

Tick Sheet

Ψ **Origins of Psychology**

- Wundt
- Introspection
- The emergence of psychology as a science

The basic assumptions of the following approaches

Ψ **Learning Approaches**

- The Behaviourist Approach
 - Classical Conditioning & Pavlov's research
 - Operant Conditioning, Types of Reinforcement & Skinner's research
- Social Learning Theory
 - Imitation, Identification, Modelling, Vicarious Reinforcement
 - The role of mediational processes & Bandura's research.

Ψ **Cognitive Approach**

- Internal mental processes
- Role of schema
- Use of theoretical and computer models
- The emergence of cognitive neuroscience

Ψ **Biological Approach**

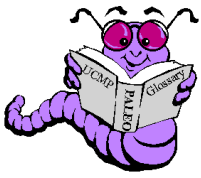
- Influence of genes, biological structures & neurochemistry on behaviour.
- Genotype and phenotype
- Genetic basis of behaviour
- Evolution and behaviour

Ψ **Psychodynamic Approach**

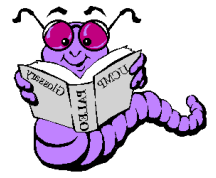
- The role of the unconscious
- The structure of personality - ID, ego and superego
- Defence mechanisms - repression, denial and displacement
- Psychosexual stages.

Ψ **Humanistic Approach**

- Free will, Self-actualisation and Maslow's hierarchy of needs
- Focus on the self & Congruence
- The role of conditions of worth
- The influence on counselling psychology
- Comparison of approaches



Key Terms Glossary



Ψ Approaches

- Psychology
- Science
- Empiricism
- Introspection

Ψ Learning Theory

- Behaviourism
- Classical Conditioning
- Neutral Stimulus
- Unconditioned Stimulus
- Unconditioned Response
- Conditioned Stimulus
- Conditioned Response
- Extinction
- Spontaneous Recovery
- Stimulus Generalisation
- Operant Conditioning
- Positive Reinforcement
- Negative Reinforcement
- Punishment
- Social Learning Theory
- Direct Reinforcement
- Indirect Reinforcement
- Imitation
- Modelling
- Vicarious Reinforcement
- Meditational Processes
- Attention
- Retention
- Motor Reproduction
- Motivation
- Mental Representation
- Self-Efficacy
- Identification

Ψ Cognitive Theory

- Cognitive Approach
- Internal Mental Processes
- Schema
- Inference
- Cognitive Neuroscience

Ψ Biological Theory

- Biological Approach
- Genes
- Monozygotic Twin
- Dizygotic Twin
- Concordance Rate
- Biological Structure
- Neurochemistry
- Genotype
- Phenotype
- Evolution
- Natural Selection
- Sexual Selection

Ψ Psychodynamic Theory

- Psychodynamic Approach
- The Unconscious
- ID
- Pleasure Principle
- Ego
- Reality Principle
- Superego
- Morality Principle
- Defence Mechanisms
- Repression
- Denial

- Replacement
- Psychosexual Stages
- Fixation
- Oral Stage
- Oral Fixation
- Anal Stage
- Anally Retentive
- Anally Expulsive
- Phallic Stage
- Oedipus Complex
- Electra Complex
- Penis Envy
- Latency Stage
- Genital Stage

Ψ Humanistic Theory

- Humanistic Approach
- Free Will
- Hierarchy of Needs
- Physiological Needs
- Safety and Security
- Love and Belonging
- Self Esteem
- Self-Actualisation
- Self
- Self-Image
- Self-Concept
- Ideal Self
- Actual Self
- Congruence
- Conditions of Worth
- Client Centred Therapy
- Unconditional Positive Regard
- Counselling Psychology



Origins of Psychology

The idea of psychology as a distinct branch of study in its own right is generally dated at around **1880** (if you are European) when the first experimental laboratory was established. That said, the philosophical roots of psychology stretch back much earlier than this. We will need to consider these early roots as well as understand how psychology became a scientific discipline. The word “psychology” comes from the Greek word “Psyche” meaning “mind” and the Greek word “logos” means “study of”. However most Psychologists might consider “The study of the mind” a too narrow definition when describing the diverse and multidisciplinary nature of their work. The widely accepted definition however is:

The scientific study of the human mind and its functions, especially those functions affecting behaviour in a given context.



Philosophical Roots

Rene Descartes (1596-1650): a French philosopher, suggested that the mind and body are independent from each other – a philosophical stance that came to be known as **Cartesian Dualism**. Descartes demonstrated his own existence with the famous quote “I think therefore I am”

Q: Impact on Psychology...

John Locke (1632 – 1704): proposed **Empiricism**, the idea that all experience can be obtained through the senses, and that human beings inherit neither knowledge nor instincts.

Q: Impact on Psychology...

Charles Darwin (1809 – 1882): central to his **evolutionary** theory is the notion that all human and animal behaviour has changed over successive generations, so that individuals with stronger, more **adaptive** genes survive and reproduce. Thus, these weaker genes are weeded out (**survival of the fittest**).

Q: Impact on Psychology...

History of Psychology

<http://origins.bps.org.uk/#>

1860 – Experimental Philosophy/Psychology

1875 – Wilhelm Wundt

1896 – Freud (Psychoanalysis)

1900s – Psychodynamic Approach

1901 – BPS Founded

1913 – John B Watson

1927 – Pavlov

1930s – Behaviourist Approach

1932 – Bartlett

1938 – BF Skinner

1943 – Maslow

1950s – Humanism Approach

1960s – Cognitive Psychology

1961 – Bandura

1963 – Milgram

1974 - Loftus

1980s – Biological Approach

1998 - fMRI

2000s – Cognitive Neuroscience

Your teacher will tell you which of these you will be required to know for your AS approaches section, which will be required at A level for the approaches section, which are from other parts of the course, and which are just interesting moments in our history.

☐

Needed for AS Approaches

☐

Needed for A Level Approaches

☐

Needed in other sections

☐

Just for Interest

Create a time line poster of these events. Colour coded with this key.

Psychology as a Science

Replicability:

The findings obtained by researchers need to be replicable or repeatable; it would be hard (or impossible) to base a science on inconsistent findings.

Replicability or repeatability of findings in psychology varies enormously. Replicability tends to be greatest when experiments are conducted in a carefully controlled way (e.g.) and it tends to be lowest when the experimenter is unable to manipulate the variable or variables of interest (e.g.).

Objectivity:

Scientists strive to be objective in their observations and measurements. Their expectations or any other internal or external factors should not affect what they record.

Some psychologists claim that human behaviour can be measured as objectively as the measurement of physical objects.
HOWEVER in psychology the object of study reacts to the researcher and this leads to problems such as experimenter bias and demand characteristics which compromise validity.
For Example?

Control:

Scientists seek to demonstrate causal relationships to enable them to predict and control our world. In most sciences it is typical for experiments to observe the effect of one thing (IV) over another (DV) in a controlled environment

Do we always have control?

Can we always have control?

Would we know more if we did?

Kuhn & Popper:

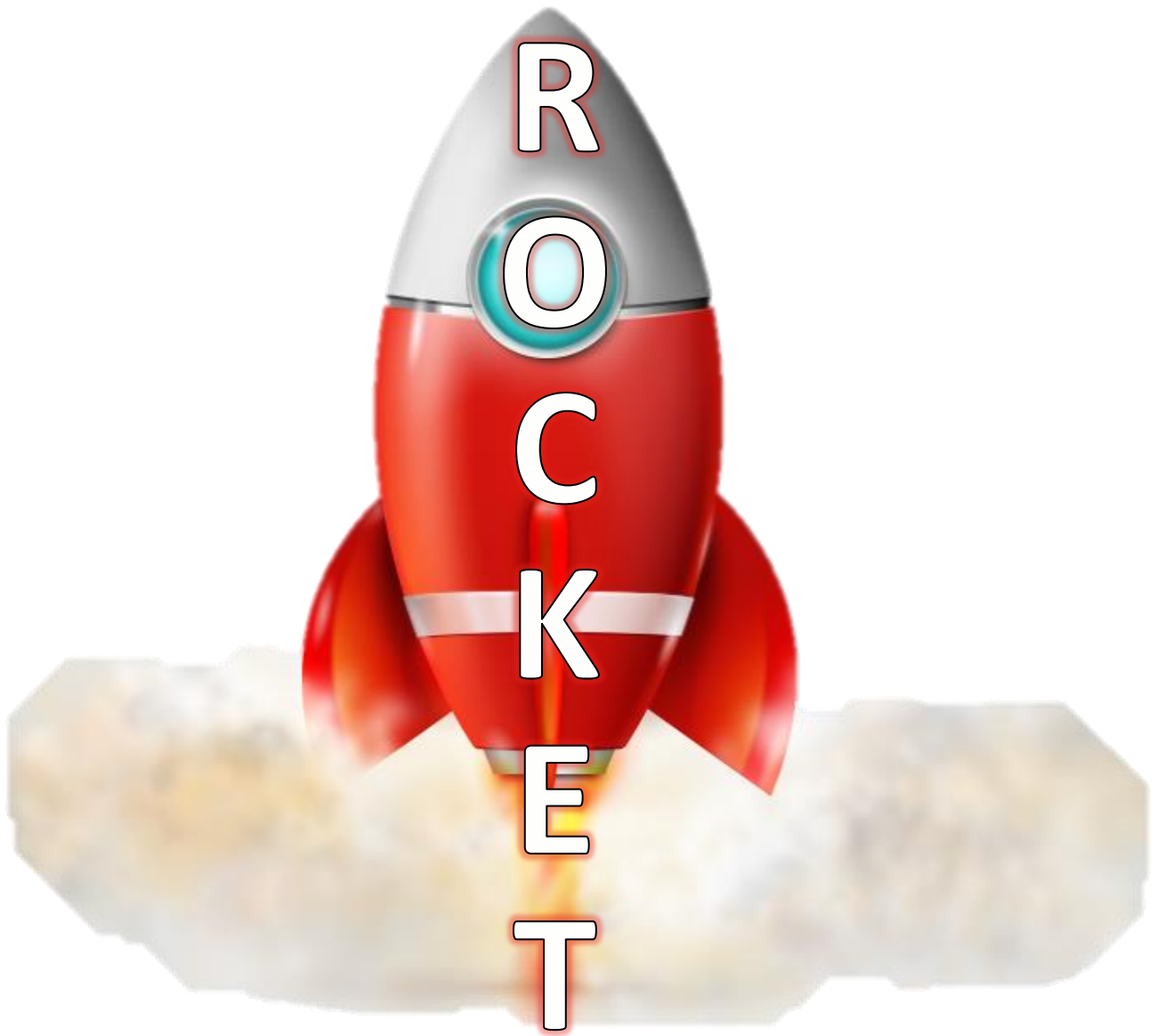
Empiricism:

In science information is gained through direct observation or experiment rather than by reasoned argument or unfounded beliefs.

It can be argued that some theories in psychology have been created without enough empirical evidence and therefore their theories are unfounded. **For Example?**

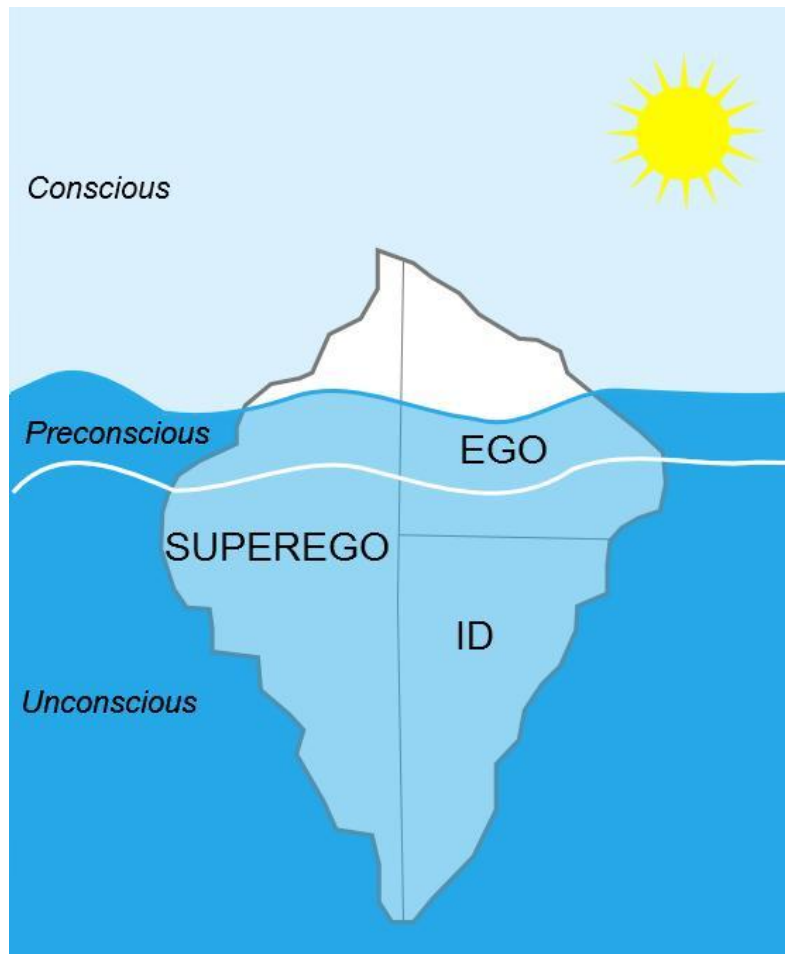
Theory Construction:

Add to your timeline evidence of where Psychology is becoming more scientific, and why?



Psychodynamic Approach -1900s

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Meet The Psyche

• **The id** - This is the animal part of the psyche and is governed by instinctual drives like food, drink and sex. Its general motive is the satisfaction of these desires. If frustrated it becomes aggressive

ID



• **The superego** - This is the moral part of the psyche and is governed by the need to behave in ways our parents would approve of. When we don't, it punishes us with anxiety and guilt.

SUPEREGO



• **The ego** - This is the part of the psyche concerned with reality. It tries to balance out the demands of the id with the constraints of the superego in a way that is realistically possible

EGO



Neurotic Personality:

Psychotic Personality:

Psychopathic Personality:

Stage Theory - Fixation

<i>Stage</i>	<i>Age</i>	<i>Erogenous Zone</i>	<i>Key Experience</i>	<i>Fixation (abnormality)</i>
<i>Oral</i>				
<i>Anal</i>				
<i>Phallic</i>				
<i>Latency</i>				
<i>Genital</i>				

Defence Mechanisms

A defence mechanism is the act or technique of coping mechanisms that reduce anxiety generated by threats from unacceptable or negative impulses.

In Freudian psychoanalytic theory, defence mechanisms are psychological strategies brought into play by the unconscious mind to manipulate, deny, or distort reality in order to defend against feelings of anxiety and unacceptable impulses to maintain one's self schema.

