

3.6: Research Design I- Experimental Designs

Psychologists agree that if their ideas and theories about human behaviour are to be taken seriously, they must be backed up by data. However, the research of different psychologists is designed with different goals in mind, and the different goals require different approaches. These varying approaches are known as research designs. In this section, we will talk about the different research designs that we use in psychology.

Experimental Research: Understanding the Causes of Behaviour

In psychology, the “gold standard” is an experimental design. Utilising an experimental design can assist in determining the impact of the predictor on the outcome by isolating the predictor as the probable cause. By comparing the outcomes of the experimental group and the control group, researchers can evaluate whether there are any differences. Since random assignment ensures that both groups are identical, with the only variation being the treatment or interventions, researchers can conclude that the difference in outcomes is likely due to the treatment. Given these factors, an experimental design is best suited to establish causation in research.

There are three critical components to experimental design: random assignment, manipulation of treatment, and the presence of a control group. Generally, there are two groups: an experimental group and a control group. The experimental group receives treatment, while the control group does not. The purpose of the control group is to represent what the experimental group would look like if it were not given the treatment.

We can diagram a research hypothesis in experimental research using an arrow pointing in one direction. This demonstrates the expected direction of causality (Figure 3.6.1):

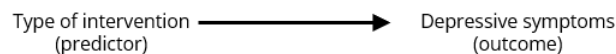


Figure 3.6.1. Expected direction of causality between the predictor and the outcome

Experimental designs can be conducted both in a lab or a field setting.

An Example of a Lab Experimental Design

Suppose a researcher aims to examine the effectiveness of cognitive-behavioural therapy (CBT) and pharmacological intervention in treating depression. To achieve this, the researcher employs an experimental design with random assignment, manipulation of treatment, and a control group. Thirty participants are recruited, and they are randomly assigned to one of three groups: a CBT group, a pharmacological intervention group, or a control group. The treatment outcome, such as reduced symptoms of depression, is the dependent variable (DV), while the type of intervention is the independent variable (IV), with three levels: CBT group, pharmacological intervention group, and control group.

To ensure the groups are comparable, the researcher may match participants based on demographic characteristics such as age, gender, and severity of depression. In the CBT group, participants may receive a standardised protocol of CBT sessions, while those in the pharmacological intervention group receive a standardised medication regimen. Participants in the control group received no treatment, simulating the natural course of depression without any intervention. By comparing the changes in the DV between the groups, the researcher can determine whether the intervention caused changes in the dependent variable. Overall, this experimental design enables the researcher to make causal inferences about the effectiveness of CBT and pharmacological intervention in treating depression.

As you can see from the above example, the researcher attempts to control all aspects of the study – especially what participants experience during the study. The idea here is to deliberately vary the predictors (IVs) to see if they have any causal effects on the outcomes. Moreover, in order to ensure that there’s no possibility that something other than the predictor variables is causing the outcomes, everything else is kept constant or is in some other way “balanced”, to ensure that they have no effect on the results.

While lab-based experiments can help in establishing cause and effect between variables, they also have limitations that researchers should consider when selecting a research design. Some of the limitations of lab-based experiments include:

1. **Artificiality:** Lab experiments often take place in a highly controlled environment that may not reflect real-world situations. Participants may behave differently in a lab than they would in their natural environment. Therefore, the results may not be generalizable to real-world situations.

2. Demand characteristics: Participants in lab experiments may behave in a way that they think the researcher expects them to behave, rather than behaving naturally. This can happen due to the artificial setting or because participants may try to please the researcher. This can lead to biased results.
3. Limited external validity: Lab experiments may not be representative of real-world populations or situations. The participants in a lab experiment may not represent the larger population, and the experimental task may not accurately represent real-world situations. This can limit the external validity of the results.

An Example of a Field Experimental Design

Field experiments take place in a real-world setting, such as a workplace, school or community. Field experiments are conducted in a natural setting, and the researcher does not have as much control over the experimental conditions as in a lab experiment. For example, a researcher may conduct a field experiment to examine the effect of a job training program on job performance by randomly assigning participants in a company to either a training or non-training condition. The researcher would observe the participants in their natural work environment rather than in a controlled lab setting.

One advantage of field experiments is that they provide greater ecological validity, meaning that the findings are more generalisable to real-world situations. Some of the limitations of field-based experiments include:

1. Limited control: Field experiments are often conducted in real-world settings, which means the researcher has less control over the experimental conditions than in lab-based experiments. This can make it more difficult to isolate the effects of the independent variable and to control for extraneous variables that may affect the outcome.
2. Confounding variables: In field experiments, there may be more confounding variables that can influence the outcome of the study. These variables are not controlled by the researcher, and therefore, their effects cannot be isolated from the effects of the independent variable.
3. Difficulties in randomisation: Randomisation, which is the process of assigning participants to different groups, can be more difficult in field experiments than in lab experiments. For example, it may be difficult to ensure that participants in the control and experimental groups are similar in terms of their demographics, attitudes and behaviours.

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