



Debates: Psychology as a Science

This **Psychology Factsheet** provides guidance as to how to describe and evaluate the debate, 'psychology as a science' to satisfy the criteria set out by the exam boards. Words in **bold** are explained in the glossary and the worksheet provides an opportunity to practice what you have learned with exam-style questions.

The examiner expects you to be able to:

1. Demonstrate that you understand what 'science' means with direct application to psychological research.
2. Describe the key aspects of psychology as a science with the use of relevant research.
3. Evaluate the idea that psychology is a science by considering the strengths and limitations of using relevant research.
4. Argue for both sides of the debate that psychology is a science.

What do we mean by science?

The word science may conjure up visions of test tubes, white lab coats and brightly coloured liquids in glass beakers. These ideas relate to what is popularly known as 'hard science' whereas psychology sits amongst the 'soft sciences' i.e. those that investigate human behaviour rather than chemicals, cells or molecules. This idea – that psychology is a 'soft science' – probably stems from the fact that human behaviour (unlike chemicals, cells or molecules) cannot easily be defined, measured or quantified. Why? Because human beings do not obey scientific laws in the same way that, say, oxygen does. We are complex, multi-faceted, often contradictory, unpredictable beings who can at times defy objective measurement or reasoning. So why bother trying to include psychology among any kind of scientific endeavour then? The reason for this is not that psychologists are aiming to be the same as the 'hard sciences' such as physics and chemistry; it is because psychologists seek to establish some answer to the question, 'Why do people do that?' in an **objective** and impersonal way. Here are some reasons as to why psychologists seek to be 'scientific' in the way they measure human behaviour:



Basing theories or conclusions on personal insight, hunches or **anecdotal** evidence is biased and flawed. If it wasn't, then everyone could claim to be an expert in human behaviour!

Psychological research needs to be open to scrutiny from others so it has to be objective in its approach rather than being based on opinion or emotion, both of which could cloud the process.

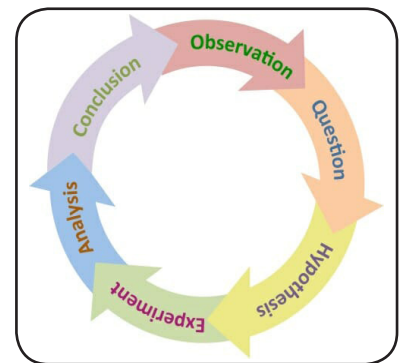
Psychological research needs to be credible, so psychologists

need to be able to **replicate** experiments to test for their **validity**.

Some academics and experts are quick to accuse psychology of not being a 'real' science so researchers must be able to demonstrate that studies have been conducted in a **standardised** manner, free of bias.

What are the features of science and how do they apply to psychology?

Objectivity: To be able to claim that it is objective, a theory or study must be impersonal, detached, unbiased and focused on fact rather than opinion. For example, **Maguire (2000)** used **MRI** technology in her research on **brain plasticity**, using MRI equipment to measure the volume of **grey matter** in the **hippocampus** of taxi drivers versus non-taxi drivers. This could be said to be an objective measure as it produces data which is non-biased and which should not be open to interpretation.



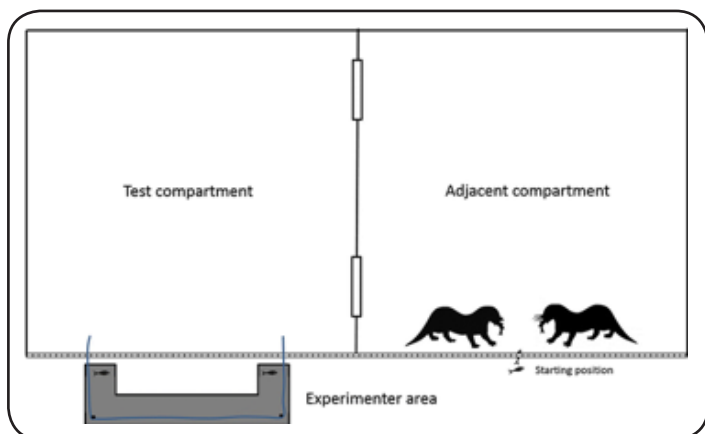
Exam Hint: Remember to keep an open and critical mind when using the psychology as a science debate in your exam evaluations. For example, Maguire's (2000) use of MRI scanning is, on the surface, an objective measure, but the analysis of the resulting brain-scan images was done by humans, which means that there is always a possible margin of error involved. You may also wish to consult Bennet and Miller's (2010) critique of brain-imaging technology, which challenges the idea that brain-imaging technologies are 100% reliable and objective.

