

7.4: Distribution of Sample Proportions (1 of 6)

Learning Objectives

- Introduction

After we develop a probability model of how sample proportions behave, we can answer questions like the following:

- The questions ask us to make an inference about a population. Our answers to these questions will be based on a sample. We will never be 100% sure of our answer, so we will make probability statements that describe the strength of the evidence and our certainty.

Brief Discussion of the Connection between These Questions and Probability

- What proportion of all college students in the United States are enrolled at a community college?
 - Note: Connected to each inference question about a population proportion, we see a probability question about the long-run behavior of sample proportions. We need to understand how proportions from random samples relate to the population proportion. We also need to understand how much variability we can expect in sample proportions. Therefore, in our early investigations, we will assume we know a population proportion and examine what happens when we select random samples from this population.

Now we begin an investigation of the long-run behavior of sample proportions.

Example

Gender in the Population of Part-time College Students

We don't have information about the population of part-time college students, so we select a random sample of 25 part-time college students and calculate the proportion of the sample that is female. We don't expect the sample proportion to be exactly 0.60. So, *how much could the sample proportion vary from 0.60 for us to feel confident in our prediction?*

To answer this question, we need to understand how much sample proportions will vary if the parameter is 0.60.

Learn By Doing

Refer to the previous example for the following questions. These questions focus on how the proportion of females will vary in random samples if we assume that 0.60 of the population of part-time college students is female.

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Use the following simulation to select a random sample of 25 part-time college students. Repeat the selection many times to observe how the proportion of females in the samples vary. Then answer the following question.

An interactive or media element has been excluded from this version of the text. You can view it online here: <http://pb.libretexts.org/sss/?p=270>

Learn By Doing

<https://assessments.lumenlearning.co...sessments/3585>

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