Randomized Controlled Trials

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Randomized controlled trials are one of the most efficient ways of reducing the influence of reducing the influence of external variables.

In any research program, especially those using human subjects, these external factors can skew the results wildly and attempts by researchers to isolate and neutralize the influence of these variables can be counter-productive and magnify them.

Any experiment that relies upon selecting subjects and placing them into groups is always at risk if the researcher is biased or simply incorrect. The researcher may fail to take into account all of the potential confounding variables, causing severe validity issues.

The Advantage of Randomized Controlled Trials

[Randomized controlled trials](#) [1] completely remove these extraneous variables without the researcher even having to isolate them or even be aware of them. [Randomized](#) [2] experiment designs completely remove any accusations of conscious or subconscious [bias](#) [3] from the researcher and practically guarantee [external validity](#) [4].

As an example, imagine that a school seeks to test whether introducing a healthy meal at lunchtime improves the overall fitness of the children. It decides to do this by giving half of the children healthy salads and wholesome meals, whilst the control group carries on as before. At regular intervals, the researchers note the cardiovascular fitness of the children, looking to see if it improves.

Confounding Variable

The number of extraneous factors and potential [confounding variables](https://verify.explorable.com/confounding-variables) [5] for such a study is enormous. Age, gender, weight, what the children eat at home, and activity level are just some of the factors that could make a difference. In addition, if the teachers, generally a health-conscious bunch, are involved in the selection of children, they might subconsciously pick those who are most likely to adapt to the healthier regime and show better results. Such a pre-determined bias destroys the chance of obtaining useful results.

By using pure randomized controlled trials and allowing chance to select children into one of the two groups, it can be assumed that any confounding variables are cancelled out, as long as you have a large enough [sample group](https://verify.explorable.com/sample-group) [6].

The Disadvantages of Randomized Controlled Trials

Ideally, randomized controlled trials would be used for most [experiments](https://verify.explorable.com/conducting-an-experiment) [7], but there are some disadvantages. Firstly, researchers often choose subjects because they do not have the resources, or time, to test larger groups, so they have to try to find a sample that is representative of the [population](https://verify.explorable.com/research-population) [8] as a whole. This select [sampling](https://verify.explorable.com/what-is-sampling) [9] means that it becomes very difficult to [generalize](https://verify.explorable.com/what-is-generalization) [10] the results to the population as a whole.

Secondly, randomized experiment designs, especially when combined with crossover studies, are extremely powerful at understanding underlying trends and causalities. However, they are a poor choice for research where temporal factors are an issue, for which a [repeated measures design](https://verify.explorable.com/repeated-measures-design) [11] is better.

Whilst randomized controlled trials are regarded as the most accurate experimental design in the social sciences, education, medicine and psychology, they can be extremely resource heavy, requiring very large sample groups, so are rarely used. Instead, researchers sacrifice generalization for convenience, leaving large scale randomized controlled trials for researchers with bigger budgets and research departments.

Source URL: https://verify.explorable.com/randomized-controlled-trials

Links
[1] http://en.wikipedia.org/wiki/Randomized_controlled_trial
[2] https://verify.explorable.com/randomization
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