A testable hypothesis: Psychologists must ensure that they base their study on a hypothesis – their prediction as to what will happen in terms of how the **independent variable (IV)** will affect the **dependent variable (DV)** that is testable. For a theory or piece of research to be testable it must be something that can be set up in experimental conditions with a clear, **operationalised** IV and DV. For example, **Glanzer and Cunitz (1966)** began their investigation into **serial position effect** by hypothesising that a distraction task would erode the **recency effect**. This was tested using two groups: one that recalled a list of words immediately and one that recalled the list after a 30-second distraction task. Their results supported their hypothesis.

A theory needs to be **falsifiable**: Falsifiability means that a theory can be investigated using objective, scientific methods and proved false (or not – the point is that the theory is testable). The idea that **serotonin** is linked to depression has been investigated in several studies e.g. **Caspi et al. (2003)** but no firm conclusion has yet been made about the true function of serotonin as a **neurotransmitter**. In this way, the theory that serotonin is implicated in depression is falsifiable i.e. it can be tested to assess the extent of the **validity** of the theory.

Controlled conditions: This refers to the researcher's attempt to ensure that their investigation is carried out in such a way as to eliminate bias and as many **extraneous variables** as possible. **Laboratory experiments** strive to operate under controlled conditions i.e. by using a neutral testing space, **standardised** procedure and instructions, a clear IV which tests a DV measured using **quantitative data**. **Loftus and Palmer (1974)** is a good example of the use of controlled conditions. Participants were **randomly allocated** to one of five conditions, they viewed the same car-crash video clips, answered the same questions (apart from the critical question that changed in each condition) and estimated the speed of the car. By imposing these conditions, the researchers could be reasonably confident that their results were the product of the IV rather than being unduly influenced by extraneous variables.

Exam Hint: Examiners frequently report that students do not include enough evaluation in their exam responses, particularly in the high-mark, longer questions. Using debates, such as psychology as a science in your exam answers will elevate your answer above the average and – if used correctly and appropriately – will earn you high marks in the 'evaluate/analyse' mark bands. You can apply the psychology as a science debate to any study in psychology, to demonstrate the scientific nature of the study – or the lack of it. And remember: just because a study or theory is 'unscientific' it doesn't mean that it is worth less than studies or theories that can claim a higher scientific level (Freud's theory is highly unscientific yet it remains one of the most influential and talked about theories and therapies to this day).



Strengths of viewing psychology as a science

The research is more likely to be open to a positive **peer review** as it is likely to be deemed objective and detached rather than personal, emotion-based or overly interpretive. The standardised nature of laboratory experiments, for example, mean that other psychologists can follow the procedure involved in the study and they themselves replicate it to check for the **reliability** of the method.

Universities and other institutions are more likely to fund research that is agreed to be 'scientific' as (rightly or wrongly) those in charge may view such research as being important and as having high status

Limitations of viewing psychology as a science

Human beings are notoriously difficult to quantify, measure and make general laws about. Human behaviour is not a static, controlled, distilled variable which can be crystallised and subsequently analysed under a microscope in the same way that a leaf or a skin cell can: it is complex, multi-faceted, unpredictable and often contradictory. We are far from being able to break down the constituent parts of human behaviour so to attempt to take an overly stringent scientific approach to it will always fall short of being conclusive.