Repression

Denial

Displacement

Psychological disorders are defence mechanisms against repressed emotional problems and impulses. The symptoms of a disorder have a hidden meaning that can be decoded. For example, depression is the aggression against the parents turned back in on the self, and anxiety disorders and the fear of something (e.g. sex) that is projected onto something harmless.

People are unaware of the causes of their behaviour because they operate in the unconscious and are the result of repression or unresolved conflicts. Therefore, a therapy needs to uncover this with a therapist tracing the behaviour back to find its origins. Whilst doing so, they attempt to help the client to deal with what comes up. There are several techniques needed to do this...

- Free Association
 - Rorschachs
 - Dreams
-

- Catharsis

Spot The Mistakes

Below is a description of treatments associated with psychoanalysis. Can you spot the 10 deliberate mistakes in this text....

Repression and the unconscious mind

As a therapy, psychoanalysis is based on the idea that individuals are aware of the many factors that cause their behaviour, emotions and general health. Some of these factors operate at an unconscious level, and are the result of regressed memories or resolved conflicts from childhood. During psychoanalysis, the therapist attempts to trace these unconscious factors to their origins and then help the individuals deal with them. The therapist uses a variety of different techniques to uncover repressed material and help the client deal with it.

Free association

One such technique is known as free association, in which the patient expresses thoughts exactly as they occur, even though they may seem unimportant or irrelevant. Freud believed that the value of free association lies in the fact that the associations are driven by the conscious factors which analysis tries to uncover. This procedure is designed to reveal areas of conflict and to bring into consciousness memories that have been repressed. The patient helps interpret these for the therapist, who corrects, rejects, and adds further thoughts and feelings.

Therapist intervention

Therapists often listen carefully as their patients talk, looking for clues and drawing tentative conclusions about the possible effect(s) of the problem. Patients may initially offer resistance to their therapist's interpretations (e.g., changing the subject to avoid a painful discussion), or may even display *transformation*, where they recreate the feelings and conflicts and transfer these onto the therapist (e.g. acting towards the therapist as if he was they despised parent).

Working through

Psychoanalysis is a brief form of therapy. Patients tend to meet up with the therapist four or five times a year. Together the patient and therapist examine the same issues over and over again, sometimes over a period of years, in an attempt to gain greater clarity concerning the causes of their neurotic behaviour.

Evaluating Psychodynamic

Although Freud's theory is controversial in many ways, and occasionally bizarre, it has nevertheless had a huge influence on psychology and Western contemporary thought. Alongside **Behaviourism**,

the psychodynamic approach remained the dominant force in psychology for the first half of the 20th century and has been used to explain a wide range of phenomena including personality development, abnormal behaviour, moral development and gender. The approach was the first to make the link between physical illness and mental causes and is significant in drawing attention to the connection between experiences in childhood, such as our relationship with our parents, and later development (Bowlby was heavily influenced by psychodynamic ideas).

Point:

Because:

So what?:

However:

Freud's theory was based on the intensive study of single individuals who were often in therapy (Little Hans, Dora, Ratman, Anna O). Although Freud's observations are detailed and carefully recorded, critics have suggested that it is not possible to make such universal claims about human nature based on the studies of such a small number of individuals who were psychologically abnormal. Furthermore Freud's interpretations were highly subjective; it is unlikely, in the case of Little Hans for instance, that any other researcher would have drawn the same conclusions. In comparison with other approaches Freud's methods lack scientific rigour.

Point:

Because:

So what?:

However:

The philosopher Karl Popper (no white swans) argued that the Psychodynamic approach does not meet the scientific criterion of **falsification**, in the sense that it is not open to empirical testing (and the possibility of being disproved). Many of Freud's concepts (such as the id and Oedipus Complex) are said to occur at an unconscious level, making them difficult, if not impossible

Point:

Because:

So what?:

However:

The biological approach is **deterministic** in the sense that it sees human behaviour as governed by internal, biological causes over which we have no control. This has implications for the legal system and wider society. One of the rules of the law is that offenders are seen as legally and morally responsible for their actions. The discovery of a 'criminal gene', if there was such a thing, may complicate this principle. **Consider: if scientists discovered a 'criminal gene' that made someone more likely to offend, and carries could use this as a defence in court, what would be the implications for society and the legal system?**

Point:

Because:

So what?:

However:

Identical twins, non-identical twins and members of the same family all have genetic similarities. Therefore, the biological approach argues, any similarities in the way that they look or behave must be genetic. However, there is an important **confounding variable**. They are also exposed to similar environmental conditions. This means that findings could just as easily be interpreted as supporting **nurture** rather than **nature**. This approach also has difficulty accounting for the fact that, in research studies, DZ twins often show higher concordance rates than pairs of ordinary siblings. This is likely to be explained by the influence of nurture as DZ and ordinary siblings both have about 50% (on average) genes in common.

Point:

Because:

So what?:

However:

The Behaviourist Approach 1913

Behaviourism was influenced by empirical philosophy that argues knowledge comes from the environment via the senses, since humans are like 'tabula rasa' or blank slates, at birth. It was also influenced by the physical sciences that emphasised scientific and objective methods. John Watson started the Behaviourist movement in 1913 when he wrote an article entitled 'Psychology as the behaviourist views it', which set out its main principles and assumptions.

"Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select - doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations and the race of his ancestors" (Watson, 1924, p. 104).

It includes theories of learning such as classical and operant conditioning that they attempted to use to explain virtually all behaviour. The behaviourist approach dominated experimental psychology until the late 1950s, when its assumptions and methods became increasingly criticised by cognitive psychologists. The behaviourist theories were modified to provide a more realistic approach by psychologists such as Bandura with his social learning theory.

Classical Conditioning

Learning theories in psychology comprise two main types: classical conditioning (also known as Pavlovian or respondent conditioning) and instrumental and operant conditioning. The origin of learning theory as a psychological discipline has its roots in a branch of philosophy called empiricism, also referred to as associationism.

Associationism marked a huge departure from another view of the human condition derived from Descartes's doctrine of innate ideas. John Locke, for example, challenged Descartes's position by suggesting

that ideas were not inborn but were derived from experience. For Locke, the mind at birth was a tabula rasa (blank slate), devoid of content until experiences shaped it. For Locke, ideas in the mind were learned through association. Associations developed because the sensations occurred close together in time and space, i.e. contiguously.

Pavlov's dogs

Contiguity became one of the basic laws of learning. Pavlov discovered that dogs could learn to associate two stimuli, such as the sound of a metronome and food. The basic

paradigm which illustrates the role of association is as follows.

CS \longrightarrow No relevant response

A conditional stimulus (CS), such as a bell, light or metronome, elicits no relevant response.

UCS \longrightarrow UCR

An unconditioned stimulus (UCS) such as food, elicits an inborn, unlearned automatic unconditioned response (UCR), such as salivation.

CS \searrow

First and Second Year Approaches

UCS → UCR

A conditioned stimulus (CS e.g. a bell, presented together (contiguously) with an unconditioned stimulus at first elicits an unconditioned response (URCR), i.e. salivation.

CS → CS

Eventually the CS (bell) elicits the CR (salivation) where it had not done so before.

The CS gained its power to elicit a conditioned response (CR) by being associated with the unconditioned response (UCR) when they were

observations about a rat's or anyone's conscious states failed to yield much agreement. Because Watson claimed that the focus of psychological investigation should be on observable behaviour, he was known as a **behaviourist**. The behaviourist school of thought was dominant until the 1950s.

Abnormal psychology

If we return to Pavlov's conditioning procedure, we can see that associations could be made and equally they could be broken. For example, if the food (UCS) was no longer offered after the light or bell (CS) was presented; the light (CS) would gradually lose its power to

for the first time behavioural psychologists described abnormal behaviours as a set of acquired behaviours which could be unacquired, thus giving hope that something could be done about them. Indeed, Watson himself demonstrated the power of Pavlov's ideas by conditioning a baby to fear a pet white rat. As in the model below, the rat (CS) produced no relevant response. Subsequently a loud noise (UCS) was introduced just prior to the introduction of the rat. The noise made the baby cry and show signs of fear. The rat (CS) now automatically elicited signs of fear in the child which it had not done



presented contiguously.

An American psychologist, Watson, was intrigued by the associationists, especially the important role that learning was assigned in human development. Working with animals, Watson became convinced that their behaviour could be categorised into behaviours that could be verified by other psychologists and those that could not. The verifiable behaviours were to do with movement. Whether a rat turned right or left in a maze was verifiable, whereas

elicit the salivary response (CR), a process described as **extinction**. One other observation was made. If a different light, say a red one, was presented, this would elicit a conditioned response but slightly weaker than the original light and this process was called **generalisation**. Psychologists realised that if one could acquire a set of behaviours, i.e. learn something, one could also unlearn the behaviours.

This represented a new way of viewing the human condition – humans were seen as pliable. For example, in abnormal psychology,

before. These acquired fear behaviours also obeyed learning laws such as generalisation and extinction. The baby became frightened of toy rats and white fluffy materials. Watson also demonstrated that the fear could be overcome through the process of extinction. In other words, the fear could be unlearned. The application of these learning principles gave rise to new and powerful techniques for treating abnormal behaviours such as phobias.

While the model appeared to be a reasonable explanation of the causes of phobias, there were some problems surrounding the generality of the principles. First, there was the problem of the selectivity of phobic objects. Phobias seem to be restricted to a small range of objects. Why? Second, most spiders are harmless, so how do they become a CS for fear? The Pavlovian model would demand that the association of the spider with fear could only come about through the contiguous presence of spider and pain, so that spiders and pain become associated. Most people have never had a painful experience with spiders, yet many are petrified of them. According to Pavlov, all stimuli have **equipotential**, i.e. any stimulus can become a CS if it occurs contiguously with a UCS. Why, therefore, are phobic objects limited?

The power of a CS

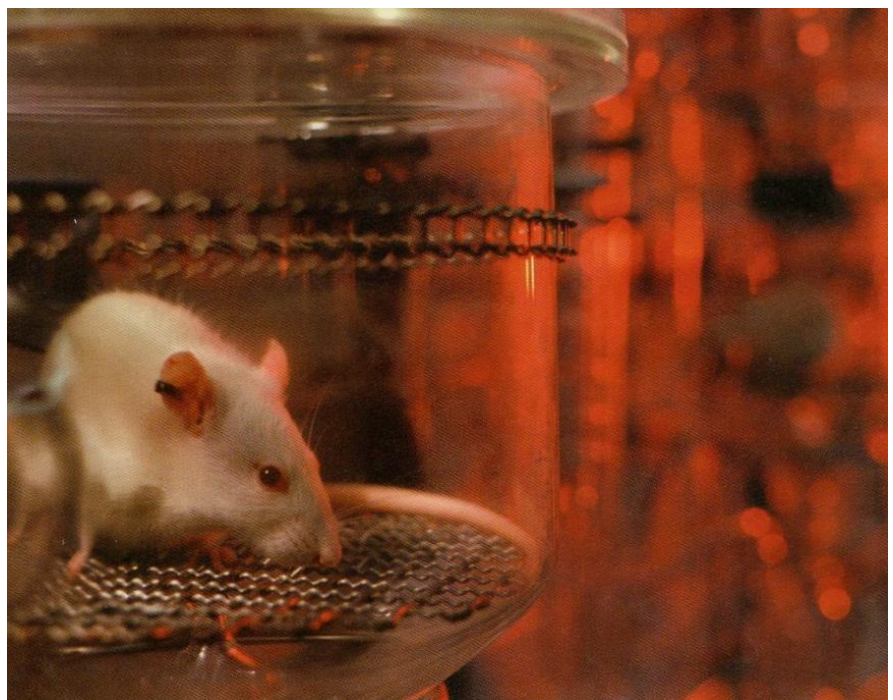
Many people will remember a time when they consumed something that made them ill and continue to retain an aversion for that substance. Researching the phenomenon of taste aversion has provided support for the notion that organisms have a **biological predisposition** to learn certain behaviours. This proved somewhat embarrassing for the behaviourists, because extreme views like Watson's suggested that conditioning experiences, not biology, determined our behaviour. One of his famous statements was that if he had a dozen healthy infants with his own specialised world in which to bring them up, he could produce any variety of individuals: saint, beggar, doctor, lawyer or thief. Now, Pavlov had said that any stimulus could acquire the power of a CS simply by being

paired with an appropriate UCS. Accordingly, all UCSs should be equally potent in becoming associated with a CS.

In one landmark experiment by Garcia and Koelling (1966), thirsty rats were allowed to drink a saccharin-flavoured solution while a light and noise stimulus was also presented. This was called the bright-noisy-tasty water experiment. The bright-noisy-taste CS was followed by a UCS. In one group, the UCS was shock and in another group the UCS was lithium chloride – a substance that produces nausea. Subsequently, the animals were tested for acquired taste aversion. The idea involved separating the compound stimulus into its components, so that the rats had a choice of drinking from three sources: sweet water, coloured water or noisy water.

flavoured water. In complete contrast, the poison-injected rats showed strong aversion to the flavour, but not to the light. In other words, the rats easily learned the flavour/poison association and the association between light/noise and shock, thus demonstrating unequivocally that CSs and UCSs, but only a subcomponents of the CSs became associated with the UCS in a selective way. This required a serious re-evaluation of the classical view of learning.

Findings like these led psychologists such as Seligman (1970) to re-examine the general process view of learning. This view suggests that the specific nature of the stimulus is relatively unimportant in determining the course of learning. So if one trained a dog to respond to a signal, it did not make much difference whether the cue was a light, bell or shock. As long as the



The rats which received the shock during training showed an aversion for the bright and noisy water, but drank copiously from the saccharin-

UCS (food) followed the CS (contiguously), learning would occur, regardless of the nature of the stimulus. Garcia's experimental findings violated the principle that

First and Second Year Approaches

all CSs could become associated with any UCS, as well as the law of contiguity. For example, the poison only had an effect hours after drinking the water.

Prepared learning

The taste aversion experiments appeared to be an example of prepared learning. Seligman (1970) has defined a continuum of preparedness which illustrates the significance of the facts relating to biological determinants of behaviour. According to Seligman, animals are prepared differentially to associate certain responses to certain stimuli. Preparedness can exist in any degree, from completely prepared to completely unprepared. Prepared behaviours are learned responses but because the behaviour is related to survival

needs, the learning takes place with minimal training. The behaviours are acquired so quickly that the conventional principles of learning seem not to apply. The behaviours are usually unique to a species and reflect a specialised mode of adapting to the environment. For example, birds isolated at birth so that they do not hear other birds singing, still manage a poor approximation of their song.

Unprepared behaviours are those which subjects learn with difficulty, like the behaviours acquired in classical conditioning. These are behaviours which obey the laws of

learning. Contra-prepared behaviours are behaviours that subjects cannot learn, despite extensive training. In this view the laws of learning apply to only a restricted range of behaviours.

