsoft PowerPoint is required. This assignment is worth 15% of your final grade and will take place in class on November 22 (and possibly December 6 as well).

|  |  |  |
| --- | --- | --- |
|  | ***Semester Schedule Overview*** |  |
| ***Date*** | ***Topics*** | ***Assignments Due*** |
| Wk 1: 8/23 | Introduction to course; cumulative knowledge in science; what is meta-analysis?; comparison to traditional reviews |  |
| Wk 2: 8/30 | Steps in meta-analysis and systematic reviews; strengths and weaknesses of meta-analysis |  |
| Wk 3:9/6 | Conceptualizing a meta-analysis: research gap, research questions, feasibility, decisions, literature boundaries, inclusion criteria |  |
| Wk 4:9/13 | Strategies for searching the published literature; strategies for searching grey literature; file drawer problems and decisions about grey literature | \*Conceptualization due |
| Wk 5: 9/20 | Creating a coding form and coding studies |  |
| Wk 6: 9/27 | *NO CLASS - Jane Brown Health Communication Lecture* | \*Literature Search Plan due |
| Wk 7: 10/4 | Critiques of null hypothesis significance testing; introduction to effect size; comparison of effect size indicators |  |
| Wk 8: 10/11 | Computing effect sizes from study reports; issues you may (will!) encounter with effect sizes - multiple studies, multiple outcomes, multiple measures, data not reported, etc. | \*Coding Form due |
| Wk 9: 10/18 | No class: Fall break |  |
| Wk 10: 10/25 | Approaches to combining effect sizes; homogeneity vs. heterogeneity; fixed vs. random effects models; analysis of moderators |  |
| Wk 11: 11/1 | Approaches to combining effect sizes (cont’d)(Comprehensive meta-analysis) |  |
| Wk 12: 11/8 | Writing up a meta-analysis of publication - dos and don’ts; Visual depictions of meta-analytic findings  | \*Analysis due |
| Wk 13: 11/15 | Limitations and future directions for meta-analysisSpecial Guest: Dr. Paschal Sheeran |  |
| Wk 14: 11/22 | Final project class presentations1 | \*Final paper due |
| Wk 15: 11/29 | No class – Thanksgiving break! |  |
| Wk 16:12/6 | Final project class presentations1 |  |

1*Note: Project presentations will begin on 11/22. They will also take place on 12/6 (or another day that works for everyone) if needed. [According to the UNC schedule, classes end on 12/4].*

*Participation, Special Needs, Diversity, Academic Integrity and AEJMC Core Competencies*

**Participation:** The format of this course requires full attendance and active participation by all students. The assigned readings should be read by the scheduled date. *All* students are expected to to participate in the discussion of each reading. Please let me know as soon as possible if there is an emergency or if you have a prior academic commitment that will keep you from attending a class session.

**Special Needs or Concerns:** If you have questions or needs related to a disability or any other area of concern, please come see me in person to discuss any accommodations that may be of help.

**Diversity:** UNC is committed to providing an inclusive and welcoming environment for all members of our community and does not discriminate in offering access to its educational programs and activities based on age, gender, race, color, national origin, religion, creed, disability, veteran’s status, sexual orientation, gender identity, or gender expression. The School of Media and Journalism adopted Diversity and Inclusion Mission and Vision statements in spring 2016 with accompanying goals - <http://www.mj.unc.edu/diversity-and-inclusion>.

**Academic Integrity:** All UNC-CH students are expected to adhere to the University’s Honor Code, which includes the following re: Academic Dishonesty:

It shall be the responsibility of every student enrolled at the University of North Carolina to support the principles of academic integrity and to refrain from all forms of academic dishonesty, including but not limited to, the following:

**1. Plagiarism** in the form of deliberate or reckless representation of another’s words, thoughts, or ideas as one’s own without attribution in connection with submission of academic work, whether graded or otherwise.

**2. Falsification, fabrication, or misrepresentation of data**, other information, or citations in connection with an academic assignment, whether graded or otherwise.

**3. Unauthorized assistance or unauthorized collaboration** in connection with academic work, whether graded or otherwise.

(For the full text of the Honor Code see [http://instrument.unc.edu/instrument.text.html)](http://instrument.unc.edu/instrument.text.html%29)

**The following AEJMC core competencies are relevant to this course:**

* Think critically, creatively and independently
* Conduct research and evaluate information by methods appropriate to the communications professions in which they work
* Write correctly and clearly in forms and styles appropriate for the communications professions, audiences and purposes they serve
* Apply basic numerical and statistical concepts
* Contribute to knowledge appropriate to the communications professions in which they work

*MEJO 890 Readings*

Week 1 - 8/23

No readings – first day of class

Week 2 - 8/30

L & W, Chapter 1

Cooper, H., Hedges, L. V., & Valentine, J. C. (2019). Research synthesis as a scientific process. In H. Cooper, L. V. Hedges & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis (3rd ed.).* (pp. 4-15). New York, NY US: Russell Sage Foundation.