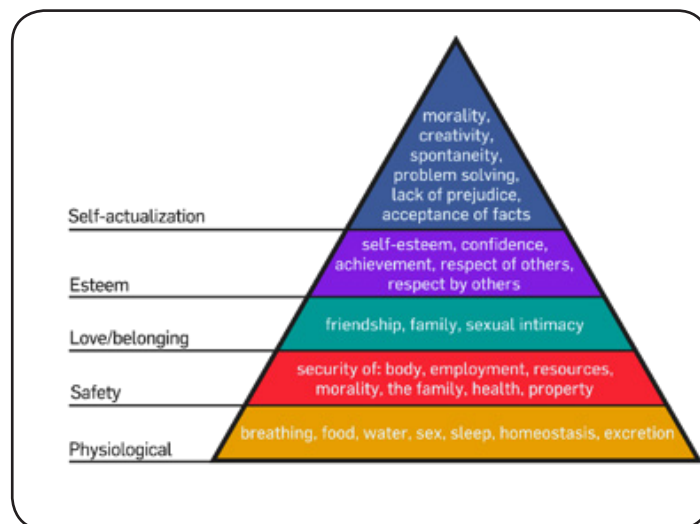
Qualitative research such as **naturalistic observations** and **interviews** provide valuable, in-depth insight into human behaviour yet they are often dismissed as being subjective and 'unscientific' which in turn means that their findings may not be viewed as seriously as laboratory experiments.

Participants in laboratory experiments are likely to experience **demand characteristics** which decreases the validity of the research findings: if humans behave in a self-conscious, contrived way while performing artificial tasks in controlled conditions, then what are such experiments truly revealing about human nature?



Non-scientific psychology

Humanism: This is based on the idea that human beings are essentially fascinating individuals, each one of whom is unique and who has the potential to achieve peaks of achievement throughout their life (**self-actualisation**). This approach is known as **phenomenology**. Humanism takes a positive view of human beings, focusing on the personal qualities and attributes of the individual in ways which are subjective and focused on expression and exploration of the person in terms of their uniqueness. This exploration usually happens via one-to-one therapist/client sessions with the therapist viewing their client with **unconditional positive regard**, looking at their level of **congruence**.



Maslow's **Hierarchy of Needs** is a feature of this approach and it may be used in therapy sessions by a therapist to chart their client's progress. The model demonstrates the different levels of 'need' that people must pass, from the most basic (e.g. food and shelter) to higher-level needs (e.g. self-confidence) in order to achieve self-actualisation (the realisation of an ambition or goal). Humanism embraces a subjective, individual approach to psychology with its emphasis on **free will** and expression which makes it an unscientific method of studying behaviour.

The **Psychodynamic** approach: This is based on Freud's concept of the unconscious mind and the ways in which the unconscious mind influences conscious behaviour. This approach takes a negative view of human experience, claiming that most people are conflicted because of events that happened in their childhood and that they need therapy in order to deal with these conflicts.

This approach uses hypnosis, dream analysis and interpretation of images among its methods, all of which are subjective and very difficult to measure, hence this approach is unscientific.

Qualitative methods: These are methods that do not impose an IV on participants, where behaviour is generally natural and uncontrived. Methods such as interviews and naturalistic observations attempt to capture the true essence and quality of behaviour rather than manipulating it via laboratory conditions.

Exam Hint: Remember that a debate involves two sides: don't feel that you have to 'prove' that psychology is a science, you are simply required to explore the debate without coming to any definite conclusion. Examiners will be interested to see how you handle this debate as it's one which students often feel unsure or unconfident about so it is worth really getting to grips with the 'psychology as a science' argument as it could earn you high marks in an exam question or essay.

References

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Glossary

Anecdotal evidence: Evidence which is based on everyday observations or experience rather than on the results of experimentation or research.

Brain plasticity: The extent to which the brain is able to compensate for loss in particular areas e.g. after surgery.

Congruence: The extent to which a person's actual self and ideal self overlap.

Controlled conditions: Ensuring that the research space, the participants and the materials are as standardised as possible so as to eliminate extraneous variables.

