

11.1a Chi-Square χ^2 Goodness of Fit Test

Is our observed sample distribution significantly different from a hypothesized distribution?

used for categorical variables (proportions)

H_0 : all proportions = hypothesized values

H_a : at least one of the hypothesized proportions is incorrect.

χ^2 Statistic

measures how far the observed counts are from the expected counts

$n \cdot P$
(total sample size)(proportion)

not a proportion

$$\chi^2 = \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

Larger χ^2 values = smaller P-values = stronger evidence against H_0

New Condition (use instead of Normal Condition)

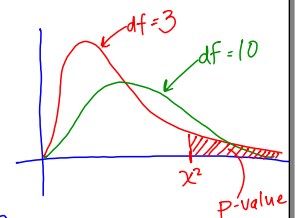
Large Sample Size

All expected counts must be at least 5

Random & Independent conditions must still be met.

χ^2 distribution

- Skewed to the right
- Always positive
- $df = (\# \text{ of categories}) - 1$
- different for each df



* p. 682

to find p-value
use table C in ref. sheets or
on calc: $\chi^2 \text{cdf}(\min, \max, df)$

2nd vars