7.4 Features of Science: Objectivity, Falsifiability, Replication and Paradigms

AQA 7182 · about 50 minutes · Write-in edition

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer in full sentences for questions worth 4 marks or more. Spend about 75 minutes on the whole pack, allocating roughly one and a half minutes per mark.

1 Outline what is meant by the empirical method in psychology, and give one example of an empirical technique used to test hypotheses in a lab context.

(Total for Question 1 is 3 marks)

2 Define 'falsifiability' with reference to Karl Popper and state why Popper considered it a key criterion for a theory to be scientific in psychology.

(Total for Question 2 is 3 marks)

3 Outline Thomas Kuhn's idea of a 'paradigm' in the context of psychology, and name one feature of a scientific paradigm Kuhn emphasised.

(Total for Question 3 is 3 marks)

4 A recent high-profile replication attempt of a social-psychology finding used the same procedure across many labs and failed to reproduce the original effect. Explain two implications this failure to replicate has for claims that psychology is a science.

(Total for Question 4 is 4 marks)

5 Discuss the extent to which psychology can be considered a science.

(Total for Question 5 is 16 marks)

6 Explain the difference between a direct replication and a conceptual replication in psychological research, and give one advantage of each type when testing a psychological theory.

(Total for Question 6 is 4 marks)

7 Explain what Kuhn meant by a 'paradigm shift' and give one historical or conceptual example from psychology that could be described as a paradigm shift.

(Total for Question 7 is 4 marks)

8 Outline two differences between the behaviourist paradigm and the psychodynamic paradigm in psychology, referring to theoretical focus and preferred methods.

(Total for Question 8 is 4 marks)

Mark scheme · 7.4 Features of Science: Objectivity, Falsifiability, Replication and Paradigms

Question 1

states that the empirical method relies on systematic observation or measurement of behaviour or mental processes oe	**M1**
gives an example of an empirical technique, e.g. controlled laboratory experiment measuring behaviour under manipulated conditions oe	**A1**
explains that empirical findings are used to support or refute hypotheses oe	**A1**

Answer: The empirical method uses systematic observation and measurement of behaviour or mental processes to test ideas. For example, a controlled laboratory experiment manipulates an independent variable and measures behaviour as empirical evidence to support or refute a hypothesis.

Question 2

defines falsifiability as the principle that a scientific theory must make predictions that could in principle be shown to be false by observation or experiment oe	**M1**
names Popper or refers to Karl Popper and his view that unfalsifiable claims are not scientific oe	**A1**
explains why Popper saw it as key: falsifiability allows theories to be tested and potentially refuted, driving scientific progress rather than protecting theories from disproof oe	**A1**

Answer: Falsifiability, in Popper's sense, means a theory must make testable predictions that could in principle be shown false by observation or experiment. Popper argued that only falsifiable theories are scientific because they can be tested and risk refutation, which is necessary for genuine scientific progress.

Question 3

outlines Kuhn's concept: a paradigm is a shared framework of theories, methods and standards that guides normal scientific research oe	**M1**
names a feature Kuhn emphasised, e.g. shared theoretical assumptions, accepted methods, or exemplar studies that define legitimate problems oe	**A1**
explains briefly that paradigms shape what counts as valid questions and acceptable evidence in a scientific community oe	**A1**

Answer: Kuhn's paradigm is a shared framework of theories, methods and standards that guides normal scientific research. One feature Kuhn emphasised is that a paradigm provides shared theoretical assumptions and exemplar studies which determine what problems and methods are considered legitimate.

Question 4

explains implication 1: failed replication undermines the reliability of the original finding and suggests that single studies are insufficient evidence oe	**M1**
develops why this matters for scientific status: reproducibility is central to scientific method, so failures reduce confidence in cumulative knowledge and indicate methodological weaknesses oe	**A1**
explains implication 2: failed replication can prompt methodological improvements or theory revision rather than showing psychology is not scientific oe	**M1**
develops that this demonstrates self-correction, a scientific strength: coordinated replication efforts, preregistration and improved methods are examples of science responding to reproducibility problems oe	**A1**

Answer: A failure to replicate undermines the reliability of the original result and shows that a single study is not enough to establish a scientific fact, which weakens claims that psychology is reliably cumulative. However, such failures also stimulate methodological reform and theory revision, which demonstrates scientific self-correction and so can be taken as evidence that psychology operates scientifically when researchers respond by improving methods and replicating systematically.