The Rescoria experiment

Pavlov thought that the necessary and sufficient condition for learning to occur was temporal contiguity. Other psychologists, Tolman, for example, felt that this was too mechanistic an account of learning and that thought or cognitions played an important role. Perhaps what is learned is not a stimulus response association but a relationship between stimuli. Some psychologists suggested that what was learned in classical conditioning

was always preceded by a tone in the first group, but in the second group, shock occurred without being preceded by a tone, thus making the tone an unreliable predictor of shock. The first group learned the association between tone and shock and the second did not, even though they had the same number of contiguous pairings as the first group. This meant that the predictive relationship between the CS and UCS was shown to be more important than contiguity. Figure 1 illustrates the Rescorla experiment.

Implications for application

Anxiety-based panic disorder treatment has been effectively developed, based on the notion that panic disorder results from

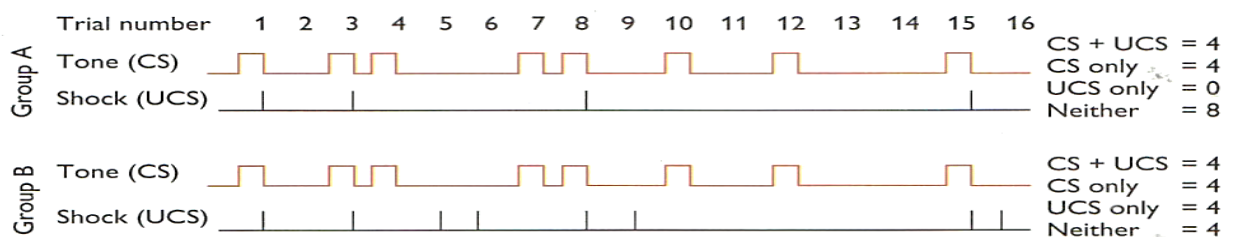


Figure 1 The Rescorla experiment.

was an expectancy. Give the CS, the animals expected the UCS to follow. The alternative to temporal contiguity suggested was that the CS became a reliable predictor of the UCS. In a classical experiment, Rescorla (1967) exposed dogs to shock (UCS). In one group the shock was preceded by a tone (CS). On some occasions the tone sounded but not shock followed. This made the CS a less than perfect predictor of shock but nevertheless a predictor. In the second group, there were exactly the same number of contiguous presentations of tone and shock as in the first group. However, the shock

catastrophic misinterpretations of bodily sensations such as heart racing, breathlessness and dizziness. People suffering from these symptoms believe they are having a heart attack. Clark (1993), for example, teaches people to correct these misinterpretations and to recognise that the symptoms signify anxiety, not physical catastrophe.

What is significant here is that thoughts banished as a focus for the study by the behaviourists became the central focus of concern in psychology, in what was described as the cognitive revolution. Strict

behavioural accounts of many behaviours became untenable. For example, conditions such as depression seems to be more appropriately defined as a state of mind involving distortions of thinking. In order to explain why some people get depressed and others do not, Seligman pointed out

that the way individuals attribute the causes of irritating or depressing events is instrumental in determining whether they get depressed or not.

For example, if an individual fails an exam and attributes the failure to poor teaching, they are less likely to be depressed than if they attribute

the failure to lack of intelligence. The role of thinking in determining a depressed state became important to many cognitive psychologists such as Beck, who then developed therapies which involved learning how to change people's thinking habits rather than behaviours.

Classical Conditioning

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Operant Conditioning

Following in the tradition of the associationists mentioned in relation to classical conditioning, Thorndike developed a view of learning which involved voluntary behaviours, rather than autonomic or automatic behaviours such as salivation. In this kind of learning, behaviours were said to be **emitted** rather than **elicited**. It involved the peripheral rather than the autonomic nervous system. The stimulus-response (S-R) relationship or association was one that existed between a voluntary response and the stimulation of reward or punishment. The model can be represented best by Figure 1.

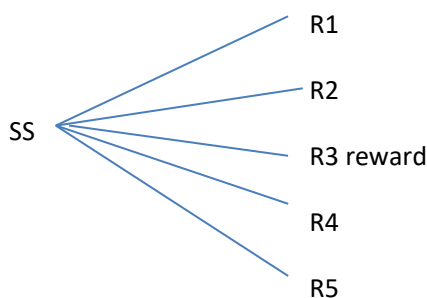


Figure 1 Stimulus-response relationship

Thorndike was struck by the incremental nature of learning. He studied the patterns of learning that occurred when animals were set certain puzzles. For example, when chickens were placed in a maze, as in Figure 2, they seemed to exhibit random behaviours at first, until they discovered the reward at the end of the maze. Gradually the wrong turns were eliminated and the chickens went straight to the reward, or goal box, without making an error.

Let us place this process in the context of the model above. In any given stimulus situation (SS), random behaviours or responses will occur (labelled R1, R2, R3, R4, R5 in Figure 1). However, a strong association develops, with the response leading to a reward, so that over time the correct response occurs and the other responses will disappear – a process we referred to in classical conditioning as **extinction**.

The S-R association

In Thorndike's experiments, the time taken to exit the maze decreased gradually. Therefore, Thorndike came to the conclusion that learning did not involve insight but the gradual formation of an association between the stimulus situation (the maze) and the response that was instrumental in producing the reward (exit from the maze to rejoin the other chickens).

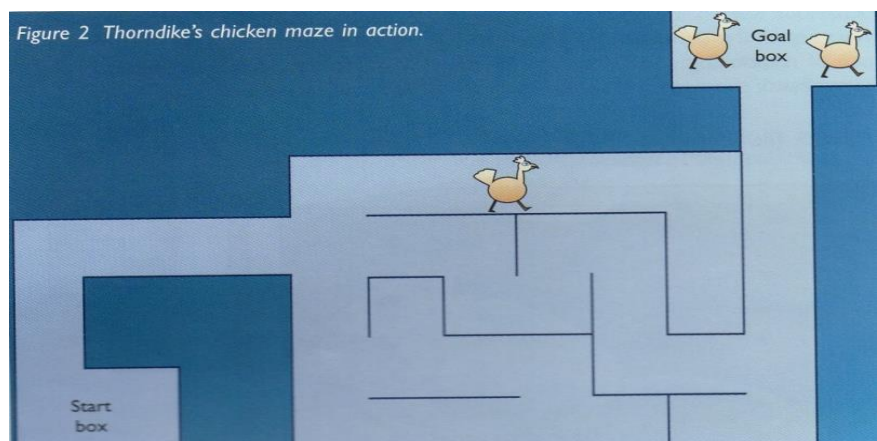
The strength of the S-R association increases gradually over the number of trials. Thorndike insisted that what was associated were not thoughts or ideas but the particular muscle movement that led to escape from the maze. The animal was said not to be able to anticipate the outcome of its actions, but to learn

mechanistically a set of muscle movements through the maze.

Laws of learning

Thorndike developed laws of learning. The law of effect, for example, suggested that learning only occurred if a response had some effect. For the chicken, escape to the other chickens was the pleasurable effect, whereas wrong turns in the maze were responses that were eliminated because they did not lead to an effect that was pleasurable.

Another law important for the strengthening of associations was the law of exercise. The more often a response led to an effect or desirable consequence, the stronger would be the S-R connection – i.e. the more difficult it would be to extinguish the learned response. Because Thorndike insisted that all learning, even in humans, took place through trial and error and that complex learning could be reduced to its fundamental S-R associations, many educationalists took up the basic principles and applied them in education.



Practice makes perfect

Take, for example, the law of exercise. In the past, many schoolchildren were encouraged to recite the alphabet or the multiplication tables every day, and rote learning was established. Important phrases like 'practice makes perfect' were derived from a knowledge of Thorndike's laws. The more often you do something, the better you are able to do it.

The process of strengthening the association between a particular stimulus and a response later became known as reinforcement. Learning was defined as associations between stimuli and responses but the procedure for producing associations was different. In classical conditioning, the food is still given whether the dog responds or not.

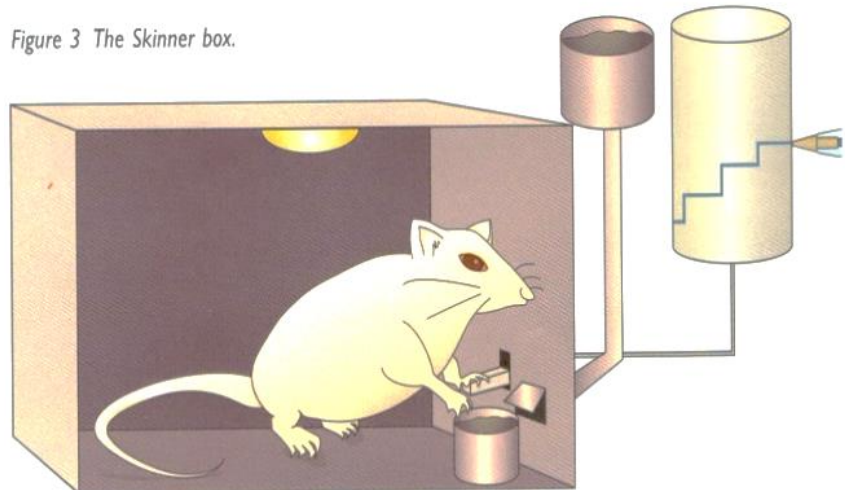
In Thorndike's experiments, the animal's own behaviour was instrumental in securing the reward. In his famous puzzle box experiments, where cats learned to escape from a cage by pulling certain levers with their paws and nudging bolts with their noses, only the correct behaviour led to escape. So the reward in instrumental conditioning was contingent upon the correct response.

If the response was correct, it was followed by a reinforcer. To both Watson and Thorndike, animal and human behaviour and learning could be explained in terms of stimulus response connections.

The Skinner box

Skinner greatly simplified and automated instrumental conditioning, renaming it operant

Figure 3 The Skinner box.



conditioning. He developed the Skinner box (Figure 2), which had a light and sound source, a food delivery chamber and a lever that could, when pressed, produce food.

When a rat was placed in the chamber it was given 'free' (non-contingent) food. At the time food was delivered, the light and sound were presented contiguously and acted as a signal that food was about to be delivered. Instead of allowing the lever press to occur accidentally, as in Thorndike's experiment, the rat was subjected to a procedure called **shaping**. Free food was stopped and only contingent food was on offer. When the rat approached the part of the chamber that had food near the lever, food was delivered. The rat heard the sound and ate the food.

The experimenter now got stricter with his food supply and only gave food when the rat was near the lever. Then he became even more strict, only giving food for touching the lever. After that, only when the rat exerted downward pressure on the lever was it given food. This successive approximation to the desired target of pressing the lever was called shaping.

Once the rat was 'hooked', the machine could be set to deliver the food automatically every time the lever was pressed. This was called continuous reinforcement. The animal was rewarded for each and every act of lever pressing. The lever itself was attached to a recorder, a pen on a drum of paper, as shown in Figure 4. Upon pressing the lever, the pen moved up one step.

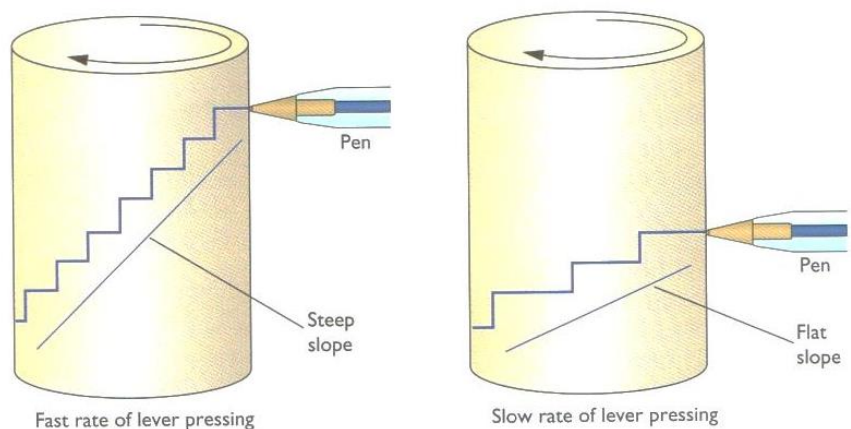


Figure 4 Slopes representing different rates of lever pressing.

This meant that the experimenter could go away and return later to see what patterns of behaviour were being emitted. In Figure 4 you can tell the difference between a high rate of responding and a low rate by the steepness of the steps.

Extinction

Now let us be clear. Lever pressing *per se* was not the important issue. Lever pressing was simply an arbitrary and convenient response to study and the rat a convenient species. In Figure 4, the two slopes represent two different rates of responding. Laws of learning would emerge to explain behaviour if the patterns were predictable and replicable. It might be easier to understand this with concrete examples. An important principle of learning, both in classical or respondent conditioning and instrumental and operant conditioning, was extinction. In respondent conditioning ((Pavlov), if food was not longer presented when the bell stimulus was sounded, the bell lost its power to elicit salivation. In operant conditioning (Skinner), if the food dispenser was turned off the rat eventually gave up lever pressing.

In Figure 5, the discovery is a rate of responding for continuous reinforcement (a food pellet delivered on every lever press or response) and a different rate during the extinction process (a steeper slope followed by a flat slope). Showing that this principle works for rats as well as humans will signal its significance and make the whole idea more meaningful. For example, a child cries in the supermarket and receives a sweet from its mother. The dentist tells the mother

subsequently that her behaviour is destroying the child's dental health. On her next visit to the supermarket, the mother does not give her child a sweet as she had done previously (extinction). The child then simply increases its rate of crying just as the rat did when it was no longer given food. Psychologists proclaimed these to be universal laws of learning that apply across all species

Schedule of reinforcement

Skinner discovered more interesting patterns of behaviour simply by observing response rates under different conditions – for example, that intermittent reinforcement caused a higher rate of responding than continuous reinforcement.

Compare the following two figures. In Figure 6, the reinforcer (food) is given every time the lever is pressed. In Figure 7, the reinforcer is only given after three presses (see arrows). The response rate is much higher under intermittent reinforcement conditions. Skinner then set about discovering the rules that govern behaviour by changing the contingencies. He called these rules **schedules of reinforcement**. He found that the way reinforcers

were delivered produced lots of different predictable patterns. The job now was to map these to explain behaviour.

Operant conditioning

Skinner, you may be surprised to know, was not a stimulus-response psychologist, but because of the unfortunate use of the word 'conditioning', he got tarred with the same brush as Watson and Thorndike. The same kind of problems that emerged for classical conditioning as a result of findings about biological constraints applied also to instrumental conditioning.

