

Jan. 5

Course overview
and introduction

1. Introductions

2. Introduction

3. Logistics

4. Software

Territorial acknowledgement

McGill University is located on 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/>.

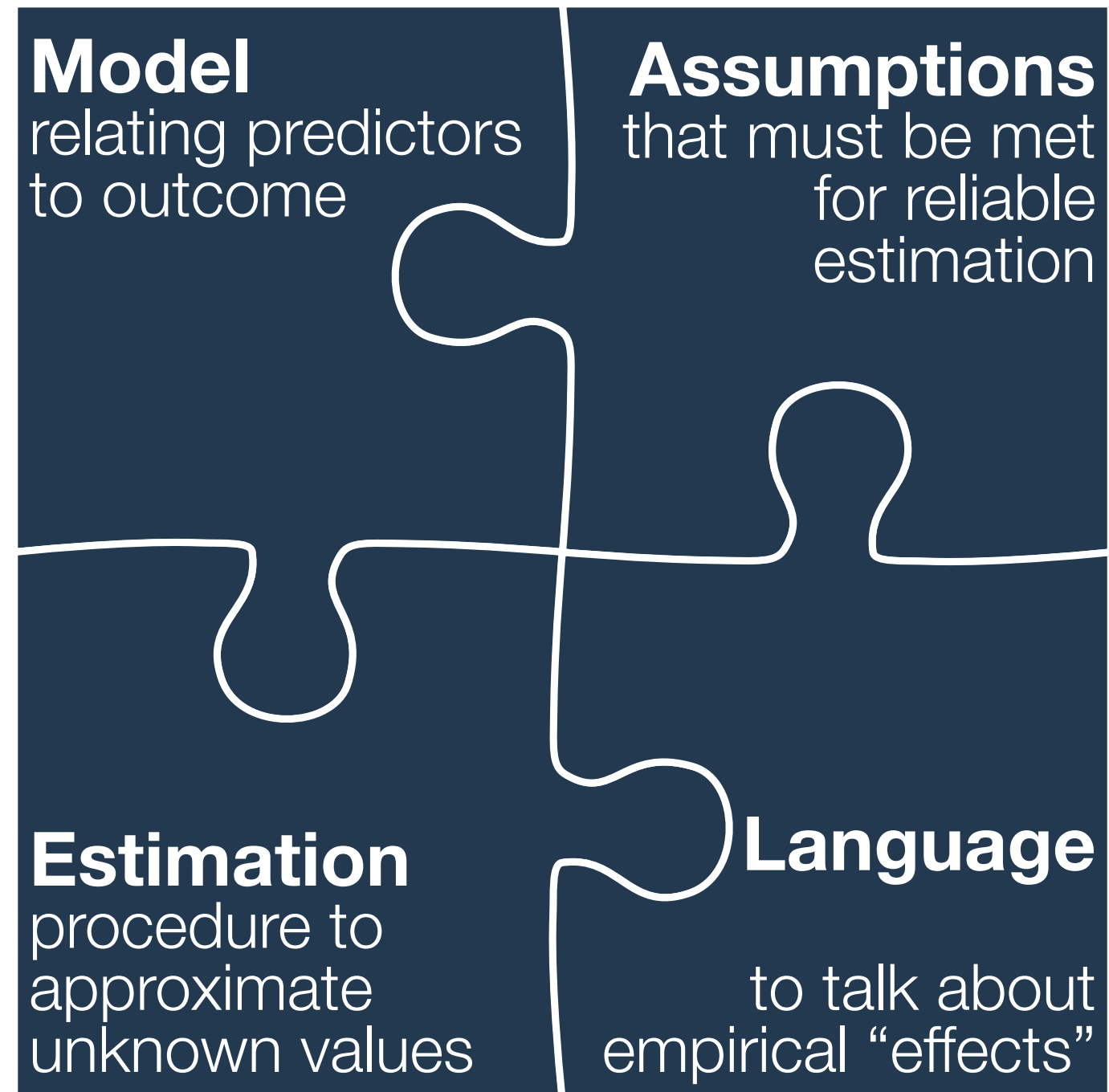
Introductions

Introduction

Multiple Linear Regression (OLS)

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

Multiple Linear Regression (OLS)