Question 5

Level 4 Knowledge of scientific features is accurate and detailed. Evaluation is well developed and balanced, using relevant named examples or approaches. The discussion integrates AO1 description and AO3 evaluation coherently, and considers both supporting and challenging evidence about psychology's status as a science. Arguments are clear and well organised, with appropriate specialist terms used correctly.	**13-16**
Level 3 Knowledge is clear with some detail. Evaluation is sound and partly balanced, using some named examples. The answer links description and evaluation, but may be less comprehensive or less consistently developed than a top-band answer. Specialist terms are used appropriately for the most part.	**9-12**
Level 2 Knowledge is present but limited or partly inaccurate. Evaluation is superficial or unbalanced and examples may be general rather than named. The response shows some relevance to the question but lacks depth, organisation or precise use of terminology.	**5-8**
Level 1 Knowledge is very limited and answers may be fragmentary. Evaluation is minimal or absent. Little or no use of relevant examples. The answer lacks structure and specialist terminology is largely absent or incorrect.	**1-4**
Level 0 No creditable content.	**0**

Indicative content:

- AO1 description: Objectivity and the empirical method, psychologists use controlled experiments, operationalisation and quantitative measurement to reduce bias, illustrated by behaviourist laboratory studies on conditioning.
- AO1 description: Falsifiability, Popper's criterion, why testable predictions matter and how unfalsifiable claims (broad psychoanalytic claims) were criticised for lacking scientific status.
- AO1 description: Replicability and the role of direct and conceptual replication in building reliable knowledge, plus recent replication projects in social psychology.
- AO1 description: Kuhn's paradigms and paradigm shifts, examples such as the rise of behaviourism emphasising observable data, then the cognitive revolution introducing information-processing models and new methods.
- AO3 evaluation: Strengths supporting psychology as a science: use of empirical methods, experimental control, predictive theories in cognitive and biological approaches, ability to falsify many hypotheses, and self-correcting practices such as replications and methodological reform.
- AO3 evaluation: Limitations: some psychological phenomena are subjective and resist full operationalisation, interpretive methods (psychodynamic case studies) are not easily falsifiable or replicable, researcher bias and theory-driven observation can limit objectivity, and paradigm disputes show psychology is not a unified science.
- AO3 evaluation: Use named examples, e.g. behaviourism's emphasis on observable, replicable experiments supports scientific status; Freud's psychodynamic theory is criticised by Popper as unfalsifiable; the cognitive revolution shows a paradigm shift bringing more experimental, testable models; replication crises in social psychology reveal vulnerabilities but also prompt scientific reforms like preregistration.
- AO3 evaluation: Balanced conclusion might state that psychology contains both highly scientific elements and areas that are more interpretive or contested, so it is partially scientific depending on the approach and methods used; highlight the importance of methodological plurality and improving standards to strengthen psychology's scientific claims.

Question 6

defines direct replication: repeating a study as closely as possible to check whether the original findings can be reproduced oe	**M1**
gives an advantage of direct replication, e.g. it tests the reliability of the exact procedure and controls for experimental error oe	**A1**
defines conceptual replication: testing the same theoretical prediction using different methods or operationalisations oe	**M1**
gives an advantage of conceptual replication, e.g. it shows whether the underlying theory holds across different measures and contexts, increasing external validity oe	**A1**

Answer: A direct replication repeats the original study as closely as possible to see if the same result is obtained; its advantage is testing the reliability of the original procedure. A conceptual replication tests the same theoretical claim using different methods or measures; its advantage is showing whether the theory generalises across contexts and operationalisations.

Question 7

explains that a paradigm shift is a revolutionary change in the overarching framework, when anomalies accumulate and the old paradigm is replaced by a new one oe	**M1**
gives an example from psychology, e.g. the rise of behaviourism as a move to observable, experimental methods, or the cognitive revolution replacing strict behaviourism with information-processing models oe	**A1**
explains why the example counts as a shift, e.g. it changed core assumptions, methods and acceptable explanations in the field oe	**M1**
links the example to a change in what counted as acceptable evidence or problems to study oe	**A1**

Answer: A paradigm shift is a revolutionary replacement of one overarching framework by another after accumulating anomalies. For example, the cognitive revolution in psychology replaced strict behaviourist assumptions by information-processing models and new experimental methods, changing core assumptions and acceptable explanations.

Question 8

identifies a difference in theoretical focus, e.g. behaviourism focuses on observable behaviour and learning processes, psychodynamic focuses on unconscious drives and early childhood experiences oe	**M1**
explains the implication of that focus, e.g. behaviourism aims to identify stimulus-response associations and laws of learning whereas psychodynamic theory seeks to interpret internal conflicts and unconscious motives oe	**A1**
identifies a difference in preferred methods, e.g. behaviourists favour controlled experiments and objective measurement, psychodynamic approaches use clinical case studies and interpretive methods oe	**M1**
explains the methodological implication, e.g. experimental methods give reproducible data while case studies produce rich but less replicable insights oe	**A1**

Answer: Behaviourism focuses on observable behaviour and learning processes, while psychodynamic theory focuses on unconscious drives and early childhood experience. Behaviourists favour controlled experiments and objective measurement; psychodynamic researchers favour clinical case studies and interpretive methods, which trade replicability for depth.