For example, Breland and Breland (1961), who were animal trainers in a zoo, noted that in teaching a racoon to deposit coins in a box for food reinforcers, the behaviour often deteriorated and instinctive behaviour took over. In a play on words about one of Skinner's papers, which they called 'the misbehaviour of organism', they said that 'Three of the most tacit assumptions of learning theory are that: the animal comes to the laboratory as a virtual *tabula rasa*, that species differences are insignificant, and that all responses are equally conditionable to all stimuli ... these assumptions are not longer tenable ... it is our

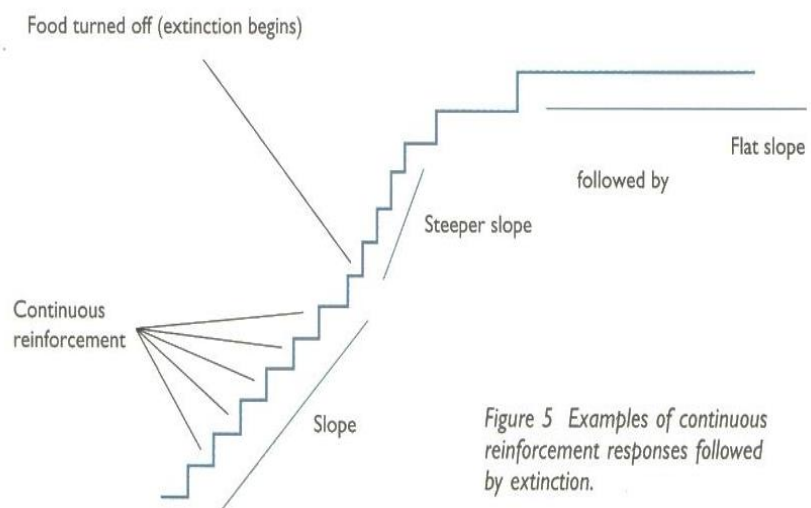


Figure 5 Examples of continuous reinforcement responses followed by extinction.

reluctant conclusion that the behaviour of any species cannot be adequately understood, predicted, or controlled without knowledge of its instinctive patterns, evolutionary history, and ecological niche'.

The nature of learning

As with classical conditioning, there were disputes from cognitive psychologists about the nature of learning. When a rat learned its way through a maze, Thorndike assumed that what was learned was a succession of muscle movements. Tolman, the father of cognitive psychology, on the other hand, believed that learning was not a peripheral but a central affair. It involved the animal acquiring a cognitive map of its surroundings, or an internal representation of the maze stored in its brain. In one experiment, McFarlane (1930)

(Tolman's student), taught his rats to swim through a maze successfully and then emptied the maze of water. The rats ran through the maze without making an error, even though this involved different muscle movements.

In order to demonstrate that learning involves an expectancy, Bolles did a lot of work with Skinner boxes and, like Tolman, came to the conclusion that his rats were acquiring temporarily organised information. In effect, Tolman's animals were always reaching some expected outcome and Bolles's were waiting for an outcome. He explained that paradox of why intermittent reinforcement was more difficult to extinguish than continuous reinforcement (see Figure 7). According to the laws of learning, continuous reinforcement should lead to stronger associations.

The cognitive revolution

Bolles's explanation is best illustrated by anthropomorphising. When a rat is on a continuous reinforcement schedule and the food is switched off, extinction takes place rapidly. The rat expects food every time the lever is pressed, so when no food appears, the rat gives up easily. If the rat is on an intermittent schedule, it cannot know for sure that the food has been switched off for extinction, so it persists for a while until it is absolutely sure no food is coming, then it gives up. This less mechanistic way of viewing learning was the start of the cognitive revolution. Despite the problems, the laws of learning led to some powerful techniques for changing behaviour.

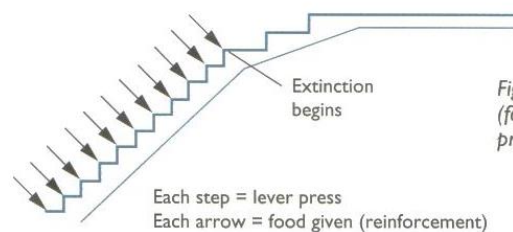


Figure 6 Response to reinforcer (food) given every time lever is pressed.

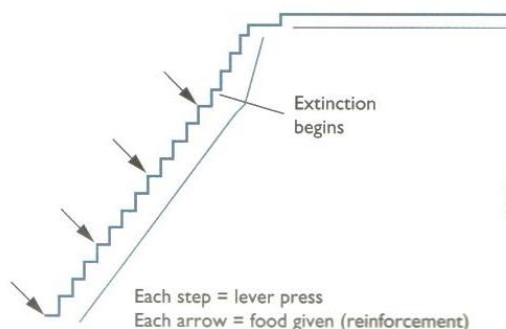
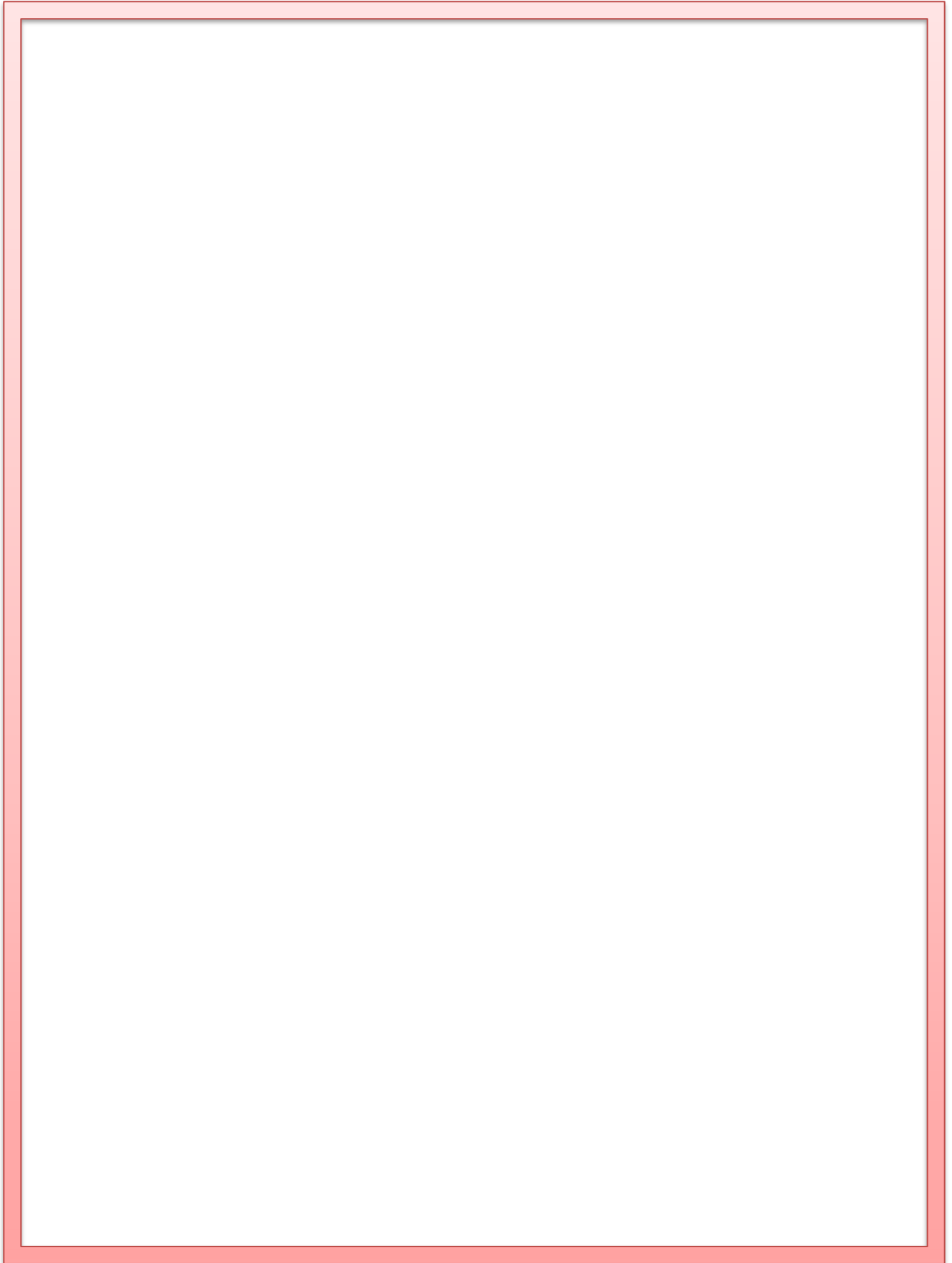


Figure 7 Response to reinforcer (food) given every third lever press.

Operant Conditioning



Evaluating Behaviourism

The main strengths of the behaviourist approach come from the methods it uses. The insistence on objectivity, control over variables and precise measurement means that the studies carried out by behaviourists tend to be very **reliable**, and the behaviourists can be credited with introducing the **scientific method** into psychology. The drawback of these methods, however, is that behaviour may be studied under very **artificial** conditions than do not reflect real-world contexts very well (although this criticism clearly does not apply to all behaviourist studies). The widespread use of animals is a source of criticism. Whilst conditioning can be observed in most species, there are **genetic influences** on what different species can and cannot learn which reflect their different evolutionary histories (e.g. rats can be conditioned to respond to tastes but not smells). This means that generalisations between species must be made with more caution than many behaviourists apply.

Point:

Because:

So what?:

However:

A more fundamental criticism of behaviourism is that it ignores the influences of **mental processes** on learning. In behaviourist theory people can only learn as a result of their own experiences. However, experience and many studies (e.g. by social learning theorists like Bandura) show that people are quite capable of **observing** and learning from the behaviour and experiences of others. Furthermore, studies of a wide range of human behaviours (principally language learning and use) have shown that classical and operant conditioning cannot adequately explain how people are able to **solve problems** without the lengthy period of trial and error that behaviourism would say is necessary. These findings imply that mental processes must play a part in explaining much human behaviour.

Point:

Because:

So what?:

However:

Nonetheless, behaviourism has supplied **practical solutions** to many human problems. Operant conditioning has proven an effective way of modifying behaviour amongst people who may be

difficult to teach in other ways (e.g. autistic children) and many people with problems like phobia have benefitted significantly from **behaviour therapies** including systematic desensitisation.

Point:

Because:

So what?:

However:

The behaviourist approach sees all behaviour as determined by past experiences that have been conditioned. Skinner suggested that everything we do is the sum total of our reinforcement history. This ignores any possible influences that free will may have on behaviour. Skinner suggested that any sense of free will was simply an illusion. When something happens we impose a sense of having made a decision but, according to Skinner, our past conditioning history determined the outcome.

Point:

Because:

So what?:

However:

Although experimental procedures such as the Skinner Box enabled behaviourists to maintain a high degree of control over their experimental subjects, many critics have questioned the ethics of and practicalities of conducting such investigations. The animals involved were exposed to stressful and aversive conditions. In addition there is argument about the usefulness of using animals when they are so different to humans. After all the human brain is more encephalised than an animal brain and therefore more capable of logic, language and emotional complexity,

Point:

Because:

So what?:

However:

The Humanistic Approach 1950s

The History & Philosophy of Humanistic Psychology

Termed the '**third force**' in psychology, the humanistic approach developed during the 1960s in opposition to behaviourism and psychoanalysis. Humanistic psychology offered an alternative to behaviourism and psychoanalytic approaches that had dominated the discipline previously.

Gestalt principles and the idea that '**the whole is greater than the sum of its parts**' heavily influenced humanistic psychologists. With this philosophy in mind Humanists argue that in order to understand human psychology it is essential to study the 'whole' individual (all that a human is and needs) rather than individual 'parts' of behaviour (their memory, their disorder).

A Critical View

Humanistic psychologists are critical of both the psychoanalytic and behaviourist approaches in relation to the methods of study and focus of attention of these approaches:

Psychoanalysis: Humanistic psychologists say that "a psychology based upon crippled personalities can only produce a crippled psychology"!! So what are the critical of?

Behaviourism: Humanistic psychologists reject behaviourism because it is based upon the study of 'lower organisms' and does not concern itself with the study of consciousness. So what are the critical of?

According to humanistic psychologists we are not ultimately motivated by basic drives (e.g. sex or aggression) or physiological needs but rather we have a need to develop to our full potential or capabilities. The criteria for psychological health is therefore different for humanistic psychologists who argue that the focus should be upon self-actualisation not ego control or successful adjustment to the environment.

Core Assumptions

- # Psychology should **study the individual** rather than seek to find general laws which apply to groups (i.e. **idiographic** not nomothetic).
- # Each individual must be described and understood in terms of their own subjective views of the world and self.
- # It is important to study humans in their environmental context as this will influence their behaviour. We don't exist in a vacuum!
- # It should be recognised that humans have a degree of **free will**.
- # Central question for everyone is "Who am I?" and in order to answer this question the psychologist must become a partner with the individual in the quest for existential meaning (think about humanistic therapies!).
- # The internal experience of human beings is just as important as studying external behaviour (e.g. how we feel about experiences and how we interpret them).
- # Humans are qualitatively different to non-human animals therefore in order to develop an understanding of human psychology you must study humans.
- # What we learn about human psychology should be put to good use and applied to areas in order to help others and society.
- # The goal of psychology should be to understand individuals not to predict or control them! Psychology should not degrade or dehumanise those people they are seeking to understand. **Note:** Think about the ethical issues regarding research (e.g. BPS guidelines) and the change in terminology such as 'participants' instead of 'subjects' or 'clients' instead of 'patients'.

