

RPE 9200A - Quantitative Research Methods and Data Collection (Fall 2020)

COURSE OUTLINE

Instructor: Paul F. Tremblay, Ph.D.

email: ptrembla@uwo.ca

office: SSC 6336

office hours: flexible; contact me by email to set appointment

Lectures and labs: Mondays 1 :30 – 4 :30 in Social Science Centre (SSC) rm 6210 (with social distancing) starting September 14.

Course overview. The overall objective of this course is to provide students with hands-on experience in designing quantitative data collection instruments and implementing data collection strategies, tailored for research in social policy and evaluation. The course lectures and labs are organized around the following six research method topics: experimental design; survey design; scaling, measure evaluation and construction; secondary data analysis; quantitative content coding and analysis; and meta-analysis. By the end of the course, students will have developed three key skill areas of research:

- First, they will be able to develop the research protocols and instruments as well as verify the soundness of their approach through a verification process (e.g., pilot testing).
- Second, they will be able to collect, evaluate, and synthesize existing quantitative evidence addressing a specific research question or program evaluation.
- Third, they will be able to report in writing and in oral presentation, their research effectively to relevant audiences in the workplace.

I. CONTENT DESCRIPTION

Course format and resources. The lecture material will be applied and integral to the term project, three lab assignments and the six research method topics. Weekly lectures will be divided into a 90 min presentation of material by me, followed by a lab session focusing on developing the projects. Lecture slides will be posted weekly on the course OWL site prior to each lecture. Readings and related resources will consist of research articles and other documents available online through the library. Students will have access to Qualtrics at Western University and will be able to use software packages that are freely available such as Jamovi (a friendly menu-driven software build from R).

Experimental design. This section includes various designs (experimental, randomized controlled trials, quasi-experimental, correlational) to test and evaluate interventions, programs, products, choices that people make, or specific research hypotheses.

Survey design. In this course, the term survey will refer to the total package of instruments administered to research participants, including the information and consent material, the

various measures addressing hypotheses and objectives, and optionally the embedded experiment material. Important design components will also include the sampling method, the use of weights, response rates, attention check variables, and missing data strategies.

Scaling, measure evaluation and construction. This section will include the selection of the scale for effective measurement, the evaluation and selection of existing measures, and the construction of measures and composite index variables tailored for a specific research objective.

Secondary data analysis. We are witnessing an exponential growth of data available to researchers, including very well designed large-scale national or international surveys. Many researchers are also making their data sets available in repositories accessible to the research community. In this section we will go through the process of designing studies using secondary data.

Quantitative content coding and analysis. Perhaps less obvious than lab experiments or the use of surveys are the more “natural” methods that extract data from existing sources of information such as observations, textual data, and other forms of media. The unit of analysis may consist of accidents at intersections occurring during a given time period, the use of violence in movies for children, or the use of specific words in tweets. Student will learn how to develop classifications for coding quantitative data and establishing interrater agreement.

Meta-analysis. Meta-analysis provides a convenient way to synthesize quantitative results from previous studies and to learn how to combine results and examine potential reasons for differences across studies. Students will learn how to extract the necessary information, the different types of effect size measures, the pooling of results, and the preparation of results of the typical forest plots and tables.

II. COURSE WORK AND EVALUATION

Term project (worth 55% of the grade). In the first half of the course, we will develop team projects that will directly incorporate the three first topics (Experimental design, Survey design, Scaling, measure evaluation and construction). We will discuss options for topics in the first class, and teams will consist of four students each. The projects will include recruitment and data collection of human participants online. Students will prepare the necessary materials including the recruitment, information, and consent form, and the survey package in Qualtrics including an experimental component with random assignment to different conditions (or the use of a quasi-experimental with covariates or repeated-measures design). The overall instrument will have the form of a survey with various sections including a set of demographic questions, an experimental manipulation component (e.g., a series of vignettes with random assignment to two or more conditions), and it will include at least one set of questions used to produce a psychometric measure (e.g., attitudes toward working from home). We will adhere

to the proper ethical procedure for pedagogical projects through the REB at Western University.

Evaluation of your performance on the project will be as follows:

- Completion of the online tutorial, Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE). You will need to create an account at: <https://tcps2core.ca/welcome>. Approximate completion time is three hours. Please send me a copy of your certificate upon completion. (5%)
- *Journal of individual contributions to the project*. Weekly individual summary progress on project sent to me through the Messages app in OWL. This could be as short as a weekly paragraph documenting your individual progress and contributions the literature review, design of material, data collection, analysis, and writing (20%).
- *The overall project (30%)*. The final product will include a team written report of the project worth 20% and a team 30 min presentation worth 10%.

Three lab assignments (45%). During the second part of the course, in addition to working on and completing the team projects, students will also work on three smaller lab assignments using the other three research method topics. More specifically, for the Secondary data analysis topic, students will have the opportunity to extract data from existing data sets, prepare the data for analysis, and conduct the preliminary descriptive analyses. For the Content coding and analysis topic, students will select a source of content data, prepare a classification scheme, code a sample of the material into categories, and conduct preliminary descriptive statistics. For the Meta-analysis topic, students will learn how to extract the necessary effect size information from individual studies and enter that information in a software package to generate the main results based on a topic of their choice.

