

Lecture 20: Single Proportion Test

Chapter 6.1

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Quiz 8

Question 1: According to the article, why do scientists even bother with correlational/observational studies, when no notions of causality can be established?

Answer: One reason is that correlational studies are excellent starting points for deciding which hypotheses to evaluate with the more rigorous randomized controlled experiment.

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Quiz 8

Question 2: The article argues that various scientific disciplines should set professional labeling standards for material discussed in the media... Rank the four possible labels in order of how much credence the public should give them, from lowest to highest.

Answer:

3. preliminary result
1. large-scale observational study
4. large-sample randomized controlled test
2. well-established scientific law that we know how to apply in a wide range of conditions

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Causality

What is causality? How do we establish it?

- ▶ http://nfs.unipv.it/nfs/minf/dispense/patgen/lectures/files/disease_causality.html
- ▶ <http://bayes.cs.ucla.edu/BOOK-2K/>

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Question for Today

According to a (representatively sampled) poll done by the New York Times/CBS News in June 2012, only about 44% of the American public approved of the Supreme Court's performance.

The sample proportion $\hat{p} = 0.44$ is **point estimate** of p : the true (population) proportion of the American public who approves.

What are some next things to ask?

- ▶ What was n ?
- ▶ What is the **SE** of $\hat{p} = 44\% = 0.44$?
- ▶ What is the sampling distribution of \hat{p} ?

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Question for Today

Just like with \bar{x} , if we want to use the normal model to

- ▶ build confidence intervals via z^*
- ▶ conduct hypothesis tests via the normal tables

we need the **sampling distribution** of \hat{p} to be nearly normal.

This happens when the population distribution of 0's and 1's is not too strongly skewed. As the sample size $n \rightarrow \infty$, this is less of an issue by the CLT.

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Conditions for Sampling Dist'n of \hat{p} Being Nearly Normal

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Conditions for Sampling Dist'n of \hat{p} Being Nearly Normal

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What p to use?

Confidence Intervals

Confidence Intervals

Hypothesis Tests

Thomas Carcetti is running for mayor of Baltimore. His campaign manager **claims** he has more than 50% support of the electorate.

The Baltimore Sun collects a random sample of $n = 500$ likely voters and finds that 52% support him. Does this provide convincing evidence for the claim of Carcetti's manager at the 5% significance level?

Hypothesis Tests

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Hypothesis Tests

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Next Time

Same as with the jump from

$$\mu \text{ to } \mu_1 - \mu_2$$

i.e. from one to two-sample tests for means, we make the jump from

$$p \text{ to } p_1 - p_2$$

i.e. from one to two-sample tests for proportions.