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CIE AS-LEVEL PSYCHOLOGY 9990

SUMMARIZED NOTES ON METHODOLOGY

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1. Research Methods

1.1 Experiments

- An experiment is an investigation looking for a causal relationship in which an independent variable (IV) is manipulated and is expected to be responsible for changes in the dependent variable (DV).
- There are three types of experiments:
  - Laboratory experiments: A research method in which there is an IV, DV, and strict controls. This looks for a causal relationship and is conducted in a setting which is not the usual environment for the participant with regard to the behaviour they are performing.
  - Field experiments: This is conducted in a setting which is the normal environment for the participant with regard to the behaviour they are performing. The researcher has control over a few variables, but it difficult to control all variables.
  - Natural experiments: An investigation looking for a causal relationship in which the IV cannot be directly manipulated by the experimenter. Instead, they study the effect of an existing difference or change. This is not a true experiment as the experimenter cannot manipulate the levels of the IV.
- **REFER TO TABLE 1**
- Each experiment consists of an experimental and control condition.
- An experimental condition is one or more of the situations in an experiment which represent the different levels of the IV and are compared, either with one another or with the control condition.
- A control condition is a situation in which the IV is absent. This is compared to the experimental condition(s).

1.2 Self-reports

- Self-reports consist of two main types — questionnaires and interviews.
- Questionnaires are a research method that involves asking questions, mainly written, to gain information from the participants.
- There are four types of questionnaires:
  - Likert scales: questions asking whether the participant likes or dislikes something.
  - Rating scales: questions that require the participant to represent their answer on the numerical scale provided to them.
  - Open questions: questions which allow the participant to give detailed answers without any restrictions.
  - Closed questions: questions which allow the participant to respond using a few, stated responses without the opportunity to expand on their answers.
- Interviews are a research method using verbal questions asked directly to the participants.
- There are three types of interviews:
  - Structured: an interview with questions in a fixed order which may be scripted. Consistency might also be required in the interviewer's posture, voice, etc., and hence these are highly standardized.
  - Semi-structured: an interview with a fixed list of questions, however, the interviewer could add more questions if required to clarify or get details on any previous answers.
  - Unstructured: an interview in which most questions depend on the respondent's answers. A list of topics may be provided that need to be covered for the interview.

	STRENGTHS	WEAKNESSES
QUESTIONNAIRES	• Participants are more likely to give truthful answers as it does not involve talking to someone face to face • A large sample can answer the questionnaire in a short time span which should increase the representativeness and generalizability of the findings	• Participants may give socially desirable answers • Too many closed questions may force an answer that does not reflect the participant's opinion
INTERVIEWS	• Lots of open questions will make participants reveal reasons as to **why** they behave in a particular way or have a particular opinion	• Participants may be less likely to give truthful answers as they are face to face with the interviewer or because of social desirability

1.3 Case studies

- A detailed investigation of a single instance, usually a person, family or institute, that produced in-depth data specific to that instance.

STRENGTHS	WEAKNESSES
• As researchers are focused on one individual, they can collect rich, in-depth data which adds validity to the findings • High ecological validity as participants are studied in their everyday lives	• As the research is focused on one person, the case is unique which makes generalisations difficult • Attachments may be formed between researcher and participant which may reduce objectivity of data collected and analysis of it. This could reduce the validity of the findings.

1.4 Observations

- A research method that involves watching human or animal behaviour.
- An observer can be overt/covert or they can be participant/non-participant observers.
- Overt observers are when the participants know who the researcher is and that they are being observed. A covert observer could be present in the group of participants observing them but they do not know who it is.
- A participant observer is one who watches from the perspective of being part of the social setting of the participants. A non-participant observer does not become involved in the situation being studied.
- An observation can be structured/unstructured or naturalistic/controlled.
- A structured observation is a study in which the observer records only a limited range of behaviours. An unstructured observation is one in which the observer records a range of behaviours, which is usually confined to a pilot study to refine the behavioural categories.
- A naturalistic observation is a study conducted by watching the participants' behaviour in their normal environment without interference from the researcher in either social or physical environment. A controlled observation is one which is conducted by watching the participants' behaviour in a situation in which the social or physical environment has been manipulated by the researcher.
- **REFER TO TABLE 2**

1.5 Correlations

- A research method which looks for a causal relationship between two measured variables. A change in one variable is related to a change in the other, although, the changes cannot be assumed to be causal. None of the variables are manipulated, they are only measured.
- A positive correlation is a relationship in which the increase in one variable accompanies an increase in the other.
- A negative correlation is a relationship in which the increase in one variable accompanies a decrease in the other.
- No correlation refuters to a situation where no definite trend occurs and the two mentioned variables do not appear to be related to each other.

