Experimental design assignment

Art & Culture

Experimental design is a research method in which researcher tries to examine causal effects by manipulating independent variable under controlled settings and measures whether it produces any change to the dependent variable. In an experiment experimenter deliberately imposes a treatment on a group of objects or subjects in the interest of observing the response. This differs from an observational study, which involves collecting and analyzing data without changing existing conditions. In an experimental design scientists try to find an experimental hypothesis.

To support their hypothesis scientists measures to find significant difference between experimental group and control group when measuring a dependent variable which can be influenced by independent variable. Independent variable: In an experiment independent variable is a factor or a treatment or something else that researcher manipulates to determine the cause-and-effect relations. An independent variable is a variable that researchers have control over, which they can choose and change as requires.

Though in some cases values of independent variables can not be manipulated as they are fixed values and taken simply as given. For example, in experiment on the impact of alcohol and expectations on sexual arousal, the experimenters used two independent variables. The first variable was weather participants received the alcoholic drink or non-alcoholic drink. The second variable manipulated participants' expectations. They were told either they that their drink contained alcohol or that it did not. In these cases independent variable is the alcohol.

Dependent variable: As the name suggests dependent variable is a variable which is dependent on another variable, the independent variable. In an experiment the factor that is measured by the researcher and apparently changes or gets affected by the influence of independent variable. In an experiment it is simply impossible to have a dependent variable without an independent variable. For example, in experiment on the impact of alcohol and expectations on sexual arousal, the dependent variable is sexual arousal. Presumably sexual arousal will depends upon weather participants drink alcoholic drink or non-alcoholic drink.

Control group: In an experiment, the members of the group that is not exposed to the treatment or which receives a zero level of independent variable is called control group. The subjects of the control group usually do not receive treatment or left unaware of some course of action and then at the end of the experiment compared with those who actually got the treatment in order to come to a conclusion. Experimental group: A group of subjects in an experiment, the members of which receives a treatment or is exposed to an active level of the independent variable is called experimental group.

In an experiment, participants are first randomly assigned to either an experimental group or a control group. The experimental group receives the treatment or active level of independent variable while the control group receives a zero level of independent variable or “ placebo”. The experimenter manipulates the independent variable and measures the effect on dependent variable for each group, and groups are statistically compared to determine if there is any significant difference between them.

For example, in the research, on the impact of alcohol and expectations on sexual arousal, independent variable is the alcohol and the dependent variable is sexual arousal. The experimental group would drink alcoholic drink like vodka, while the control group would take a placebo, such as tonic water and a squirt of lime juice, that resembles alcoholic drink but there is no alcohol contains in the drink. Operational definition: Operational definition is the definition of a variable or a concept in terms of the specific procedures experimenters use to produce or measure or manipulate.

In case of sexual arousal example operational definition is number of participants men reported changes in size of their penis, which measured the dependent variable, sexual arousal. Experiment or experimental design is a powerful tool for examining cause and effect relations. Experimentation is the most popular method among psychologists for testing explanations of why phenomena occur. In the experiment on the impact of alcohol and expectations on sexual arousal, participants are given alcoholic drink and then they are shown sexually stimulating materials, like slides or films.

Their sexual arousal is then assessed by self report ratings on questionnaires and psychological measure. In any form of experiment, there are three essential characteristics. First the experimenter manipulates one variable. This is known as independent variable. In the alcohol and sexual arousal experiment researchers manipulates the drink participants are drinking. Some participants are drinking alcoholic drink while others are drinking non alcoholic drink. Second essential characteristics of an experiment are researcher measures whether the manipulation produces changes in second variable, known as dependent variable.

In alcohol and sexual arousal example, sexual arousal is assessed by self report ratings on questionnaires to measure whether drinking alcohol drink enhances sexual arousal then drinking non alcoholic drink. Third, the researcher attempts to control for extraneous or confounding variables that might influence the outcome of the experiment. Random assignment to groups is important to make sure that the experiment starts out with equivalent groups of people and they receive equivalent treatment. The logic behind experiment is very straight forward.

In its simplest form, experiments begin with equivalent groups of people. Then experimenter treat them equally in all respects expect for one variable, independent variable, that is experimenters particular interest. In this case alcohol is independent variable or cause. Experimenters manipulates this variable and then measures how the groups respond differently, then the plausible explanation is that these differences were caused or in other words the differences were the effect of independent variable or the variable that experimenter manipulated.