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

Introduction

Model

relating predictors to outcome

- 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

Estimation

procedure to approximate unknown values

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

Bayesian data analysis

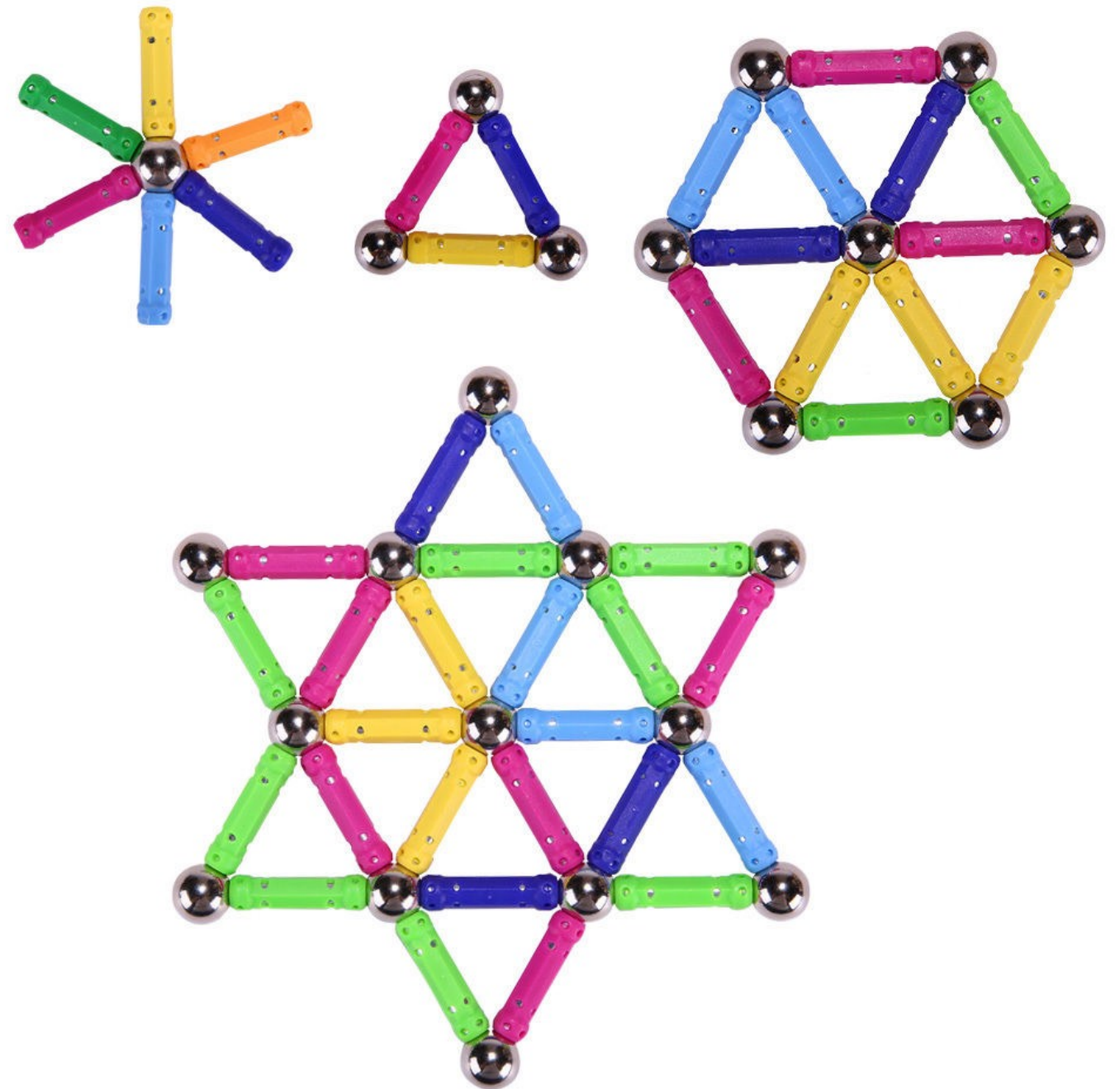
“Bayesian” approach

More intuitive (for most) than “frequentist” approach

- ∴ e.g. p -values versus Bayesian posterior probabilities

More flexible

- ∴ Probability distributions can describe a wide array of ‘uncertain’ processes
- ∴ Bayesian analysis lets you fit these together in a modular way



