Controversies in Psychology: Scientific Status

(pg 166-167)

What I will need to know:
- Be able to describe the issue of the scientific status of psychology
- Evaluate the issue of the scientific status of psychology
- Be able to apply to a novel situation
- Be able to discuss:
  - Benefits of being a science to society and the economy
  - Changing nature of 'science'
  - Costs of being a science
  - Methodologies used by the various approaches

Introduction
Almost since the beginning of psychology at the end of the 19th century, it has been hotly debated whether the subject is a science or not. Psychology is often referred to as the “science of behaviour”. However, the word science has a specific meaning, and there is a lot of debate as to whether psychology meets the criteria to be classed as a true science. As well as this debate over whether or not psychology is a science, there is also a debate over whether psychology should even strive to be a science. Being a science may bring benefits, but it could be argued that human behaviour is too complex and unpredictable for the rules of scientific inquiry to apply.

What is meant by the term “scientific”? How do we know if something is a science?

In your opinion, is psychology a science? Explain your view.

In your opinion, is should psychology aim to be a science? Explain your view.
What do we mean by “science”?

Before we look at the different aspects of this controversy, it will be worth defining what science is. Science can be defined as “the systematic study of the structure and behaviour of the physical and natural world through observation and experiment”. According to modern definitions, science has the following features (Eysenck and Keane 1990):

1. **Controlled observations**: in most sciences, it is typical for experiments to involve observing the effects of some specific manipulation.
2. **Objectivity**: even if total objectivity is impossible, it is still important for data to be collected in a way as close as objective as possible.
3. **Testing theoretical predictions**: scientific experiments are generally carried out to test the prediction of some theory.
4. **Falsifiability**: the notion that scientific theories can potentially be disproved by evidence.
5. **Paradigm**: there is a generally accepted theoretic orientation within a science.
6. **Replicability**: the findings obtained by researchers need to be replicable or repeatable; it would be hard (or impossible) to base a science in inconsistent findings.

The scientific method is argued to be the best way to find out what is true. The scientific method involves asking a question, creating a hypothesis, testing that hypothesis, drawing conclusions from results, and then reporting those results. The important thing about the scientific method is that if the findings of a study do not support the theory that is being tested, the **theory** changes. This is linked with **falsifiability**.

Science is self-correcting. Theories are never proven true as it is always possible for new evidence to disprove a theory. However, we can tentatively accept theories as true if we fail to find evidence that falsifies them.

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**What is “peer review” and why is it an important part of the scientific process?**

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**1. Benefits of being a science to society and the economy**

One of the key arguments in favour of psychology being scientific is that being a science is beneficial in a number of ways. The scientific method is **empirical**. This means that theories are based on data that is gained through direct observation and experiment rather than by reasoned argument or unfounded beliefs (known as rationalism). Being empirical prevents people from making unfounded claims about human behaviour. For a theory in psychology to be accepted, it must be supported by data and evidence.

This has important social consequences. A person can make any kind of claim they like, and some of these may promote discrimination or prejudice. For example, it has been claimed in the past that certain ethnic groups are mentally inferior, lower in intelligence or morally inferior to others. However, these beliefs are not supported by any empirical evidence. Therefore, such harmful attitudes can be dismissed, as they are easily falsified.
The scientific method is the only way to separate fact from opinion. This is vitally important when examining human behaviour, as we cannot always rely on “common sense”. For example, Milgram’s experiment produced surprising results; no one predicted that the average American man would be potentially capable of murder under the influence of a perceived authority figure. This finding was only discovered through the use of an empirical, scientific study. Studies such as this one have social implications. Milgram initially was aiming to discover what was different about the German people as a way to explain what happened during the holocaust. However, his findings provided strong evidence that it was the social situation, rather than the innate personality of the individual that leads to the behaviour observed. This greater understanding of human nature is important for society to be able to explain and better understand political and historical events.

Another example where psychology has had an effect on society is with the changing diagnosis of homosexuality. Historically, homosexuality was seen as a perversion, or as a mental illness, and early editions of the DSM classified it as such. However, as more and more empirical research was carried out, this classification was seen to be unjustifiable, and eventually it was removed from the DSM. This has huge social consequences; homosexuality is no longer viewed as a problem that needs treatment, but as an alternative and equally valid sexuality. Homosexual people in the UK today have the same legal rights as their heterosexual counterparts. It could be argued that the shift in the public perception of homosexuality can be attributed (at least in part) to its declassification as a mental illness. This is just one example of how empirical, scientific research in psychology can have a trickle-down effect in society in general.

