Interpreting p-values

When we use statistical methods to perform a hypothesis test, the conclusion is a *p*-value.

For the following, assume such a test has been done and the *p*-value is 0.04

- What, exactly, does the p-value mean?
  If we assume the null hypothesis is true, then the *probability of obtaining data* (from this size sample) that gives a sample statistic as far from the Ho value as the sample statistic (in the direction of the alternative hypothesis) *is 0.04*.

- How do statisticians explain to someone what the p-value means?
  There are two methods, illustrated in the figure below.

  "Strength of evidence" conclusion:

  The data provide moderate evidence for the claim in the alternative hypothesis. (p = 0.04)

  "Significance-level" conclusion:

  The method assumes that someone who has balanced the relative importance of the consequences of the two possible errors has used that to decide on an appropriate significance level.
  Suppose that significance level that has been decided on is 3%.

  The data do *NOT* provide significant evidence, at the 3% level, that the claim in the alternative hypothesis is true. (p = 0.04)