

## CHAPTER OVERVIEW

### 18: Quantifying Effects and Designing Studies

#### Learning Objectives

- Describe the proper interpretation of a confidence interval, and compute a confidence interval for the mean of a given dataset.
- Define the concept of effect size, and compute the effect size for a given test.

In the previous chapter we discussed how we can use data to test hypotheses. Those methods provided a binary answer: we either reject or fail to reject the null hypothesis. However, this kind of decision overlooks a couple of important questions. First, we would like to know how much uncertainty we have about the answer (regardless of which way it goes). In addition, sometimes we don't have a clear null hypothesis, so we would like to see what range of estimates are consistent with the data. Second, we would like to know how large the effect actually is, since as we saw in the weight loss example in the previous chapter, a statistically significant effect is not necessarily a practically important effect.

In this chapter we will discuss methods to address these two questions: confidence intervals to provide a measure of our uncertainty about our estimates, and effect sizes to provide a standardized way to understand how large the effects are. We will also discuss the concept of *statistical power* which tells us how well we can expect to find any true effects that might exist.

[18.1: Confidence Intervals](#)

[18.2: Effect Sizes](#)

[18.3: Statistical Power](#)

[18.4: Suggested Readings](#)

---

This page titled [18: Quantifying Effects and Designing Studies](#) is shared under a [CC BY-NC 4.0](#) license and was authored, remixed, and/or curated by [Russell A. Poldrack](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.