

Type	Rookie	Veteran	All-Star
Count	30	60	10

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The Chi Square Distribution's Shape

This shape is not constant – it depends on some things.

This is handled by the **degrees of freedom**

For the GOF test, DF is the number of categories minus 1

The higher the DF, the closer the Chi Square gets to being normal

The Chi Square Distribution

Mean: the same as the degrees of freedom!

Standard Deviation: the square root of twice the degrees of freedom

Shape: varies...mostly skew right

The Chi Square Goodness of Fit Hypothesis Test

H_0 : the distribution of the variable is *something*

H_a : the distribution of the variable is not
something

For a chi-square goodness-of-fit test, the null hypothesis specifies null proportions for each category, and the alternative hypothesis is that at least one of these proportions is not as specified in the null hypothesis.

Conditions

- Random (sample or experiment)
 - *if a sample, the 10% condition applies
 - All expected counts are at least 5
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Expected counts are found by applying the distribution in the null hypothesis to the total sample size (this is similar to doing "np" for each category)

Mechanics

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

$df = \text{categories} - 1$

Example

An ABC News Poll asked adults whether they felt that genetically modified food was safe to eat. 35% said it was safe; 52% said that it was not safe; and 13% had no opinion.

The same question was given to a random sample of 120 adults at the State Fair.

Example (continued)

At the fair, 40 people said that it was safe; 60 said that it was not safe; and 20 had no opinion.

Is there evidence that State Fair attendees have a different opinion on the safety of genetically modified food?
