JMP® Introductory Lab Activities

Activity 8: Confidence Interval for a Proportion

Data Set: Students.jmp

Summary

A confidence interval for a proportion is an interval that is computed from sample data, providing a range of plausible values for the value of the population proportion.

You should have already used the formula for a confidence interval for a proportion:

$$\text{C.I. for a proportion: } p \pm (\text{z critical value})\sqrt{\frac{p(1 - p)}{n}}$$

In this activity, you will learn how to use JMP to construct a confidence interval for a proportion. You will also explore the widths of confidence intervals for different confidence levels, and will summarize your findings in a report (required output and discussion is in italics).

The Students Data

Open the JMP data table **Students.jmp** from the **Sample Data** directory.

This data set contains the sex, heights and weights for a sample of 233 students. This is a large sample, and the required conditions for the large-sample confidence interval technique are met. The variable of interest in this activity is **sex**.

Constructing a Confidence Interval in JMP®

Go to **Analyze > Distribution**. Select **sex** as **Y, Columns** and click **OK**.

By default, JMP creates a histogram (bar chart), and calculates the frequencies and probabilities. To add a probability axis to the histogram, select **Histogram Options > Prob Axis** from the **red triangle** next to **sex**.

To calculate a 95% confidence interval for sex, click on the **red triangle** for **sex** and select **Confidence Interval**, then **0.95**.

The resulting confidence intervals table displays the following for females and males:

- Count – observed counts.
- Probabilities – the observed probabilities.
- Lower CI – the lower end of the confidence interval.

- Upper CI – the upper end of the confidence interval.
- 1-Alpha – the confidence level.

Copy and paste the histogram (with a probability axis), frequencies table and Confidence Intervals display into your report. Make sure you put a title on your graph.

Interpret the confidence interval in the context of the data.

Calculate a Confidence Interval Using the Formula

Use the confidence interval formula given above to calculate the 95% confidence interval for the proportion of males in the population from which this sample was drawn.

Show your calculations and resulting confidence interval in your report. Compare your result to the result from JMP.

Explore Different Confidence Levels

- Click the red triangle next to sex and select **Confidence Interval**, then **0.90**.

  Copy this new confidence interval table into your report.

- Click the red triangle next to sex and select **Confidence Interval**, then **0.99**.

  Again, copy this into your report.

Describe how changing the confidence level affects the width of the confidence interval.