

Political Science 209 - Fall 2018

Hypothesis Testing

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Hypothesis Testing

Goal: Try to determine whether result is due to chance or not

Method: “*Proof*” by contradiction

We try to reject the *null hypothesis*

Generally we have two hypotheses:

1. H_0 Null hypothesis: no relationship

2. H_1 Alternative hypothesis: complement to null hypothesis:
expected relationship

Hypothesis Testing

We can **never** prove a hypothesis to be true or reject a hypothesis with certainty

Instead, we may **fail to reject the null**

We use data and statistical test to infer whether we can *reject or fail to reject the null*

Hypothesis Testing

In general, **statistical** hypothesis testing consists of the following five steps:

1. Specify a **null hypothesis** and an alternative hypothesis
2. Choose a test statistic and the **level of test** α
3. Derive the **reference distribution**, which refers to the sampling distribution of the test statistic under the null hypothesis
4. Compute the **p -value**, either one-sided or two-sided depending on the alternative hypothesis
5. Reject the null hypothesis if the p -value is less than or equal to α . Otherwise, retain the null hypothesis (i.e., fail to reject the null hypothesis)