**Discuss the hormonal explanations of aggression ( 8 marks)**

An example a hormonal mechanism in aggression is testosterone. Testosterone is a hormone which regulates the part of the brain which controls social behaviour. High levels of testosterone are linked to aggressive behaviour in males, as the high levels result in a lack of control over behaviour.

There is much supporting scientific research for the role of testosterone on aggression. This biological explanation can also explain the variation in findings between boys and girls in Bandura’s Bobo doll experiment. Bandura found that boys consistently behaved more aggressively than girls despite having the same modelling. We can explain this difference in levels of aggression as the result of different levels of the hormone testosterone between the genders. These findings can also explain the variation between the levels of aggression found in society.

Additionally, Mehta and Joseph provided research support for the role of testosterone. They measured levels of testosterone before and after males completed a competitive game. In which all the males lost. They were then offered the chance to challenge their competitor again (aggressive task) or take part in an unrelated task (non-aggressive). 77% of males whose testosterone had increased after losing the task were more likely to challenge again (the aggressive task). Whereas only 23% of males who testosterone decreased after the task chose to challenge the competitor again. This suggests that the hormone testosterone has a crucial role in how aggressively we behave.

However, this suggestion that high levels of testosterone causing aggressive behaviour depends on correlational research. Although a correlation between high levels of testosterone and aggressive has been found, this does not mean that we can assume cause and effect. For example the dual hormone hypothesis has recently stated that low cortisol levels combined with high testosterone levels is the cause of aggression, rather than just testosterone. There are also other environmental factors (such as upbringing) which may cause aggressive behaviour which the biological approach doesn’t consider, therefore may not have a true understanding of the causes of aggression.

**Discuss the neural and hormonal explanations of aggression**

A neural mechanism in aggression is the limbic system. The limbic system is a complex system of networks and nerves in the brain, controlling basic drives and emotions. It responds to environmental stimuli and assesses whether to respond in an aggressive way. Its core structure is the amygdala, which assesses and responds to environmental threats and challenges, evaluating the emotional importance of sensory information. Its overactivity is a predictor of aggression, for example, in animals, electrical stimulation of the amygdala results in an aggressive response such as snarling.

A hormonal mechanism in aggression is testosterone. This is a hormone produced mainly in the male testes, associated with aggressiveness and is implicated in the development of masculine features and regulating social behaviour. Research has shown that males tend to be more aggressive than females, and the role of testosterone therefore may be able to explain gender differences.

A criticism of the limbic system’s explanation of aggressive behaviour is that it doesn’t consider other brain structures involved in aggressive responses. The amygdala appears to function with the orbitofrontal cortex (OFC). The OFC is involved in self-control, impulsive regulation and inhibition of aggressive behaviour. For example, Coccaro found reduced OFC activity in patients with psychiatric disorders prominently featuring aggression. Alongside Gospic’s findings, this suggests that the regulation of aggression is more complex than the limbic system operating in isolation and this explanation is too simplistic, due to not acknowledging interactions with other neural structures.

A strength of much supporting research into the neural and hormonal explanation is that it is highly controlled and uses scientific methods. For example Gospic used FMRI scans to spot patterns and trends in the brain and aggression. These methods are valued as they can be easily repeated, objective and are reliable. However, a weakness of Gospic’s research, similar to other research into aggression, is that it lacks mundane realism. For example the ultimatum game isn’t representative of real life aggression and there is a lack of consequences. Furthermore much of the research into the biological explanations has to be conducted on animals, as scientists are altering hormone levels of brain structures. Therefore these findings have limited application to humans and whilst they may demonstrate the role of the amygdala in aggression, we can’t generalise findings to humans as we have different brain structures.

A limitation of the role of testosterone is that there is mixed evidence for its link with aggression. For example, Carre and Mehta’s dual-hormone hypothesis claims that high levels of testosterone lead to aggressive behaviour, only when cortisol levels are low. When cortisol is high, testosterone’s influence on aggression is blocked. Cortisol is a glucocorticoid hormone that plays a central role in the stress response. Therefore, the interaction between the activity of testosterone and cortisol may be a better predictor of human aggression than either hormone alone. This suggests the explanation is too simplistic as there are multiple contributing factors to aggressive behaviour.

A limitation of biological explanations is that they are reductionist and deterministic. It reduces aggressive behaviour to the action of hormones and neural mechanisms, viewing humans as passive responders to the environment, controlled by biological structures. It is ignorant to the mental processes and wider social contributing factors. Due to behaviour being determined by such structures, this has implications for the legal system in terms of people being held accountable for their actions, as biology may be used as a defence.