

RMTD 488
Meta-analysis

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Class hours: Tuesdays, 4:15 - 6:45pm
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Course content

The purpose of this course is to familiarize you with the literature on and methods for meta-analysis. While our focus is primarily on the social sciences, we will also have readings from the medical literature, where much of the recent work on methods for synthesis has appeared. Conceptual issues in reviewing research will be discussed, and methods for quantitative research synthesis will be presented. This class covers a mix of issues relevant to research reviews and quantitative synthesis methods. An introductory statistics sequence (e.g., RMTD 404 & 482) or an equivalent is a prerequisite.

School of Education's Conceptual Framework
[\(www.luc.edu/education/mission/\)](http://www.luc.edu/education/mission/)

Our School's conceptual framework is "social action through education". This course contributes to this framework by learning the skills to conduct rigorous research on issues of professional practice and social justice. Specifically, this course will equip students with the special analytical skill, meta-analysis, to possibly explore research questions related to social action using statistical software, such as SPSS and R. The statistical techniques used in this course also add to students' ability to explore diversity of perspectives that researchers used to address social problems.

Required text(s)

Set 1: Cooper, H.M., Hedges, L.V., & Valentine, J. (2008). *The handbook of research synthesis and meta-analysis*. New York: Russell Sage Foundation.

OR

Set 2: Lipsey, M.W., & Wilson, D.B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage Publications. AND

Cooper, H. M. (2009). *Research synthesis and meta-analysis: A step by step approach* (4th ed.). Thousand Oaks, CA: Sage.

Course Objectives

The broad goal of the course is to introduce students to the issues and controversies in the area of research synthesis and to a set of quantitative procedures for summarizing primary studies. Specifically, students will

1. Understand the benefit and limitation of meta-analysis;
2. Acquire the quantitative skills to synthesize previous studies focusing on the same research question by practicing data analyses using prepared computer programs of existing data sets;
3. Conduct and present a synthesis of a small set of outcomes (at least 10 outcomes per person), including a quantitative synthesis of effect-magnitude measures. Specifically students will
 - a. identify and code potential explanatory variables;
 - b. identify different kinds of study outcomes, select a measure of effect magnitude to best represent those outcomes, and use the sampling distribution appropriate to their chosen effect-magnitude measure in data analyses;
 - c. conduct appropriate data analyses, including homogeneity tests, the estimation and testing of categorical or continuous models, and analyses of confounding variables; and
 - d. prepare a report of the synthesis.

Grades

Course grades will be based on class participation, exercises, a series of memos and a final project. These items will be weighted as follows in the computation of the final grade:

Class participation	10%
Exercises	50%
Memos	15%
Project	25%

Class participation. Attendance and attending classes on time are mandatory. If you will have to miss a class, inform the instruction as early as possible. Unexcused absence will impact the final grade. In addition, be sure you finish reading the assigned articles and join the discussion in the class.

Exercises. You will do several data-analysis exercises to get experience using SPSS, Excel, or other software to compute estimates and to conduct meta-analysis tests. Eight exercises are planned. Some of you may not have the kind of data that are required to do some exercises. By the end of the semester, you will have to complete at least **four** of the eight exercises, using the data from your project (see below). No specific due date for each exercises is listed but you will need to turn in all the four exercises by the **13th week** of the class. Start doing the exercises as early as possible.

Project. The project will be a longer paper reporting on a research synthesis of a relatively circumscribed area of literature of your choosing. A project done by one person is expected to include at least 10 studies. You may also wish to do a *larger* project as a group of 2 and include at least 20 studies. You may select your own research topic, or if you don't have a particular area of interest you may choose to update an existing (older) meta-analysis. One required part of the project will be a search of a computerized reference database (e.g., ERIC, Psych Abstracts). In the project you will also be expected to apply appropriate quantitative research-synthesis methods to the available data (as will be discussed in class). Final papers must be typed using APA or other format adopted in your field.

Preparation memos. A series of three memos (very short papers) will be due as indicated on the schedule. Those memos work as the log of your project. In each memo you can write your thoughts, questions, ideas or insights about your project. You will show your progress through the memos. You can write these like short papers *or* like notes or letters. The length of each memo is one single-spaced typed page (minimum) or two single-spaced typed page (maximum). Late memos will not count toward your grade.

The grade ranges in terms of percentage are:

100.0-90.0 = A	84.9-80.0 = B+	69.9-65.0 = C+	54.9 and below= F
89.9-85.0 = A-	79.9-75.0 = B	64.9-60.0 = C	
	74.9-70.0 = B-	59.9-55.0= C-	

IDEA Objectives

IDEA is an evaluation system that our School uses to assess whether a class reaches the major goals in the end of the semester. The essential objectives for this course are:

- Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
- Learning to apply course material (to improve thinking, problem solving, and decisions)
- Learning appropriate methods for collecting, analyzing, and interpreting numerical information

Please see Syllabus Addendum below for more information.

