The biological approach

The basic assumption of this approach is that our thinking and behaviour (both normal and abnormal) are strongly influenced by the way our central nervous system (the brain) works.

This is not a new approach, in 387 BC, Plato (a Greek philosopher) suggested that the brain is the mechanism of all mental processes.

Methodology

This approach therefore uses a very scientific methodology focusing on exploring the activity and the structure of the brain.

- **Genetic studies:**

  Genes code for physical characteristics such as the colour of your eyes but they also code for the structure and functioning of the brain.

  1. **Twin studies:** these are used to find out the role of nature and nurture in a particular characteristic i.e. schizophrenia.

     Monozygotic (MZ) twins have exactly the same DNA whereas dizygotic (DZ) twins have only 50% of their genes in common. The concordance rate (the rate of probability that two people with shared genes will develop the same disease) of MZ twins and DZ twins are compared. As both twins whether they are MZ or DZ twins share the same environment, if the MZ twins have a higher concordance rate than the DZ twins then we can say that genetic factors are involved in the particular characteristic we are studying. However it could be argued that if MZ twins have the same DNA they should have 100% concordance rate and this is not the case for psychological characteristics.

     There are a few reasons for this. Firstly we assume that because they have the same DNA they develop exactly in the same way but this is not the case one twin is always heavier- more developed- than the other at birth. Also epigenetics contributes to the differences. Epigenetics is the interaction between nature and nurture, MZ twins have the same genes but they might not be switched on in the same way, environmental factors turn genes on and off. In a way it explains how nurture shapes nature. For example an environmental trigger for schizophrenia is cannabis, if one MZ twin takes cannabis it might switch on the genes responsible for schizophrenia and this twin will develop the disorder whereas the other twin does not use the drug and will not become schizophrenic.

     Another limitation of twin studies is that it is a limited sample (in 2004. about 1 in 34 babies was born a twin in the UK) also because they had to share limited resources during gestation they are unrepresentative of the general population.

  2. **Adoption studies**

     When children are adopted, they are brought up in a different environment than the biological parents so if a trait is learnt the child should not develop this characteristic but
if it is genetic then the disorder should develop at the same rate than it would if the child had been raised by the biological parents. So by comparing the concordance rate between biological parents and adopted children we should be able to determine whether genetic factors are involved in a particular disorder.

There are many limitations to this type of studies. The first one is that we generally do not know at what age the child was adopted so the behaviour could have been learnt from the biological parents, also the child might have been adopted by the extended family and still have contact with the biological parents therefore still be able to learn the behaviour. Also adopted children have been through traumatic events i.e. separation from the biological parents this in itself could lead to psychological difficulties, therefore such a sample is not representative of the general population.

3. Family studies

These are very common; researchers compare the concordance rate of a particular characteristic in a family (grand-parents, uncle, cousins, children). If the concordance rate for a particular disorder is higher in members of a family than in the general population then we can conclude that genetic factors are involved. However members of a family share the same environment so we cannot say with any certainty whether nature or nurture are responsible for the particular characteristic.

- **Scans**
  1. **MRI (magnetic resonance imaging)**
     This technique allows us to visualise the structures of the brain in high resolution. This is widely used i.e. to measure and compare the size of the ventricles in schizophrenics.
  2. **fMRI (functional magnetic resonance imaging)**
     This allows us to see the brain at work. The image is based on the use of oxygen by areas of the brain however it does not measure directly the activity of the brain so we do not know whether the change of consumption of oxygen is the cause or the consequence of the activity.
     Although these techniques are a great improvement on the techniques used in the past we have to be aware of their limitations. They are correlational studies, the brain changes all the time so we cannot say with any certainty that the changes we see are caused by the tasks we ask the participants to perform while having a scan or by other thoughts or processes. However this tendency to interpret these scans as objective and “hard science” evidence can have very serious consequences as there are more and more calls for these scans to be used in courts of law.

- **Post mortem studies of the brain**

These studies are carried out because of the assumption that major psychiatric disorders are diseases of the brain, and that at least some disorders, such as schizophrenia, are associated with altered brain anatomy. Although neuroimaging (MRI and fMRI) provide information on structures of the brain and pattern of activity they cannot yet provide information about the nature and possible alterations of neurones, these have to be studied by looking directly at the neurone involved. However it is difficult to get hold of appropriate sample to study.
• Case studies

Case studies are carried out on individuals presenting unusual characteristics such as Clive Wearing although the usual evaluation of these studies is that they have a limited sample therefore we cannot generalise the results to the general population we must not forget that they are very valuable sources of information on conditions that, for ethical reasons, we could not carry out artificially.

Evaluation of the biological approach

Strengths

It is a very scientific approach as it relies on precise measurements and laboratory experiments which are replicable therefore the results are reliable.

The theories from this approach are supported by empirical evidence.

The biological approach makes precise predications which can be tested objectively.

It has given rise to therapies (drugs mainly) which have improved the quality of life of many patients.

Weaknesses

A weakness usually levelled to the biological approach is that it does not recognise the influence of environmental factors. This is not quite the case as it does recognise that the environment can switch genes on and off (epigenetics) and also that environmental factors can change the structure and functioning of the brain (brain plasticity also called neuroplasticity).

It is fairly deterministic; it argues that if you have low serotonin for example you are likely to develop depression so it reduces our feelings and reactions to physiological mechanisms therefore ignoring the factors in our every day environment - our childhood experiences and the influence and behaviour of friends and media - that have been found to affect us.

The therapies offered by the biological approach can have serious side-effects i.e. tardive dyskinesia. These therapies treat only the symptoms not the cause of the disorders.

Some disorders can be caused by childhood experiences that cause trauma and depression during adulthood. These may be better treated by confronting our past than by using anti-depressants.

The biological approach supports the nature side over nurture however the debate is not so much whether nature or nurture is most influential but rather how nature interacts with nurture.