

Is Psychology a Science?

1) Watch:

- <https://www.youtube.com/watch?v=VtXFzW4GAyg> (is Psych a Science)
- <https://www.youtube.com/watch?v=wf-sGqBsWv4> (Karl Popper and falsifiability)
- <https://www.youtube.com/watch?v=Zohkzd0MYil> (Psych **is** a science video)

2) Define these keywords into your workbooks:

- a) Hypothesis, Falsifiability, Objectivity, Subjectivity,
- b) Empiricism, Reductionism, Holism, Nomothetic, Idiographic

3) Read this basic information:

For a subject to be considered a science it should fulfil the following criteria:

- Use hypothesis testing with hypotheses that can be falsified
- Be objective (not down to opinion, but factual)
- Demonstrate control over extraneous variables
- Be empirical (use knowledge based on experience - i.e. experiments)
- Be replicable (you can do it again)
- Be reliable (you get similar results when you do it again)
- Be valid: it measures/tests what it is supposed to measure/test
- Be reductionist: study the smallest (and most testable) elements (DNA, atoms etc.)
- Be nomothetic: it develops general theories about how things work

Main Task

Using your textbook and the extra material, go through each criteria and build a table which looks like the one below. The table should include selected examples from different areas of psychology as per the material you have. You should aim to have at least 2 for/against in each criteria:

What	Psychology meets this	Psychology doesn't meet this
Use hypothesis testing A science should produce hypotheses that can be tested and shown to be true or false through evidence	Biological psychology has run experiments to test whether reducing dopamine levels can also reduce certain schizophrenia symptoms	Psychodynamic psychology (Freud) doesn't produce easily testable hypotheses Schema theory in Cognitive Psychology can't be tested directly (you can't 'measure' a schema)

Note - ** elements are extension and more challenging

Objectivity

- For a subject to be a science, it needs to be objective – the researcher should not impose his or her own interpretation onto a particular result. Psychology demonstrates this in the biological and cognitive approaches. Both use controlled lab studies to test theories and hypotheses. The biological approach also uses objective physiological measures such as brain scans.
- On the other hand, the psychodynamic approach takes a more subjective viewpoint, in which the issues raised by a client are interpreted by the therapist. This approach also raises the issue of the generalisability of results as the single case studies it tends to use may not be applicable to other people or cultures.

Testable hypotheses

- A science should develop testable hypotheses and these should be falsifiable (proven false). While the biological and cognitive approaches are able to develop such hypotheses, the concepts (such as id, ego, and superego) in the psychodynamic approach can be neither proven nor disproven. It is unfalsifiable, and therefore unscientific.
- Psychology is full of theory which attempts to explain certain phenomenon for example there are several theories for the causation of Schizophrenia, one is that it stems from a biological causation in the same way that a physical illness would another theory is the dopamine hypothesis.
- Problems arise when trying to test these hypotheses as to carry out a scientific test the thing being tested needs to be observable and behaviours such as motivation are hypothetical constructs which cannot be observed.
- Some theories such as schemas are not testable although their ideas are widely accepted

Objectivity/control

- A science requires variables to be operationalised – made objectively measurable. Psychology often has to investigate indirectly, and cannot fully operationalise variables such as 'stress'. Sweat responses and other physiological measures may be used, but these are indirect and may not firmly link to the concept of 'stress'.
- Both the cognitive, physiological and behaviourist approaches use objective methods such as lab experiments, CAT scans and EEG machines.
- However approaches such as the psychodynamic approach are not objective as methods such as dream analysis rely on personal interpretations therefore making them subjective.

Empiricism

- Demonstrating causality is also important in science. This can be shown in the behavioural and biological approaches through the use of experiments with highly controlled conditions, however it is more difficult to do in areas such as social psychology. Some researchers have criticised Milgram's experiments for actually measuring behaviour in a specific situation rather than 'obedience'.
- Where high levels of controls are used in psychology to improve causality this may lead to a reduction in ecological validity as the behaviour may have no relevance outside of the laboratory setting. They can also lack experimental validity where by the participant does not believe in the experiment.
- If the behaviourist and physiological approaches are to be considered than psychology can be considered to be observable as both approaches focus on behaviour which is an observable phenomenon.
- However the psychodynamic and cognitive approach both focus on the mind which is a hypothetical construct and therefore not observable.
- ** One problem with observation in psychology is that some of the things studied cannot be observed directly - so what are considered to be the effects of fear are measured instead, for instance pupil dilation. This can cause problems as it can be argued that we are not focusing on and testing the thing we originally intended to.