Other social benefits from scientific research comes from studies conducted into the causes of certain negatively perceived behaviour such as addiction. Historically, addiction was seen as signs of moral weakness, and the blame for it was placed squarely within the addict. This had implications for any attempts to modify addictive behaviour, with punishment being the most likely method used. However, due to empirical scientific research, we now know that addiction may have its roots in genes or other biological causes, or social and environmental causes. A growing understanding of the determinants of behaviour such as addiction opens up new options for modification, and may also lead to a more ethical understanding of addicts themselves.

What explanations for addiction have you learned about? How might understanding these causes of addiction help to both alter the public perception of addicts, and also to treat addicts?

It is also vital for psychology to be empirical in the area of treatments for mental illness. Before the rise of empirical research in psychology, treatments for the mentally ill were limited. Institutionalisation was common, and there was little understanding of the causes of mental illness. This lack of understanding therefore meant that treatments were often inappropriate, or even harmful. For example, early lobotomies or electroconvulsive shock therapy were dangerous and ineffective.
Throughout your A-level studies, you have come across many treatments for various disorders or behaviours. These treatments and therapies are nearly all based upon a body of empirical evidence carried out into their effectiveness. The best studies are randomised control trials, where participants will be randomly assigned to be given the treatment or a placebo, so that the effectiveness can be scientifically measured. Such research is important ethically as it means that patients with mental illnesses are not receiving treatment that is at best ineffective, and at worst, harmful.

**Why is such research also important to the economy?**

Think back to the studies and theories from C1. What other examples are there of empirical, scientific research leading to economic or social benefits?

2. **Changing nature of science**

For as long as there have been humans, there has been a desire to understand the world around us. Explanations of the natural world are apparent even in the earliest examples of humans cultures discovered. Our oldest ancestors tried to track the seasons and the stars, and tried to link cause with effect. Curiosity is a core human trait, and humans have always sought to understand the world.

The characteristics of science that we looked at in the introduction may seem obvious to us in the 21st Century. The idea that theories should be empirical (based on evidence) and that studies should be controlled and replicable seem common sense. However, science as a method has evolved over the centuries, constantly being refined and improved. It was the Ancient Greeks who first argued for the importance of empirical theories. Early scientists/philosophers (in the early days of human civilization, there was no distinction between the two) for example argued that all things were made of four elements; earth, fire, water and air.

For centuries, scientific progress was slow, but at the start of the 17th Century, modern science was really born. Technology such as telescopes, microscopes, clocks and barometers allowed reliable and accurate
measurements of the natural world to be taken for the first time. Scientific laws started to be proposed, universities built, and explorers set of on voyages around the world to collect data. However, while huge leaps were being made in physics, biology and chemistry, human behaviour was not systematically investigated.

One early theory of human behaviour came from the Greek Philosopher Hippocrates (400 BC). He argued that differences in personality were attributable to four bodily fluids called “humours”. These were linked to the four elements. Too much of black bile for example could lead to depression while an excess of yellow bile was thought to produce aggression. This idea of the four humours persisted in some form up to the 19th Century.

Psychology in its modern form was only established in the late 19th Century with Wilhelm Wundt who set up the first psychology laboratory at Leipzig University in Germany. He aimed to make the process of investigating human behaviour more scientific by training students in the skill of introspection. This involves objectively observing and reporting your thought processes.

Would introspection meet the criteria of scientific investigation today? Why not?

Later advances in psychological investigation were conducted by Freud at the start of the 20th Century. Freud, like Wundt aimed to investigate human behaviour in a rational, scientific way. Freud used methods such as case studies and clinical interviews (and therefore collected mainly qualitative data) to investigate behaviour in an idiographic way. Freud used the evidence from these case studies to build his theories of behaviour and the mind.

What does idiographic mean?

Do Freud’s methods meet the modern criteria for scientific investigation? Why not?

Modern psychologists still use qualitative methods such as case studies and interviews. However, how do they ensure that the data they collect is valid and objective?
While Wundt and Freud were the first to make a scientific attempt at the investigation of human behaviour, it has been argued that psychology as a modern science can be credited to John Watson, the father of behaviourism. The behaviourists argued that the mind is a black box, and that while thoughts and feelings exist, they cannot be observed and measured, and therefore are not worthy of scientific study. Behaviour on the other hand could be accurately observed and measured, and so therefore according to behaviourists, the only valid method of investigation is to measure observable behaviour. Watson was influenced by the work of Pavlov who discovered classical conditioning in dogs. Watson wanted to apply the same scientific rigour to the study of behaviour in humans.