Bayesian data analysis

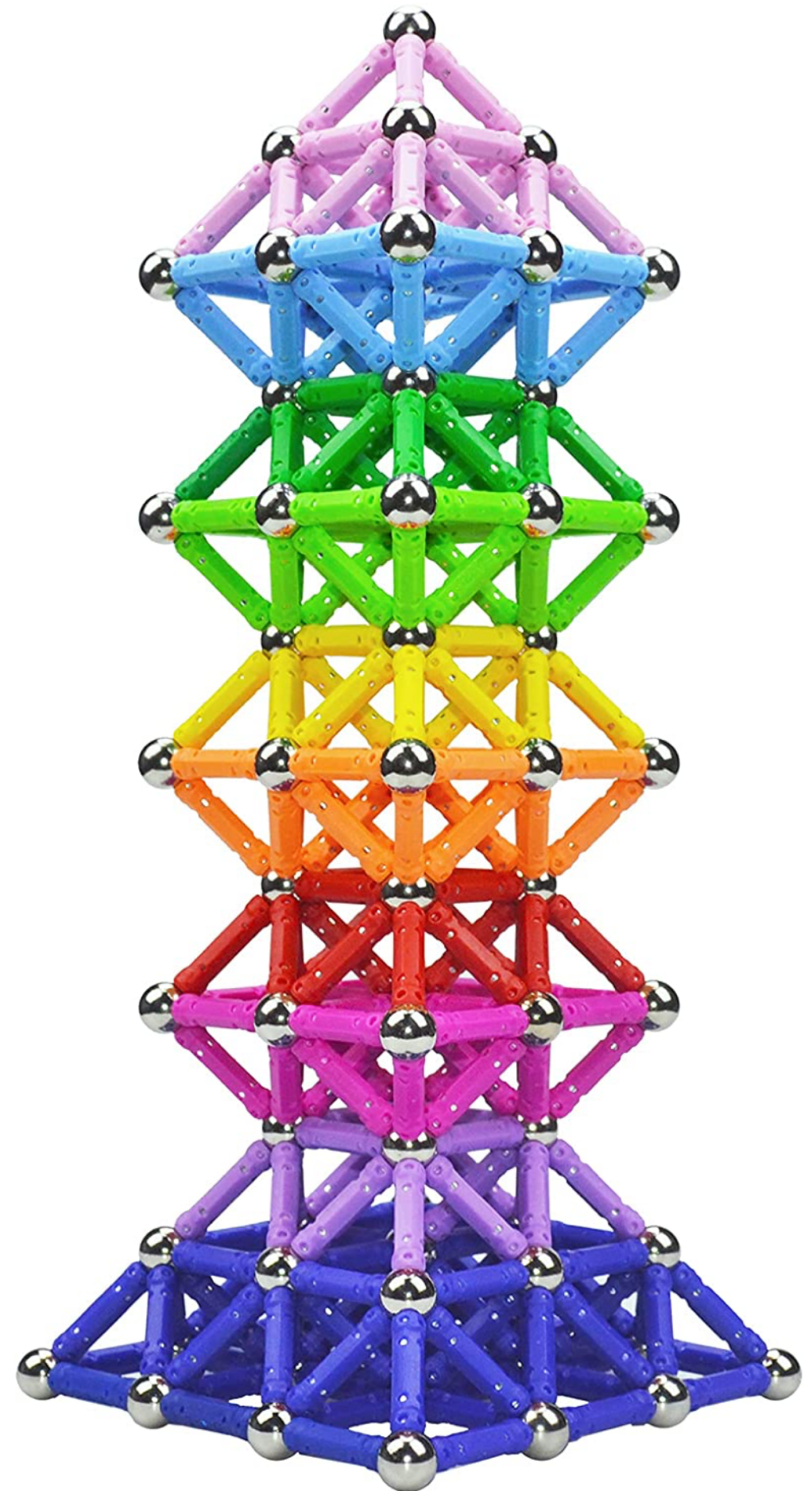
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Bayesian data analysis

What is the difference between “Bayesian” and “frequentist” statistics, really?

Frequentist

Bayesian

Philosophical contrasts

∴ The *probability* of an event is the *proportional frequency* of that event across the entirety of a given ‘context’

∴ The *probability* of an event is a rigorous way to *quantify subjective uncertainty* about that event

Practical contrasts

∴ Significant limitations on *types of models* that can be used

∴ *Easy to build* models and talk about *confidence* in estimates

∴ *Fast computation* of estimates for those models

∴ Computationally “*expensive*”

∴ Difficult to talk about *confidence in estimates*

∴ Need to specify *prior beliefs* (more on this next week)

Logistics

Schedule

Syllabus

- ⋮ <https://soci620.netlify.app/>
- ⋮ Updated with links to assignments and slides and changes to the schedule

Class periods

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

Labs

- ⋮ **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/?18136969-Vq8Sv>

Tools & resources

Microsoft Teams

- ∴ Discussions, questions, resources, etc should all go on Microsoft Teams
- ∴ *Ask and answer* questions!
- ∴ Best place to contact me
- ∴ 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*

Assess- ments

Worksheets

- ∴ Four over the term
- ∴ 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 a 'knitable' RMarkdown (or Quarto) file

Research project

- ∴ Original research project
- ∴ Due in pieces
Four P's:
precis, proposal, presentation, and paper
- ∴ Meet with me early in semester to talk about ideas and what is appropriate

Software

RStudio

User-friendly interface
to the R environment



R

Statistical language &
computational tool




rethinking

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

brms

Bayesian modeling
package

...

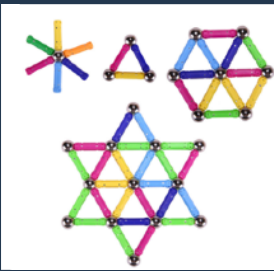
Other add-ons to R
(e.g. the 'tidy'
packages) 

Stan

General-purpose
Bayesian estimation
software



Image credit



PlayMaty magnetic building blocks, via worthpoint.com



Veatree magnetic building blocks, via [Amazon](https://www.amazon.com)