Design Strengths & Weaknesses & Confounding Variables

LABORATORY EXPERIMENTS

***Strengths**: Tighter control of variables. Easier to comment on cause and effect. Relatively easy to replicate. Enable use of complex equipment. Often cheaper and less time-consuming than other methods.*

***Weaknesses**: Demand characteristics - participants aware of experiment, may change behavior. Artificial environment - low realism. May have low ecological validity - difficult to generalize to other situations. Experimenter effects - bias when experimenter's expectations affect behavior.*

FIELD EXPERIMENTS

A field experiment takes place anywhere in a natural setting; it could take place in a school, hospital, the street or an office.
Note: A field experiment is an experiment; the independent variable is manipulated. Not all field studies are experiments.

***Strengths**: People may behave more naturally than in laboratory - higher realism. Easier to generalize from results. Less chance of interference from experimenter bias.*

***Weaknesses**: Often only weak control of extraneous variables - difficult to replicate. Can be time-consuming and costly. No control over the allocation of participants to groups (random in a 'true experiment').*

CASE STUDY

In-depth investigation of an individual's life, used to reconstruct major aspects of a person's life. Attempt to see what events led up to current situation.

Usually involves: interview, observation, examine records, & psych. testing.

***Weaknesses**: very subjective. Like piecing together a puzzle, often there are gaps - relies on memory of the individual, medical records, etc.*

***Strengths**: good for assessing psychological disorders - can see history and development.*

PSYCHOLOGICAL TESTING

Provide a test and then score the answers to draw conclusions from.

Examples. - I.Q. tests, personality inventories, S.A.T., G.R.E., etc...

***Weaknesses**: validity is always a question; honesty of answers.*

***Strengths**: can be very predictive and useful if valid.*

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SURVEY

Either a written questionnaire, verbal interview, or combination of the two, used to gather information about specific aspects of behavior.

Weaknesses*: self-report data (honesty is questionable). Yay-saying or nay-saying. Trying to 'psych out' the researcher by trying to guess what is being studied. Not taking the questions seriously. Limits the kind of data one can obtain to the questions asked.*

Strengths*: Can gather a lot of information in a short time. Can gather information on issues that are not easily observable. Less costly. Can provide valuable information.*

EXPERIMENTAL RESEARCH:
Only way to approach Cause & Effect - method of determining whether variables are related, in which the researcher manipulates the independent variable and controls all other variables either by randomization or by direct experimental control.

EXPERIMENTAL DESIGN:

Three experimental designs are commonly used.
INDEPENDENT GROUPS*: Testing separate groups of people, each group is tested in a different condition.*

REPEATED MEASURES*: Testing the same group of people in different conditions, the same people are used repeatedly.*

MATCHED PAIRS*: Testing separate groups of people - each member of one group is same age, sex, or social background as a member of the other group.*

ADVANTAGES AND DISADVANTAGES FOR EACH EXPERIMENTAL DESIGN

INDEPENDENT GROUPS:
Avoids order effects. If a person is involved in several tests they man become bored, tired and fed up by the time they come to the second test, or becoming wise to the requirements of the experiment!
More people are needed than with the repeated measures design.
Differences between participants in the groups may affect results, for example; variations in age, sex or social background. These differences are known as participant variables.

REPEATED MEASURES:
Avoids the problem of participant variables.
Fewer people are needed.
Order effects are more likely to occur.
MATCHED PAIRS:

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Reduces participant variables.
Avoids order effects.
Very time-consuming trying to find closely matched pairs.
Impossible to match people exactly, unless identical twins!

Note:
COUNTERBALANCING: *Alternating the order in which participants perform in different conditions of an experiment. For example, group 1 does 'A' then 'B', group 2 does 'B' then 'A' this is to eliminate order effects.*

RANDOMIZATION: *Material for each condition in an experiment is presented in a random order, this is also to prevent order effects.*

CONFOUNDING VARIABLES:
A confounding variable is a variable, other than the independent variable that you're interested in, that may affect the dependent variable. This can lead to erroneous conclusions about the relationship between the independent and dependent variables. You deal with confounding variables by controlling them; by matching; by randomizing; or by statistical control.

COMMON CONFOUNDING VARIABLES INCLUDE:
Intelligence of participants, Personality of participants, Gender of participants, Time of day, Weather, Noise levels, Temperature… Obviously in an experiment we take steps to minimize these, for example we could ensure that the procedure is carried out at the same time of day, in the same room, with similar temperature settings etc.