

Goodness of Fit

- Observed vs. Expected Counts
- χ^2
- χ^2 -Goodness of Fit Hypothesis Test
- Requirements

Observed vs. Expected

A craps player suspects that the casino is using weighted dice. A die throw is observed **300** times and the outcomes are shown below.

	1	2	3	4	5	6
Observed	45	50	58	40	53	54
Expected	50	50	50	50	50	50

Observed vs. Expected

A craps player suspects that the casino is using weighted dice. A die throw is observed **300** times and the outcomes are shown below.

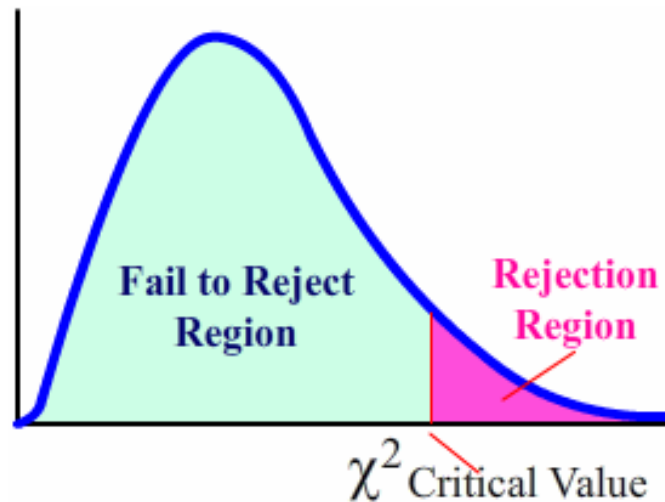
	1	2	3	4	5	6
Observed	45	50	58	40	53	54
Expected	50	50	50	50	50	50

$$\chi^2 = \sum \frac{(O - E)^2}{E} \quad \frac{(45 - 50)^2}{50} = 0.5...$$

χ^2 Hypothesis Test

$$H_0 : p_1 = p_2 = p_3 = p_4 = p_5 = p_6$$

H_1 : At least two of the proportions differ from each other



Requirements: Data were randomly selected and all of the expected counts are at least 5.

TI 83+/TI 84 Calculator

TI 83+

- Download the app at www.aw.com/triola
- Press PRGM -> X2GOF -> ENTER
- Enter observed and expected into L1 and L2

TI 84

- STAT -> TESTS -> χ^2 GOF-Test
- Enter observed and expected into L1 and L2

Hypothesis Test

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H_1 : At least two of the proportions differ from each other

$$\alpha = 0.05$$

$$\text{P-Value} = 0.51$$

There is insufficient evidence to make a conclusion about the die having any one number more likely to occur than any other.

Goodness of Fit

South Lake Tahoe is 62% White, 23% Hispanic, 7% Asian, and 8% Other. A survey of 350 LTCC students found that 245 were White, 55 were Hispanic, 36 were Asian, and 14 were Other. What can be concluded at the 0.05 level of significance?

Goodness of Fit

Bedford's Law States that the leading digits of numbers follows this distribution

Digit	1	2	3	4	5	6	7	8	9
Percent	30.1	17.6	12.5	9.7	7.9	6.7	5.8	5.1	4.6

The IRS suspects that a business is making up numbers in its tax return. They look at the 348 leading digits of all the numbers from the return and come up with the following frequency table. What can be concluded at the 0.05 level of significance?

Digit	1	2	3	4	5	6	7	8	9
Frequency	48	52	35	40	34	50	47	20	22