Key Writers

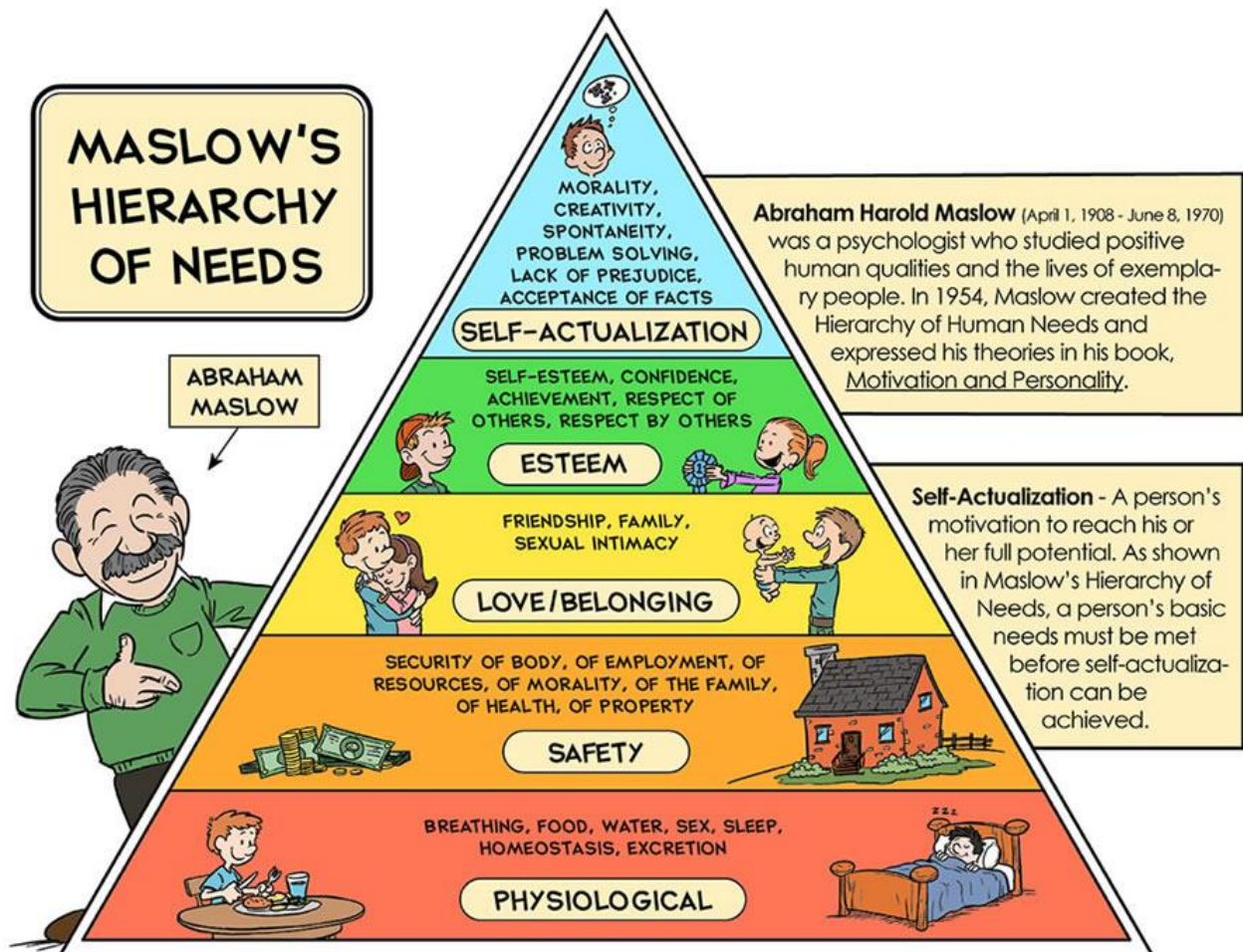
Abraham H. Maslow (1908-1970)



Maslow didn't reject the Psychodynamic and Behaviourist approach, he brought the objective and subjective together. His hierarchy of needs can be seen as an extension of the psychodynamic approach. For instance, the physiological needs would represent the id. Horney, focused on the safety and love. Adler, focused on the esteem needs.

Maslow's theory is relevant to personality and motivation. It has been applied to Education, the workplace, management training, personal development and therapy. Maslow stated that we share the need for food with all living things, the need for love with (perhaps) the higher apes, (and) the need for self actualisation with (no other species).

Physiological, safety, love and belonging, and esteem needs are known as the **deficiency-motives**. If you do not acquire them, then you are deficient. If you have them, then you cease to be motivated by them. Can you think of some examples to illustrate this point?



Key points

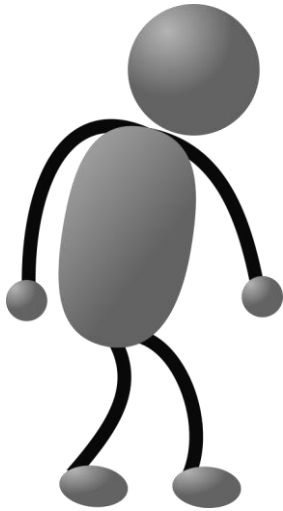
- Each need must be satisfied before we can move onto the next need.
- Children develop through the lower level needs first before moving onto the higher level needs as they grow and mature into adults (**ontogeny**).
- Higher level needs are new to the evolutionary process (**phylogenesis**).
- The higher needs become linked to life experience and become less linked to biology.
- Every individual is unique (idiographic approach).



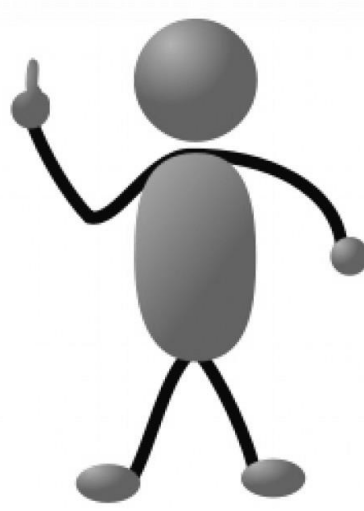
Carl Rogers (1902-1987)

Theory based upon research with '**clients**' in the clinic. From this work Rogers came to believe that the basic motivating force behind humans is towards achieving '**actualisation**'. This is the tendency towards the fulfilment of realisation of our potential. His focus was on getting clients to actualise (grow) and said they need an environment that provides them with genuineness (openness and self-disclosure), acceptance (being seen with unconditional positive regard), and empathy (being listened to and understood).

Self



Ideal Self



Congruence/Incongruence:

Conditions of Worth:

Client-centred therapy:

This is the **non-directive method of psychotherapy** developed by Rogers. He believed that each individual has both the **motivation and the ability to change** and that the decision on the direction of that change should come from the **client rather than the therapist**. The role of the therapist is simply a '**sounding board**' who should offer the client **unconditional positive regard**.

Maslow and Rogers stressed the 'healthy half' of psychology, whilst according to Maslow, Freud represented the 'sick half'. Individuals naturally move towards developing healthy personalities, unless external factors block this).

We attempt to maintain consistency between our self-image and our actual behaviour. This isn't always achieved. How we see ourselves may not be how others see us. This incongruence can be threatening so we block, deny or distort it from our conscious awareness.

First and Second Year Approaches

These defence mechanisms prevent the self from growing and changing. The gap between the self-image and reality widens. This can lead to confusion, vulnerability, dissatisfaction and eventually maladaptive behaviours.

Rogers wanted to create an atmosphere in which the individual is at the centre of the therapy. This includes total acceptance and non-judgemental support, regardless of what the client says or does. By creating this, the client will come to accept their own distortions and denials and own up to them. This enables the client to move towards a healthier personality by valuing themselves and not relying on others to provide love and acceptance in a conditional way. They no longer need to depend on conditions of worth. This is still used and is now known as Person-centered therapy (PCT). Rogers saw many parallels between therapists and teachers. They are both facilitators of an atmosphere of freedom and support for individual pursuits. (Nye 2000)

Rogers wanted an objective measurement of the self-concept, ideal self and their relationship over the course of the therapy. He designed the Q-sort. The client is asked to arrange the Q-sort cards (which contain statements on each) into an order ranging from 'very characteristic of me' to 'not at all characteristic of me'. This is done to measure the self-image and then again for the ideal self. The two Q-sorts are then correlated to determine the discrepancy between self-image and ideal-self. This is repeated at various points throughout the therapy.

ANXIOUS	ATTRACTIVE	CARELESS	DEPRESSED
DISHONEST	ENERGETIC	FUNNY	HAPPY
HONEST	INTELLIGENT	KIND	LAZY
OPTIMISTIC	ORGANIZED	OUT-GOING	PLAIN
RELAXED	SAD	SERIOUS	SHY
SLOPPY	STRONG	UNHELPFUL	WEAK

Evaluating Humanism

Humanists reject any attempt to break up behaviour and experience into smaller components. Behaviourists explain human and animal learning in terms of simple stimulus-response connections; Freud described the personality as a conflict between three things; id, ego, superego; biological psychologists reduce behaviour to its basic physiological processes and supporters of the cognitive approach see human beings as little more than information processing 'machines'. In contrast, humanistic psychologists advocate **holism**, the idea that subjective experience can only be understood by considering the whole person. This approach may have more **validity** than its alternatives by considering meaningful human behaviour within its real-life context.

Point:

Because:

So what?:

However:

Unlike some of the other approaches we have come across, humanistic psychology has relatively little real-world application. It is true that Rogerian therapy has revolutionised **counselling** techniques and Maslow's hierarchy of needs has been used to explain **motivation**, particularly in the workplace. However, it remains the case that the approach has limited impact within the discipline of psychology as a whole. This may in part be due to humanistic psychology lacking sound evidence-base and due to the fact that the approach has been described, not as a comprehensive theory, but as a loose set of rather abstract concepts.

Point:

Because:

So what?:

However:

Humanistic psychologists have been praised for 'bringing the person back into psychology' and promoting positive image of the human condition. Freud saw human beings as slaves to their past and claimed all of us existed somewhere between 'common unhappiness and absolute despair'. Humanistic psychology offers a refreshing and optimistic alternative; it sees all people as basically good, free to work towards achievement of their potential and in control of their lives.

Point:

Because:

So what?:

However:

Humanistic psychology does include a number of vague ideas that are abstract and difficult to test. Concepts such as 'self-actualisation' and 'congruence' may be useful therapeutic tools but would prove problematic to assess under experimental conditions. Rogers did attempt to introduce more rigour into his work by developing the Q-Sort – an objective measure of progress in therapy. Nevertheless, as would be expected of an approach that describes itself as anti-scientific, humanistic psychology is short of empirical evidence to support its claims.

Point:

Because:

So what?:

However:

Many of the ideas that are central to humanistic psychology, such as individual freedom, autonomy and personal growth, would be much more readily associated with **individualist** cultures in the Western world such as the United States. **Collectivist** cultures, such as India, which emphasise the needs of the group, community and interdependence, may not identify so easily with the ideals and values of humanistic psychology. Therefore, it is possible that this approach would not travel well and is the product of the cultural context within which it was developed.

Point:

Because:

So what?:

However:

The Cognitive Approach – 1960s

WAR OF THE GHOSTS

One night two young men from Egulac went down to the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: 'Maybe this is a war party'. They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

'What do you think? We wish to take you along. We are going up the river to make war on the people'.

One of the young men said: 'I have no arrows'.

'Arrows are in the canoe', they said.

'I will not go along. I might be killed. My relatives do not know where I have gone. But you', he said, turning to the other, 'may go with them.'

So one of the young men went, but the other returned home.

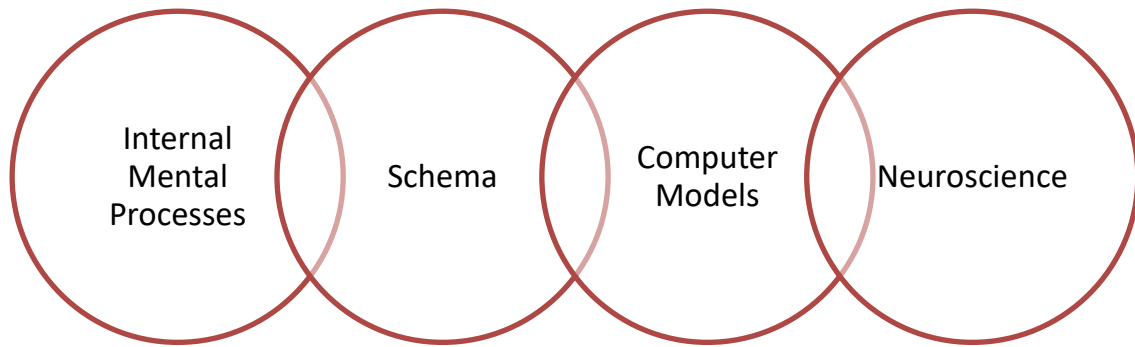
And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say: 'Quickly, let us go home: that Indian has been hit'. Now he thought: 'Oh, they are ghosts'. He did not feel sick, but they said he had been shot.

So the canoes went back to Egulac, and the young man went ashore to his house, and made a fire. And he told everybody and said: 'Behold I accompanied the ghosts, and went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick'.

He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of mouth. His face became contorted. The people jumped up and cried.

He was dead.

Assumptions: In direct contrast to the behaviourist approach, the cognitive approach argues that internal mental processes can, and should, be studied scientifically. As a result, the cognitive approach has investigated those areas of human behaviours that were neglected by behaviourists, such as memory, perception, and thinking. These processes are 'private' and cannot be observed, so cognitive psychologists study them indirectly by making inferences about what is going on inside people's minds on the basis of their behaviour.



Attention: Gorillas in the Midst

Procedure and aims: The gorilla in the midst experiment was to test how we only choose to see relevant detail in a situation. The study consists of people watching a video of 6 participants playing basket ball, 3 in white shirts and 3 in black. They were asked to count how many passes the people in white shirts made. The video was done in 2 ways. A video of the distractions in opaque and one transparent.



During this experiment there was a man in a gorilla costume to be used as a distraction and a woman carrying an umbrella. The gorilla would come to the camera and tump his chest before leaving and the woman would walk to the centre. At the end of the experiments they were asked who saw the man in the gorilla costume and woman with the umbrella.

Results: In the transparent video, 54% of the observers noticed the distractions and 46% didn't. more observers noticed the distractions in the opaque conditions. 67% saw it and 33% didn't.

War of the Ghosts (recall 1)

Theoretical Models - MSM

Theoretical Models - WMM

Learn This:

The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.

Schemas are mental representations of situations, events, people, objects. They are organised packages of information which are stored in our long-term memory. E.g. what happens when you go to a restaurant. Schemas help to make sense of situations & make life predictable

Bransford & Johnson (1972)

Procedure	One group of participants were asked to read the passage
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	Another group was given the appropriate schema (washing clothes) before they read the passage
Findings	Found those given the appropriate schema recalled twice as much information as the participants not given the passage. Suggests participants given the schema were relating the passage back to stored information
Conclusions	This study suggests that it is not just the retrieval process that is effected by schemas, but also the storage process.
Criticisms	The notion of schemas is a vague concept No explanation is offered of how schemas are acquired in the first place

Stereotypes

These are usually simplistic schema that we hold about a particular group or class of people. We often resort to commonly held stereotypes when reconstructing a memory.

Allport & Postman (1947) showed two men (one black and one white) on a subway train arguing. The white man was holding a razor (this was a weapon of choice for mugging in those days). Participants remembered the open razor as being held by the black man (even though it was not).

Gender Schema

Children are pre-programmed to organise information in terms of **schemas** – gender schemas are organised sets of information about gender-appropriate behaviour. Children learn these schemas from their interactions with people such as what toys are appropriate for each gender, what clothes to wear etc. These schemas are formed as soon as children have acquired basic gender identity (from around age 2. The first schema that is formed is an **ingroup/outgroup schema**, consisting of organised information about which toys and activities are suitable for boys and which are suitable for girls. Children are most interested in the schemas appropriate for their own gender – **ingroup** schemas and avoid behaviours that belong to outgroup schemas. Children hold very **fixed gender attitudes** because they ignore any information which is not consistent with ingroup information – not schema consistent. For example if a boy sees a male nurse this information is likely to be ignored because the man is not behaving consistently with ingroup schema. Therefore the boy does not alter his existing schema.

