Outline principles that define the biological level of analysis

Introduction

• The biological level of analysis argues that there are physiological origins of many behaviours and therefore humans should be studied as biological systems

• Three key principles:
  o Emotions and behaviours are products of the anatomy and physiology of the nervous and endocrine systems
  o Animal research may inform our understanding of human behaviour
  o Patterns of behaviour can be inherited; behaviour is innate because it is genetically based

• These principles are the main ideas that have driven research on specific areas of behaviour and physiology

Emotions and behaviours are products of the anatomy and physiology of the nervous and endocrine systems

• Suggests that all observable behaviours, as well as the internal mental activity of an individual, can be traced back to physiological events

• Encouraged by research findings that there are biological correlates of behaviour

• Links have been found between psychological events and physiological activity in three main areas:
  o The effect of neurotransmitters
  o The effect of hormones
  o The effect of brain localisation

• Could be argued that this principle is reductionist

• Psychologists working at this level do not deny the influence of biological factors. They work to understand the interaction of social and cognitive factors with physiological and genetic factors

Study: Grafman et al. (1996)

• This principle can be demonstrated through this study by Grafman et al. (1996)

• Looked at Vietnam veterans with frontal lobe damage

• Compared to controls matched for age, education and time in Vietnam but who did not have frontal lobe lesions

• Those with lesions were rated as more aggressive on a range of measures

• Suggests an anatomical cause for violent behaviour

Animal research may inform our understanding of behaviour

• Because of the idea of evolution, it is suggested that we share a common ancestral species to certain animals.

• Therefore, when it comes to physiology and behaviour, it is valid to try and make inferences about human behaviour based on animal research

• Brains can be studied in animals that appear to be closely related to humans

• However, there is controversy regarding the use of animals in research, as it could be seen as unethical

Study: Martinez and Kesner (1999)

• This principle can be demonstrated through this study by Martinez and Kesner (1999)

• Looked at role of acetylcholine (Ach) on memory, specifically memory formation

• Rats were trained to go through a maze, where they received food at the end

• After:
  o Group 1: scopolamine (blocks Ach receptor sites)
  o Group 2: Physostigmine (does ‘clean-up’ of Ach from synapse and returns neuron to its resting state)
Outline the role of genetic factors in one behaviour (8)

• A key principle of the biological approach is that behaviour can be inherited
• This is based on the assumption that specific genes code for particular behaviour
• As we acquire our genes from our parents, if we acquire the gene that codes for a behaviour, then the assumption is that we will also acquire that behaviour

• One way to investigate the role of genes in behaviour is by looking at people with varying levels of shared genetic information – often results in the use of twin and family studies
• In twin studies, monozygotic (MZ) twins, who share 100% of their genetic information, are compared to dizygotic (DZ) twins, who share 50% of their genetic information
  o We then identify the likelihood of one twin sharing a behaviour if the other twin is already demonstrating it – known as CONCORDANCE RATE
  o If the behaviour does have a genetic component, we would expect MZ twins to have a higher concordance rate, because they share more genetic information
    ▪ Indeed, if the behaviour was purely genetic then we would expect MZ twins to have a 100% concordance rate
• In this response, the role of genetic factors will be outlined in regards to depressive behaviour

Silberg et al. (1999)
• Aimed to assess both the role of genes and recent life events in the onset of depression
• 902 pairs of twins; both pre-pubertal and at puberty
• Each completed an interview to assess depression. Life events were measured both by a questionnaire and an interview with their parents
• Findings:
  o Girls suffered more depression than boys
  o Also more susceptible to depression in response to recent life events. However, there were wider individual differences among girls in their response to life events
  o Girls who suffered depression after a negative life event were often those whose twin also suffered depression
• Suggests an important role for genes in determining individual differences in vulnerability to depression in response to life events
  o Diathesis stress model
• Seems that rather than causing depression directly, genetic factors make us more susceptible to depression after life events

Conclusion
• This study has a lot of value in investigating the role of genetics in determining our behaviour
  o Clearly shows a correlation between genetics and the way we behave, in terms of our likeliness to exhibit depressive behaviour
• The results show great potential, as we may be able to predict the development of certain psychological disorders in a person – could undoubtedly help in its treatment
• Must remember that there is also evidence for environment playing an important role