Dispositions

Each course in the School of Education focuses on one or more professional dispositions. Students are offered opportunities to receive feedback on their dispositional growth in the areas of professionalism, Inquiry and/or social justice.

The expected behaviors for the specific dispositions for this class and the evaluation rubric are listed in the end of this syllabus.

Diversity

The School of Education is committed to diversity including but not limited to race, gender, sexual orientation, social class, ethnicity, and ability. Through this course, students will learn how to interpret and critique fundamental research methods used in the social sciences. The course is designed to provide students with the knowledge necessary to evaluate research concerning the social dimensions mentioned above.

Loyola University Chicago School of Education Syllabus Addendum

IDEA Course Evaluation Link for Students

Each course you take in the School of Education is evaluated through the IDEA Campus Labs system. We ask that when you receive an email alerting you that the evaluation is available that you promptly complete it. To learn more about IDEA or to access the website directly to complete your course evaluation go to: <http://luc.edu/idea/> and click on **STUDENT IDEA LOGIN** on the left hand side of the page.

Dispositions

All students are assessed on one or more dispositional areas of growth across our programs: **Professionalism, Inquiry, and Social Justice**. The instructor in your course will identify the dispositions assessed in this course and you can find the rubrics related to these dispositions in LiveText. *For those students in non-degree programs, the rubric for dispositions may be available through Sakai, TaskStream or another platform.* Disposition data is reviewed by program faculty on a regular basis. This allows faculty to work with students to develop throughout their program and address any issues as they arise.

LiveText

All students, *except those who are non-degree*, must have access to LiveText to complete the benchmark assessments aligned to the Conceptual Framework Standards and all other accreditation, school-wide and/or program-wide related assessments. You can access more information on LiveText here: [LiveText](#).

Syllabus Addendum Link

- www.luc.edu/education/syllabus-addendum/

This link directs students to statements on essential policies regarding *academic honesty, accessibility, ethics line reporting* and *electronic communication policies and guidelines*. We ask that you read each policy carefully.

This link will also bring you to the full text of our conceptual framework that guides the work of the School of Education – ***Social Action through Education***.

Schedule

CHV: Handbook (Set 1)

C: Cooper (Set 2); LW: Lipsey & Wilson (Set 2)

Week	Date	Topic	Reading	Due
1	1/17	Introduction to research synthesis	CHV 1 C 1 LW 1	
2	1/24	Formulating problems	CHV 2 C 2 LW 2 Tutorial by Field & Gillet ^a	
3	1/31	Data collection; Guidelines for syntheses	CHV 7-9 C 3 LW 2	Memo 1 due: Research Question(s)
4	2/7	Data evaluation	CHV 10 C 4 & 5 LW 3	Memo 2 due: List of quantitative studies for your synthesis
5	2/14	Effect sizes	CHV 11 & 12 C 6 LW 4 & Appendix B	Memo 3 due: Coding sheet/Codebook
6	2/21	Fixed-effects models	CHV 15 C 7 LW 7	*Coding swap
7	2/28	Random-effects models	CHV 16	*Coding for your partner
8	3/7	~~ Spring Break~~		*Set up your dataset
9	3/14	Mixed models	CHV 16	
10	3/21	Modeling in meta-analysis I	CHV 20	
11	3/28	Modeling in meta-analysis II	CHV 20	

12	4/4	Publication bias (& artifacts correction)	CHV 17, 22 & 23 C 8 LW 8	
13	4/11	Using R – Review of the concept	“Metafor” user guide ^b	Four exercises due
14	4/18	Using R – Application	“Metafor” user guide ^b	
15	4/25	Final presentation		Final project due on 5/2

- a. Field, A. P. and Gillett, R. (2010), How to do a meta-analysis. *British Journal of Mathematical and Statistical Psychology*, 63: 665–694. doi:10.1348/000711010X502733
- b. Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36(3), 1–48.

Evaluation of Disposition in RMTD 488
Rubric

	Exceeds Standard	Meets Standard	Partially Meets Standard	Does Not Meet Standard
Professionalism (management domain)	Candidate manages time and responsibilities to meet deadlines and expectations, making adjustments as appropriate and assist others to meet the standard.	Candidate manages time and responsibilities to meet deadlines and expectations, making adjustments as appropriate.	More than 2/3 of the time throughout the course candidate manages time and responsibilities to meet deadlines and expectations, making adjustments as appropriate.	Candidate does not manage time and responsibilities to meet deadlines and expectations, making adjustments as appropriate.
Inquiry (methodology domain)	Candidate is able to carry out an inquiry process, including asking questions, designing studies, sampling, collecting and analyzing data, interpreting results, and reporting findings outside of the classroom setting.	Candidate is able to carry out an inquiry process, including asking questions, designing studies, sampling, collecting and analyzing data, interpreting results, and reporting findings.	Candidate sometimes is able to carry out an inquiry process, including asking questions, designing studies, sampling, collecting and analyzing data, interpreting results, and reporting findings.	Candidate is not able to carry out an inquiry process, including asking questions, designing studies, sampling, collecting and analyzing data, interpreting results, and reporting findings.