- Create an ingroup gender schema for a 4 year old boy and one for a 4 year old girl who lives in the UK.

War of the Ghosts (recall 2)

Evaluating Cognitive

The cognitive approach has always employed highly controlled and rigorous methods of study in order to enable researchers to infer cognitive processes at work. This has involved the use of **laboratory experiments** to produce **reliable, objective** data. In addition, the emergence of cognitive neuroscience has enabled the two fields of biology and cognitive psychology to come together. This means that the study of the mind has established a credible **scientific** basis.

Point:

Because:

So what?:

However:

Although there are similarities between the human mind and the operations of a computer (inputs and outputs, storage systems, the use of a central processor), the computer analogy has been criticised by many. Such Machine reductionism ignores the influence of human emotion and motivation on the cognitive system, and how this may affect our ability to process information. For instance, research has found that human memory may be affected by emotional factors such as the effect anxiety has on eyewitnesses.

Point:

Because:

So what?:

However:

As we have seen, cognitive psychologists are only able to infer mental processes from the behaviour they observe in their research. As a consequence, cognitive psychology occasionally suffers from being too abstract and theoretical in nature. Similarly, experimental studies of mental processes are often carried out using artificial stimuli (such as tests of memory involving word lists) that many not represent everyday memory experiences. Therefore research on cognitive processes may lack mundane realism and ecological validity.

Point:

Because:

So what?:

However:

The cognitive approach is probably the dominant approach in psychology today and has been applied to a wide range of practical and theoretical contexts. For example, cognitive psychology has made an important contribution in the field of AI and the development of thinking machines (robots), exciting advances that may now revolutionise how we live our lives in the future.

Point:

Because:

So what?:

However:

The cognitive approach is founded of soft determinism – it recognises that our cognitive system can only operate within the limits of what we know, but we are free to think before responding to a stimulus. This is a more reasonable ‘interactionist’ (middle ground) position than the hard determinism suggested by some other approaches.

Point:

Because:

So what?:

However:

Bartlett (1932)

The original story

One night two young men from Egulac went down to the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: 'Maybe this is a war party'. They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

'What do you think? We wish to take you along. We are going up the river to make war on the people'.

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'Arrows are in the canoe', they said.

'I will not go along. I might be killed. My relatives do not know where I have gone. But you', he said, turning to the other, 'may go with them.'

So one of the young men went, but the other returned home.

And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say:

'Quickly, let us go home: that Indian has been hit'. Now he thought: 'Oh, they are ghosts'. He did not feel sick, but they said he had been shot.

So the canoes went back to Egulac, and the young man went ashore to his house, and made a fire. And he told everybody and said: 'Behold I accompanied the ghosts, and went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick'.

He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of mouth. His face became contorted. The people jumped up and cried.

He was dead

Language to suit own culture

Recall after 8 days.

Two men from Egulac went fishing. While thus engaged they heard a noise in the distance. 'That sounds like a war cry' said one, 'there is going to be some fighting'. Presently there appeared some warriors who invited them to join an expedition up the river.

One of the young men excused himself on the grounds of family ties. 'I cannot come' he said 'as I might get killed'. So they returned home. The other man however, joined the party, and they proceeded on boats up the river. While landing on the banks the enemy appeared and were running down to meet them. Soon someone was wounded, and the party discovered that they were fighting against ghosts. The young man and his companion returned to the boats, and went back to their homes.

The next morning at dawn he was describing his adventures to his friends, who gathered around him. Suddenly something black issued from his mouth, and he fell down uttering a cry. His friends closed around him, but found that he was dead.

Omissions

Example of culturally influenced language change:

Original	My alteration

Omissions in my recall:

(highlight in original story)

Examples of fixed recollections:

(things you recalled in the same way each time you recalled the story: highlight in your recollections)

Social Learning Theory

The first two parts of this series on behaviourism covered classical conditioning (Pavlov) and operant conditioning (Watson and Skinner). Both have the important common feature of reinforcement influencing behaviour. The last part of this perspective is one that tries to explain learning when there is not obvious external reinforcement involved.

Social learning theory

Not everyone agreed with Watson and Skinner's radical behaviourism – that all behaviour can be explained by stimulus, response and reinforcement. It is also important to consider mental (cognitive) processes.



Julian Rotter (b. 1916) invented the term social learning theory (1947) when studying social interactions in laboratory conditions. For him humans have *expectations* about the effects of their behaviour and the kind of reinforcement they get. In addition, people have their individual values that they apply to their behaviour and the reinforcements they receive. An important question for Rotter is, Where is your locus of

1 *Internal locus of control*. People believe that reinforcement depends on personal efforts – thinking they are in charge of their lives and acting accordingly. They are physically and mentally healthier and more socially skilled. Their parents are supportive, generous with praise, consistent with discipline, and non-authoritarian.

2 *External locus of control*. People believe that reinforcement depends on outside sources – so they make less attempts at improving their lives.

The Bobo doll experiments



Albert Bandura (b. 1925) developed a version of behaviourism in the early 1960s, initially called 'sociobehaviourism' and then *social cognitive theory*. It is now usually included under the general heading of *social learning theory*.

Behaviour doesn't always have to be directly reinforced for it to occur. We can learn through simply observing others and seeing the consequences of their actions such as when children imitate their parents or peers. This important 'second-hand' learning is called 'vicarious learning' or observational learning. In the simplest experiment Bandura (1963) used two groups

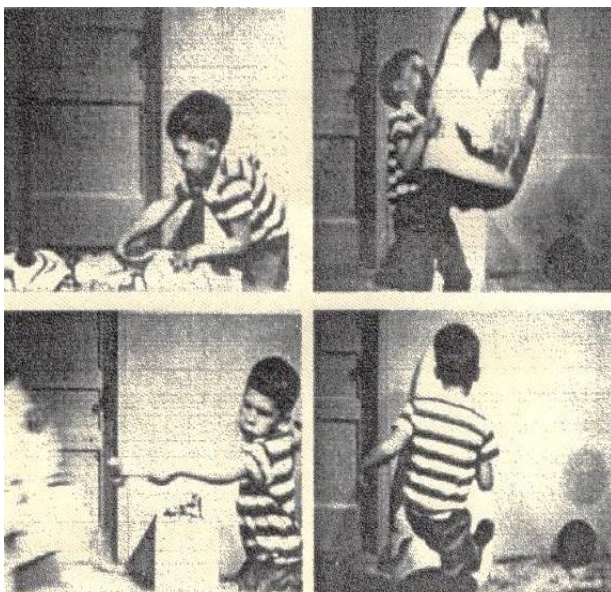
control?'

Each child was then left alone in the toy room and observed (on film).



Bandura's results

Without any direct encouragement, the experimental group performed significantly more aggressive acts than the control group.



Conclusion: Children will spontaneously imitate the behaviour of a model, without any obvious reinforcement.

This was also an early demonstration that children will specifically imitate violence. Subsequent variations by Bandura – showing realistic and cartoon aggression on film – clearly showed that children can be strongly influenced by violence on TV and in the cinema. (Although these experiments didn't measure long-term

of children.

The processes of imitation and modelling have also been important in therapy.

Modelling

Like Skinner, Bandura applied his work to practical problems – modifying abnormal and undesirable behaviour. The therapist acts as a model – showing a patient how to behave. For example, an arachnophobic

Modelling can be used to treat phobias, obsessive-compulsive disorders, sexual problems, anxieties, etc.

Education and training can also benefit; the teacher or trainer acts as a 'model' for the students.

Behaviourism, therefore, did eventually become less mechanistic, and more cognitive – sometimes called 'neo-behaviourism'. But this came too late to stop the early backlash against it.



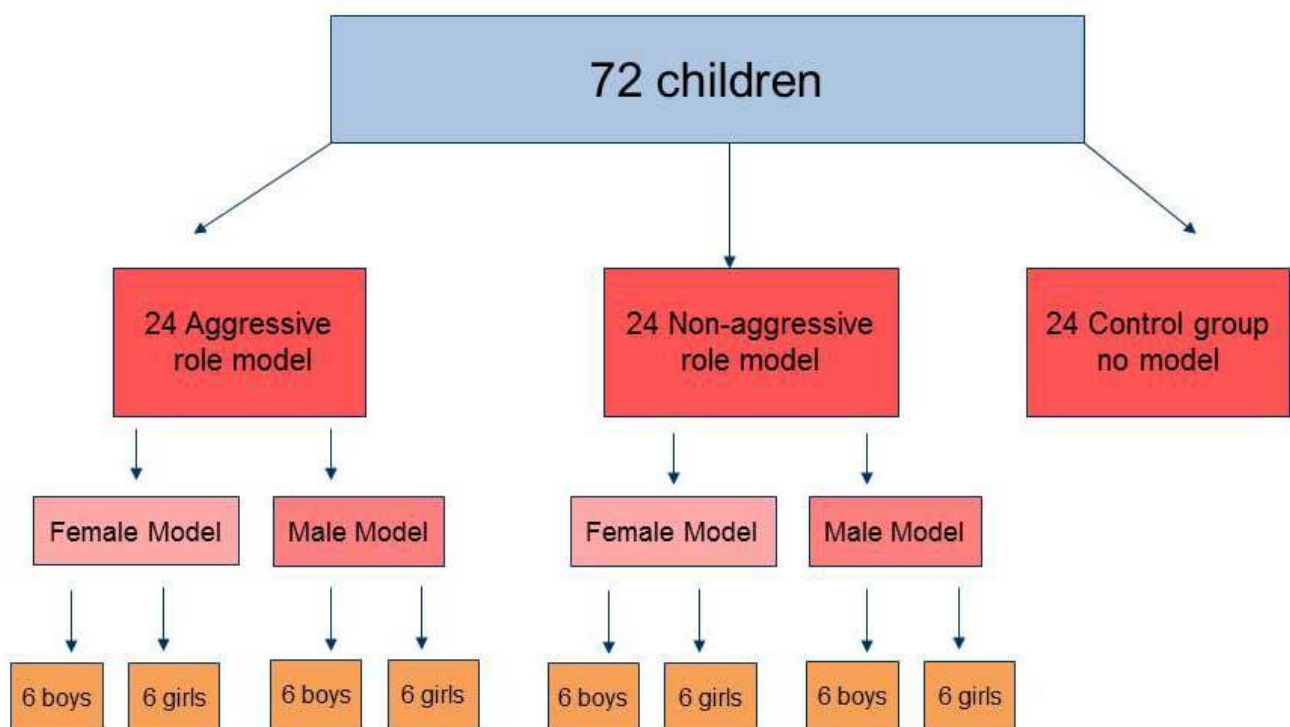
effects).

Social Learning Theory – 1960s

Bandura (1961) conducted a study to investigate if social behaviours (i.e. aggression) can be acquired by observation and imitation. They tested 36 boys and 36 girls from the Stanford University Nursery School aged between 3 to 6 years old. The researchers pre-tested the children for how aggressive they were by observing the children in the nursery and judged their aggressive behaviour on four 5-point rating scales. It was then possible to match the children in each group so that they had similar levels of aggression in their everyday behaviour. The experiment is therefore an example of a matched pairs design. To test the inter-rater reliability of the observers, 51 of the children were rated by two observers independently and their ratings compared. These ratings showed a very high reliability correlation ($r = 0.89$), which suggested that the observers had good agreement about the behaviour of the children.

A lab experiment was used, in which the IV (type of model) was manipulated in three conditions:

- Aggressive model shown to 24 children
- Non-aggressive model shown to 24 children
- No model shown (control condition) - 24 children



Stage 1: Modelling

In the experimental conditions children were individually shown into a room containing toys and played with some potato prints and pictures in a corner for 10 minutes while either:

- 24 children (12 boys and 12 girls) watched a male or female model behaving aggressively towards a toy called a 'Bobo doll'. The adults attacked the Bobo doll in a distinctive manner - they used a hammer in some cases, and in others threw the doll in the air and shouted "Pow, Boom".
 - Another 24 children (12 boys and 12 girls) were exposed to a non-aggressive model who played in a quiet and subdued manner for 10 minutes (playing with a tinker toy set and ignoring the bobo-doll).
-

- The final 24 children (12 boys and 12 girls) were used as a control group and not exposed to any model at all.

Stage 2: Aggression Arousal

All the children (including the control group) were subjected to 'mild aggression arousal'. Each child was (separately) taken to a room with relatively attractive toys. As soon as the child started to play with the toys the experimenter told the child that these were the experimenter's very best toys and she had decided to reserve them for the other children.

Stage 3: Test for Delayed Imitation

The next room contained some aggressive toys and some non-aggressive toys. The non-aggressive toys included a tea set, crayons, three bears and plastic farm animals. The aggressive toys included a mallet and peg board, dart guns, and a 3 foot Bobo doll. The child was in the room for 20 minutes and their behaviour was observed and rated through a one-way mirror. Observations were made at 5-second intervals therefore giving 240 response units for each child. Other behaviours that didn't imitate that of the model were also recorded e.g. punching the Bobo doll on the nose.

Results

2. Children who observed the aggressive model made far more imitative aggressive responses than those who were in the non-aggressive or control groups.
3. There was more partial and non-imitative aggression among those children who have observed aggressive behaviour, although the difference for non-imitative aggression was small.
4. The girls in the aggressive model condition also showed more physical aggressive responses if the model was male, but more verbal aggressive responses if the model was female. However, the exception to this general pattern was the observation of how often they punched Bobo, and in this case the effects of gender were reversed.
5. Boys were more likely to imitate same-sex models than girls. The evidence for girls imitating same-sex models is not strong.
6. Boys imitated more physically aggressive acts than girls. There was little difference in the verbal aggression between boys and girls.

Social Learning Theory is:

Let's review the concepts.

1. **Imitation:** when the observer notices behaviour that they begin to emulate
 2. **Identification:** When an observer associates themselves with a role model and wants to be like the role model. This is impacted by many factors.
 3. **Modelling: (observational learning):** A model is one who exhibits certain behaviours in a given situation. Modelling provides examples for observers of situational behaviour.
 4. **Vicarious Learning:** when the observer views a model being reinforced for behaviour they will increase their own in attempts to win such a favour.
 5. **Meditational Processes:** Cognitive factors (thought) which come between the stimulus and response to influence the learning that takes place.
-

6. **Self-Efficacy**: internal belief based on past experience, perceived ability, and likelihood of success which determines whether or not the behaviour is imitated.

Evaluating Social Learning

Its commitment to scientific methods is a strength of the social learning approach as its research studies are **reliable** and allow inferences about **cause and effect** to be drawn. However, this does give rise to the criticism that it relies heavily on research conducted in rather **artificial** settings. For example, some critics argue that the behaviour of the children in Bandura's studies was significantly influenced by **demand characteristics** and that they were, in effect, deliberately producing the behaviour they thought the experimenters wanted to see.

