

How to Implement a Matched Pairs Design in Your Research

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A Matched Pairs Design is a type of research design in which two sets of data are compared, with each set consisting of pairs of similar subjects. In this design, the pairs are matched based on certain characteristics, such as age, gender, or other relevant factors. This ensures that any differences observed between the two groups can be attributed to the intervention or treatment being studied, rather than individual differences.

Some examples of Matched Pairs Design include comparing the effectiveness of two different medications on a group of patients with similar medical conditions or comparing the impact of two teaching methods on students with similar academic backgrounds. In both cases, the pairs would be matched to control for any confounding variables and to enhance the validity of the study results. This type of design is commonly used in medical and educational research, as well as in other fields where it is important to control for individual differences when examining the effects of a specific intervention or treatment.

Matched Pairs Design: Definition + Examples

A matched pairs design is an experimental design that is used when an experiment only has two treatment conditions. The subjects in the experiment are grouped together into pairs based on some variable they "match" on, such as age or gender. Then, within each pair, subjects are randomly assigned to different treatments

Example of a Matched Pairs Design

Suppose researchers want to know how a new diet affects weight loss compared to a standard diet. Since this experiment only has two treatment conditions (new diet and standard diet), they can use a matched pairs

design.

They recruit 100 subjects, then group the subjects into 50 pairs based on their age and gender. For example:

A 25-year-old male will be paired with another 25-year-old male, since they "match" in terms of age and gender. A 30-year-old female will be paired with another 30-year-old female since they also match on age and gender, and so on.

Then, within each pair, one subject will randomly be assigned to follow the new diet for 30 days and the other subject will be assigned to follow the standard diet for 30 days. At the end of the 30 days, researchers will measure the total weight loss for each subject.

Pair	Total weight loss (lbs)	
	New Diet	Standard Diet
1	3	1
2	6	4
3	7	2
4	5	5
...	...	...
99	3	4
100	8	5

Advantages & Disadvantages of a Matched Pairs Design

There are some notable advantages and some potential disadvantages of using a matched pairs design.

Advantages:

1. Controls for lurking variables.

A **lurking variable** is a variable that is not accounted for in an experiment that could potentially affect the outcomes of the experiment.

In the previous example, both age and gender can have a significant effect on weight loss. By matching subjects based on these two variables, we are eliminating the effect that these two variables could have on weight loss since we're only comparing the weight loss between subjects who are identical in age and gender.

Thus, any difference in weight loss that we observe can be attributed to the diet, as opposed to age or gender.

2. Eliminates order effect. refers to differences in outcomes due to the order in which experimental

materials are presented to subjects. By using a matched pairs design, you don't have to worry about order effect since each subject only receives one treatment.

In our previous example, each subject in the experiment was only placed on one diet. If instead we made one subject use the standard diet for 30 days, then the new diet for 30 days, there could be an order effect due to the fact that the subject used one particular diet before the other.

Disadvantages:

2. Time-consuming to find matches. It can be quite time-consuming to find subjects who match on certain variables, particularly if you use two or more variables. For example, it might not be hard to find 50 females to use as pairs, but it could be quite hard to find 50 female pairs in which each pair matches exactly on age.

3. Impossible to match subjects perfectly. No matter how hard researchers try, there will always be some variation within the subjects in each pair. The only way to match perfectly is to find identical twins who

essentially share the same genetic code, which is actually why identical twins are often used in matched pairs studies.

Advantages of Using Ranges in a Matched Pairs Design

One way to make it slightly easier to find subjects that match is to use ranges for the variables you're attempting to match on.

For example, instead of matching a 22-year-old with another 22-year old, researchers may instead create age ranges like 21-25, 26-30, 31-35, etc. so they can match one subject in the 21-25 age range with another subject in the 21-25 age range.

Using ranges has pros and cons. The obvious pro is that you can find matches more easily, but the con is that the subjects will match less precisely. For example, using the approach above it's possible for a 21-year-old and a 25-year-old to be matched up, which is a rather notable difference in age. This is a trade-off that researchers must decide is worth or not in order to find pairs more easily.