

DSFA
Spring 2021

Lecture 20

Examples

Announcements

- Homework 4
 - due Friday 5:59PM, 1 point bonus for turning in on Thursday

Testing a Hypothesis

Step 1: Select Two Hypotheses

- A test chooses between two views of how data were generated:
Null hypothesis proposes that data were generated at random;
Alternative hypothesis proposes some effect other than chance

Step 2: Choose a Test Statistic

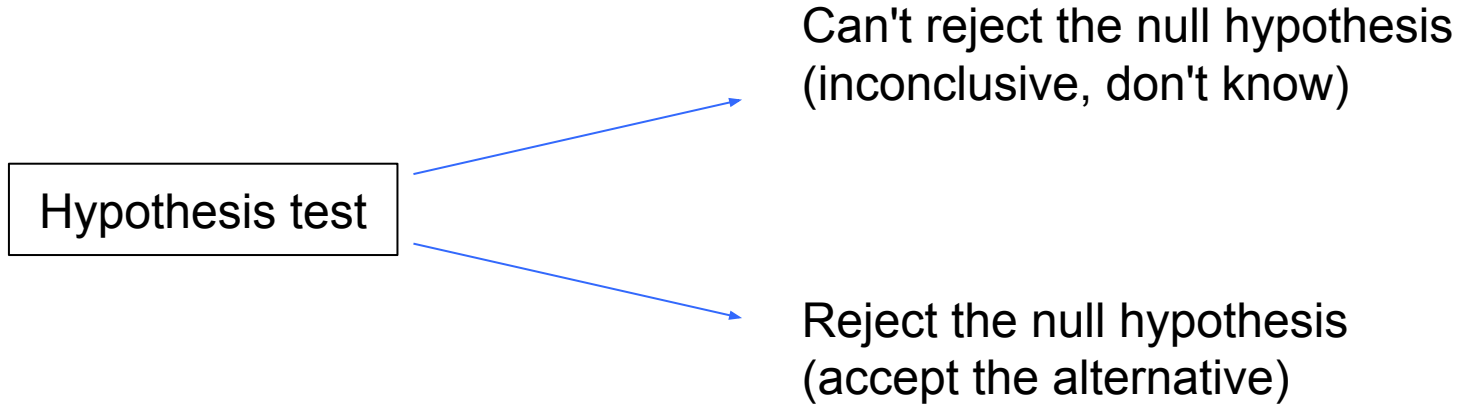
- A value that can be computed from the data

Step 3: Compute What The Null Hypothesis Predicts

- Compute the distribution of the test statistic: what the test statistic might be if the null hypothesis were true.

Step 4: Compare the Prediction to the Observed Data

Conclusions From a Test







Definition of P -value

The P -value is the chance,

- under the null hypothesis,
 - that the test statistic
 - is equal to the value that was observed in the data or is even further in the direction of the alternative.
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Can the Conclusion be Wrong?

Yes.

	Null is true	Alternative is true
Test rejects the null		
Test doesn't reject the null		

An Error Probability

- The cutoff for the P-value is an error probability.
 - If:
 - your **cutoff is 5%**
 - and the **null hypothesis happens to be true**
 - (but you don't know that)
 - then there is about a **5% chance** that **your test will reject the null hypothesis anyway**.
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Assess this:

“Statistical significance is an objective, unambiguous, universally accepted standard of scientific proof.

— Letter to *Nature*, 1994

When poll is active, respond at pollev.com/dsfa

Text **DSFA** to **22333** once to join

What month were you born in?

Jan-March

April-June

July-Sept

Oct-Dec



Deflategate

Deflategate



Tom Brady Then



Afterwards

Tom Brady on Deflategate: 'I've just moved on, man'

Adam Kurkjian Sunday, October 09, 2016



Boston Globe,
Sunday 10/9/16

(Demo)
