

1. Define the population that you're interested in learning about, and define the parameter that you want to find out about.

Specify the sample that you've observed or collected data on, and calculate the value of the statistic in this sample.

2. Formulate the null hypothesis – what a skeptic would say, that the results were due to chance.
Formulate the alternative hypothesis – that there is a real effect.

3. Assume the null hypothesis is true. In that case, what would the sampling distribution of the statistic look like? Would it be Normal?
What is the mean of the sampling distribution?
What is the SD of the sampling distribution?

4. Compare

the value of the statistic we actually observed

to

the value we would have expected if the null hypothesis were true.

How much of a discrepancy is there between the observed value and the expected value? How many SDs is this? (The number of SDs is called the *test statistic*.)

5. What's the probability of getting a value as large as (or larger than) the observed value of the statistic, if the null hypothesis were true? (This probability is the *P-value*.)

6. If the *P-value* is small, then the observed results would be unlikely if the null hypothesis were true.
In other words, the observed results are inconsistent with the null hypothesis, so we reject the null hypothesis.

If the *P-value* is not small, then the observed results would not be unlikely if the null hypothesis were true.

In other words, the observed results are consistent with the null hypothesis, so there is not sufficient evidence to reject the null hypothesis.

7. How do we decide whether the *P-value* “small” or “not small”?
By convention, the *P-value* is considered small when it is less than .05, and otherwise not small. (This cutoff (.05) between “small” and “not small” is the alpha level, or α .)