Western SocialScience | Network for Economic and Social Trends (NEST)

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

Fall Term 2024
The University of Western Ontario

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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 methods 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 the collection of data from previous studies for systematic reviews and meta-analysis.

Course format and resources. The lecture material for these six methods will be applied and integral to a group project and three 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.

Survey design. In this course, the term survey will refer to the "total package of self-report measures" 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 performance 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 do 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:

- **Research design**. Ability to design studies with particular research designs focus on the data collection, inspection and description.
- **Survey design**. Ability to design online high-quality surveys in Qualtrics, extract test data, prepare data file, and run descriptive statistics and quality checks.
- **Creating multi-item measures**. Ability to develop a multi-item measure to assess a concept/construct such as attitudes toward immigration or composite index such as marginalization and ability to evaluate the soundness of these measures.
- **Secondary data analysis**. Ability to locate archival/secondary 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 conceptualize a study extracting data from textual sources such as newspaper articles or video clips and developing a codebook that specifies the variables that will be investigated.
- **Meta-analysis**. Ability to design a meta-analysis study and conduct a preliminary systematic search for studies in various databases. Understand the logic of pooling effect sizes using software and the complete process including the development of forest plots and the use of PRISMA flow diagrams.

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).

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

Although the above textbook focuses on running specific statistical analyses for particular research designs, it will help students in this course understand data format setup, manipulation, inspection, and description (i.e., descriptive statistics).

Additional readings are listed in the Course schedule

Course Evaluation

Project/Assignment	Grade	Date available	Due date
Group Project. Multi-item measure development and Qualtrics survey			
• Multi-item measure	10%	Sep 19	Oct 10
• Qualtrics survey	10%	Sep 19	Nov 7
• Presentation	10%	Sep 19	Dec 5
• Report	10%	Sep 19	Dec 12
Assign 1. Secondary Data Retrieval and Preliminary Analyses	20%	Oct 3	Oct 24
Assign 2. Experimental Design Proposal and Data File Setup	20%	Oct 24	Nov 14
Assign 3. Meta-analysis Proposal	20%	Nov 14	Dec 5

Group Project (3 students per group max). Qualtrics Survey with development of a multi-item measure. 40% (10% measure, 10% Qualtrics survey, 10% presentation, 10% report)

Individual Secondary Data Retrieval and Descriptive Statistics Analysis (20%). Extract data from secondary data sets to test a specific research question or hypothesis, prepare the data for analysis, and conduct the preliminary descriptive analyses.

Individual Experimental Design Proposal and Data File Setup (20%). Prepare a two-page max research proposal to test a specific research question (e.g., evaluation of a program) or hypothesis using a randomized controlled trial including at least two experimental conditions and at least two time points (e.g., pre-test and post-test). Include a data file with variable and label names.

Individual Preliminary Search and proposal for a meta-analysis (20%). Prepare a two-page max research proposal to address a specific gap in the research literature on a particular problem (e.g.,

efficacy of needle exchange programs). Include the eligibility criteria of the studies, the proposed sources (i.e., databases), a preliminary search indicating the keywords used and the number of records retrieved.

How to Contact Me

Please contact me by email at ptrembla@uwo.ca to ask questions or set an appointment, or see me directly in SSC 6336 if my door is open.

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.

Attendance. Class attendance is mandatory, with the option for students to miss a maximum of two classes without penalty. If you are absent for more than two classes, a discussion with the course instructor will be required in order to determine whether it is possible to make up the missed time or a Fail will be assigned to the course.

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).

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 others; 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 (www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

Artificial Intelligence. Unless otherwise explicitly stated by your course instructor, all assignments must be completed independently, without the aid of artificial intelligence (AI). Suspected use of AI will result in an automatic zero on assignments and may be escalated to the Program's Director to investigate for possible scholastic offence.

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. More details regarding incompletes are outlined in the Graduate Handbook: http://www.sociology.uwo.ca/graduate_handbook/course_information.html.

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.

Mental Health. Students in emotional/mental distress should refer to Mental Health@Western (http://uwo.ca/health/mental_wellbeing/index.html) for a complete list of options on 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). 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.

Course 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 Brightspace course website.

Week 1 (Sep 12). Data file structure, levels of measurement, and software

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

Navarro & Foxcroft (N & F) Ch2 2.1 and 2.2, Ch3

Week 2 (Sep 19). Single and composite item measures, survey construction, Qualtrics

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

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

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

Qualtrics
https://mysurveys.uwo.ca/

Week 3 (Sep 26). Item-level data collection, analysis, reliability and validation

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

Navarro & Foxcroft (N & F) Ch 15

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

Week 4 (Oct 3). Secondary data retrieval and analysis

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).

Navarro & Foxcroft (N & F) Ch 4, Ch 5

Week 5 (Oct 10). Secondary data retrieval and analysis continued

Cumming G., & Finch, S. (2005). Inference by eye. Confidence intervals and how to read pictures of data. *American Psychologist*, *60*, 170-180. doi: 10.1037/0003-066X.60.2.170

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

Navarro & Foxcroft (N & F) Ch 6 (sections 6.1, 6.3, 6.5), Ch 8

Week 6. Fall Reading Week. No class.

Week 7 (Oct 24). Experimental research design

Kim, S., & Lee, K. (2023). Development and evaluation of an online mental health program for traumatized female college students: A randomized controlled trial. *Archives of Psychiatric Nursing*, *43*, 118-126.

Navarro & Foxcroft (N & F) Ch 11, Ch 13, Ch 14 (skim these chapters)

Week 8 (Oct 31). Quasi experimental and other research designs

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).

Navarro & Foxcroft (N & F) Ch 12

Week 9 (Nov. 7). Completion of research designs

Week 10 (Nov 14). Meta analysis and systematic review

Cruz, S. M. (2017). The relationships of political ideology and party affiliation with environmental concern: A meta-analysis. *Journal of Environmental Psychology*, *53*, 81–91. https://doi.org/10.1016/j.jenvp.2017.06.010

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

Page, M. J., Moher, D., Bossuyt, P. M. et al. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ. British Medical Journal (International Ed.)*, 372, n160–n160. https://doi.org/10.1136/bmj.n160

Pigott, T. D., & Polanin, J. R. (2020). Methodological guidance paper: High-quality meta-analysis in a systematic review. Review of Educational Research, 90(1), 24-46. https://doi.org/10.3102/0034654319877153

Week 11 (Nov 21). Meta-analysis continued

Same as previous week

Week 12 (Nov 28). Quantitative content coding

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).

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

Week 13. (Dec 5). Presentations. Reports due (Dec 12).