

Extraneous variables and control techniques

Extraneous Variables (Any variable other than the independent variable that may influence the dependent variable)	Techniques for achieving control
History (Events that occur between a pre and a post-measurement of the dependent variables)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group)
Maturation (Internal conditions of the participant that change as a function of time)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group)
Instrumentation (Changes that occur as a function of measuring the dependent variable)	Standardization of procedures and instructions (Ensures that in every step of the experiment procedure all participants are treated in the same way)
Statistical regression (Any change that can be attributed to the tendency of extremely high or low scores to regress toward the mean)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group)
Selection (Changes due to using different criteria to place the participants in the various comparison groups)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group) Matching by equating participants (Equates participants on the variable or variables to be controlled, e.g., gender, age)
Participant effect (Any change in performance that can be attributed to a participant's motives or attitude, such as positive self-presentation)	Standardization of procedures and instructions (Ensures that in every step of the experiment procedure all participants are treated in the same way) Single blind procedure (the participants may know about the goal of the experiment, but do not know which group they are in) Double blind procedure (Neither the experimenter and the participant knows who is in each condition/group) Deception (Providing all participants a rationale for the experiment that is unrelated to the true its true purpose)
Experimenter effect (Any changes in participant's performance that can be attributed to the experimenter, such as expectancies regarding the outcome of an experiment)	Standardization of procedures and instructions (Ensures that in every step of the experiment procedure all participants are treated in the same way) Double blind procedure (Neither the experimenter and the participant knows who is in each condition/group)
Sequencing (Any change in a participant's performance that can be attributed to the fact that the participant participated in more than one condition, such as order and carry-over effects)	Counterbalancing (Manipulation of the order of conditions intra-participant or intra-group to ensure that participants run through the different orders in the sequence) Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group)
Participant sophistication (Any change in a participant's performance as a function of sophistication or familiarity with the experimental procedures of subject matter)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group)
Confounding variables (These refers to extraneous variables that vary with variations in the independent variable)	Randomization (Equates groups of participants by ensuring every member an equal chance of being assigned to any group) Matching by holding confound variables constant (Produces control by including in the study only participants with a given amount or type of a confound variable) Matching by building the Extraneous Variable into the design (Produces control by including in the study the confounding variable as another independent variable, isolating its effects from the other independent variables)