Point:

Because:

So what?:

However:

Because the social learning approach takes into account the **cognitive factors** that mediate between stimuli and responses, it addresses one of the most important criticisms of behaviourism: its neglect of thinking processes. Consequently, social learning theory can explain a range of processes that behaviourism has difficulties with, especially behaviours that emerge without the person that produces them being directly conditioned. As such it has contributed significantly to our understanding of processes like **aggression** and gender development and has also formed the basis of a range of **treatments** for problems like phobias. Modelling-based therapies are particularly effective with children, who may find behaviour therapies using direct conditioning hard to deal with.

Point:

Because:

So what?:

However:

Some criticisms of social learning theory arise from their commitment to the environment as the chief influence on behaviour. For example, there are several gender differences that appear to be universal, such as preferences for particular characteristics in a potential heterosexual partner (men prioritise youth and fertility, women prioritise status and resources) and differences in the gender

thinking of boys and girls (boys tend to be more rigid) that social learning theory cannot account for. It may be that differences like these reflect **genetic influences** on behaviour that social learning theory takes no account of.

Point:

Because:

So what?:

However:

Social learning theory has the advantage of being able to explain cultural differences in behaviour. Social learning principles can account for how children learn from other individuals around them, as well as through the media, and this can explain how cultural norms are transmitted through particular societies. This has been useful in understanding a range of behaviours, such as how children come to understand their gender role. For instance Margret Mead (sociologists should know this one) studied social groups in Papua New Guinea. She found the Arapesh men & women to be gentle, responsible and cooperative while Mundugumor men & women were violent and aggressive and Tchambuli had gender role differences where the women were dominant, impersonal & managerial whereas men were emotionally dependent.

Point:

Because:

So what?:

However:

Bandura emphasised **reciprocal determinism**, in the sense that we are not merely influenced by our external environment, but also exert an influence upon it, through the behaviours we choose to perform. This element of choice suggests that there is some **free will** in the way we behave.

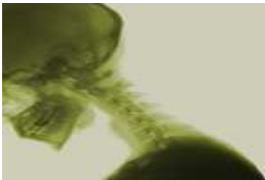
Point:

Because:

So what?:

However:

The Biological Approach



● The biological (medical) model of abnormality makes the assumption that psychological and behavioural abnormalities have biological causes. In other words, things go wrong with behaviour and experience, because something has gone wrong with the brain.

From the sixteenth century, there was a steady increase in the reported incidence of symptoms such as delusions of grandeur, progressive forgetfulness, and mental deterioration. People who faced all these symptoms together also faced an early death. In the nineteenth century these symptoms were identified as a syndrome called general paresis. The first step in curing general paresis was to find its cause, which was thought to be from the syphilis bacterium. In its early stages syphilis causes genital sores, but these are short lived, and so it appeared the person had recovered. Doctors suspected that the bacterium might cause the mental deterioration and later death. The issue was people who had general paresis would not admit to having had syphilis and so they could not make the link. Later one doctor took nine paretics, and injected them with syphilis. If they had had syphilis they could not be re-infected and would therefore not develop symptoms. None did, which demonstrated the link.

What is the importance of this?

Possible Causes of Behaviour

- **Genetics**
 - **Neurochemistry**
-

- Infection
- Neuroanatomy

Explanation	Image	Example
<p>The genes we inherit from our parents provide the 'blueprint' for our bodies and brains. A slight abnormality in the genes could result in abnormalities in a person's brain functioning with the consequence that their behaviour becomes abnormal.</p>		
<p>To operate properly, the brain relies on hundreds of different chemicals all being in the correct balance. These chemicals (neurotransmitters and hormones) are used to send messages round the brain and nervous system, so too much or too little of any of them can cause the brain to function abnormally.</p>		
<p>The brain itself has no immune response. It relies on keeping infections (e.g. bacteria or viruses) out with a barrier. Infections that get into the brain can cause widespread damage, and if the brain is damaged then a person may start to have abnormal experiences or to behave in abnormal ways.</p>		
<p>The brain's structure can also be damaged or improperly formed during development. This would then impact the person's ability to think, and their emotional responses, therefore their behaviour may change.</p>		

Factor	Genetics	Neuro-chemistry	Infection	Neuro-anatomy
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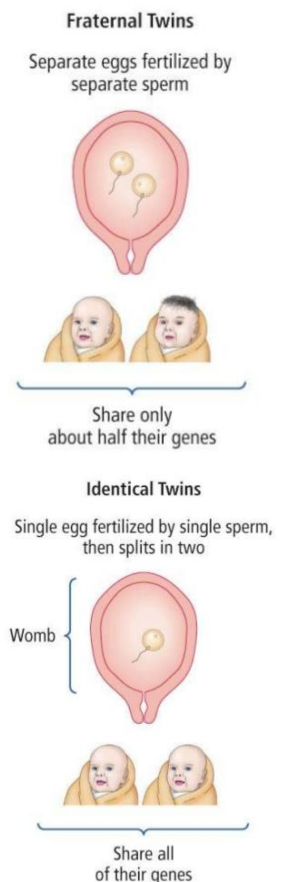
The Use of Twins

Twins: nature's little experiment

It is unethical to perform breeding experiments to study human genetics. However, there are natural "experiments" that have helped geneticists to study the influence of heredity and environment on the phenotypes of humans.

Dizygotic and monozygotic twins

- Dizygotic twins are non-identical twins.
- They share 50% of their genes like any other children from the same couple of parents.
- Dizygotic twins are the product of two sperms fertilising two eggs. Many other animals produce multiple births like this (e.g. cats produce litters of 4 or 5 kittens). Humans normally produce single births because the parents invest a lot of care and attention on their offspring.
- Monozygotic twins are identical twins.
- They share 100% of their genes.
- Monozygotic twins are the product of one egg fertilised by one sperm. Early on in the development of the embryo (usually during the first two weeks) the cells of the embryo split into two groups and develop into two embryos.
- Monozygotic twins are a clone. They may provide an opportunity to determine whether a characteristic is controlled by inherited genes or the environment.

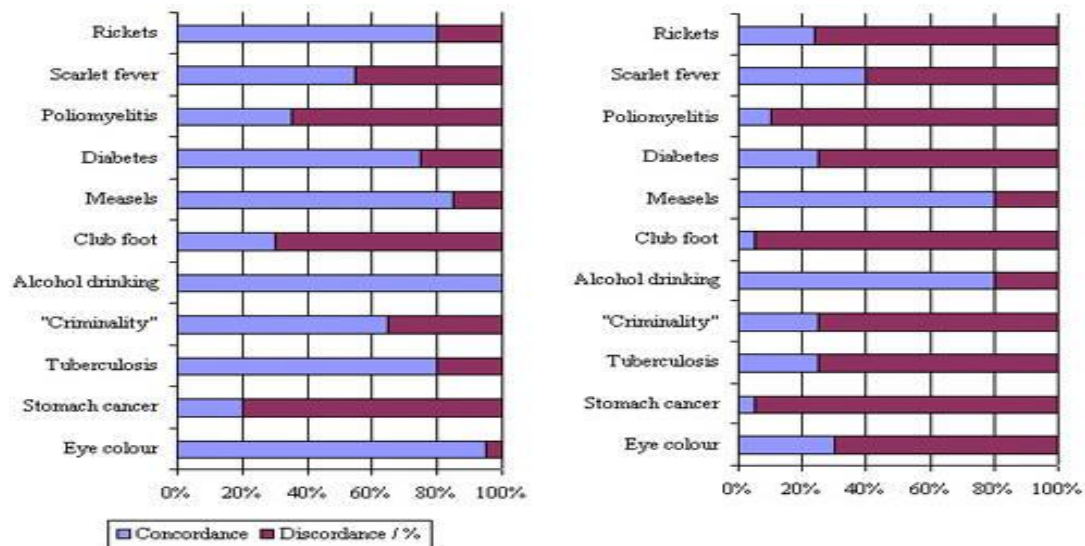


Concordance and discordance

The degree of concordance is the degree of similarity between two individuals. The data below shows the degree of concordance and discordance of twins for a selection of characters.

Monozygous twins

Dizygous twins



What does a high degree of concordance between the twins indicate?

What does a high degree of discordance between the twins indicate?

What do the differences between the data for monozygotic and dizygotic twins suggest?

Is it possible to distinguish between environmental and genetic effects this way?

Genotype and Phenotype

Genotype and phenotype are very similar-sounding words that are related, but actually mean different things. The genotype is the set of genes in our DNA which is responsible for a particular trait. The phenotype is the physical expression, or characteristics, of that trait. For example, two organisms that have even the minutest difference in their genes are said to have different genotypes. These two mice may have different genotypes and both can still be white if they share the particular phenotype for white fur.

First and Second Year Approaches

Genotype is what makes the trait - the information within a gene, or the genetic makeup of a specific organism. Genotype is determined by the makeup of something called "alleles," a word that refers to the form of a gene that produces different effects. Genotype is the information contained within two alleles. Genotype is the genetic makeup of an organism and it results in some of the physical characteristics of that organism. Genotypes can only be determined by biological tests, not observations. Genotype is an inherited trait and hereditary information passed by the parents determines genotype. The entire genetic information about an organism is contained in a genotype – even those characteristics which are not expressed visually.

Phenotype is what you see - the visible or observable expression of the results of genes, combined with the environmental influence on an organism's appearance or behaviour. For example it is the expression of gene information which is observable with the senses (like the sound of a bird's chirping or the color of a cat's hair). Phenotype can be determined by mere, simple observation.

The Darwin Diary:

How have Darwin's ideas contributed to Psychology?

Charles Darwin was born 200 years ago on 12th February 1809. He was a naturalist and made a vast difference to our understanding of the variety and history of living things. After dropping out of a medical degree in Edinburgh he later earned a Bachelor of Arts from Cambridge – the first step towards being a vicar. Instead of completing this training he went on a five year voyage on the HMS Beagle, which took him to many places including the Galápagos Islands where he observed differences between finch species and between sub-species of tortoise. On the journey he studied relationships between species and this, his understanding of geology and many other influences including reading of An Essay on the Principle of Population by Thomas Malthus, allowed him to develop his ideas.

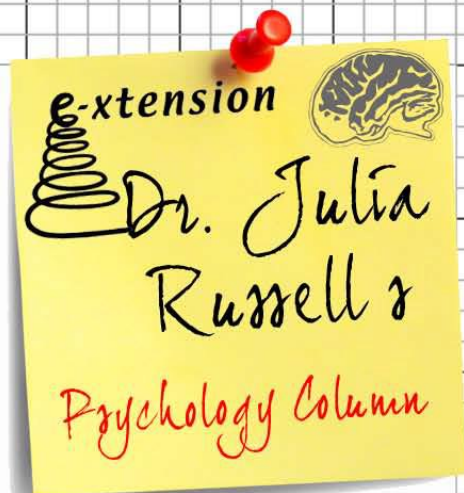
The theory of evolution by natural selection

Through years of painstaking observation and a good deal of imaginative thought, Darwin developed an explanation for the diversity of living things on Earth: the theory of evolution by natural selection. Although at the time he was writing the knowledge of genes and other biological principles was very limited he explained that organisms vary and that some will be more likely to survive. Those with advantageous characteristics will be more likely to live long enough to reproduce. Importantly, if these characteristics can be inherited, they will be passed on to their offspring. The consequence of this process is that the population will change. The frequency of individuals with those beneficial characteristics will increase.



Darwin envisaged that the initial differences between organisms could be very slight as any small advantage would help in the struggle for survival. Such differences, we know now, are caused by mutations to the organism's genetic material and sometimes these can in fact be quite major. Most mutations are harmful but when they are beneficial they can contribute towards survival, for example, in helping an animal to compete for food or to hide from predators. The factors that influence the relative success of individuals are called selection pressures. They are simply environmental conditions that make survival and reproduction difficult.

They can, however, make the difference between life and death. An animal which is more likely to win a fight, perhaps because it is better equipped with bigger horns or claws, is more likely to have offspring. If these individuals carry genes for this advantageous structure or behaviour, they too will be better adapted to survive. Since the adaptation allows individuals to





survive and reproduce more effectively, these individuals become more common. Darwin published these ideas in *The Origin of Species by Means of Natural Selection*, published in 1859.

The basic principles of evolution by natural selection:

- Organisms vary (due to mutations)
- These variations can be passed on to offspring (through genes)
- More individuals are produced than can possibly survive
- Individuals compete for scarce resources (such as food and mates)
- Some variations are advantageous and lead to enhanced survival and/or reproduction

As a consequence, those individuals with beneficial characteristics which allow them to survive and reproduce will pass these on to their offspring and such individuals – those which are better adapted - will increase in the population. These individuals have the highest 'fitness'. Hence the expression:

'Survival of the fittest'

Evolution and psychology

But isn't natural selection all about finches with funny beaks and giant tortoises? What does that have to do with human psychology?

Evolutionary ideas have been applied to a wide range of human behaviours including:

- why we sleep
- Mate choice and relationships
- Attachment
- Aggressive behaviour
- Pro-social behaviour
- Gender differences
- Phobias
- Food choices and eating disorders
- Communication

One reason why evolutionary theories are so useful is that they help to explain behaviours at different levels. We can consider four answers to the question 'why does this behaviour happen?'

- **Ontogenic** – a 'developmental' answer or 'how does this behaviour come about in this individual during the course of its lifetime' eg 'is it innate or learned?'
- **Phylogenetic** – an 'ancestral' answer or 'was this behaviour present in more primitive ancestors?'
- **Proximate** – an answer about what triggers the behaviour at that time in that individual eg 'what situation or stimulus makes it happen?'
- **Ultimate** – an answer about selective advantage eg 'why would it benefit an individual to do that?'

When we look at evolutionary explanations we focus largely on the ultimate causation of the behaviour. This is helpful because it can account for human behaviours that cannot necessarily be understood in the context of the social or physical environment in which we now live. These same behaviour patterns may, however, make a lot of sense when considered in terms of the problems



faced by humans early in their evolution. The prehistoric environment in which humans evolved is sometimes called our **environment of evolutionary adaptedness** so our behaviours, cognitions and preferences need to be viewed from the perspective of the problems faced by humans in that ancestral situation.

Questions

1. Using the information in the blue box above, explain how an animal which has a mutation that causes it to stand motionless when it is frightened by a predator is better adapted than one which does not.

2. Here are four possible answers to the question 'why is this arctic fox asleep in the daytime?' Identify the which corresponds to each level of explanation (ontogenic, phylogenetic, proximate and ultimate):

- Because its dog-like ancestors slept in the daytime
- Because it has a body clock that governs its 24 hour sleep-wake cycle
- Because it is better at hunting prey when it's dark so needs to be awake at night
- Because as a young fox it learned to sleep when its mother did, and she slept in the daytime



Question 2.



Question 3.

3. Look at the four ways to answer the question 'why does this behaviour happen?' above.

Now write four different answers to the questions 'why does a bluetit sing?'. One should correspond to each level of explanation.