As technology has progressed, the methods used for investigating behaviour have become more refined. The cognitive approach has made great use of the lab study which meets the criteria for a highly scientific method of investigation. Biological psychology has been able to look inside living brains through the use of brain scans. Unlike Watson, modern psychologists can start to look inside the “black box”.

**What is triangulation, and how is it used to check the validity of research findings?**

The scientific process itself has also been refined in order to improve the scientific rigour of research. Initially, peer review was done through researchers circulating letters of their findings to each other, simply to share their work. There was no effort to use this process to authenticate or validate findings. The responsibility for scientific integrity relied upon the author of the paper. It wasn’t until the middle of the 20th Century that research began to be subjected to review from peers outside of the publisher of a journal. Peer review is now a vital part of the scientific process, as it ensures that only research that meets the highest scientific standards is published. The peer review process is still evolving. The internet has opened up peer review to a greater number of reviewers.

As you can see, the methods used to investigate human behaviour have undergone huge changes over the years, and it is likely that these changes will continue into the future. Psychology has moved from being a philosophical investigation, towards a legitimate science. However, one area where psychology may progress in the future is with regards to the development of a paradigm.

According to Kuhn (1962) the most essential ingredient in a science is what is called a paradigm. This is a theoretic orientation which is accepted by the great majority of workers in that field. A paradigm is a set of assumptions which can govern the subject. This includes what is to be observed and scrutinized, the kind of questions that are supposed to be asked and probed for answers in relation to this subject, how these questions are to be structured, and how the results of scientific investigations should be interpreted. Kuhn (1970) argued that there are three distinct stages in the development of a science.

1. **Pre-science**: no paradigm exists, and there is much debate about what the subject is and its theoretical approach.
2. **Normal Science**: A generally accepted paradigm that can account for all the phenomena related to the subject, and can explain and interpret all findings.
3. **Revolutionary science**: evidence against the old paradigm reaches a certain point, and there is a paradigm shift. The old paradigm is replaced by a new one.
A good example of a paradigm shift was in physics. Copernicus showed that the earth revolved around the sun, which replaced the old paradigm of the sun revolving around the earth.

**According to the definition by Kuhn, does psychology have a paradigm? What evidence do you have?**

3. Costs of being a science
While being a science undoubtedly brings benefits to both psychology and society in general, being a science may have its drawbacks. It could be argued that trying for force complex human behaviour to fit the demands of scientific investigation means that we lose sight of what it is we are attempting to investigate in the first place.

**Scientific methods are not appropriate for psychology**
Some have also argued that due to the nature of human behaviour, psychology can never be a true science. Miller (1983) suggests that psychologists who attempt to be scientists are doing no more than “dressing up”. They take on the tools of science such as quantifiable measures and statistical analysis, but the essence of science has eluded them. He suggests psychology is a pseudoscience (an approach that claims to be scientific, but does not adhere to the key principles of the scientific process). However, this is more dangerous in psychology as psychologists claim their findings to be “fact”, and findings in psychology can be used as the basis for public policy.

Linked in with Miller's objection above is the criticism that while the scientific method may be appropriate for studying other elements of the natural world such as cells or atoms, the method is not suitable for humans. Popper (1972) argued that it is impossible to observe something and remain completely objective. He argues that no-one ever observes without some idea of what they are looking for. Thus, scientific observation is always driven by hypotheses and theories, and what you observe depends in part on what you expect to see. Psychology has the unique position of being humans studying other humans. This can make objectivity difficult as Popper argues that we all see the world from our own viewpoint or biases. This can influence our observations. While objectivity can be an issue in all sciences, it is particularly relevant in psychology as what we are measuring is often human behaviour, which unlike atomic mass, or miles per hour can often not be measured completely objectively and often relies on the interpretation of the observer.

Another issue with the use of the scientific method is that the things under investigation (i.e. people) are not just passive, unresponsive and unreactive. Heather (1976) was very dismissive of laboratory experiments. He argued that they were very artificial, and all that can be learned from them was how strangers interact in an unusual situation. This is an issue as what we find in psychological studies may not actually reflect real life, yet they are published and discussed as facts.

