OCR Psychology A-level

Paper 1: Research Methods

What Makes A Science?

As modern psychological research often takes a highly scientific approach to its research, such as through use of specialised machines like fMRI and EEG, as well as standardised and thorough tests, it is important that you understand these key terms relating to how science works.

Scientific Concept	What This Means	How This Relates to Psychology
Inductive Reasoning	The logical process in which a conclusion is reached based on previous observations - explanations are proposed based on experience.	In psychological experiments, inductive reasoning may involve making conclusions based on evidence shown from several similar, pre-existing studies to explain the results of your study.
Deductive Reasoning	A way of deducing whether there is evidence for accepting or rejecting an explanation concluded from data by predicting consequences.	Deductive reasoning in psychology may involve making predictions based on assumptions that can be applied to the study at hand.
Falsification	Karl Popper suggests that good scientific research should aim to falsify hypotheses instead of proving them. Falsification involves disproving a hypothesis or statement, to therefore prove the alternative.	For example, you can prove that not all swans are white not by checking all swans, but by finding one black one.
Objectivity	Being objective is a way of avoiding bias when investigating in order to not influence or interpret data wrongly based on experience or views. This is crucial for research to be considered scientific as science requires facts with evidence, which is not the case where personal views are influential.	Psychological research often is not as objective as other disciplines of science and has historically been known to draw conclusions based on bias ideas - for example, Freud and his theories have no empirical evidence, but were based on his opinions and beliefs of the unconscious mind. Therefore, it is now important that psychological research is objective to

		restore the confidence in the discipline. Biological and neuropsychology can use objective measurement tools, however, social psychology must employ concepts such as inter-rater reliability and replicability in order to ensure objectivity and accuracy.
Hypothesis Testing	Hypothesis testing involves deriving a prediction from a theory at the beginning of an experiment. These are stated in order to clearly demonstrate the researchers thoughts on what will happen in the investigation. A hypothesis is either null (states there is no significance between variables in the results), or alternate (there is significance between variables).	At the start of an experiment, a null and alternate hypothesis will be proposed. One of these will be accepted depending on the outcome of statistical analysis that determines the significance. This is important in regards to what makes a science as hypothesis testing allows a clear and standard way of making predictions about an experiment before it takes place so that the results can be compared to these. As hypotheses are created based on existing evidence or reasoning, they give a good indicator of unexpected results from a study that may be scientifically interesting and lead to further research.
Replicability	It is important that in a psychological experiment, the method is operationalised and clear enough that the study can be repeated to test for similar results. A non-replicable or repeatable study (one that does not obtain the same or similar results) can not be accepted by the scientific community as this suggests faults may be present in the original study. Replicability ensures	Social psychology is the area of psychology that involves the most extraneous or individual variables as personality, lifestyle and upbringing are all huge influencers on behaviour outside of the variables being tested. Therefore, it is important for the method to be highly standardised and clear in order for replications to occur, as where results are found multiple times in

	accuracy, reliability of conclusions and confidence.	different environments, times or cross-culturally, this provides stronger evidence that the variable/s being tested are responsible for the consistent results.
Standardisation	In order for the variables and conditions of an experiment to be standardised, extraneous variables must be controlled to ensure that these variables are not affecting the results. A standardised test has reliable measuring tools, detailed steps to carry out the investigation and consistency.	The variables involved in psychological studies should be as standardised as possible (individual differences can even be controlled for by using matched pairs or doing interviews and research into participants before hand to identify personal similarities). Extraneous variables will most likely be the biggest cause of inaccuracies or anomalies, so standardization of variables is key.
Cause and Effect	The best way to exemplify the importance of results is to establish cause and effect. This involves gathering substantial evidence that one tested variable was the cause of the change in another variable, with no other variables being responsible. Through standardisation, it is more likely that cause and effect can be confidently established as all variables are highly controlled, making confounding variables less likely. Correlational studies alone can not find cause and effect, only show the relationship between variables. **Variables must be manipulated** to establish cause and effect.	Though confidently establishing cause and effect is quite rare in science as a whole, it is still crucial for psychological studies to attempt to find cause and effect between variables as this provides a vast amount of information into the topic being researched.