III. LECTURE AND LAB SCHEDULE

Week 1 (Sep 14). Experimental Design I

1. Overview of research designs (experimental, quasi-experimental, repeated measures)
2. Random assignment in experiments and other forms of control for confounds
3. Sampling methods and external validity
4. Improving IVs and DVs for external validity

Lab. Overview of the term project. Developing a research question and experiment. Ethics

Week 2 (Sep 21). Experimental Design II

1. More on internal validity, causality and control
2. Experimental design with random assignment to hypothetical vignettes
3. Experimental design with intervention and repeated measures
4. Understanding effect size, accuracy of results, statistical power

Lab. Developing an experiment with a vignette approach. Qualtrics

Week 3. (Sep 28). Survey Design I

1. Best practices in survey structure
2. Sampling methods used in large survey design
3. Sample size, design effect, how to reduce standard error
4. Overview of Qualtrics and other online approaches

Lab. Design of the survey with Qualtrics

Week 4. (Oct 5). Survey Design II

1. Survey questions to address research hypotheses and questions
2. Handling missing data
3. Visualization and descriptive statistics to report
4. Interpreting and reporting results

Lab. Pilot test survey data collection and visualization of results

Week 5. (Oct 19). Scaling, Measure Evaluation and Construction I

1. Selecting the proper scale (i.e., level of measurement) for predictors and outcome variables
2. How to evaluate the quality and select existing measures
3. Fundamental measure construction steps
4. Creating items and overview of item analysis

Lab. Developing a proposal for a new measure with initial pool of items

Week 6. (Oct 26). Measure Construction II

1. Using factor analysis to confirm unidimensionality of measure
2. Item analysis using factor analysis to promote reliability
3. Construct validation design
4. A different kind of measure: the index

Lab. Pilot item analysis

Week 7. (Nov 2). Secondary Data Analysis I

1. The world of secondary and Big Data
2. Research design considerations
3. Taking advantage of multilevel data
4. Examples of studies and large data set repositories

Lab. Developing a research proposal and locating data source

Week 8. (Nov 9). Secondary Data Analysis II

1. Data inspection and preparation for analysis
2. Visualization methods
3. Basic descriptive analyses
4. Reporting results

Lab. Interpreting and writing a results section

Week 9. (Nov 16). Content Coding and Analysis I

1. Examples in the research literature from natural observation
2. Examples from textual or other forms of data
3. Developing the research proposal and identifying source of information
4. Developing the content code classification

Lab. Develop a research question that can be assessed quantitatively with existing content and develop the content code classification

Week 10. (Nov 23). Content Coding and Analysis II

1. Interrater agreement and reliability
2. Coding stimuli and preparing the data file
3. Creating the summary descriptive statistics
4. Examples of reports and preliminary analyses

Lab. Conduct a test-run of the content coding and analysis for a project.

Week 11. (Nov 30). Meta-Analysis I

1. Overview, logic, and the objective to contribute to knowledge synthesis
2. How to collect and organize the information from studies
3. Understanding the basic unit: the effect size
4. Different versions of effect size.

Lab. Identify a topic and do a literature search to evaluate feasibility and identify usable studies

Week 12. (Dec 7). Meta-Analysis II

1. How to do the analysis in Jamovi (Major module)
2. Understanding how the studies are combined
3. The basic table and figure: Forest plots
4. Dealing with challenges such as publication bias

Lab. Use Jamovi to generate the forest plot and table of results from your coded studies.

IV. WEEKLY READINGS AND RESOURCES

All resources will be available online through the Owl Course site and the Western U. library.

General Resources

Navarro, D. J., & Foxcroft, D. R. (latest version). *Learning statistics with jamovi. A tutorial for psychology students and other beginners*. <http://www.learnstatswithjamovi.com>

Qualtrics. *How to: A guide to using Qualtrics research suite*.

Snow, J. (Qualtrics). *The complete research suite. A step-by-step guide to using Qualtrics*.

Tri-Council Policy Statement. Ethical conduct for research involving humans. TCPS2 2018.
<https://ethics.gc.ca/eng/documents/tcps2-2018-en-interactive-final.pdf>

Experimental Design I, II

Borush, R. F., Weisburg, D., Turner III, Karpyn, A., & Littell, J. (2009). Randomized controlled trials for evaluation and planning. In L. Bickman & D. J. Rog (Eds.), *The SAGE handbook of applied social research methods*. (pp. 147-181).

