

Psychology as a Science

### Falsifiability

If an experiment is replicated and yields different results, it has arguably been **falsified**. **But** to what extent has it been falsified? How many studies are required to prove that another is false?

Scientists should therefore attempt to falsify their theories, as opposed to trying to confirm them.

E.g. Popper was initially cynical of the falsifiability of natural selection. Freud's theory regarded the unconscious and so was unfalsifiable (and was also based on idiographic data). Many humanistic theories (Rogers' theory of 'self actualisation' or Maslow's 'hierarchy of needs' theory) are unfalsifiable. These are example of alleged **pseudo-sciences**. However, it could be argued that the discusssion that these theories provokes warrants their existence (e.g. Bowlby extended Freud's theories brilliantly. As did Michael Rutter after that!)

**20th Century philosopher Karl Popper** asserted that a theory is only scientific if it is falsifiable. He proposed this as a solution to the **problem of induction**, which states that people make deductive statements using their own experiences (e.g. "all swans are white") to make conclusions about objects they haven't experienced. Theoretically, a statement is only true until it has been falsified (e.g. australian black swans).

How realistic is this in practice? How useful was the '**reification**' of Behaviourism in explaining behaviour?!

**Thomas Kuhn** argued that science undergoes stages of "**paradigm shifts**" in which a major breakthrough occurs and shifts the direction of research. Science is broken up in to three stages: **Pre-science**, which lacks a central paradigm. Then **normal science**, which has a paradigm. A build up of refuting evidence is seen to suggest more and more that the existing paradigm is false, and this builds up to a critical mass. At this point, **revolutionary science** occurs under a 'paradigm shift'. This partly suggests that falsifying evidence is not the be-all-and-end-all of a theory.

**Imre Lakatos** sought to resolve the supposed Kuhn-Popper conflict by developing a methodology in which the scientific method could be both **rational and conform with historical progress**. He did this by suggesting **Research Programmes** in which groups are dedicated to prove separate and conflicting theories.

To ensure that the findings of a previous experiment were not systematically **biased**, it is important to replicate an experiment. It also helps to ensure that the experimental hypothesis can be **generalised**.

### Replication

The scientific method is a set of rules consisting of certain assumptions, attitudes, goals and procedures for creating and answering questions about nature.

### Definitions

#### Psychology

"The scientific study of the mind"

"The scientific study of behaviour"

"The scientific study of the brain"

Most definitions will use the word 'scientific'. So, to what extent is psychology scientific, and what does it actually mean to be scientific? Why is it important?

#### Definitions of Science

"the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment"  
**OED**

If we develop a descriptive hypothesis, are we able to explain behaviour, even though we are not identifying a cause? This would raise questions about quasi, correlational and natural studies.

#### We aim to describe, explain, control and predict

But if we can't do these things then are we still partaking in Science? For example, when describing the modus operandi of a killer or describing brain abnormalities in a fMRI machine (e.g. Raine), are we able to predict future killers?

But this is inherently deterministic. The nature of science is such that we are looking to find out what determines what.

#### Identifying a cause and an effect

## The Scientific Approach

### The mind

"The faculty of consciousness and thought that enables a person to think, feel and behave."

#### How do we study it?

**Typical adult function** – e.g. reactions to spots on a screen, behaviour in a group.

**Atypical Function** – Schizophrenia, brain lesions, severe amnesia (Psychopathology).

**Development** – Age of acquiring words.

**Introspection or Observation?** Introspection is unreliable and people can be prone to all sorts of biases (e.g. judgments about one own attitudes can be subject to social desirability or may differ from implicit attitudes (Greenwald et al. and the IAT, 1998)). Observation of other people must therefore be the correct method.

**This is why psychology must be treated as a science! Because it is studying through observation and experiment.**

### Theories

**1. Develop a Hypothesis** – In order to describe, explain, predict and control, we need to develop a question about what we are investigation, known as a hypothesis. This might be based on a theory (which is parsimonious, predictable and falsifiable) or on an idea (even an introspection). It must be as **parsimonious** as possible, so as to ensure that it is not overly complex. Only when we find subtle differences can we adapt the hypothesis and the theory

**2. Design an objective, empirical, systematic and controlled study** – Objective because it must reflect what describe without bias. Empirical because it must be observed to be true, not just predicted or theorised. Systematic because it must be careful of inconsistencies in behaviour and all participants should have the same experience. Controlled to ensure the experiment measures what it claims to be measuring.

**3. Conduct the study** – Gather observations through data and descriptions. This satisfies the objectivity and empiricism criteria.

**4. Confirm or Revise Hypothesis** – Based on observations!

**Blindsight (Weiskrantz, 1986)** – Showed that thought participants could not see light in a particular area in their field of vision, it was reasonable to assume that their visual cortex was registering the light. Theory, in this case took precedent over the apparent 'empirical' importance of science.

**These tie in to the exam question** "What distinguishes science from other forms of human enquiry?"

**The objective nature of science** can be problematic in particular for the patients of psychology and more so, psychiatry. **R.D. Laing's** objection to the objectivity of psychiatry made him widely appreciated for taking a 'person-centred' even 'humanistic' approach to treatment. Defying science in this way arguably made him closer to achieving the ultimate goals of Psychology than any 'true' scientists!