Demand characteristics: When a participant is aware that they are taking part in research and so may change their behaviour so that it becomes artificial or contrived.

Dependent variable (DV): – The variable that is measured by researchers.

Extraneous variables: Any variable in a study which is not part of the study and which may confound the results if not controlled for (e.g. noise, temperature, time of day).

Falsifiable: The extent to which a theory can be tested using a hypothesis and objective measurements in order to demonstrate it to be false.

Free will: The idea that people can make their own choices and life, rather than fate deciding their outcome.

Grey matter: Contains most of the brain's neuronal cell bodies and includes regions of the brain involved in muscle control, and sensory perception.

Hippocampus: A region of the brain, part of the limbic system, which has been linked to memory and spatial navigation.

Humanism: An approach to psychology which involves focus on the individual via one-to-one sessions covering a range of personalised techniques.

Hypothesis: A statement predicting what the researcher expects to find after conducting their study.

Independent variable (IV): The variable that is manipulated by the researchers to test for an effect on the dependent variable.

Interview: A one-to-one session in which the researcher directs questions to the participant who expresses their responses verbally.

Laboratory experiment: A study carried out in controlled conditions in which an independent variable is tested for its effect on the dependent variable.

Maslow's Hierarchy of Needs: A model which demonstrates the different levels of need, from low to high, which a person must pass through to achieve self-actualisation.

MRI: Magnetic Resonance Imaging is a procedure used in hospitals to scan patients and determine the severity of certain injuries.

Naturalistic observation: The observation of a group of people in a natural setting.

Neurotransmitter: A brain chemical which is implicated in specific behaviours e.g. euphoria, depression, movement.

Objective: Being unbiased and without a personal view.

Operationalise: When a researcher defines both how the IV will be put in place (e.g. noisy room/silent room) and how the DV will be measured (e.g. number of words recalled out of 20). Not a clear definition.

Peer review: The scrutiny given to a study by other experts in the field in order to highlight any anomalies or issues and to give the work the stamp of credibility.

Phenomenology: The study of an individual, based on that individual's personal experiences, their view of the world and how they create meaning from them.

Psychodynamic: An approach to understanding behaviour based on Freud's theory of the unconscious mind.

Qualitative data: Data in the form of words.

Quantitative data: Data in the form of numbers.

Random allocation: When participants are assigned to a group/condition using an unbiased method e.g. names out of a hat.

Reliability: Being able to replicate the study and come up with the same findings.

Replicate: When an experiment is repeated using the same procedure and materials.

Science: The systematic study of a phenomenon (e.g. human behaviour) using objective methods in a bid to establish general laws.

Self-actualisation: The highest point of Maslow's Hierarchy of Needs, it involves an individual achieving a peak moment in their life (e.g. getting a promotion).

Serial position effect: Occurs when participants recall more items from either the beginning (primacy effect) or end of a list (recency effect).

Serotonin: A neurotransmitter that plays a role in regulating mood and sleep, a deficiency of which has been linked to depression.

Standardised: To ensure that all aspects of a procedure or a resource conform to the same standard (e.g. all participants experience the same procedure in an experiment; all questions on a questionnaire are the same per participant).

Testable: An idea or theory which can be tested.

Unconditional Positive Regard: This involves viewing yourself or other people without any degree of criticism or judgement: the self (or other) is accepted fully for who/what they are.

Validity: The extent to which a study measures what it set out to measure.

Worksheet: Debates: Psychology as a Science

Name: _____

1. Outline the 'psychology as a science' debate, using at least **one** study to support your answer.

2. A researcher wants to investigate the emotional nature of memory. She obtains 30 participants and randomly allocates them to two conditions: condition A requires the participants to rate a series of 15 images according to how emotional they made them feel; condition B requires participants to write down a highly emotional event from their childhood, including as much detail as possible.

Identify **two** scientific features of this piece of research and **two** unscientific features of the research.

3. To what extent do you think it is possible to approach human behaviour using a purely scientific approach?

4. What is the value of non-scientific research?
