

BUS 715: Experimental Methods for Behavioral Science

Course Syllabus

Winter 2021

Instructor: Gerald Häubl, ghaeubl@ualberta.ca, 780-492-6886

Prerequisites:

Registration in the Business PhD Program or permission of instructor.

Course Overview:

The objective of this course is to provide students with an understanding of the essential principles and techniques for conducting scientific experiments on human behavior. It is tailored for individuals with an interest in doing research (using experimental methods) in areas such as psychology, judgment and decision making, behavioral economics, consumer behavior, organizational behavior, and human performance. The course covers a variety of topics, including the formulation of research hypotheses, the construction of experimental designs, the development of experimental tasks and stimuli, how to avoid confounds and other threats to validity, procedural aspects of administering experiments, the analysis of experimental data, the reporting of results obtained from experiments, and ethical aspects of experimental behavioral science. Classes are conducted in an interactive seminar format, with extensive discussion of concrete examples, challenges, and solutions.

Topics:

The topics covered in the course include:

- Basic principles of experimental research
- Formulation of research question and hypothesis development
- Experimental paradigms
- Design and manipulation
- Measurement
- Factorial designs
- Implementation of experiments
- Data analysis and reporting of results
- Advanced methods and complex experimental designs
- Ethical issues

Class Schedule:

Date & Time	Location	Special Events (i.e., other than lectures and class discussion)
Jan 16 (Sat), 12:00-18:30	Zoom	Presentations (15 min) of Initial Project Proposals
Feb 6 (Sat), 12:00-18:30	Zoom	
Feb 27 (Sat), 12:00-18:30	Zoom	
Mar 27 (Sat), 12:00-18:30	Zoom	
June 5 (Sat), 12:00-16:00	TBD	Interim Reports Due; Interim Presentations (30 min)
Aug 26 (Thu), 12:00-17:00 *	TBD	Final Papers Due; Final Project Presentations (30 min)
Aug 28 (Sat), 12:00-16:00 *	TBD	Exam

* Tentative. To be confirmed with enrolled students.

Grading:

A student's overall grade is based on the following components:

Component	Weight
Course Project: Initial Proposal & Presentation	10%
Course Project: Interim Report & Interim Presentation	20%
Exam	30%
Course Project: Final Paper & Final Presentation	40%

Regular attendance is mandatory, and active participation in class is expected. Where necessary, a student's grade will be adjusted downward in the event of poor attendance and/or failure to participate in class discussion.

Exam:

In the exam, students will be given a description of a research question, along with specific hypotheses. Their task is to produce a proposal for an experiment for testing these hypotheses. The exam is "open book" – students are free to use any appropriate resources they wish in developing their proposal. (What types of resources are appropriate will be discussed during the course.)

Course Project and Assignments:

As the major project for this course, each student is to conduct an experiment that is designed to examine a research question of her/his choice. This course project involves three stages, with a formal assignment for each stage.

1. Initial Proposal

Each student is to submit a brief initial proposal (no more than 2 pages in length) outlining a research question that s/he would like to examine using experimental methods for a paper project.

This must be for a project that is driven by the student's own initiative (and not, e.g., an advisor's), and the envisioned experiment must be original and distinct from prior work (e.g., it must not be a mere variant or extension of a study already conducted).

The initial proposal should describe:

- The research area/domain to which this experiment is intended to make a contribution
- The essential research question
- The key theory/ies and idea(s) that have inspired this research question
- A list of the independent (i.e., antecedent) and dependent (i.e., outcome) variables to be examined
- The specific hypothesis/es to be tested in this experiment
- Any additional hypotheses about the process(es)/mechanism(s) that might underlie the predicted effect(s)
- A graphical representation of the pattern(s) of results that would provide support for the (primary) hypothesis/es

Due: January 16, 11:00

Initial proposals (in PDF format, file name format: "LastName-FirstName-InitialProposal.pdf") must be e-mailed to ghaeubl@ualberta.ca with "BUS 715" as the subject line.

Students are to give a 15-minute in-class presentation of their initial proposal on January 16.

2. Interim Report: Plan for Experiment

Each student is to develop a detailed plan for an experiment to examine a research question of her/his choice. This plan should include the following components, along with any other information that might be pertinent:

- Hypothesis development & conceptual model
- Graph(s) portraying the key predicted pattern(s) of results

- Experimental environment and task(s)
- Experimental design
- Implementation plan for manipulations
- Stimuli
- Measurement of outcome variables (DVs)
- Other measures (manipulation and confounding checks, covariates, mediators, ...)
- Data collection plan (participant recruitment, sample size, where/how to run the experiment, ...)
- A plan for data analysis (methods to be used, coding, ...)

