S2.2 - Quantitative Methods
Fall 2023

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Course Overview

This course will help you become familiar with the general approaches to conducting quantitative research. Generally, this course should provide you with a basic overview of the main quantitive hypothesis testing techniques. At the end of this course, you should have a general idea of which types of quantitative methods you could implement in a Master's thesis, as well as have a clear idea of which resources to consult for assistance in conducting a quantitative analysis.

Course Objectives

Broadly speaking, the major task of this course is the ability to conduct basic quantitative analysis techniques using R statistical software. Therefore, it is expected that at the end of the course that you will be able to conduct a range of general techniques related to data analysis/munging, descriptive statistics, visualization, and statistical modeling.

Measure 1: Is able to analyze data and evaluate descriptive statistics.

Measure 2: Is able to estimate the appropriate statistical model based on the dependent variable's level of measurement.

Additional Learning Objectives

- Recode variables in an intelligible manner.
- Evaluate the usefulness of variables for statistical analysis.
- Visually display a variable in a coherent manner.
- Utilize and evaluate measurement techniques.
- Estimate and interpret linear, logistic, ordinal, & multinomial logistic regression.

Course Requirements

R Homework Assignments = 4

There are 4 substantive weeks where there are readings and labs. For these weeks, there is a lab assignment based on the readings and lab. Each assignment must provide the R code that was utilized for the assignment, original presentation of the output created as if you were going to include them in a thesis, and a full explanation regarding what the output means substantively. The assignments are due to be submitted online the following Tuesday after we cover the topic by 17.00 (see, schedule).

Participation

Half of the tasks in this course require in class participation. In particular, every lab session has a lab activity portion where you must complete tasks in R. Therefore, attendance in class session, as well as active participation, is mandatory to pass.

Empirical Analysis - (ONLY FOR STUDENTS SEEKING 4 CREDITS)

There is the option to receive 4-credits for this course in order to finish the methods credits requirements more quickly. Students that would like to receive 4 credits must complete a data analysis assignment.

The data analysis assignment must include the following sections:

- Data - discussion of the data source & collection method
  (.5 - 1 page)
- Dependent variable(s) - operationalization, measurement, & visual display
  (1 - 1.5 pages)
- Research Method - type of method, implementation, difficulties
  (.5 - 1 pages)
- Independent variables - operationalization, measurement, & visual display
  (1 - 2 pages)
- Analysis - original presentation of regression output & discussion of findings
  (1.5 - 2.5 page)
- Limitations - issues with the analysis
  (.5 - 1 pages)

Textbooks

Holbrook, Thomas M. 2023. *Introduction to Political and Social Data Analysis (Using R)*. Bookdown.org.

Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Advanced Quantitative Techniques in the Social Sciences Series 7. Sage Publications.

Class Schedule

Part I - Introduction to R & Variable Coding

Week 1: Wed 18.10.2023 12:00-14:00 ARC B233
Syllabus
Student introductions
Topic: *Course Introduction & Introduction to R*

Week 1: Thu 19.10.2023 12:00-14:00 ARC B233
Topic: *Variable Coding*
Read: Holbrook (2023), Ch. 1-2, 4.

Homework 1 - 24.10.2023 at 17.00

Part II - Descriptive Statistics, Measures of Dispersion, & Visualization

Week 2: Wed 25.10.2023 12:00-14:00 ARC B233
Topic: *Frequencies & Measures of Central Tendency*
Read: Holbrook (2023), Ch. 3 & 5

Week 2: Thu 26.10.2023 12:00-14:00 ARC B233
Topic: *Measures of Dispersion*
Read: Holbrook (2023), Ch. 6

Homework 2 - 31.10.2023 at 17.00

Part III - Measurement, Correlation, & Linear Regression

Week 3: Wed 01.11.2023 12:00-14:00 ARC B233
Topic: *Correlation & Measurement*
Read: Holbrook (2023), Ch. 14

Week 3: Thu 02.11.2023 12:00-14:00 ARC B233
Topic: *Linear Regression*
Read: Holbrook (2023), Ch. 15-16

Homework 3 - 7.11.2023 at 17.00

Part IV - Logistic, Ordinal, & Multinomial Logistic Regression

Week 4: Wed 08.11.2023 12:00-14:00 ARC B233
Topic: *Logistic & Ordinal Regression*
Read: Long (1997), Ch. 3 & 5

Week 4: Thu 09.11.2023 12:00-14:00 ARC B233
Topic: *Multinomial Logistic Regression*
Read: Long (1997), Ch. 6

Homework 4 - 14.11.2023 at 17.00

Empirical Analysis - 21.11.2023 at 17.00
ONLY FOR STUDENTS SEEKING THE 4 CREDIT COURSE OPTION