

# The biological approach: the basics

## What assumptions do biopsychologists make?

Psychologists from the biological approach assume that behaviour and experiences are caused by activity in the **nervous system** of the body. The things that people think and feel, say and do are caused, one way or another, by electrochemical events occurring within and between the **neurones** that make up their nervous system, particular those in the **brain**. Many biopsychologists also agree that because the development of the brain is determined (at least partly) by the **genes** a person inherits, that behaviour may be influenced by genetic factors. Furthermore, because the genes we inherit are the result of **evolution**, many biopsychologists think that behavioural and psychological characteristics may have evolutionary explanations.

## How do biopsychologists explain human behaviour?

Biological psychologists explain behaviour by trying to relate it to the functioning of the brain and nervous system. The brain can be subdivided into many different areas and structures and biopsychological explanations often focus on which **brain areas** are responsible for which types of thinking or behaviour and how they connect with other functions and brain areas. For example, biopsychologists believe that language in humans is governed by two areas of the cerebral cortex, **Broca's area**, which controls the production of speech and **Wernicke's area**, which controls the comprehension of speech. These 'speech centres' are connected to a variety of other brain areas including those involved in thinking and in auditory working memory.

Other biopsychologists focus more on the role of **genetic influences** in particular types of behaviour. For example, it is widely believed by biopsychologists that **schizophrenia**, a psychological disorder involving a range of symptoms including hallucinations, delusions and disorganized thinking and speech, is at least partly the result of inheriting a faulty gene or genes. These genes are thought to influence the development of the nervous system, making it vulnerable to malfunctioning in certain ways that produce the symptoms of the disorder.

Biopsychologists believe that **chemical processes** in the brain can be an important influence on behaviour. The brain relies on a large number of chemicals (called **neurotransmitters** and hormones) to send signals between neurones. Too much or too little of any of these chemicals can result in over- or under-activity in various parts of the brain, which results in changes to thinking, feeling and behaviour. For example, some researchers have shown how behaviour can be affected by altered levels of **sex hormones**. Increased **testosterone** leads to increased risk-taking, whereas increased **oxytocin** leads to increased nurturing and **social responsiveness**.

## How do biopsychologists study human behaviour?

The role of biological processes in behaviour can be studied in many different ways, but researchers favour methods that are **quantitative**, **objective** and well controlled because these are most likely to produce valid **scientific** evidence.

Researchers who are interested in genetic influences may use **twin**, **family history** and **adoption studies**. All of these involve comparing people with different degrees of genetic relatedness to see how similar they are in relation to a particular trait or behaviour. Studies of schizophrenia patients and their families, for example, have shown that the more closely a person is related to a schizophrenia patient, the greater their own risk of developing the disorder, which supports a role for genes in the disorder.

Various types of **brain scanning** technology including **PET** and **MRI** can be used to study the structure and functioning of the brain. The nervous system can also be studied by manipulating the brain **surgically**. This might be done with animals, as biopsychologists view the human nervous system as having a lot in common with those of other mammals. Alternately, researchers might investigate the effects of brain injury, or brain surgery in people who need to have an operation in order to remove a tumour or an epileptic focus.

One example of such an approach is the studies by **Wilder Penfield** in the 1950s. Penfield electrically stimulated different parts of the **cerebral cortex** in patients he was operating on. He found that, under some circumstances, they would start having unusual experiences or vivid memories of past events. This gave researchers insight into how the brain stores memories.

## **Evaluation of the biological approach**

The methods used by the biological approach give its studies a high degree of **reliability**, validity and scientific credibility, which is enhanced by its focus on **objectively observable** phenomena rather than subjective experiences. Whilst most people regard this as a strength some would suggest that biopsychologists neglect an important aspect of being a person: their experiences. Another objection to the biological approach would be its use of **animal models** as a basis for understanding human behaviour: given that each animal's nervous system reflects its unique evolutionary niche and history, it might not be possible to draw clear conclusions about human behaviour from studies of other animals.

A further objection to the biological approach could be that it tends to focus on genetic and biological influences on behaviour to the exclusion of social and **cultural influences**. Social psychologists would suggest that it is difficult to explain what people do without reference to their relationships with other people, and many psychologists would suggest that culture, particularly in the forms of social learning and **language**, has a critical impact on thinking and behaviour that the biological approach tends to neglect.

However, it cannot be denied that the biological approach has contributed an enormous amount to our understanding of the fundamental processes of behaviour. It has also fed into many other areas including medicine and surgery. Biological psychologists have provided explanations for a range of **psychological disorders** including depression and schizophrenia, and the **drug therapies** they have helped to develop have allowed many people to live normal lives that previously would not have been able to.

## **The biological approach and key debates**

Biopsychologists are generally **deterministic** in their outlook (although Daniel Dennett, a philosopher who is heavily influenced by biopsychology, suggests that people have a sort of free will). As might be expected, they tend to favour the **nature** side of the nature-nurture debate. Because they take a very scientific approach to studying people their approach is **nomological** – they are most interested in the features that people have in common and in understanding the fundamental laws of human behaviour. Their scientific approach also inclines them to explain human behaviour in a **reductionist** manner, by breaking complex processes down into more fundamental biological ones.