



## MRPE 9200A · *Quantitative Research Methods and Data Collection*

Fall Term 2021  
The University of Western Ontario

Paul F. Tremblay, Ph.D.  
Assistant Professor, Department of Psychology

Class: Mondays 1:30 – 4:30 in Social Science Centre SSC 6210  
Office Hours: Contact me by email to set appointment  
Contact Details: Office SSC 6336,  
email: [ptrembla@uwo.ca](mailto:ptrembla@uwo.ca) phone: (519) 661-2111 ext 85644

Although this academic year might be different, Western University is committed to a thriving campus. We encourage you to check out the **Digital Student Experience** website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>.

### Course Description

**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: (1) data collection for various research designs; (2) survey design; (3) creating multi-item measures that are psychometrically sound; (4) working with secondary data (archival) sets; (5) creating data and variables from textual/observed/media (i.e., quantitative content coding); (6) and meta-analysis.

**Course format and resources.** The lecture material for these six methods will be applied and integral to a group project and two individual lab assignments. Weekly lectures (approximately 2 hours) will be followed by a one-hour lab session focusing on the group projects and the lab assignments.

The six course topics are described below.

**Research 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. We will focus on how to apply an experimental design of hypothetical vignettes approach to a Qualtrics survey data collection.

**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, 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 multi-item composite 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 and extract and prepare the necessary data from secondary sources.

**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 or concepts in newspaper articles. Students will learn how to develop codebooks for coding information into quantitative data and variables and promote and establish interrater agreement.

**Meta-analysis.** Meta-analysis provides a convenient way to synthesize quantitative results from previous studies into a systematic review 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.

## Learning Outcomes

By the end of the course, students will have developed the following skills and knowledge:

- Ability to develop the research protocols and instruments as well as verify the soundness of their approach through a verification process (e.g., pilot testing).
- **Research design.** Ability to set up a data collection online that will randomly assign participants to different experimental conditions and that will collect additional measures for correlational investigation.
- **Survey design.** Ability to work in a group to design an online high-quality survey that includes various components and follow up with a real data collection.
- **Creating multi-item measures.** Knowledge and ability to develop a multi-item measure to assess a concept/construct such as Quality of Life or composite index such as marginalization and knowledge to evaluate the soundness of these measures.
- **Secondary data analysis.** Ability to locate archival data related to a specific research question and extract and manipulate data to create new variables (possibly multi-item measures).
- **Quantitative content coding.** Ability to locate resources such as newspaper databases, social media sources, or data from observation studies and create a set of variables and codebook to extract data that will address a research question or hypothesis.

- **Meta-analysis.** Ability to interpret meta-analytic articles focusing particularly on effect size, precision, bias. Knowledge of the steps involved in a meta analysis, especially the collection of studies by conducting systematic searches with a selection of key words from databases.
- Ability to write a research report focusing on the parts relevant to this course: the research methods including sampling and instruments as well as the preliminary results focusing on descriptive statistics, instrument evaluation such as reliability indices and general understanding of factor analysis.

## Course Materials

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 built from R).

Readings mostly from journal articles and book chapters, available electronically through the Western University Library and linked in the OWL course site are listed below.

### General Resources

Herman, L. (2013). *Tips for writing policy papers. A policy lab communications workshop.* Stanford Law School. <https://www-cdn.law.stanford.edu/wp-content/uploads/2015/04/White-Papers-Guidelines.pdf>

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

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>

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

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). Chapter 15: Survey Research (pp. 567-617). In *Principles of Research in Behavioral Science. 4<sup>th</sup> edition*. New York: Routledge.

### **Scaling, Measure Evaluation and Construction**

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>

### **Secondary Data Analysis**

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).

### **Quantitative Content Coding**

Riff, D., Lacy, S., Fico, F., & Watson, B. (2019). *Analyzing media messages. Using quantitative content analysis in research. 4<sup>th</sup> 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., & Hennessy, 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>

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>

## Course Evaluation

**Term project (worth 50% of the grade).** In the first half of the course, we will develop team projects that will directly incorporate the first three 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 to five 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 (10%).

- *The overall project (35%)*. The final product will include a team written report of the project worth 25% and a team 30 min presentation worth 10%.

**Two lab assignments (25% x 2)**. During the second part of the course, in addition to working on and completing the team projects, students will also work individually on two smaller lab assignments using the methods of secondary data analysis and quantitative content coding. 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.

## Lecture and Lab Schedule

Please note: This schedule is subject to change over the course of the term in order to meet the needs of the class. Any changes will be announced through our OWL course website.