Due: June 5, 11:00

Interim reports (in PDF format, file name format: “LastName-FirstName-InterimReport.pdf”) must be e-mailed to ghaeubl@ualberta.ca with “BUS 715” as the subject line.

Students are to give a 30-minute in-class presentation of their plan for their experiment on June 5.

3. Final Paper

Each student is to (obtain research ethics approval for and) conduct her/his proposed experiment, analyze the data, and report the findings in a final paper. Naturally, the final paper will contain (revised versions of) sections – such as those on the theoretical background, hypotheses, experimental procedure, stimuli, etc. – that are already included in the interim report. Thus, the final paper can be viewed as an expanded (and refined) version of the interim report that contains the results of the experiment.

Due: August 26, 11:00

Final papers (in PDF format, file name format: “LastName-FirstName-FinalPaper.pdf”) must be e-mailed to ghaeubl@ualberta.ca with “BUS 715” as the subject line.

Students are to give a 30-minute in-class presentation of their final paper, with a focus on the results of their experiment, on August 26.

Recommended Books and Materials:

There is no textbook for this course.

However, here are some recommended books on the design (and analysis) of experiments:

Abdi, Edelman, Valentin, and Dowling (2009), *Experimental Design and Analysis for Psychology*, Oxford University Press.

Field and Hole (2003), *How to Design and Report Experiments*, Sage.

Keppel and Wickens (2004), *Design and Analysis: A Researcher's Handbook*, Pearson.

Kirk (2013), *Experimental Design: Procedures for the Behavioral Sciences*, Sage.

Martin (2007), *Doing Psychology Experiments*, Wadsworth.

Oehlert (2010), *A First Course in Design and Analysis of Experiments*, available online at: <http://users.stat.umn.edu/~gary/book/fcdae.pdf>.

In addition, the following papers are recommended as background readings for the course:

Oppenheimer, Meyvis, and Davidenko (2009), "Instructional Manipulation Checks: Detecting Satisficing to Increase Statistical Power," *Journal of Experimental Social Psychology*, 45, 867-872.

Zhao, Lynch, and Chen (2010), "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis," *Journal of Consumer Research*, 37, 197-206.

Spiller, Fitzsimons, Lynch, and McClelland (2013), "Spotlights, Floodlights, and the Magic Number Zero: Simple Effects Tests in Moderated Regression," *Journal of Marketing Research*, 50, 277-288.

Cumming, Geoff (2014), "The New Statistics: Why and How," *Psychological Science*, 25, 1, 7-29.

Elrod, Häubl, and Tipps (2012), "Parsimonious Structural Equation Models for Repeated Measures Data, With Application to the Study of Consumer Preferences," *Psychometrika*, 77, 2, 358-387.

Simmons, Nelson, and Simonsohn (2011), "False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant," *Psychological Science*, 22, 11, 1359-1366.

Simonsohn, Nelson, and Simmons (2014), "*P*-Curve: A Key to the File-Drawer," *Journal of Experimental Psychology: General*, 143, 2, 534-547.

Discussion Papers:

Goodman and Paolacci (2017), “Crowdsourcing Consumer Research,” *Journal of Consumer Research*, 44, 1, 196-210.

McShane and Böckenholt (2017), “Single-Paper Meta-Analysis: Benefits for Study Summary, Theory Testing, and Replicability,” *Journal of Consumer Research*, 43, 6, 1048-1063.

Meyvis and Van Osselaer (2018), “Increasing the Power of Your Study by Increasing the Effect Size,” *Journal of Consumer Research*, 44, 5, 1157-1173.

Morales, Amir, and Lee (2017), “Keeping It Real in Experimental Research—Understanding When, Where, and How to Enhance Realism and Measure Consumer Behavior,” *Journal of Consumer Research*, 44, 2, 465-476.

Pieters (2017), “Meaningful Mediation Analysis: Plausible Causal Inference and Informative Communication,” *Journal of Consumer Research*, 44, 3, 692-716.

Other Resources:

Amazon Mechanical Turk (a marketplace for “hiring” study participants):
www.mturk.com

CloudResearch (tools for participant recruitment; formerly known as TurkPrime):
www.cloudresearch.com

Prolific (platform for participant recruitment):
www.prolific.co

Qualtrics (an easy-to-use web-based system for implementing experiments):
www.qualtrics.com

Materials for the PhD course “Computer-Based Experiments for Behavioral Research” (BUS 716), last offered in 2012:
<http://res.bus.ualberta.ca/gh/www/cbe>

Academic Integrity:

Work submitted by students must be their own. Submitting what someone else has created is not acceptable. However, I encourage students to seek the help of myself and others in developing their own understanding of the material covered in this course.