Research Synthesis / Meta-analysis
Psych 319 - 01, Spring 2002

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Monday 8:45 - 11:15

Course Overview and Objectives. This seminar focuses on the conceptual basis and techniques for conducting meta-analyses. Rather than a statistical technique or statistical perspective, Meta-analysis represents a set of methods for quantitatively integrating findings across multiple studies. There are three basic goals to meta-analyses: (a) determining whether the effect of some variable / manipulation is reliably different from zero when considered across multiple studies in a literature, (b) if so, in what direction and how large is this effect; and (c) identifying predictors (i.e., moderators) of the size of this effect.

The objectives of this seminar are for participants to: (a) understand the rationale, and conceptual and statistical assumptions for meta-analysis, and hence understand when it is and is not appropriate to conduct a meta-analysis; (b) be able to critique published meta-analyses in order to interpret them correctly; and (c) be able to conduct a meta-analysis. In addition, it's my hope that the seminar will help people learn (if they don't already know) how to use simple simulations to test assumptions and see how different procedures respond to different data conditions.

Seminar mechanics. This will be a seminar. This means (a) that there isn't a lot of emphasis on grading, (b) students will be expected to function relatively independently, and (c) because participants will read the readings prior to coming to class, I won't be doing a lot of lecturing; rather, we will be doing a lot of discussing. Our basic text will be the Cooper and Hedges book and there will be a few other readings on web-reserves.

In this seminar, we will tend to focus on treatment outcome meta-analyses, and in particular, meta-analyses of which I have been a part. This is not because I necessarily think that they are exemplars but because I have access to these data.

As loathe as I am to have student presentations, we may (depending on whether we have time) have one day devoted to students presenting and critiquing a meta-analysis that they have read and evaluated. We also may have students presenting a meta-analysis that they have conducted. If they occur these presentations will be formal, as if they were conference presentations. I will explain this in more detail during class.

Schedule. I do not plan that we will cover a particular topic on a particular day, but rather that we will discuss a particular topic until we understand it sufficiently well to move on to the next topic, or until we have reached a point of diminishing returns. The schedule below relates readings to the topics.

Topic area		**Reading**
Topic 1:	*Introduction*	CH c1, *WWHGM
	A. Rationale and the background for research synthesis	
	B. Overview of meta-analysis	
Topic 2:	*Finding the data*	CH c4
	A. Is there a sufficient literature to conduct a meta-analysis	
	B. Finding studies	
	C. The file drawer problem	CH c25
	D. Study quality	CH c8, *WW
	a. Minimum criteria	
	b. Coding for design quality, and testing their effects	
Topic 3:	*Dependent variables: Effect sizes.*	
	A. Mean difference effect sizes	CH c16
	a. Theoretical description, and theoretical variance of an effect size	
	b. Indirect computation	*SGM appendix 7
	c. Adjustments	
	B. Correlation coefficient effect sizes	CH c17
	C. Categorical outcome effect sizes	
	D. Computer programs for coding effect sizes	
Topic 4:	*Independent variables: Coding predictors.*	CH c10
	A. Deciding on feasible variables	
	B. Pilot coding	
	C. Reliability	CH c11
Topic 5:	*Dataset structure and database management: What's the big deal?*	CH c13
Topic 6:	*Analysis*	
	A. Analytic approaches	CH c3, F
	a. GLM	CH c19
	i. Fixed models	CH c20
	ii. Random models	*HO pp. 122-128
	b. Significant variability across effect sizes	*HO c7
	c. Variance partitioning	
	B. Multivariate analysis	KR

Topic 7:	*Issues / complications / limitations*	CH c31, LGBLD,
	A. Meta-analysis is a correlational technique	CH 24
	B. Treatment studies: There is no population in nature	
	C. Violation of assumption of independence of observations	CH c22
Topic 8:	*Interpretation of results*	LW c8
Topic 9:	*Use of simulations*	
	A. To study effects of violations of assumptions	

References

Cooper, H. & Hedges, L. V. (1997). *The Handbook of Research Synthesis*. New York: Sage Foundation.

Field, A. P. (2001). Meta-analysis of correlation coefficients: A Monte Carlo comparison of fixed- and random-effects methods. *Psychological Methods*, *6*, 161-180.

Hedges, L. V. (1987). How hard is hard science, how soft is soft science? The empirical cumulativeness of research. *American Psycholoigst*, *432*, 443-455.

Hedges, L. V. & Olkin, I. (1985). *Statistical methods for meta-analysis*. New York: Academic Press.

Hedges, L. V. & Vevea, J. L. (1998). Fixed and random-effects models in meta-analysis. *Psychological Methods*, *3*, 486-504.

Kalaian, H. A., & Raudenbush, S. W. (1996). A multivariate mixed linear model for meta-analysis. *Psychological Methods*, *3*, 227-235.

Lelorier, J., Gregoire, G., Benhaddad, A., Lapierre, J., & Derderian, F. (1997). Discrepancies between meta-analyses and subsequent large randomized, controlled trials. *New England Journal of Medicine*, *337*, 536-542.

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

Smith, M. L., Glass, G. V., & Miller, T. I. (1980). *The benefits of psychotherapy*. Baltimore: Johns Hopkins University Press.

Weiss, B., & Weisz, J. R. (1990). The impact of methodological factors on child psychotherapy outcome research: A meta-analysis for researchers. *Journal of Abnormal Child Psychology, 18*, 639-670.

Weisz, J. R., Weiss, B., Han, S. S., Granger, D.A. & Morton, T. (1995). Effects of psychotherapy with children and adolescents: A meta-analysis of treatment outcome studies. *Psychological Bulletin, 117*, 450-468.

ADDITIONS:

Wang, M. C. & Bushman, B. J. (1998). *Integrating results through meta-analytic review using SAS software*. Cary, NC: SAS Institute.

Cooper and Rosenthal, 1980 have nice study where they have people synthesize research and show that narrative reviews are biased.