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

Spring 2022

Tuesdays 12:30 – 3:15 p.m.

338 Carroll Hall

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| **Seth M. Noar, Ph.D.** | **Office Hours:** |
| Professor | By appointment |
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***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 This includes defining the research question, setting boundaries for the literature search, locating published (and unpublished) studies, developing a coding protocol and coding studies, retrieving and calculating effect sizes, analyzing the dataset, and writing up the study for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:

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| **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, presentation and discussion of core class material, and engagement with 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 (i.e., list of potential citations).

*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. Include a forest plot with your results. If possible, conduct 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 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.

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|  | ***Semester Schedule Overview*** |  |
| ***Date*** | ***Topics*** | ***Assignments Due*** |
| Wk 1: 1/11 | Introduction to course; cumulative knowledge in science; what is meta-analysis?; comparison to traditional reviews |  |
| Wk 2: 1/18 | Steps in meta-analysis and systematic reviews; strengths and weaknesses of meta-analysis\**Shortened class due to job candidate*  |  |
| Wk 3:1/25 | Steps in meta-analysis and systematic reviews (cont’d) |  |
| Wk 4:2/1 | Conceptualizing a meta-analysis: research gap, research questions, feasibility, decisions, literature boundaries, inclusion criteria | \*Conceptualization due |
| Wk 5: 2/8 | Strategies for searching the published literature; strategies for searching grey literature; file drawer problems and decisions about grey literatureGuest speaker at 2pm: Stephanie Willen Brown, Director, Park Library |  |
| Wk 6: 2/15 | Creating a coding form and coding studies |  |
| Wk 7: 2/22 | Critiques of null hypothesis significance testing; introduction to effect size; comparison of effect size indicators | \*Literature Search Plan due |
| Wk 8: 3/1 | Computing effect sizes from study reports; issues you may (will!) encounter with effect sizes - multiple studies, multiple outcomes, multiple measures, data not reported, etc. |  |
| Wk 9: 3/8 | Approaches to combining effect sizes; homogeneity vs. heterogeneity; fixed vs. random effects models; analysis of moderators | \*Coding Form due |
| Wk 10: 3/15 | No class: Spring break |  |
| Wk 11:3/22 | Approaches to combining effect sizes (cont’d)(Comprehensive meta-analysis) | Note: Additional lab time(s) may be added as needed |
| Wk 12:3/29 | Approaches to combining effect sizes (cont’d)(Comprehensive meta-analysis) | Note: Additional lab time(s) may be added as needed |
| Wk 13:4/5 | Writing up a meta-analysis for publication - dos and don’ts; Visual depictions of meta-analytic findings  | \*Analysis due |
| Wk 14: 4/12 | Limitations and future directions for meta-analysisGuest Speaker |  |
| Wk 15: 4/19 | Final project class presentations | \*Final paper due |
| Wk 16:4/26 | Final project class presentations |  |

*Policies and Procedures*

**COVID-19 and Mask Use**

All enrolled students are required to wear a mask covering your mouth and nose at all times in our classroom. This requirement is to protect our educational community -- your classmates and myself – as we learn together. If you choose not to wear a mask, or wear it improperly, I will ask you to leave immediately, and I will submit a report to the [Office of Student Conduct](https://cm.maxient.com/reportingform.php?UNCChapelHill&layout_id=23).  At that point you will be disenrolled from this course for the protection of our educational community. Students who have an authorized accommodation from Accessibility Resources and Service have an exception.  For additional information, see  <https://carolinatogether.unc.edu/community-standards/>

**Participation and Attendance:** 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 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. University attendance policy is as follows:No right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

1. Authorized University activities
2. Disability/religious observance/pregnancy, as required by law and approved by [Accessibility Resources and Service](https://ars.unc.edu/) and/or the [Equal Opportunity and Compliance Office](https://eoc.unc.edu/what-we-do/accommodations/) (EOC)
3. Significant health condition and/or personal/family emergency as approved by the [Office of the Dean of Students](https://odos.unc.edu/), [Gender Violence Service Coordinators,](https://womenscenter.unc.edu/resources/gender-violence-services/) and/or the [Equal Opportunity and Compliance Office](https://eoc.unc.edu/what-we-do/accommodations/) (EOC).

Please communicate with me early about potential absences, and be aware that you are bound by the [Honor Code](http://catalog.unc.edu/policies-procedures/honor-code/) when making a request for a University approved absence.