	STRENGTHS	WEAKNESSES
CORRELATIONS	• The researchers easily establish a cause and effect relationship • Correlations do not require any manipulation so can be used where experiments are unethical or impractical	• Issues of causality because there could be a third variable affecting the changes • Correlations are restricted to research that are quantitative and so they cannot be used to measure **why** behaviours are occurring

1.6 Hypotheses and aims

- An aim tells you the purpose of the investigation. It is generally expressed in terms of what the study intends to show. It is written before the experiment is carried out and does not predict the outcomes.
- A hypothesis is a testable statement predicting a difference between levels of the IV in an experiment or a relationship between variables in a correlation.
- An alternative hypothesis is the testable statement which predicts the difference or relationship between the variables in a particular investigation.
- There are three types of hypothesis.
  - A directional (one-tailed) hypothesis is a statement predicting the direction of a relationship between variables.
  - A non-directional (two-tailed) hypothesis is a statement predicting only that one variable will be related to the other, not the direction of the relationship.
  - A null hypothesis is a testable statement stating that any difference or correlation in the results is due to chance.

1.7 Variables

- Independent variable (IV): the factor under investigation in an experiment which is manipulated to create two or more conditions and is expected to be responsible for changes in the DV.
- Dependent variable (DV): the factor in an experiment which is measured and is expected to change under the influence of the IV.
- Operationalization is the definition of variables so that they can be accurately manipulated, measured or quantified and replicated.

1.8 Experimental design

- This is the way in which participants are allocated to the different levels of the IV.
- An **independent measures design** is an experimental design in which a different group of participants is used for each level of the IV. If the IV is naturally occurring the researcher must use.
- A **repeated measures design** is an experimental design in which each participant performs in every level of the IV. It cannot be used if the IV is naturally occurring. It also uses counterbalancing (ABBA design).
- A **matched pairs design** is an experimental design in which participants are arranged in pairs. Each pair is similar in ways that are important to the study and one member of each pair performs in a different level of the IV.
- **REFER TO TABLE 3**

1.9 Controlling of variables

- It is essential to control variables in order to be certain about the finding of a study.
- An extraneous variable is a variable which either acts randomly, affecting the DV in all levels of the IV, or systematically, affecting only one level of the IV (called a confounding variable), so can obscure the effect of the IV, making the results difficult to interpret.
- A situational variable is a confounding variable caused by an aspect of the environment.
- Participant variables are another confounding variable caused by the individual differences of participants.
- Control is a way to keep any potential extraneous variables constant. These are required to ensure that the results of the study are reliable.

1.10 Types of data

- There are two types of data: qualitative and quantitative.
- Qualitative data is descriptive in-depth data indicating the quality of a psychological characteristic.
- Quantitative data is the numerical data about the quantity of a psychological measure.

	STRENGTHS	WEAKNESSES
QUALITATIVE DATA	• In-depth, detailed accounts given in the words of participants are collected. It can be argued that using qualitative data is not reductionist • As the data comes directly from the participant we can understand **why** the participant thinks, feels or acts in a particular way	• Interpretation of data could be subjective as these are words rather than numbers • There may be researcher bias - the researcher may only select data that fits into the hypothesis or aim of the study
QUANTITATIVE DATA	• As the data are numerical, it allows easier comparison and statistical analysis to take place • Numerical data are objective and scientific so there is only minimal chance of psychologists miscalculating the data and drawing invalid conclusions	• As the data are numerical, they miss out on why participants chose the answers that they did • Using quantitative data can be seen as reductionist as it involves researchers reducing complex ideas and behaviours to a number or percentage

1.11 Sampling of participants

- A population is a group, sharing one or more characteristics, from which a sample is drawn.
- A sample is the group of people selected to represent the population in a study.
- Sampling technique is the method used to obtain the participants for a study from the population. There are three types of sampling techniques.
  - Opportunity sampling is when the participants are chosen because they are available at the time and place where the research is taking place.
  - Volunteer (self-selected) sampling is when participants are invited to take part in studies via advertisements or emails.
  - Random sampling is when all members of the population are allocated number and a fixed amount of these are chosen in an unbiased way, for example, picking out numbers from a hat.

