Statistics with jamovi

Dana Wanzer

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Welcome

This is the website for PSYC 290 and PSYC 790 at the University of Wisconsin-Stout, taught by Dana Wanzer. These resources are aimed at teaching you how to use jamovi and null hypothesis significance testing (NHST) to answer research questions.

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Portions of this book may have been adapted from "Learning statistics with jamovi: A tutorial for psychology students and other beginners" by Danielle J. Navarro and David R. Foxcroft, version 0.70. Furthermore, the template and style of this book is from PsyTeachR.

Chapter 1

Introduction

This chapter will walk you through how this website/book works.

1.1 Quiz Questions

Throughout this website, there will be questions to help you test your knowledge. When you type in or select the correct answer, the dashed box will change color and become solid.

For example:

- What is 2+2?

- We attend the University of Wisconsin- Stout Madison Green Bay

- True or false: Statistics is awesome. TRUE FALSE

1.2 Errors and mistakes

I am human, therefore I err. If you find an error in the textbook or something you think might be a mistake, please let me know ASAP so I can update this for everyone else. Let me know which section you find the error or mistake in and what the error or mistake is. For example, if there was an error here you could say, "There was an error in 1.2 that the first sentence should really be 'To err is human.'"

Part I

t-tests

Chapter 2

Independent t-test

2.1 What is the t-test?

The t-test looks at difference in means between two things (e.g., groups, time, observations). There are three different types of t-tests:

1. The **one-sample t-test** tests how sample mean relates to the population mean.

2. The **independent t-test** has *independent* groups. The participants or things in group 1 are *not* the same as the participants or things in group 2.

3. The **dependent t-test** has *dependent* or *paired* data. The dependent variable is measured at two different times or for two different conditions for all participants or things.

This chapter will focus on the independent t-test and the next chapter will discuss the dependent t-test.

2.2 What is the independent t-test?

The independent t-test is used to test the difference in our dependent variable between two different groups of observations. Our grouping variable is our independent variable. In other words, we use the independent t-test when we have a research question with a **continuous dependent variable** and a **categorical independent variable with two categories in which different participants are in each category**.

The independent t-test is also called the independent samples t-test and the Student's t-test. I will use these terms interchangeably.

There are three different types of alternative hypotheses we could have for the independent t-test:

1. **Two-tailed**

   - H_1: Group 1 has a different mean than Group 2.
   - H_0: There is no difference in means between the two groups.

2. **One-tailed**

   - H_1: Group 1 has a greater mean than Group 2.
   - H_0: The mean for Group 1 is less than or equal to the mean for Group 2.

3. **One-tailed**

   - H_1: Group 1 has a smaller mean than Group 2.
   - H_0: The mean for Group 1 is greater than or equal to the mean for Group 2.

2.3   Data set-up

To conduct the independent t-test, we first need to ensure our data is set-up properly in our dataset. This requires having two columns: one with our continuous dependent variable and one indicating which group the participant is in. Each row is a unique participant or unit of analysis. Here's what example data may look like if we were testing for differences in a test score by students in my fall or spring semesters of this course:

Table 2.1: Example data for the independent t-test

ID	Semester	TestScore
1	Fall	86
2	Fall	80
3	Fall	75
4	Fall	79
5	Fall	82
6	Spring	84
7	Spring	90
8	Spring	72
9	Spring	75
10	Spring	81