Australian National University

Foundations of Statistical Analysis in Political Science

Instructor

Dr Patrick Leslie Is a lecturer and research fellow at the School of Politics and International Relations at The Australian National University. He completed his PhD in political science at The University of Essex in 2018 on political behaviour in British politics. His work focuses on the quantitative understanding of social processes. Between 2018-2020 he was a research fellow at the ANU Centre for Gambling Research, designing and analysing surveys of gambling behaviour for Australian state governments. His work has been published In the *American Political Science Review, Political Geography* and the *Journal of Gambling Studies.*

Course Outline

Statistics can often seem daunting to the uninitiated - and politcal science methods are quickly becoming more complicated over time. This course attempts to simplify (and solidify) the principles of casual inference and statistical analysis so that the student can think about the fundamentals of statistical analysis for their own research project and begin to use R to apply these principles to their own data.
The course will be focused on understanding the following concepts: understanding types of data and how to treat them; the basics of data visualisation using the ggplot2 package In R; a brief introduction to thinking about causality in politics with reference to directed acyclis graphs (DAGs); bivariate statistical methods such as difference of means, crosstabulation, correlation and simple linear regression and finally an introduction to multiple regression with reference to confounders and interations.

Learning outcomes

Upon the successful completion of this course, students will have the knowledge and skills to:

- Understand and distinguish casual from correlational research in published political science research.
- Design political research using a casual framework.
- Understand the uses for different forms of data.

- Understand the basics of statistical programming using R.
- Apply bivariate and multivariate methods to real data.

Readings

Wickham, H., & Grolemund, G. (2016). *R for data science: Import, tidy, transform, visualize and model data.* "O'reilly Media, Inc.". DOI: https://r4ds.had.co.nz/

Pearl, Judea and Dana Mackenzie. (2018). *The Book of Why: The New Science of Cause and Effect.* New York Basic Book.

Recommended pre-requisite understanding

This course Is aimed at the graduate interested in quantitative anaylsis - perhaps the first time (or for those with some limited training in other software packages such as Stata or SPSS). This course covers some algebra but does not require students to derive or solve equations.