	STRENGTHS	WEAKNESSES
OPPORTUNITY SAMPLING	• Large numbers of participants can be obtained relatively quickly and easily because researchers use people who are around	• Researchers are unlikely to gain a wide variety of participants to allow for generalisation
VOLUNTEER SAMPLING	• Participants are more likely to participate if they have already volunteered so the drop-out rate should be lower, making generalisations stronger	• Researchers are unlikely to gain a wide variety of participants to allow for generalisation because participants will only be of a certain type
RANDOM SAMPLING	• Researchers can generalise the target population (TP) with more confidence	• Obtaining details of the TP to use to draw the sample may be difficult - a representative sample cannot be guaranteed • Researchers may gain a 'perfect sample' but still have the problem that participants will not take

1.12 Validity

- Validity is the extent to which the researcher is testing what they claim to be testing.
- Internal validity is how well an experiment controls confounding variables. This allows the researcher to be more confident about the causal relationship.
- Ecological validity is the extent to which the findings in one situation would generalise to other situations. This is influenced by whether the situation represents the real world effectively and whether the task is relevant to real life.

- Mundane realism is the extent to which a task represents the real world situation.
- Face validity is a measure of validity indicating whether a measure appears to test what it claims to.
- Concurrent validity is when a test correlates well with a measure that has previously been validated.
- Generalizability is defined as how widely the findings of a study apply to other settings and populations.
- Demand characteristics are features of an experiment that give away the aims. This could cause participants to change their behaviour and hence reduce the validity of the study.
- Objectivity is an unbiased viewpoint that is not affected by an individual's feelings, beliefs or experiences, so should be consistent between different researchers. This would increase the validity of the study.
- Subjectivity is a personal viewpoint which may be biased by one's feelings, beliefs or experiences and may differ between researchers. Since this is not consistent, it may reduce the validity of the study.

1.13 Reliability

- This is the extent to which a procedure, task or measure is consistent.
- Internal reliability refers to whether the procedures are standardised so that each participant experiences the same thing.
- External reliability is the extent to which the results of a procedure can be replicated from one time to another, gaining consistent results.
- Inter-rater/inter-observer reliability refers to the extent to which two researchers interpreting qualitative responses will produce the same records from the same raw data.
- There are two methods to test the reliability of a study: the split-half method and the test-retest method.
- The split-half method involves the results of the first half of the questionnaire or interview to be the same as the results of second half when the questions are the same in both halves but presented in different a manner.
- The test-retest method is a way to measure the consistency of a test or task by using it twice and then comparing the results of each time to check how similar they are.

1.14 Data analysis

- Measures of central tendency: a mathematical way to find out the typical or average score from a data set. This includes the mean, median and mode.
- Mean is calculated by adding all the scores in a data set and dividing them by the number of scores in the data set.
- Median is the middle score of a data set when it is ranked in order (ascending order).
- Mode is the most frequent score in a data set.
- Measures of spread: a mathematical way to describe the variation or spread within a data set. This includes the range and the standard deviation.
- Range is the difference between the largest and smallest values with an addition of 1.
- Standard deviation is a calculation of the average difference between each score and the mean of the data set.
- Normal distribution is an even spread of a variable that is symmetrical about the mean, median and mode. It forms a bell-shaped curve and is symmetrical.
- Bar charts are graphs used for data in discrete categories and total or average scores. There are gaps between the columns as the data is not related in a linear way.
- A histogram is used to illustrate continuous data.
- A scatter graph is a way to display data from a correlational analysis.

