

Essay experimental design

[Design](#)



In a " within-subjects" design experiment, all participants are exposed to every level of the independent variable being tested. In a " between-subjects" design, participants are randomly assigned to only one level of the independent variable being tested. Both designs have their merits, and the choice of designs should be carefully considered in the context of the question being studied and in the execution of the research study (Chariness, Engage, Kuhn, 2011).

A third factor to also consider is the nature of the research design, choosing the one which provides the sensitive and uncompounded test of the independent variable (Sweepers, 2009) In this essay I will discuss, using experiments from published sources, the advantages and disadvantages of between-subjects designs. What motivates the use of this type of design and how potential problems associated with this type of design are usually tackled. Between-subjects designs are one of the most common experimental designs in many scientific disciplines, especially within the world of Psychology.

In the case of a traditional experiment, one group will be exposed to some kind of experimental condition (treatment), while the second group is not, so as to serve as a comparison to the group exposed to the condition. This comparison group is termed as the intro group, and the group exposed to the treatment is termed as the experimental group. Participants cannot be part of both groups, if more than one condition is tested, then a completely new group is required in order to perform the experiment successfully.

A main advantage of a between-subjects design is that each individual score is independent from all other scores (as participants are measured only once). Researchers can be reasonably confident in knowing that any resulting measurements are not negatively effected by other treatment factors. For this reason, between-subjects design is also commonly known as an independent-measures design (Aggravate & Forman, (2012), 230) Choosing to employ this type of design is a way of avoiding the carryover and order effects that can plague a within-subjects designs.

Thus lowering the chances of participants suffering boredom or fatigue due to long periods of testing or, alternatively, becoming more familiar with the task through practice which can confound causality (Greenland 1976), skewing the results of the experiment. Between-subjects designs ensure that participants enter studies rest and naive with respect to the procedure/purpose of the study, the avoidance of cueing the participants will in turn reduce demand characteristics.

The utilization of this design allows experimenters to test multiple variables, or multiple levels of a variable simultaneously, saving a great deal of time, which is absolute in studies where the results can aid in time-sensitive issues such as health care. There is also a lessened risk of data loss due to participant drop-outs, because participants are only measure the once. The main disadvantage with between-subjects designs is that they can be very employ and can often require a large number of participants in order to generate reliable and usable data.

The potential scale of these studies can make employing these types of designs impractical when it comes resources and space. In most research settings, participants are at a premium. Of course there are ways in which to tackle this type of problem, several psychological studies, one of which demonstrated the "beer Google effect" (Barry et al, 2003); and the other which concerns the effects and the remote detection of staring (Washman & Schlitz, 2001) OTOH made use of psychology undergraduate students from their own universities.

Student enrolled in courses of study such as Psychology are obliged to participate in free-to-select experiments for a specific number of credits or hours during their first year at university (Korean et al, 2009) Another major concern of a between-subjects design stems from the fact that each measurement (score) obtained comes from every unique individual. Each and every one of these individuals has their own personal characteristics. Whilst it would appear to be effortless in selecting participants of the same age, gender or social class.

Homogeneity across the groups is impossible to maintain, subtle differences in individuals' intelligence, emotional status and any other personality construct can cause particular concern. A researcher would like to conclude that the difference in scores between participants in the control group and of those in the experimental group were caused by the treatment. However, individual differences can become compounding variables, producing high variability in the scores and making it extremely difficult to determine whether the treatment had any effect or not.

Individual differences can cloud the results of a study, lowering the power of statistics, while obscuring any patterns or trends (Aggravate & Forman, 2012). The assumption is that, in order to draw meaningful conclusions from an experiment, all the while controlling any potential confounding variables, then the initial groups of participants must be as equivalent as possible at the start of the study. In accomplishing this task, researchers can typically use three of the following procedures; random assignment (randomization), matching groups and holding rables constant.