Psychology: Knowledge Organiser. Paper 2: Research Methods

Experiments

- Experimental: researcher varies independent variable and measures the effect on the dependent variable.

	Strength	*Limitation*
Laboratory experiment: controlled environment, IV manipulated, effect on DV measured	EVs controlled & easily replicated.	Low generalisability & low external validity.
Field experiment: natural setting, IV manipulated, effect on DV measured	Higher ecological validity (generalisable) and reduction in demand characteristics.	EVs are harder to control, and ethical issues raised.
Natural experiment: IV varies anyway i.e. natural. Setting/DV may be natural or in a lab	High ecological validity & ethical option	difficult to replicate.
Quasi-experiment: IV pre-existing difference, DV as for natural experiment.	Comparisons between preexisiting types of people.	No random allocation and can share limitations of lab ex.

Experimental designs

	Strength	*Limitation*
Independent groups design: one group condition A, another group condition B—random allocation.	Demand characteristics less of an issue and no order effects.	Participant variables act as EV/CV & need twice as many participants.
Repeated measures design: each participant does all conditions of IV. Counterbalancing to control order effects	No participant variables (same people) therefore controls this EV & fewer participants compared to IG design.	Order effects. Demand characteristics. Can't use the same materials in both conditions.
Matched pairs design: two separate groups but participants paired on participant variable/s.	Fewer participant variables—reduced through matching and no order effects.	Imperfect matching and needs twice as many participants as RM.

Self report techniques

- Social desirability bias.
- Questionnaires: pre-set list of items. ☺ Simplicity & less influence of interpersonal variables. ☹ Social desirability bias & issues with question wording.
- Structured interview: predetermined. ☺ Easier to replicate. ☹ Interviewer cannot elaborate.
- Unstructured interview: no set questions. ☺ Insight & validity ☹ More chance of interviewer bias.
- Semi-structured: some set question but further questions based on previous answers.
- Interviews improved by interview schedule (reduces bias), rapport (relaxes interviewees).
- Closed questions: limited responses. ☺ Easier to analyse. ☹ Responses are restricted.
- Open questions: own words (qualitative) ☺ Detailed, unexpected responses. ☹ Difficult to analyse.

Types of data

- Qualitative data: non-numerical data expressed in words. ☺ Richness in detail. ☹ Difficult to analyse.
- Quantitative data: numerical data. ☺ Comparisons possible: graphs. ☹ Expresses less meaning.
- Primary data: Data comes directly from the source purpose of investigation. ☺ Tailored to the study itself. ☹ Requires time & expense.
- Secondary data: Data that does not come directly from source and is not specific to the purpose of the study. ☺ Inexpensive. ☹ Quality may be poor or mismatch aims.
- Meta-analysis: combines data from large number of studies, calculate an effect size. ☺ conclusions have a greater validity. ☹ Publication bias.

Observational Techniques

- All observations: limitation ☹ Observer bias.
- Naturalistic: where target behaviour would normally occur. ☺ High external validity. ☹ Low control.
- Controlled: some control over variables. ☺ Replication & standardisation. ☹ Low external validity.
- Covert: unaware being studied. ☺ Fewer demand characteristics. ☹ Ethics.
- Overt: participants aware being studied. ☺ More ethical. ☹ Demand characteristics.
- Participant: researcher part of group. ☺ Greater insight. ☹ Loss of objectivity.
- Non-participant: separate from group. ☺ More objective. ☹ Loss of insight.
- Behavioural categories: target behaviour broken up into observable categories (operationalisation).
- Event sampling: target behaviour/event recorded every time it occurs. ☺ Record infrequent behaviour. ☹ Complex behaviour over simplified.
- Time sampling: observations at regular intervals (e.g. every 15 seconds). ☺ Reduces observations. ☹ Miss things outside of time frame.

Aims & Hypotheses

- Aim: what researcher intends to investigate.
- Operationalised: clearly defined and measurable.
- Hypothesis: testable statement.
- Null hypothesis: predicts no effect or relationship.
- Directional hypothesis: based on previous research. States direction.
- Non-directional hypothesis: no theory or past research. Does not specify direction.

Measures of central tendency

- Mean: arithmetic average, add up all scores and divide by number of scores. ☺ includes all scores ☹ Distorted by extreme values.
- Median: all scores in ascending order, middle value. ☺ less affected by extreme scores ☹ extreme values may be important.
- Mode: most common value. ☺ relevant to categorical data. ☹ overly simple.

Measures of dispersion

- Range: difference between highest and lowest +1. ☺ Easy to calculate. ☹ No account of distribution.
- Standard deviation: dispersion of values around the mean, larger SD means more spread out. ☺ more precise than range. ☹ distorted by extreme values.

Display of quantitative data

- Tables: raw scores in columns and rows.
- Scattergram: continuous data, correlation, data pairs.
- Bar charts: categories, bar height represents frequency.
- Histogram: data is continuous. No space between bars.

Distributions

- Normal distribution: bell shaped, mean, median, mode all together.
- Negative skew: modal scores higher, tail to left (e.g. easy test).
- Positive skew: modal scores lower, tail to right (e.g. hard test).

Pilot studies

- Trial run: small scale test of procedure and techniques before doing full scale study. Aims of piloting: find what does not work e.g. timings, stimulus, standardised instructions.

Sampling

- Population: Target group of interest to researcher. Sample: smaller subset of population. Generalisation: applying findings beyond the sample. Bias: Samples under or over represent certain groups.
- Random sampling: Everyone in population equal chance. Select via lottery method. ☺ Potentially unbiased. ☹ Representativeness not guaranteed.
- Systematic sampling: Create sampling frame (e.g. alphabetical order) then select every nth name. ☺ Unbiased, objective. ☹ Sample could be unrepresentative.
- Stratified sampling: Identify subgroups (strata), select in proportion to numbers in the population. ☺ Representative & generalisable. ☹ Imperfect stratification.
- Opportunity sampling: Select by asking people nearby. ☺ Convenient. ☹ Inevitably biased unlikely to be representative.
- Volunteer sampling: Participants select themselves e.g. advert. ☺ Minimal input from researcher. ☹ Volunteer bias, unlikely to produce a representative sample.

Control of variables

- Random allocation: avoids bias.
- Standardisation: ensure key aspects of research kept the same.
- Counterbalancing: ensures each condition in a RMD is tested first or second in equal amounts. Controls order effects so they are distributed evenly.
- Demand characteristics: participants working out what is going on. Control with single blind design.
- Investigator effects: Any effect of the investigators behaviour on the research outcome. Control with double blind design.

Ethical Issues

- Ethical issue: conflict between rights of participants and aims of research. So we have BPS code of ethics. Ethics committee

Ethical issues and how to deal with them:

- Informed consent: Participants make informed decision to take part. Presumptive consent, retrospective consent.
- Deception: Misleading/withholding information. Debrief: told real aims & right to withdraw data.
- Protection from harm: No more risk than everyday life. Right to withdraw at any stage & debrief.
- Privacy and confidentiality: right to control information & confidentiality protected. Personal details protected. Participants refereed to as number or initial.

Correlations

- Shows relationship (strength and direction) between co-variables.
- Scattergram: one co-variable on each axis.
- Correlation vs experiment: no IV manipulated, no cause and effect.
- Types of correlation: positive, negative and zero
- Correlation coefficient: number between –1 and +1. Closer to '1' = stronger the correlation.

☺ Useful starting point: future experiments & measure things that ethically may not be able to in experiments. ☹ No cause and effect shown and intervening variables missed, wrong conclusions.