Nomothetic - Core Paradigm

- A science should also be able to demonstrate a core paradigm – a general theory or set of principles to explain the phenomena being investigated. Psychology has struggled to establish such a paradigm, and instead offers a number of different approaches that investigate and explain behaviour using very different viewpoints.
- For example, the biological approach explains behaviour through genetic inheritance, hormones and brain structure, while the learning approach focuses on how behaviour is learned through classical and operant conditioning, as well as from others (social learning theory) - creating laws that can be applied to everyone (in theory).
- ** Taking an idiographic approach, i.e. looking purely at individuals without generalisation, can actually be more scientific than a nomothetic approach as it can make better predictions about individuals. A modern example of how this may be true is that by looking at how individuals have unique genomes and unique environments, using elements of the idiographic approach, we can make better predictions about individuals when compared to the nomothetic approach.

For example, a **nomothetic** approach would predict that 1 in every 5000 children in the UK will develop symptoms of PKU, yet by taking an **idiographic** approach and looking at an individual's genes and what environment they grow up in, we can make far greater predictions about whether a child will develop the disorder.

Conclusion

In conclusion, there are both arguments for and against psychology as a science. In several approaches (biological, cognitive and learning) the scientific principles of objectivity, operationalisation and causality go some way to being established. However, in the psychodynamic approach this is far less the case with major issues of objectivity and a lack of falsifiability reducing any claim to be scientific.

Is Psychology a Science - Example Essay (20 marks)

For a subject to be a science, it needs to be objective – the researcher should not impose his or her own interpretation onto a particular result. Psychology demonstrates this in the biological and cognitive approaches. Both use controlled lab studies to test theories and hypotheses. The biological approach also uses objective physiological measures such as brain scans.

On the other hand, the psychodynamic approach takes a more subjective viewpoint, in which the issues raised by a client are interpreted by the therapist. This approach also raises the issue of the generalisability of results as the single case studies it tends to use may not be applicable to other people or cultures.

A science should develop testable hypotheses and these should be falsifiable (proven false). While the biological and cognitive approaches are able to develop such hypotheses, the concepts (such as id, ego, and superego) in the psychodynamic approach can be neither proven nor disproven. It is unfalsifiable, and therefore unscientific.

Psychology is full of theory which attempts to explain certain phenomenon for example there are several theories for the causation of Schizophrenia - biological (the dopamine hypothesis) and psychological. The problems arise when trying to test these hypotheses, as to carry out a scientific test the thing being tested needs to be observable and behaviours such as motivation are hypothetical constructs which cannot be observed.

Some theories such as schemas are not testable although their ideas are widely accepted

A science requires variables to be operationalised – made objectively measurable. Psychology often has to investigate indirectly, and cannot fully operationalise variables such as 'stress'. Sweat responses and other physiological measures may be used, but these are indirect and may not firmly link to the concept of 'stress'.

Both the cognitive, physiological and behaviourist approaches use objective methods such as lab experiments, CAT scans and fMRI machines. However approaches such as the psychodynamic approach are not objective as methods such as dream analysis rely on personal interpretations therefore making them subjective.

A science should demonstrate reliability in its procedures and results. For psychology to be a science it should demonstrate validity - internal, predictive and ecological. It should also be as reductionist as possible.

Demonstrating causality is also important in science. This can be shown in the behavioural and biological approaches through the use of experiments with highly controlled conditions, however it is more difficult to do in areas such as social psychology. Some researchers have criticised Milgram's experiments for actually measuring behaviour in a specific situation rather than 'obedience'.

Where high levels of controls are used in psychology to improve causality this may lead to a reduction in ecological validity as the behaviour may have no relevance outside of the laboratory setting. They can also lack experimental validity where by the participant does not believe in the experiment.

A science should also be nomothetic. This means able to demonstrate a core paradigm – a general theory or set of principles to explain the phenomena being investigated. Psychology has struggled to establish such a paradigm, and instead offers a number of different approaches that investigate and explain behaviour using very different viewpoints.

