Chapter 13.1 Introduction

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Chapter 13 Case Studies

Three Case Studies

This chapter provides several illustrations of Bayesian modeling that extend some of the models described in earlier chapters.

▶ Authorship of the Federalist papers.

▶ Learning about the career trajectory of a baseball player.

▶ A latent class model for a multiple choice exam with two classes of students.

Federalist Paper Study

- ▶ Mosteller and Wallace (1963) explore the frequencies of word use in the well-known Federalist Papers.

- ▶ Object was to determine the authorship between Alexander Hamilton and James Madison.

- ▶ What is a suitable sampling distribution for word use?

- ▶ What are good ways of comparing the word use of several authors?

Career Trajectory Study

- ▶ In sports, a career trajectory is the pattern of increase and decrease in the performance of a player.

- ▶ A baseball player is believed to reach a level of peak performance at age of 30.

- ▶ Use a hierarchical model to simultaneously estimate the career trajectories for a group of baseball players using on-base percentage as the measure of performance

Latent Class Study

- ▶ A class is taking a multiple choice exam where there are two groups of students.

- ▶ Some students are well-prepared and other students have not studied and will essentially guess at the answers.

- ▶ Introduce a latent class model that assumes that the class consists of two groups of students with different success rates and the group ids of the students are unknown.

- ▶ We learn about the location of the two success rates and the group classifications of the students.

- ▶ Use this latent class framework, learn about the true author identity in the Federalist Papers example using frequencies of particular filler words.