2. Ethical Guidelines

- **Ethical Issues:** Problems in research that raise concerns about the welfare of participants
- **Ethical Guidelines:** Pieces of advice that guide psychologists to consider the welfare of participants and wider society

2.1 Ethical guidelines in relation to human participants

- Based on British Psychological Society's (BPS) Code of Human Research Ethics (2014)
- Privacy: An ethical guideline related to avoiding the invasion of the participant's personal physical space
- Debriefing: An ethical procedure giving all participants a full explanation of the aims and potential consequences of the study at the end so that they leave in the same psychological state that they arrived in

- Protection: Participants should not be exposed to any greater physical or psychological risk than they would expect in their day-to-day life
- Informed consent: An ethical guideline stating that participants should know enough about a study to decide whether they want to agree to participate
- Right to withdraw: An ethical guideline relating to ensuring that participants know that they can remove themselves and their data from the study at any time.
- Deception: An ethical guideline as participant's should not be deliberately misinformed about the aim or procedure of the study. If this is unavoidable, the study should be planned to minimise the risk of distress and participants should be thoroughly debriefed.
- Confidentiality: An ethical guideline stating that participants' results and personal information should be kept safely and not released to anyone outside the study

2.2 Ethical guidelines in relation to animal participants

- Based on British Psychological Society's guidelines for Psychologists working with animals (2012)
- Replacement: Researchers should consider replacing animal experiments with videos or computer simulations.
- Species and strain: Psychologists should choose a species that is scientifically and ethically suitable for the intended use. Knowledge of the animal's previous experience is also essential.
- Numbers: According to the Animal Scientific Procedures Act (1986), psychologists should always use the smallest number of animals that still accomplish the research aims and goals. These could be calculated via a pilot study and statistical programs.
- Procedures: Psychologists should consider research that enriches rather than harms. Procedures that may cause discomfort, injury, stress, etc. need a Project Licence which can be gained after a cost-benefit analysis.
- Pain and distress: Research causing physiological or psychological pain or distress should be avoided. Whatever procedure is in use, any adverse effects on animals must be recognised and assessed, and immediate action taken wherever necessary.
- Housing: Isolation & crowding should be avoided. Caging should recreate aspects of the natural environment that are important to the welfare of the animal and must take into account the social behaviour of the species.
- Reward, deprivation and aversive stimuli: Researcher should consider the animal's normal eating and drinking habits and its metabolic requirements. When using deprivation and aversive stimuli, the researcher should make sure that there is no alternative way of motivating the animal that is consistent with the aims of the experiment and that the levels of deprivation is no greater than that needed to achieve the goals of the experiment.
- Anaesthesia, Analgesia & Euthanasia: Animals should be protected from pain relating to surgery and euthanized if suffering lasting pain. Procedures that are likely to cause pain and discomfort should be performed only on animals that have been adequately anaesthetised, and analgesics should be used before and after such procedures to minimise pain and distress whenever possible.

3. Issues and Debates

3.1 The application of psychology to everyday life

- The practical use of a theory, or the findings of a study, to help improve processes or people's lives, for example, in terms of bettering physical or mental health, safety, production at work or sales by a company.

	STRENGTHS	WEAKNESSES
CONDUCTING USEFUL RESEARCH	• It can be used to improve human behaviour	• Studies might be unethical to gain more valid results • Studies need to be high in ecological validity to be of more use to society but this can be quite difficult if they are conducted in a laboratory

3.2 Individual and situational explanations

- The extent to which a person's beliefs or behaviours are controlled by factors, such as their personality or physiology that are unique to them (individual explanation) or by factors in the setting, such as the people or place (situational explanation).

STRENGTHS	WEAKNESSES
• If we find out which behaviours are which side of the debate, that can help to explain human behaviour • If there is an interaction between both sides then that is useful too	• It is not always easy to separate individual and situational factors • Studies might be unethical in order to gain more valid results • Studies need high ecological validity to be of more use to this debate but this can be difficult if it is a laboratory experiment

3.3 Nature versus nurture

- Nature refers to the extent to which behaviour, feelings or thinking results from innate, genetic factors.
- Nurture refers to the extent to which behaviour, feelings or thinking results from environmental influences such as learning or other people.

STRENGTHS	WEAKNESSES
• If we find out which behaviours are which side of the debate, that can help to explain human behaviour more clearly • If there is an interaction between both sides, then that is useful too	• It is not always easy to separate out what is nature and what is nurture • If behaviour is seen to be purely down to nature (genetics) this can be very socially sensitive • Studies might be unethical in order to gain more valid results

3.4 The use of children in psychological research

- Giving consent is important for children under 16 & a risk assessment must take place
- Refer to Ethical guidelines for human participants (Section 2.1)

3.5 The use of animals in psychological research

- Refer to Ethical guidelines for animal participants (Section 2.2)

4. TABLES

TABLE 1:

	STRENGTHS	WEAKNESSES
LABORATORY EXPERIMENTS	• High levels of standardization hence can it can be replicated easily to test for reliability • High levels of control hence researches can be more confident that the IV is directly affecting the DV	• Artificial Environment hence it lacks ecological validity • Participants may show demand characteristics
FIELD EXPERIMENTS	• Realistic setting hence high ecological validity • Limited demand characteristics so behaviour is more likely to be natural and valid	• Situational variables are difficult to control so it is tough know if the IV is affecting the DV • Issues in breaking ethics since the participants do not know that they're taking part in a study
NATURAL EXPERIMENTS	• High ecological validity because the IV is naturally occurring • Valid representation of a person's behaviour	• Difficult to know whether the IV caused an effect on the DV • Difficult to replicate to test for reliability as the event is naturally occurring

TABLE 2:

	STRENGTHS	WEAKNESSES
GENERAL	• If participants are unaware of the observation taking place - increases ecological validity • As behaviours are 'counted', data can be analysed statistically with minimal bias	• If the participants are aware of the observation, they may not act 'naturally' but show more socially desirable behaviour. This can reduce the validity of the findings • It may be difficult to replicate the study if it is naturalistic as many variables cannot be controlled which reduces the reliability
PARTICIPANT OBSERVATION	• High ecological validity as the participants are observed in a real-life setting • As the observers become involved with the group, they are more likely to understand the motives and reasons for behaviours which increases the validity of the findings	• There are ethical problems of informed consent • The presence of an outsider can change the behaviours of the group members. This lowers the validity of the findings
NON-PARTICIPANT OBSERVATION	• Participants behaviour will not be affected by observation because the observer is out of sight • Researchers' observations are more likely to be objective as they are detaching from the people they are observing	• It can be difficult to make detailed observations and to produce qualitative data that allows understandings as to why the behaviours are occurring
STRUCTURED OBSERVATION	• The behavioural checklist allows objective quantitative data to be collected which can then be analysed statistically	• The sampling of observed behaviour tends to be restricted and does not give an idea of the reasons as to why the behaviours are occurring

UNSTRUCTURED OBSERVATION	• **THEY CAN GENERATE IN-DEPTH, RICH QUANTITATIVE DATA THAT CAN HELP EXPLAIN WHY BEHAVIOURS ARE OCCURRING**	• **OBSERVERS MAY EASILY BE DRAWN TO EYE CATCHING BEHAVIOURS AND HENCE MAY NOT FULLY REPRESENT ALL THE BEHAVIOURS**
NATURALLISTIC OBSERVATION	• As participants are unaware that they are being watched, they should behave more naturally, removing the chances of demand characteristics • High ecological validity as the observation takes place in a natural setting	• Very little control over extraneous variables which makes it difficult to draw a cause and effect relationship • Replication may be difficult as there cannot be a totally standardised procedure, hence making it difficult to test for reliability
CONTROLLED OBSERVATION	• As the set-up is controlled, the observers can be more confident about what is causing the behaviours • Less chance of extraneous variables affecting participants' behaviour	• An artificial situation can easily influence participants' behaviour • Low ecological validity as the setting is artificial

TABLE 3:

	STRENGTHS	**TO USE**
INDEPENDENT MEASURES DESIGN	• As participants take [art on only one condition, they are less likely to guess the aim of the study hence reducing the effects of demand characteristics • There are no order effects that can reduce the validity of findings	• There may be participant variables affecting the DV rather than the IV • More participants are required for this type of design as compared to repeated measures
REPEATED MEASURES DESIGN	• Eliminates any participant variables as all of them take part in all conditions • Fewer participants are needed as compared to independent measures	• There is a chance of demand characteristics as participants may work out the aim or change their behaviour. • Order effects can affect the findings of the study and reduce its validity. This could be overcome using counterbalancing.
MATCHED PAIRS DESIGN	• Matching participants as close as possible on measurable traits may help control for individual differences affecting the results. • This design is better suited when a repeated measures design may not work due to an order effect occurring which may affect results.	• Trying to match participants' similar traits is very time consuming. • Trying to match people exactly is impossible as there will always be individual differences from one person to another. Therefore the study may lack internal validity if these differences affect the IV rather than the experimental condition. • The sample may be smaller as trying to find a large sample of people matching across similar traits may be difficult. This may mean the findings may lack external validity.

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