SOCI 620: Quantitative methods 2

Agenda

Course overview and introduction

1. Introductions
2. Introduction
3. Logistics
4. Software

Important note on privacy:

The class lectures will be recorded using Microsoft Team's automatic recording feature. This means that a few students' video feeds will be recorded alongside the slides.

If you do not want your video to be part of the recording, please turn off your camera during the lecture.

You will receive notifications when Teams is recording.

Territorial acknowledgement

McGill University is located on [*unceded*] land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. Mcgill honours, recognizes, and respects these nations as the traditional stewards of the lands and waters on which we meet today.

https://www.mcgill.ca/fph/welcome/traditional-territory

See also:

Chelsea Vowel. 2016. “Beyond Territorial Acknowledgments.” Âpihtawikosisân. https://apihtawikosisan.com/2016/09/beyond-territorial-acknowledgments/.

Introductions

Introduction

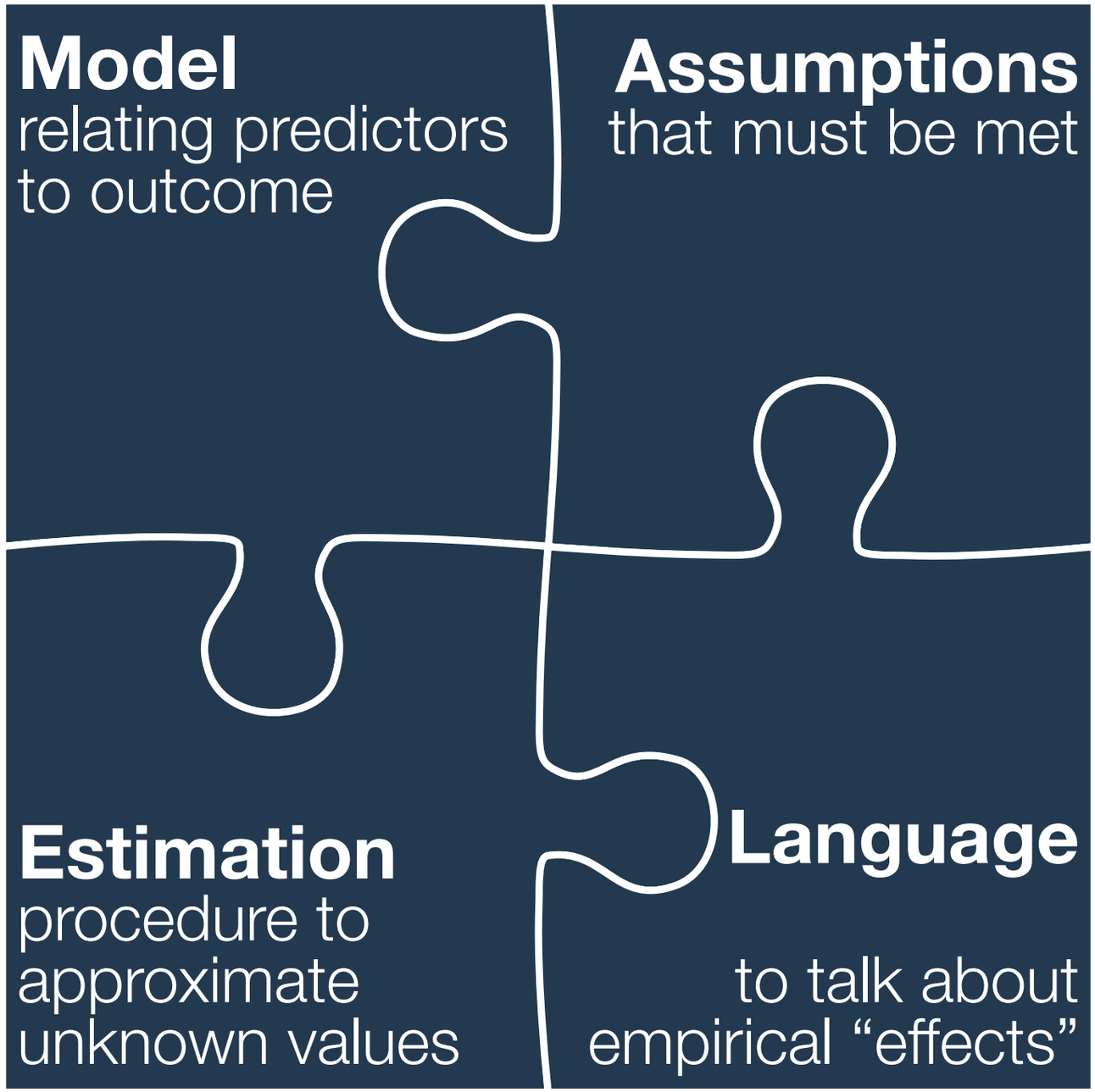
Introduction

Multiple Least Squares

$$y_i = \alpha + \beta_0 x_{0i} + \beta_1 x_{1i} + \varepsilon_i$$

Introduction

Multiple Least Squares



$$y_i = \alpha + \beta_0 x_{0i} + \beta_1 x_{1i} + \varepsilon_i$$

Introduction

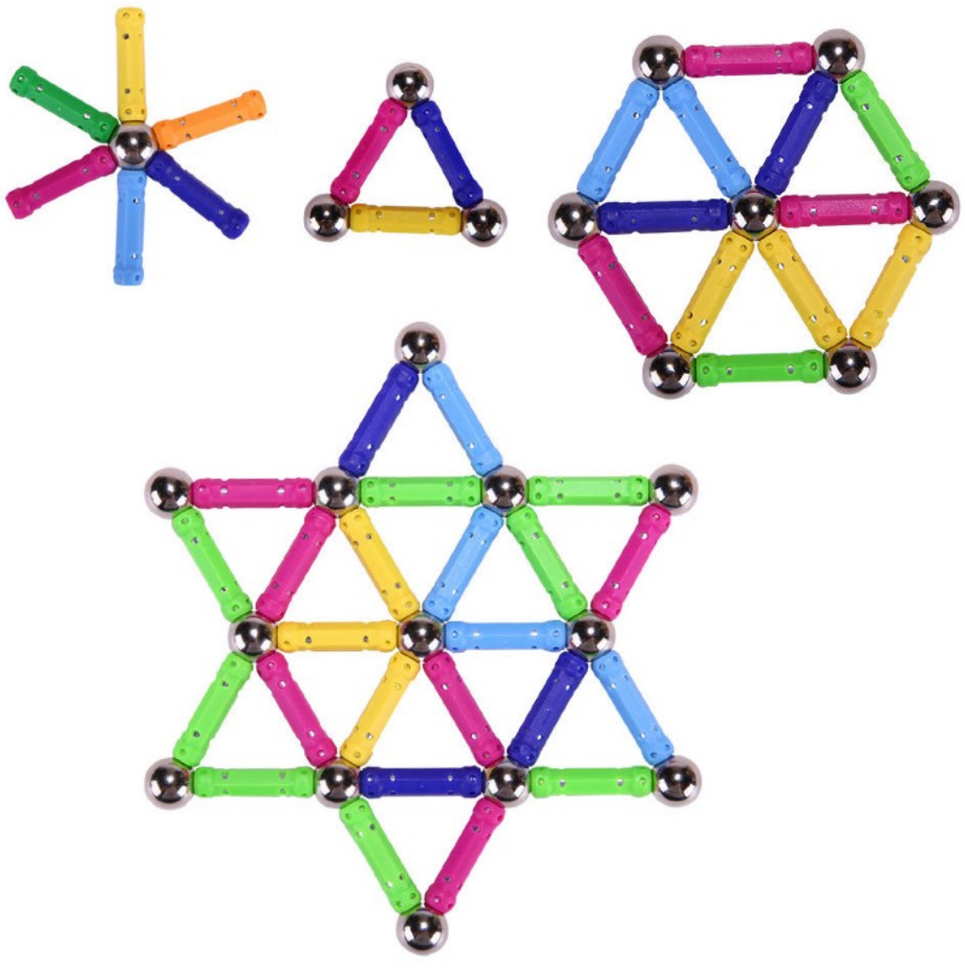
- As social scientists, the model is what we really care about
  'Mental map' of your argument
- Also the fun part
  Building a tiny working model of the social world

- Predictions and measures from model and data
- Technical procedures
  Important, but less sociological
- Ordinary least Squares (OLS)
- MAP & MCMC

