Week 9 – Comparing Many Means (ANOVA)

# Chapter 22

**What does ANOVA stand for?**

**What is the null hypothesis for an ANOVA?**

**What is the alternative hypothesis for an ANOVA?**

**What are the conditions for an ANOVA?**

## Section 2 – Randomization Test for Comparing Many Means

### Conditions

**What are ways to assess the equal variability condition?**

**If it appears that the variability between groups is similar can we say that the equal variance condition is met?**

### Comparing every mean

**Why should we compare every mean rather than only the means that look the most different?**

## Test statistic

**What is the statistic used in an ANOVA?**

**How is this statistic calculated?**

## Creating a permuted sample

Last week, we used cards to simulate what could have happened if was true by ripping the cards in half to separate the and values. We then shuffled the cards and created new (, ) pairs by resampling from the data without replacement.

**How do we simulate what could have happened if** was true for an ANOVA?

**What tail do we use to calculate the p-value for an ANOVA?**

**If you reject** in an ANOVA what can you conclude?

## Section 3 – Mathematical Model

**What distribution do we use to calculate the p-value for a theory-based ANOVA?**

| term | df | sumsq | meansq | statistic | p.value |
| --- | --- | --- | --- | --- | --- |
| gender | 1 | 2.260213 | 2.2602134 | 7.753005 | 0.005583 |
| Residuals | 461 | 134.394128 | 0.2915274 | NA | NA |

**In the ANOVA table above, what does the statistic column represent?**

**How was that statistic calculated? Specifically, what values from the table were used to obtain it?**

**What distribution was used to calculate the p.value?**