D'Antoni, D. A., Auyeung, V., & Weinman, J. (2019). The effect of framed health messages on intention to take antivirals for pandemic influenza: A vignette-based randomized controlled trial. *Journal of Health Communication, 24*, 442-455.
<https://doi.org/10.1080/10810730.2019.1631914>

Kaplan, K., Salzer, M. S., Solomon, P., Brusilovskiy, E., & Cousounis, P. (2011). Internet peer support for individuals with psychiatric disabilities: A randomized controlled trial. *Social Science & Medicine, 72*, 54-62. doi:10.1016/j.socscimed.2010.09.037

Mark, M. M., & Reichardt, C. S. (2008). Quasi-experimental and correlational designs: Methods for the real world when random assignment isn't feasible. In C. C. Morf & A. T. Panter (Eds.), *The SAGE handbook of methods in social psychology*. (pp. 265-286).

Survey Design I, II

See Qualtrics (in General Resources above)

Krosnick, J. A., Kavrakas, P. J., & Kim, N. (2014). Survey Research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology. Second edition* (p. 404-442). New York: Cambridge University Press.

Whitley, Jr., B. E., & Kite, M. E. (2018). *Principles of Research in Behavioral Science. 4th edition*. New York: Routledge. Chapter 15: Survey Research (pp. 567-617)

Scaling, Measure Evaluation and Construction I, II

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*, 309-319. doi: 10.1037/1040-3590.7.3.309

Clark, L. A., & Watson, D. (2019, March 21). Constructing validity: New developments in creating objective measuring instruments. *Psychological Assessment*. Advance online publication. <http://dx.doi.org/10.1037/pas0000626>

Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *Journal of Experimental Social Psychology, 66*, 4-19.
<http://dx.doi.org/10.1016/j.jesp.2015.07.006>

DeVellis, R. F. (2006). Classical test theory. *Medical Care, 44*, S50-S59.
<http://www.jstor.org/stable/41219505>

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology, 44*, 219-246. doi: 10.1177/0095798418771807

Secondary Data Analysis I, II

See jamovi manual (General Resources) for running basic descriptive statistics analyses

Cheng, H. G., & Phillips, M. R. (2014). Secondary analysis of existing data: opportunities and implementation. *Shanghai Archives of Psychiatry, 26*, 371-375.

Corti, L., & Wathan, J. (2017). Online access to quantitative data resources. In R. M. Lee & G. Black (Eds.), *The SAGE handbook of online research methods*. (pp.489-507).

Content Coding and Analysis I, II

Riff, D., Lacy, S., Fico, F., & Watson, B. (2019). *Analyzing media messages. Using quantitative content analysis in research. 4th edition*. New York: Routledge. (Chapter 4. Measurement); (Chapter 5. Sampling); (Chapter 8. Designing a content study).

Robinson, M. D., Boyd, R. L., & Fetterman, A. K. (2014). An emotional signature of political ideology: Evidence from two linguistic content-coding studies. *Personality and Individual Differences, 71*, 98-102. <http://dx.doi.org/10.1016/j.paid.2014.07.039>

Syed, M., & Nelson, S. C. (2015). Guidelines for establishing reliability when coding narrative data. *Emerging Adulthood, 1-13*. doi: 10.1177/2167696815587648

Wild, T. C. et al. (2019). Media coverage of harm reduction, 2000-2016: A content analysis of tone, topics, and interventions in Canadian print news. *Drug and Alcohol Dependence, 205*. Available online at <https://doi.org/10.1016/j.drugalcdep.2019.107599>

Meta Analysis

de Freitas, D. F., Fernandes-Jesus, M., Ferreira, P. D., Coimbra, S., Teixeira, P. M., de Moura, A., Gato, J., Marques, S. C., & Fontaine, A. M. (2018). Psychological correlates of perceived ethnic discrimination in Europe: A Meta-analysis. *Psychology of Violence, 8*, 712-725.
<http://dx.doi.org/10.1037/vio0000215>

Johnson, B. T., & Hennessey, E. A. (2019). Systematic reviews and meta-analyses in the health care sciences: Best practice methods for research syntheses. *Social Science & Medicine*, 233, 237-251. <https://doi.org/10.1016/j.socscimed.2019.05.035>

Karamouzian, M., Nasirian, M., Hoseini, S. G., Mirzazadeh, A. (2020). HIV and other sexually transmitted infections among female sex workers in Iran: A systematic review and meta-analysis. *Archives of Sexual Behavior*, 49, 1923-1937. <https://doi.org/10.1007/s10508-019-01574-0>

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *frontiers in Psychology*. doi: 10.3389/fpsyg.2013.00863

Muka, T., Glisic, M., Milic, J., Verhoog, S., Bohlius, J., Bramer, W., Chowdhury, R., & Franco, O. H., (2020). A 24-step guide on how to design, conduct, and successfully publish a systematic review and meta-analysis in medical research. *European Journal of Epidemiology*, 35, 49-60. <https://doi.org/10.1007/s10654-019-00576-5>

Vannucci, A., Simpson, E. G., Gagnon, S., & McCauley Ohannessian, C. (2020). Social media use and risky behaviors in adolescents: A meta-analysis. *Journal of Adolescence*, 79, 258-274. <https://doi.org/10.1016/j.adolescence.2020.01.014>

V. STATEMENT OF ACADEMIC OFFENCES

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).