### Week 1 (Sep 13). 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 20). 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 27). 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 4). 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 11). Thanksgiving.** No lecture but I am available during the week for consultation on projects

### Week 6. (Oct 18). Scaling, Measure Evaluation and Construction

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 (reliability and factor analysis)
  3. Fundamental multi-item measure construction steps
  4. Creating items and overview of item analysis
- Lab. Developing a multi-item measure.

**Week 7. (Oct 25). 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 1.). Fall reading week. No lecture.** I will be available during the week for consultation on projects.

**Week 9. (Nov 8). 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 methods and results section

**Week 10. (Nov 15). 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 11. (Nov 22). 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 12. (Nov 29). Meta-Analysis**

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.
5. The basic table and figure: Forest plots
6. Dealing with challenges such as publication bias

Lab. Discussion of the examples in articles and potential topics for research in policy and evaluation.

**Week 13. (Dec 6). Presentations of Group projects**

## Important Policies

**Assignment Deadlines.** Students must submit their assignments by the date and time stated in the course outline and on the OWL website. Late assignments will be penalized 10% for each day they are late. Any assignment not received within 5 days of the due date will not be accepted, except in the event of a documented medical or family emergency. If a student anticipates an issue with an assignment, they are recommended to speak to the professor as early as possible to make alternative arrangements.

**Plagiarism.** Students must write their assignments in their own words. Whenever students take an idea from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major scholastic offence (the Scholastic Offence Policy can be viewed in the Western Academic Calendar). All required assignments may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for 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 ([www.turnitin.com](http://www.turnitin.com)).

**Standards of Professional Behaviour.** It is the responsibility of all to adhere to and promote standards of professional behaviour that support an effective learning environment. These include:

- Respect for others both in and out of the classroom through words and actions (be professional, fair, and respectful in interactions with people on-line and in-person; understand and respect differences among classmates and colleagues; avoid disrupting the learning environment; respect others' expectations of confidentiality and privacy).
- Active engagement in learning and commitment to quality (being prepared for classes; participating and listening actively to other; using technology and social media appropriately, striving to do your best). Take responsibility for your own learning by: relating course content and projects to your own professional interests; monitoring your own understanding; seeking clarification and assistance when necessary.
- Personal integrity (following through on commitments; doing one's own work).

Students should also be aware of the UWO Student Code of Conduct found at:

<https://www.uwo.ca/univsec/pdf/board/code.pdf>

**Copyright of Lectures and Other Course Materials.** Any materials created by the instructor (e.g., videos, notes, handouts, summaries, slide decks, assignments, exams, etc.) are protected by copyright law and may not be copied or distributed in any form without the explicit permission of the instructor. Any non-authorized use of these materials constitutes an academic offence.

**Scholastic Offences.** Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence ([https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/appealsgrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/appealsgrad.pdf)).

**Accommodation.** Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted



to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both SAS and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction. For more information, see <http://www.sdc.uwo.ca/ssd/>.

**Completion of Course Requirements.** Course requirements must be completed by the end of the term in which the course is offered (Fall–December 31; Winter–April 30, Summer–August 31). Only in exceptional circumstances may a student take additional time to complete the course requirements. In such a case, the student must first meet with the Graduate Chair to request permission to carry the incomplete. Medical documentation, where required, will be kept on file in the graduate program office.

**Accessibility Options.** Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111, x82147 for any specific question regarding an accommodation. Information regarding accommodation of exams is available on the Registrar's website: [www.registrar.uwo.ca/examinations/accommodated\\_exams.html](http://www.registrar.uwo.ca/examinations/accommodated_exams.html).

**Mental Health.** Students in emotional/mental distress should refer to Mental Health@Western ([http://uwo.ca/health/mental\\_wellbeing/index.html](http://uwo.ca/health/mental_wellbeing/index.html)) for a complete list of options how to obtain help.

**Health and Wellness.** As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. The Wellness Education Centre (lower level UCC) assists students in finding mental health and other related resources best suited to their needs (<http://se.uwo.ca/wec.html>). Western's School of Graduate and Postdoctoral Studies' Living Well website provides tips for thriving at grad school and other helpful information ([http://grad.uwo.ca/current\\_students/living\\_well/index.html](http://grad.uwo.ca/current_students/living_well/index.html)). Western provides several on-campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Also, we encourage you to check out the Faculty of Music web page (<http://www.music.uwo.ca/>), and our own McIntosh Gallery (<http://www.mcintoshgallery.ca/>).

**Disputing a Grade.** Students who wish to dispute an assignment, exam, or course grade must write a one-page explanation justifying why their work should be re-evaluated. Work will not be re-evaluated on the basis that students were sick or feeling stressed when completing the assignment. Please be advised that a student's mark may go up or down upon re-evaluation.

**Extraordinary Circumstances.** The content and/or evaluation of this course is subject to change in the event of extraordinary circumstances beyond the University's or instructor's control.