**Can you think of any studies where the results may just be due to the artificial nature of the study rather than reflecting real valid behaviour?**
Psychology should not aim to be a science

Some approaches in psychology are opposed to psychology being a science. The **humanistic approach** is strongly opposed to the traditional scientific approach to psychology. According to the humanist psychologist **Maslow (1968)** “The uniqueness of the individual does not fit into what we know of science”. In other words, science is an inadequate tool for completely understanding the human experience. If we really want to investigate and understand human behaviour, we must use more idiographic than nomothetic methods. We also need to be less reductionist in our studies and theories so that we are truly understanding human behaviour. However, reductionism is a core scientific principle.

**What is reductionism, and why can it be a bad thing?**

The humanists favoured the use of **phenomenology** in which individuals report their conscious experiences in as pure and undistorted way as possible. This approach was justified by **Rogers (1959)** as being more valuable than traditional scientific measures, as it gives the deepest insight into experiences. It could also be argued that the data would be much more valid than by using traditional scientific methods, and be more representative of real life. However, this would also raise issues of reliability. So in this method of investigation is unscientific, which the humanists would argue is the point, and something to be desired!

Another area in which the goals of science are considered inappropriate is with the treatment of psychological disorders. **Laing (1965)** argued that by using scientific explanations to explain and treat schizophrenia, important factors were missed out such as the distress and suffering experienced by the patient. He argued that each individual could only be treated by seeing them as a unique individual rather than a set of symptoms. Evidence for this argument comes from the success rates of various treatments. For example, psychoactive drugs and ECT (which are both ‘scientific’ treatments) have had limited success, suggesting that the scientific method may not always be appropriate. In particular, rather than being nomothetic, the treatment of mental illness needs to be more idiographic.

4. Methodologies used by the approaches

The five approaches that you learned about in C1 each investigate behaviour in different ways. These various research methods differ in the extent to which they could be classed as scientific, and this in turn has its own strengths and weaknesses.

The fact that each approach tends to use different methods, and has different approaches towards the investigation of human behaviour means that trying to draw any overall conclusions about the scientific status of psychology as a whole is problematic. Each approach investigates behaviour differently; some of the methods are scientific, some are not.

**On the A3 sheet, complete the table to show the main methods used by each approach, an example of a study, an description of how scientific these methods are, and an evaluation.**
Conclusion

What can you conclude in this controversy? Does psychology qualify as a science? Do you think it should be a science? What is the biggest benefit from being a science? What is the biggest drawback? In what direction do you think psychology should go? How has psychology changed over time? How might it change in the future?
Exam Practice

1. “Psychology can only benefit from seeking status as a science.” To what extent do you agree with this statement? [25]
   - This question is testing your AO2 application skills [10]. You can gain AO2 marks from providing evidence and examples to support the points you make, providing good arguments, and using correct terminology.
   - It is also testing your AO3 evaluation skills [15]. You can gain AO3 marks by interpreting the evidence, discussing the arguments and evaluating them, and coming to a conclusion.
   - There is a large scope to discuss many issues in this essay. The question does not specify any particular subtopic that needs to be included, but it is asking for a discussion of the quote given. You need to ensure to give both arguments for and against.
   - You need to reference specific studies and/or theories in your answer. These should be used to demonstrate the points that you make.
   - You need to come to a conclusion. This means that at the end you need to have provided an answer to the quote given. You may agree, disagree or be sitting on the fence. However, your conclusion should follow logically on from the arguments and evidence you have presented.

2. “When psychological research is conducted in a scientific way, it brings benefits to society and the economy.” With reference to this quote, assess the scientific status of psychology. [25]
   - This question is testing your AO2 application skills [10]. You can gain AO2 marks from providing evidence and examples to support the points you make, providing good arguments, and using correct terminology.
   - It is also testing your AO3 evaluation skills [15]. You can gain AO3 marks by interpreting the evidence, discussing the arguments and evaluating them, and coming to a conclusion.
   - There is a large scope to discuss many issues in this essay. However this essay clearly states that you need to include the benefits of being a science to society and the economy in your answer. While this does not necessarily need to be your entire answer, it needs to be included.
   - You need to reference specific studies in your answer. These should be used to demonstrate the points that you make.
   - You need to come to a conclusion. This means that at the end you need to have provided an answer to the quote given. You may agree, disagree or be sitting on the fence. However, your conclusion should follow logically on from the arguments and evidence you have presented.

3. “There are many drawbacks to psychology being a science.” With reference to this quote, assess the scientific status of psychology. [25]
   - See the notes for Q2 above.

4. There is an additional question on page 167 in the textbook with a step by step guide on how to answer it.