For example, the biological approach explains behaviour through genetic inheritance, hormones and brain structure, while the learning approach focuses on how behaviour is learned through classical and operant conditioning, as well as from others (social learning theory) - creating laws that can be applied to everyone (in theory).

** Taking an ideographic approach, i.e. looking purely at individuals without generalisation, can actually be more scientific than a nomothetic approach as it can make better predictions about individuals. A modern example of how this may be true is that by looking at how individuals have unique genomes and unique environments, using elements of the ideographic approach, we can make better predictions about individuals when compared to the nomothetic approach.

** For example, a **nomothetic** approach would predict that 1 in every 5000 children in the UK will develop symptoms of PKU, yet by taking an **ideographic** approach and looking at an individual's genes and what environment they grow up in, we can make far greater predictions about whether a child will develop the disorder.

In conclusion, there are both arguments for and against psychology as a science. In several approaches (biological, cognitive and learning) the scientific principles of objectivity, operationalisation and causality go some way to being established. However, in the psychodynamic approach this is far less the case with major issues of objectivity and a lack of falsifiability reducing any claim to be scientific.

Tasks - these are progressive from C/D to A*

Task 1 - Match the term with the definition (D):

1	Hypothesis		Doing an experiment again + getting same results
2	Falsifiability		Variables that might impact the outcome of your experiment - but you don't want them to!!
3	Objectivity		Being able to disprove a hypothesis
4	Control		Reducing complex phenomena to their smallest explanations, e.g. explaining depression as a result of too little serotonin
5	Extraneous variables		Trying to ensure that other variables (apart from your IV) don't impact your DV
6	Empirical		Looking at individuals and developing theories based on their behaviours rather trying to develop an overarching theory about how something works
7	Replicable		Developing general theories about a science works - e.g. Chemistry = atoms and bonds, Biology = DNA
8	Reliable		A type of validity that, if you have it, means you've controlled for extraneous variables and are sure you are measuring what you want
9	Validity		Based on observable evidence only
10	Internal validity		The extent to which your experiment can be generalised to the real world (from the lab setting usually)
11	Ecological validity		An experiment measures what it is supposed to measure has...
12	Predictive validity		Down to facts and actual observable evidence rather opinions
13	Reductionist		A prediction - written as a statement
14	Nomothetic		The extent to which your hypothesis, experiment or test is able to say what will happen in the future
15	Idiographic		A procedure or process that you can do over and over again in a similar way

Task 2 (C)

Label each paragraph with the main area/s it looks at. This could be from this list:

Hypothesis testing
Reliability

Objectivity
Validity

Empiricism
Reductionism

Replicability
Nomethetic

Task 3 (C/D)

These sentences wouldn't help you reach the C level on their own.

What is missing? Jot down what you could add:

A science should demonstrate replicability reliability in its procedures and results.	
For psychology to be a science it should demonstrate validity - internal, predictive and ecological.	
It should also be as reductionist as possible.	

Task 4 (C+)

Identify (in different colours):

- A01: where is there description - explaining **what** something is
- A03: where is there evaluation and discussion **supported by evidence** (identify for + against)
- A03: where is there judgement/conclusion? Where is the balance in the conclusion?

Task 5 (A/B)

These sentences are currently at a C-D level of discussion - partly because they don't really explain or get into the issue in any great depth. Jot down what you could do to improve these to get to the A/B:

This approach also raises the issue of the generalisability of results as the single case studies it tends to use may not be applicable to other people or cultures.	
Some theories such as schemas are not testable although their ideas are widely accepted	

Task 7 (A/A*)

The section below is at an A/A* level of discussion. Why might that be? Jot down your ideas below:

Taking an ideographic approach, i.e. looking purely at individuals without generalisation, can actually be more scientific than a nomothetic approach as it can make better predictions about individuals. A modern example of how this may be true is that by looking at how individuals have unique genomes and unique environments, using elements of the ideographic approach, we can make better predictions about individuals when compared to the nomothetic approach.

For example, a **nomothetic** approach would predict that 1 in every 5000 children in the UK will develop symptoms of PKU, yet by taking an **ideographic** approach and looking at an individual's genes and what environment they grow up in, we can make far greater predictions about whether a child will develop the disorder