Sexual attraction can be used to explain almost anything, from the origins of 'beauty' to the evolution of intelligence. Read on and all will be revealed ...

Why does a peahen find a peacock's tail attractive? The answer would seem simple – it is because a peacock's tail is beautiful. But think again. A female turkey finds a male turkey attractive, but we would not describe the bulbous red head of a male turkey as 'beautiful' or even attractive. What makes these male characteristics attractive to a female? What makes something 'beautiful'? What is beauty?

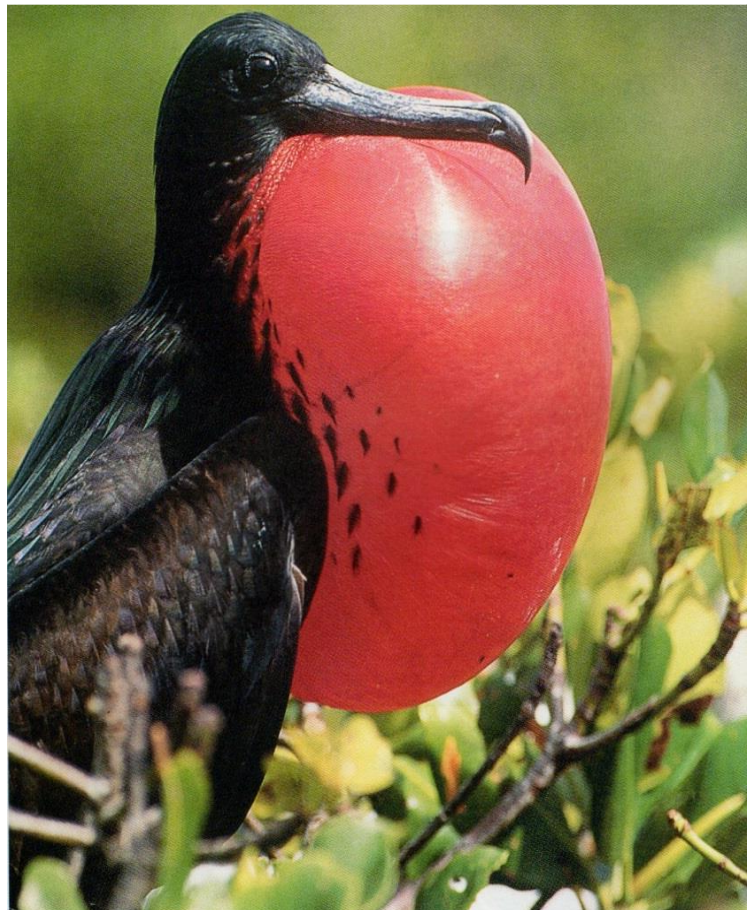
Natural and sexual selection

Charles Darwin introduced the concept of **natural selection** to explain his observation that separate species appear to evolve to fit their ecological niche. His observations were of finches in the Galapagos Islands. He noticed that on some islands, finches had thick, heavy beak, whereas on other islands, their beaks were elongated. This difference could be related to differences in diet. On the first set of islands the finches ate hard-shelled seeds, on other islands they fed off insects hiding under rocks. Each species adapted to features of its environment, thus developing unique characteristics.

The point is that the finches do not think. 'A longer beak would be a good idea'. Any individual who is born with a

Sexiness

In the eye of the beholder?



that the genes of such an individual are perpetuated and are selected by nature (i.e. naturally selected).

Thus Darwin proposed that all physical characteristics are likely to have been naturally selected because they promote survival and reproduction in that individual. How then do we explain the peacock's tail? Such a trait would appear to be downright disadvantageous, because any predator would spot a peacock from some distance and the poor peacock would have very little chance of escaping with that lengthy tail. This disadvantage must be outweighed by some other advantage. Darwin proposed the concept of **sexual selection** – the idea that certain traits increase reproductive success and this

slightly longer beak has a greater chance of surviving and, most importantly, reproducing. This means

Ultimately it doesn't matter if you survive or not, as long as you have passed on your genes. So if you possess a sexy trait that means the opposite sex selects you (sexual selection), this will ensure the perpetuation of your genes for that sexy trait (because your offspring inherit it).

Why does the male have the sexy trait?

According to the principles of sexual selection, males and females should both benefit from possessing sexy traits, so why is it that in many species, it is the male that has ostentatious plumage and colouring? The answer is anisogamy (males and females having different gametes or 'sex cells'). Males and females invest differently in reproduction. Females produce eggs which incur a greater physiological cost than sperm because the eggs contain nutrients. Males produce thousands of sperm at relatively less physiological cost. Therefore females ensure that reproduction is successful by being more selective, because they have more investment in each individual reproduction. Males tend to ensure the perpetuation of their genes in numbers alone. They invest through quantity.

The result is that females tend to choose between different males (intersexual selection), and males compete among themselves to be the one who is chosen (intersexual

outweighs any other disadvantage.

attractive to the female than peacock B or C. Two possible explanations have been offered: the 'good taste' view or the 'good gene' view.



Do bright colours denote good genes?

Good taste or Fisher's process

Fisher (1930) suggested that the main benefit of these 'attractive' traits (the peacock's tail or the turkey's red bits) is that they are inherited by sons. Any female selects a male who possesses these traits because she knows that this is what other females go for. Therefore her sons will inherit the same traits, will be more likely to be selected themselves and, as a result, the females' genes will be perpetuated. (Remember that no animal is actually doing any 'thinking'. It is a passive process where the genes of any individual who is successful are perpetuated).

This explanation has also been called the 'runaway process', because the selection of such sexy traits leads to their exaggeration. If a long, gaudy tail is attractive, then the male with the longest and brightest tail is selected. This leads males to possess rather bizarre traits. As long as the selective advantage outweighs the disadvantage, the traits will persist.

Research support includes observations that females commonly prefer males who possess the most exaggerated traits - for example, female green tree frogs

selection)

But this still doesn't explain exactly what it is that makes peacock A more.

do prefer the male with the most exaggerated trait. For example, Andersson (1982) cut off the tails of male widow birds and replaced it with either a long or short tail. The longer tailed males were preferred.

Good genes and the handicapping hypothesis

The rival view proposes that the point of the peacock's tails is an advertisement of the owner's excellent genetic quality. A mangle tail with dull colours suggests poor genetic quality and lower resistance to disease. A female who selects good genes is likely to be represented well in future generations (or rather her genes will be). A symmetrical body is also a sign of robust genes, which may explain why we find symmetrical features attractive.

This view has also been called 'good sense' and 'healthy offspring'. But why do signals of good genetic quality have to be a handicap (e.g. bright colours or long tails)? Zahavi (1975) proposed the **handicapping theory**, which explains that the more costly the handicap is, the more 'honest' the trait must be to be a signal of good genetic quality. A weak specimen could not support such a handicap.

Support for this hypothesis comes from Moller (1991), who showed that if you cut off the tail of a male swallow, and

select the male that calls the loudest, and female guppies choose the most brightly-colour male (Dugatkin and Godin 1998). Experiments have shown that females

grouse is infected by lice. Such males had reduced mating success.

Combined view

It is quite possible that the peacock's tail and other sexy traits are both an advertisement of good genes and a promise of sexy sons. It is likely that initial preference for a trait is due to an innate sensory bias. Each male trait may start as a chance mutation, but those that happen to involve a certain bright colour or a certain tone invite interest because they match this innate sensory bias. Females choose these males rather than others. For example, Ryan (1991) discovered that tungara frogs have a special whine followed by a chuck call. Related species have no such chuck, yet the females are attracted by the tungara chuck. It would seem that females of this group are tuned in to the chuck frequency.

Once females express preference for a trait, then runaway selection will occur. However, once this trait has spread to all males (through sexual selection), then the trait has no further advantage and will fade – unless it also is a sign of good genes.

Inconsistencies

There are a few things that may seem inconsistent in this story. First of all, in many birds such as cockatoos, the female also possesses colourful traits. The reason for this is that most genes are the same in males and females of the same species; there are only a few genes that are sex-linked and present in only males or females. Therefore, if a characteristic confers reproductive advantages for a male and is sexually selected, it may also appear in female offspring.

A second puzzling question relates to those species where males actually devote a significant amount of time to caring for the young, as in humans. One might wonder why such males don't then become as choosy as the females. These

give him a longer one, then the tail that grows back is shorter than the original – presumably because the male is handicapped by the extra burden. Boyce (1990) painted spots on the air sacs of male grouse – a sign that the

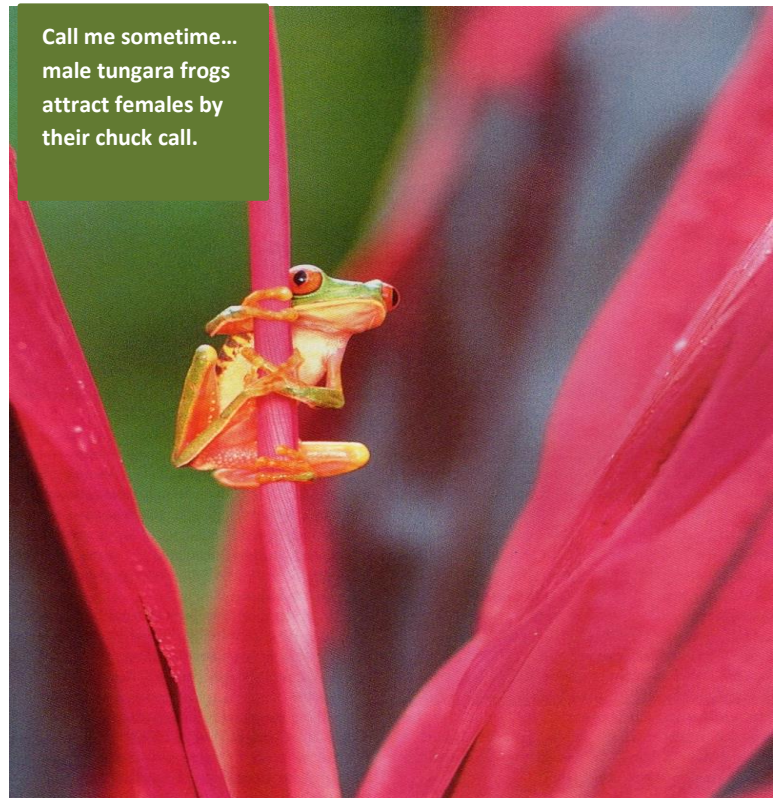
In humans, it is female and not male beauty which is highly prized. The turn-about occurs, because in monogamous partnerships, males have a greater interest in the females' genes because reproduction is likely to be limited for males as well as females. Therefore human males also look for signs of good genes (e.g. symmetrical faces, signs of good health such as rosy cheeks and lustrous hair – a classic sleeping beauty). In addition, fertility is likely to be lined to youthfulness, which would lead us to expect that signs of youth, such as a narrow waist in a female, would be considered beautiful.

Human females, on the other hand, may want sexy sons, but they also want a man who will provide, thus females seek signs of resources. These male-female differences have been supported by studies of personal ads (men advertise for looks and sell themselves in terms of resources; the opposite is true of females, e.g. Dunbar 1995) and by cross-cultural studies of what males and females want in a partner (Buss 1989).

The most surprising sexy trait

Miller (1992) made the astonishing suggestion that our minds evolved not as survival machines, but as courtship

males devote considerable energy and resources to rearing offspring, thus reducing future reproductive success. In fact, males in such a position do become as choosy as the females. And this might explain human interest in female beauty.



and it soon became a runaway characteristic. People became too intelligent and developed over-large brains, which made birth very difficult if not downright dangerous, and also led to a prolonged developmental period in humans.

Only the sexual selection of intelligence can explain why humans so often give intelligence as one of the reasons for selecting a partner. It can also explain the exponential growth of human brain size (trebling in the last 3 million years). Only sexual selection would exert the kind of pressure for this relatively (in evolutionary terms) rapid change (Ridley, 1994).

Sexy traits and beauty

So, what is a sexy trait? It is a trait that increases the possessor's reproductive success. A 'sexy' car or 'sexy' handbag has characteristics that make it more appealing, more likely to be popular and more likely to be around for some time to come.

machines. Intelligence is a sexy trait. Its initial appearance no doubt was because of the advantages that it incurred. Intelligent individuals were better hunters and better at managing in social situations. However, females may have selected men with this trait

What is beauty? Traits that are appealing and likely to be related to sexual selection. They may well be based on innate sensory biases that have become exaggerated through good taste and good sense.

Evaluating Biological

In order to investigate the genetic and biological basis of behaviour, the biological approach makes use of a range of precise and highly scientific methods. These include scanning techniques, such as **fMRIs** and **EEGs**, family and **twin studies**, and drug trials. With advances in technology, it is possible to accurately measure biological and neural processes in ways that are not open to bias. This means that the biological approach is based on reliable data.

Point:

Because:

So what?:

However:

Increased understanding of biochemical processes in the brain has led to the development of psychoactive drugs that treat serious mental illnesses, such as depression. Although these drugs are not effective for all patients, they have revolutionised treatment for many. This is a strength of the biological approach because it means that sufferers are able to manage their condition and live a relatively normal life, rather than remain in hospital.

Point:

Because:

So what?:

However:

The biological approach offers explanations for mental illness in terms of the action of **neurotransmitters** in the brain. The evidence for this relationship comes from studies that show a particular drug reduces symptoms of a mental disorder and this it is assumed that the neurochemical

in the drug *causes* the disorder. This is a bit like assuming that the cause of a headache is lack of paracetamol simply because taking paracetamol is effective in relieving symptoms of a headache. Discovering an association between two factors does not mean that one is a cause. This is a limitation because the biological approach is claiming to have discovered causes where only an association exists.

Point:

Because:

So what?:

However:

The biological approach is **deterministic** in the sense that it sees human behaviour as governed by internal, biological causes over which we have no control. This has implications for the legal system and wider society. One of the rules of the law is that offenders are seen as legally and morally responsible for their actions. The discovery of a 'criminal gene', if there was such a thing, may complicate this principle. **Consider: if scientists discovered a 'criminal gene' that made someone more likely to offend, and carries could use this as a defence in court, what would be the implications for society and the legal system?**

Point:

Because:

So what?:

However:

Identical twins, non-identical twins and members of the same family all have genetic similarities. Therefore, the biological approach argues, any similarities in the way that they look or behave must be genetic. However, there is an important **confounding variable**. They are also exposed to similar environmental conditions. This means that findings could just as easily be interpreted as supporting **nurture** rather than **nature**. This approach also has difficulty accounting for the fact that, in research studies, DZ twins often show higher concordance rates than pairs of ordinary siblings. This is likely to be explained by the influence of nurture as DZ and ordinary siblings both have about 50% (on average) genes in common.

Point:

Because:

So what?:

However: