What is Paired Data?

Authored by

stats writer

April 23, 2024

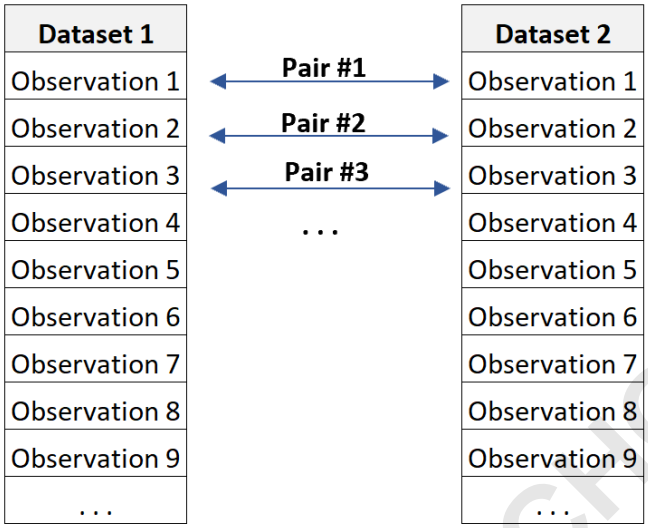
ARABPSYCHOLOGY.COM

RECOMMENDED CITATION

stats writer (2024). *What is Paired Data?*. PSYCHOLOGICAL SCALES. Retrieved from https://scales.arabpsychology.com/?p=138355

What is Paired Data? (Explanation & Examples)

When two datasets are of equal length and each observation in one dataset can be "paired" with an observation in another dataset, we call this paired data.



ARABPSYCHOLOGY.COM

In order for two datasets to be paired, it's important that each in one dataset can only be paired with one observation in the other dataset.

Examples of Paired Data

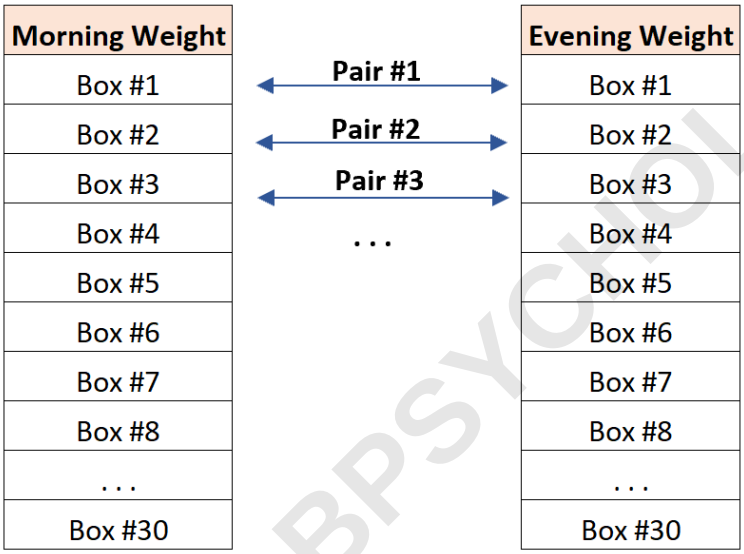
Here are a few examples of paired data:

Example 1: Duplicate Measurements.

Suppose researchers want to know if a scale is

consistent in weighing boxes at all hours of the day in a certain warehouse. To test this, researchers use the scale to weigh 30 different boxes in the morning and then again in the evening.

The end result is two datasets in which the morning and evening weights of each box can be "paired" with themselves.



ARABPSYCHOLOGY.COM

Example 2: Pre-Post Measurements.

A doctor wants to know if a new drug is capable of reducing blood pressure in patients. To test this, he measures the blood pressure of 20 different patients before and after using the drug for one week.

The end result is two datasets, in which the before and after blood pressure of each individual can be "paired" with themselves.

Blood Pressure Before		Blood Pressure After
Patient #1	Pair #1	Patient #1
Patient #2	Pair #2	Patient #2
Patient #3	Pair #3	Patient #3
Patient #4	. . .	Patient #4
Patient #5		Patient #5
Patient #6		Patient #6
Patient #7		Patient #7
Patient #8		Patient #8
. . .		. . .
Patient #20		Patient #20

ARABPSYCHOLOGY.COM

How to Analyze Paired Data

There are two common ways to analyze paired data:

1. Perform a paired t-test.

One way to analyze paired data is to perform a , which compares the means of two when each observation in one sample can be paired with an observation in the other sample.

2. Calculate the correlation between the two datasets.

Another way to analyze paired data is to calculate the between the two datasets.

This gives us an idea of the direction and the strength of the relationship between the values in the two datasets.

Paired Data vs. Unpaired Data

Unlike paired data, unpaired data occurs when the observations of one dataset cannot be uniquely paired with an observation in another dataset.

For example, suppose researchers want to know whether or not a certain training program increases the average vertical jump of basketball players.

One way to test this using paired data would be to measure the max vertical jump of the same 20 players before and after using the training program:

ARABPSYCHOLOGY.COM

Jump Before Training Program		Jump After Training Program
Player #1	Pair #1	Player #1
Player #2	Pair #2	Player #2
Player #3	Pair #3	Player #3
Player #4	. . .	Player #4
Player #5		Player #5
Player #6		Player #6
Player #7		Player #7
Player #8		Player #8
. . .		. . .
Player #20		Player #20

To test this using unpaired data, the researchers could measure the max vertical jump of 20 players who did not use the training program and then measure the max vertical jump of 20 different players who did use the training program:

Jump Before Training Program	Jump After Training Program
Player #1	Player #21
Player #2	Player #22
Player #3	Player #23
Player #4	Player #24
Player #5	Player #25
Player #6	Player #26
Player #7	Player #27
Player #8	Player #28
. . .	. . .
Player #20	Player #40

ARABPSYCHOLOGY.COM

When we're working with paired data, we use a to determine if the difference between the sample means is different.

And when we're working with unpaired data, we use an to determine if the difference between the sample means is different.

ARABPSYCHOLOGY.COM