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[Home](#) > Repeated Measures Design

Repeated Measures Design

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The repeated measures design is a stalwart of scientific research, and offers a less unwieldy way of comparing the effects of treatments upon participants.

The term 'repeated measures design' is often interchanged with the term 'within subjects design,' although many researchers only class a subtype of the within subjects design, known as a crossover study, as a repeated measures design.

The banner features the Explorable logo and the text 'Quiz Time!' in a white, handwritten-style font. Below this, there are three white-bordered cards, each with a different image and a quiz title. The first card shows a pair of red roller skates on a wooden deck, with the title 'Quiz: Psychology 101 Part 2'. The second card shows a fan of colorful pencils, also with the title 'Quiz: Psychology 101 Part 2'. The third card shows a Ferris wheel at sunset, with the title 'Quiz: Flags in Europe'. To the right of the cards is a link that says 'See all quizzes =>'.

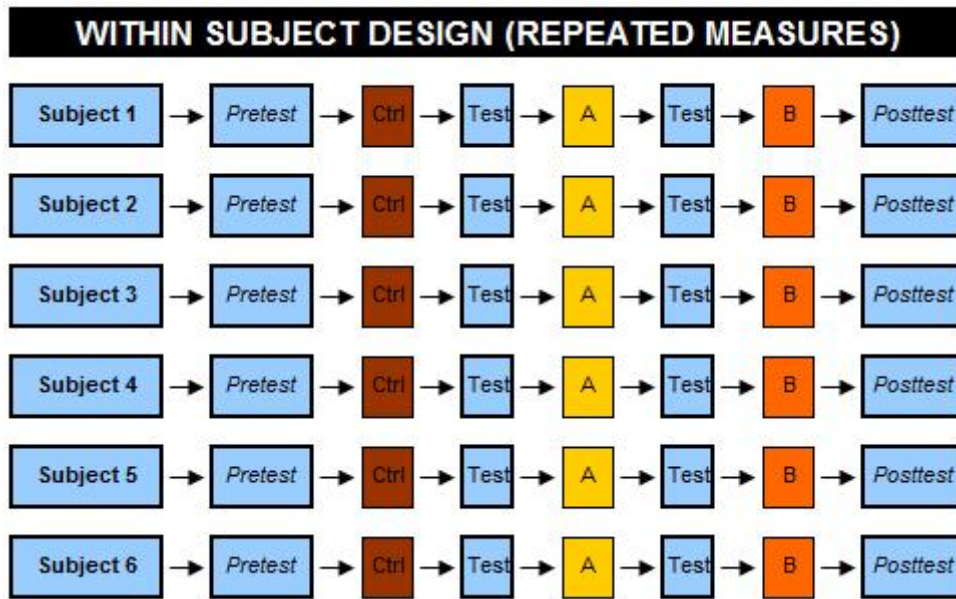
What is a Repeated Studies Design?

The repeated measures design [1] uses the same subjects with every condition of the research, including the control [2].

This requires fewer participants and resources and also decreases the effects of natural variation between individuals upon the results. Repeated subject designs are commonly used in longitudinal studies [3], over the long term, and in educational tests where it is important to ensure that variability is low.

Repeated subjects designs do have a couple of disadvantages, mainly that the subjects can become better at a task over time, known as practice effects or, conversely, they become worse through boredom and fatigue. In addition, if some of the subjects pull out before completing the second part, this can result in a sample group [4] too small to have any statistical significance

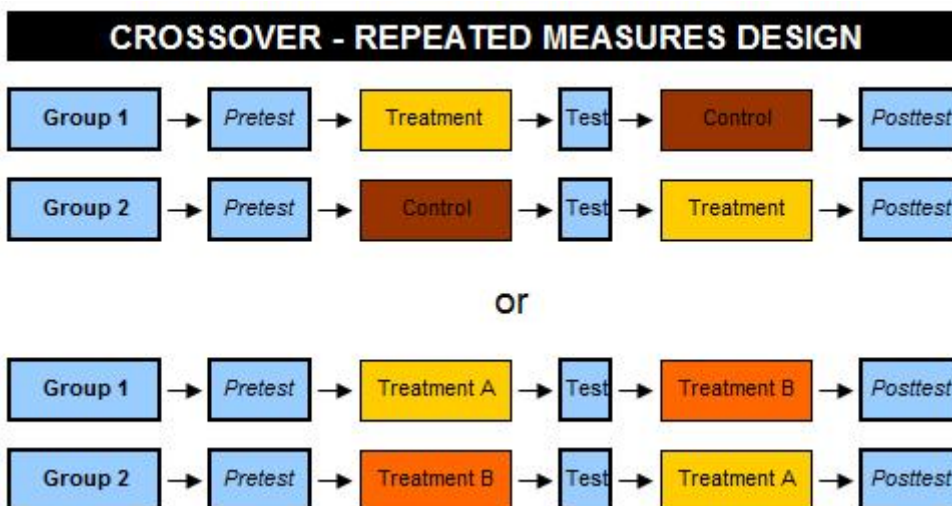
[5].



Repeated Measures Designs - Crossover Studies

The crossover design is, by far, the most common type of repeated measures design, based around ensuring that all of the subjects receive all of the treatments.

In an experiment with two treatments, the subjects would be randomized [6] into two groups. The first group would be given treatment A followed by treatment B, the second would be given treatment B followed by treatment A. It is also possible to test more than two conditions, if required, and this experiment meets the requirements of randomization [6], manipulation [7] and control [2].



Like all repeated measures designs, this reduces the chance of variation between individuals skewing the results and also requires a smaller group of subjects. It also reduces the chance of practice or fatigue effects influencing the results because, presumably, it will be the same for both groups and can be removed by statistical tests. The major pitfall is if the carryover effects are asymmetrical, if B affects A more than A affects B, for example.

The main weakness of a crossover study is the possibility of carryover effects, where administration of the first condition affects the results gained in the second. For example, imagine medical researchers testing the effects of two drugs upon asthma sufferers. There is a chance that the first drug may remain in the subject's system and affect the results of the second, one of the reasons why medical researchers usually leave a 'washout' period between treatments.

In addition, crossover studies suffer badly if there is a high dropout rate amongst participants, which can adversely affect the validity by unbalancing the groups and reducing the statistical validity [8]. Despite this, crossover studies remain the most common repeated measures design, due to the ease and practicality.

Bibliography

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Source URL: <https://explorable.com/repeated-measures-design?gid=1580>

Links

[1] http://en.wikipedia.org/wiki/Repeated_measures_design

[2] <https://explorable.com/scientific-control-group>

[3] <https://explorable.com/longitudinal-study>

[4] <https://explorable.com/sample-group>

[5] <https://explorable.com/significance-test>

[6] <https://explorable.com/randomization>

[7] <https://explorable.com/independent-variable>

[8] <https://explorable.com/statistical-validity>