

Learning Goals

- Compare two population proportions using a hypothesis test and interpret the results in context.
- Determine when to use a pooled or unpooled standard error for comparing two proportions.
- Use a chi-square goodness-of-fit test to determine whether observed categorical counts match expected proportions.
- Use a chi-square test of independence to determine whether two categorical variables are associated.

- two-proportion test:

- successes and failures condition:

- observed counts / expected counts:

- goodness-of-fit test:

- test of independence:

- contingency table:

Practice Problems

For each task below, write the R code you would use and briefly describe what you expect the output to look like.

1. In Section A, 42 out of 60 students passed an online quiz. In Section B, 35 out of 55 students passed the same quiz. Use a two-proportion test to determine whether the passing proportions are different between the two sections.

2. A company claims that four fruit snack flavors appear equally often in each bag. A student randomly selects 80 fruit snacks and records the following counts:

Flavor	Strawberry	Grape	Orange	Lemon
Count	18	22	25	15

Use a chi-square goodness-of-fit test to determine if the flavors appear equally often.

3. A researcher wants to know whether preferred study method is associated with class level. The results are shown below:

	Study Alone	Study in a Group
First-Year	28	22
Sophomore	35	15
Junior/Senior	30	20

Use a chi-square test of independence to determine whether study method preference and class level are associated.