My attendance policy is as follows: For each absence above two unexcused absences, 5 percent will be deducted from your overall grade in the course. You are required to provide official written documentation for excused absences.  Excuses for university-sponsored activities must be presented in advance of the absence and arrangements for work missed for such activities must be made prior to such absences. No excuses or documentation will be accepted more than two weeks after the absence.

**Missed or late assignments**. Missed or late assignments create major time and scheduling conflicts and are unfair to those who turn things in on time. For these reasons, any late assignment will have *10 percent* deducted from the score as a penalty for *each day* it is late (including weekends). An assignment is considered late when it is submitted after the stated deadline, and deductions will be taken beginning with the missed deadline. The *only* exception to this policy will be *documented* and *university accepted* excuses.

**Honor Code.** I expect that each student will conduct himself or herself within the guidelines of the University honor system ([http://honor.unc.edu](https://outlook.unc.edu/owa/redir.aspx?C=_PwXhu5wkEKfdEIVTpil9KJAr6RORM8IBwmgW7JyZPUuO4or7Dri_9D4gXEkBO0Z0IIreRKEjIQ.&URL=http%3a%2f%2fhonor.unc.edu)). All academic work should be done with the high levels of honesty and integrity that this University demands. You are expected to produce your own work in this class. If you have any questions about your responsibility or your instructor’s responsibility as a faculty member under the Honor Code, please see the course instructor or Senior Associate Dean C. A. Tuggle, or you may speak with a representative of the Student Attorney Office or the Office of the Dean of Students.

**Diversity.** I strive to make this classroom an inclusive space for all students.  Please let me know if there is anything I can do to improve this; I appreciate any suggestions.  More broadly, our school has adopted diversity and inclusion [mission and vision statements](http://hussman.unc.edu/diversity-and-inclusion) with accompanying goals. These complement the University policy on [prohibiting harassment and discrimination](https://eoc.unc.edu/our-policies/ppdhrm/).  In summary, 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 on the basis of age, gender, race, color, national origin, religion, creed, disability, veteran’s status, sexual orientation, gender identity, or gender expression. The Dean of Students (Suite 1106, Student Academic Services Building, CB# 5100, 450 Ridge Road, Chapel Hill, NC 27599-5100 or [919] 966-4042) has been designated to handle inquiries regarding the University’s nondiscrimination policies.

**Policy on Non-Discrimination.** The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals’ abilities and qualifications. Consistent with this principle and applicable laws, the University’s [Policy Statement on Non-Discrimination](https://unc.policystat.com/policy/4467906/latest/) offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, creed, genetic information, disability, veteran’s status, sexual orientation, gender identity or gender expression.  Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (see contact info at  [safe.unc.edu](https://safe.unc.edu/)) or the [Equal Opportunity and Compliance Office](http://eoc.unc.edu/), or online to the EOC at <https://eoc.unc.edu/report-an-incident/>.

**Title IX.** Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University’s Title IX Coordinator (Elizabeth Hall, interim – titleixcoordinator@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at [safe.unc.edu](https://safe.unc.edu/).

**Seeking Help.** If you need individual assistance, it is your responsibility to meet with the instructor during office hours or to set up an appointment for another time. If you are serious about wanting to improve your performance in the course, the time to seek help is as soon as you are aware of the problem – whether the problem is difficulty with course material, a disability, or an illness.

**Special Accommodations.** The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability, or pregnancy complications resulting in barriers to fully accessing University courses, programs, and activities.

Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: [https://ars.unc.edu](https://ars.unc.edu/) or email ars@unc.edu.

(source: <https://ars.unc.edu/faculty-staff/syllabus-statement>)

**Counseling and Psychological Services.** CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

**Syllabus Changes**. The professor reserves the right to make changes to the syllabus, including project due dates and test dates. These changes will be announced as early as possible.

**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 - 1/11

No readings – first day of class

Week 2 - 1/18

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 – 1/25

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 – 2/1

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 – 2/8

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 – 2/15

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 7 – 2/22

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

Week 8 – 3/1

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 9 – 3/8

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Week 10 – 3/15

No class – spring break

Week 11 – 3/22

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Week 12 – 3/29

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Week 13 – 4/5

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 14 – 4/12

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.

Week 15 – 4/19

No readings – presentations

Week 16 – 4/26

No readings – presentations