Gurevitch J, Koricheva J, Nakagawa S, Stewart G. (2018). Meta-analysis and the science of research synthesis. *Nature,* 555(7695),175-182.

Noar, S. M., & Snyder, L. B. (2014). Building cumulative knowledge in health communication: The application of meta-analytic methods. In B. B. Whaley (Ed.), *Research methods in health communication: Principles and Application* (pp. 232-253)*.* New York: Routledge.

Week 3 - 9/6

L & W, Chapter 2

Cooper, H. (2019). Hypotheses and problems in research synthesis. In H. Cooper, L. V. Hedges & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis (3rd ed.).* (pp. 4-15). New York, NY US: Russell Sage Foundation.

Johnson, B. T., & Hennessy, E. A. (2019). Systematic reviews and meta-analyses in the health sciences: Best practice methods for research syntheses. *Social Science & Medicine, 233,* 237-251.

Noar, S. M. (2006). In pursuit of cumulative knowledge in health communication: The role of meta-analysis. *Health Communication, 20*(2), 169-175.

Week 4 – 9/13

L & W, Chapter 2

Glanville, J. (2019). Searching bibliographic databases. In H. Cooper, L. V. Hedges & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis (3rd ed.).* (pp. 73-100). New York, NY US: Russell Sage Foundation.

Giustini, D. (2019). Retrieving grey literature, information, and data in the digital age. In H. Cooper, L. V. Hedges & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis (3rd ed.).* (pp. 101-128). New York, NY US: Russell Sage Foundation.

Week 5 – 9/20

L & W, Chapter 4, 5, & Appendix E

Wilson, D. B. (2009). Systematic coding for research synthesis. In H. Cooper, L. V. Hedges

& J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis (3rd*

*ed.).* (pp. 153-172). New York, NY US: Russell Sage Foundation.

Week 6 – 9/27

No readings (no class this day)

Week 7 – 10/4

L & W Chapter 3

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*(2),156-168.

Kirk, R. E. (1996). Practical significance: A concept whose time has come. *Educational & Psychological Measurement, 56*(5), 746-759.

McCartney, K., & Rosenthal, R. (2000). Effect size, practical importance, and social policy for children. *Child Development, 71*(1), 173-180.

Rosenthal, R. (1990). How are we doing in soft psychology? *American Psychologist, 45*(6), 775-777.

Week 8 – 10/11

L & W Chapter 8 & Appendices B, C, D

Week 9 – 10/18

No class – fall break

Week 10 – 10/25

L & W Chapters 6 & 7

Borenstein, M., Hedges, L. V., Higgins, J. P., Rothstein, H. R. (2010). A basic introduction to fixed‐

effect and random‐effects models for meta‐analysis. *Research Synthesis Methods, 1*(2), 97-

111.

Head, K., J., Noar, S. M., Iannarino, N., & Harrington, N. G. (2013). Efficacy of text messaging-based interventions for health promotion: A meta-analysis*.* *Social Science & Medicine, 97*, 41-48.

Week 11 – 11/1

Review last week’s readings

Week 12 – 11/8

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & the Prisma Group (2009). Preferred

Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA

Statement. *PLoS Med, 6*(7), e1000097.

Donnelly C. A., Boyd I., Campbell P., et al. (2018). Four principles to make evidence synthesis more useful for policy. *Nature, 558*(7710), 361-364.

Kepes, S., McDaniel, M.A., Brannick, M.T., Banks, G.C. (2013). Meta-analytic reviews in the organizational sciences: Two meta-analytic schools on the way to MARS (the Meta-Analytic Reporting Standards). *Journal of Business and Psychology, 28*(2),123-143.

Stewart L., Moher D., & Shekelle P. (2012). Why prospective registration of systematic reviews makes sense. *Systematic Reviews, 1*(1), 7.

Week 13 – 11/15

Brewer, N. T., & Noar, S. M. (2019). A consumer’s guide to understanding and critically evaluating meta-analyses. *Unpublished manuscript.*

Eysenck, H. J. (1994). Meta-analysis and its problems. *BMJ, 309*(6957), 789.

Lipsey, M. W. (2003). Those confounded moderators in meta-analysis: Good, bad, and ugly. *Annals of the American Academy of Political and Social Science, 587,* 69-81.

Sheeran, P., Abraham, C., Jones, K., et al. (2019). Promoting physical activity among cancer survivors: Meta-analysis and meta-CART analysis of randomized controlled trials. *Health Psychology, 38*(6),467-482.

Protogerou C., Johnson, B. T., & Hagger, M . S. (2018). An integrated model of condom use in Sub-Saharan African youth: A meta-analysis. *Health Psychology, 37*(6), 586-602.

Week 14 – 11/22

No readings – presentations

Week 15 – 11/29

No readings – Thanksgiving break