Bayesian data analysis

“Bayesian” approach

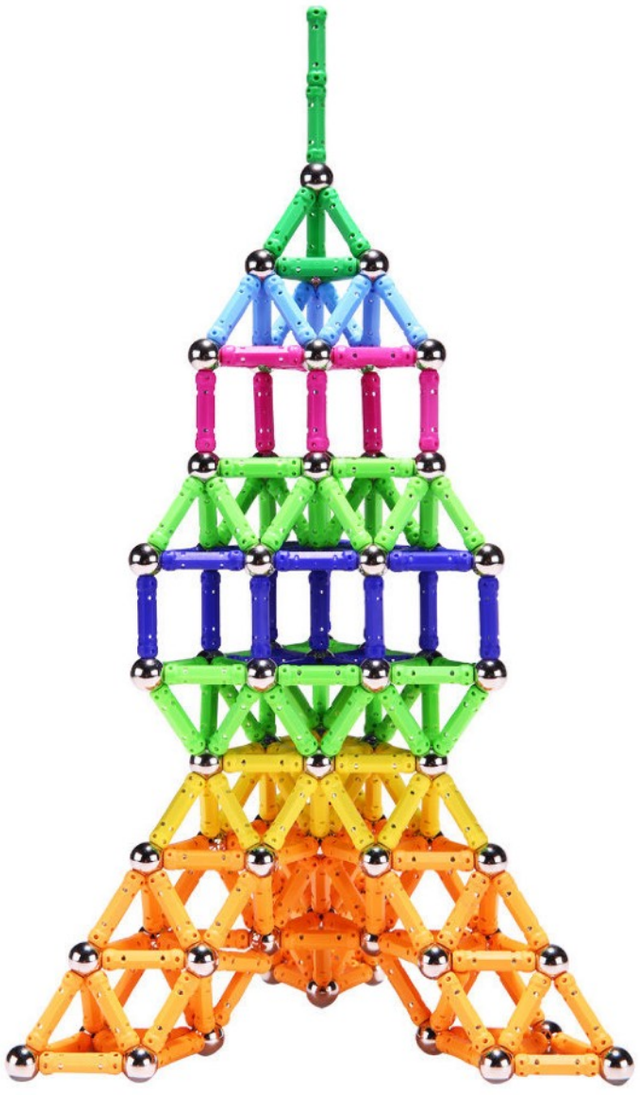
- More intuitive (for most) than “frequentist” approach
  e.g. *p*-values versus Bayesian posterior probabilities
- More flexible



Bayesian data analysis

Why a Bayesian approach

- More intuitive (for most) than “frequentist” approach
  e.g. *p*-values versus Bayesian posterior probabilities
- More flexible



Bayesian data analysis

What does "Bayesian" really mean?

Philosophically:

- Frequentist
  The *probability* of an event is the proportional frequency of that event across the entirety of a given context
- Bayesian
  the *probability* of an event is a rigorous way to quantify subjective uncertainty about that event

Practically:

- Frequentist
  Limitations on types of models that can be used
  Fast computation of estimates for those models
  Difficult to talk about our confidence in estimates
- Bayesian
  Easy to build models and talk about confidence in estimates
  Computationally "expensive"
  Need to specify prior beliefs (more on this next week)

Logistics

Logistics

Syllabus

- https://soci620.netlify.com/

Class periods

- Lecture and discussion
  Formal discussion of topics
- Usually finish with demos
  Working in R
- Laptop will be necessary

Lab

- Work through example code with TA
- Work on assignments/projects in the same space as one another (study hall)
  Ask questions, consult, commiserate
- Once per week (needs to be scheduled)
  https://www.when2meet.com/?8529940-mDiyZ

Logistics

Microsoft Teams

- Discussions, questions, resources, etc should all go on Microsoft Teams
- If you are having any trouble with access, *let me know*

Readings

- Textbook
  Richard McElreath, *Statistical Rethinking*
  Second Edition
  Online access through library
- If you are having any trouble with access, *let me know*

Logistics

Assignments

- Semi-weekly
- Working together is fine, but each person needs to create their own writeup of code and prose
  Copy/pasting code is no way to learn
- Submit through Teams
- Should be submitted as RMarkdown output (HTML, PDF, or Word Doc is fine)

Final project

- Original research
- Due in pieces
  (precis, proposal, presentation, and writeup)
- Meet with me early in semester to talk about ideas and what is appropriate

Software

Software

RStudio

User-friendly interface
to the R environment

R

Statistical language &
computational tool

rethinking

Companion package
for *Statistical Rethinking*
(McElreath, 2020)

brms

Bayesian modelling
package

…

Other add-ons to R

Stan

General-purpose
Bayesian estimation
software