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| **Biological explanations: Genetic and neural explanations AO1** | | | |
| **Genetic explanations:**  Genetic explanations for crime suggest that would-be offenders inherit a gene, or combination of genes, that predispose them to commit crime.  Twin studies: The importance of genes is illustrated by twin studies. The first criminal twin study was conducted by Lange (1930) who investigated 13 identical (MZ) and 17 non identical (DZ) twins where one of the twins in each pair had served time in prison. Lange found that 10 of the MZ twins but only but only 2 of DZ twins has a co-twin who was also in prison. Lange concluded that genetic factors must play a predominant part in offending behaviour.  Most recent research by Christiansen (1977) studied 87 MZ and 147 DZ pairs and found a concordance of 33% for MZs and 12% for DZs which supports the view that offending may have a genetic component.  Candidate genes: A genetic analysis of almost 900 offenders by Tiihonen et al (2014) revealed abnormalities on two genes that may be associated with violent crime – the MAOA gene (which controls dopamine and serotonin in the brain and has been linked to aggressive behaviour) and CDH13 (that has been linked to substance abuse and attention deficit disorder). Within the Finnish sample, individuals with high risk combination were 13 more times more likely to have a history of violent behaviour. However, it must be emphasised that this research is in its infancy and has, so far, not been replicated.  Diathesis-stress model: If genetics do have some influence on offending, it seems likely that this is at least partly moderated by the effects of the environment. Elsewhere, we have seen how the diathesis-stress model has been applied to schizophrenia. A tendency towards criminal behaviour may come about through the combination of genetic predisposition and biological or psychological trigger – for example, being raised in a dysfunctional environment or having criminal role models. | | | |
| **Neural explanations:**  Evidence suggests there may be neural differences in the brains of criminals and non-criminals. Much of the evidence in this area has investigated individuals diagnosed with antisocial personality disorder. APD is associated with reduced emotional responses, a lack of empathy for the feelings of others, and is a condition that characterises many convicted criminals.  Pre-fontal cortex:  Adrian Raine has conducted many studies of the APD brain, reporting that there are several dozen brain-imaging studies demonstrating that individuals with antisocial personalities have reduced activity in the prefrontal cortex, the part of the brain that regulates emotional behaviour. Alongside this, Raine and his colleagues (2000) found an 11% reduction in the volume of grey matter in the prefrontal cortex of people with APD compared to controls.  Mirror neurons:  Recent research suggests that criminals with APD can experience empathy but they do so more sporadically than the rest of us. Keysers et al (2011) found that only when criminals were asked to empathise (with a person depicted on film experiencing pain) did their empathy reaction (controlled by mirror neuron in the brain) activate. This suggests that APD individuals are not totally without empathy, but may have a neural ‘switch’ that can be turned on and off, unlike the ‘normal’ brain which has the empathy switch permanently on. | | | |
| **Problems with twin studies**  P: One problem with the early twin studies such as Lange’s research is that they were poorly controlled.  E: For example, the judgements related to whether the twins were MZ or DZ were based on appearance rather than DNA testing.  E: This is a weakness because many DZ twins look similar and some MZ twins may not look alike, which means that the results may lack validity.  L: As a result, the overall credibility of the genetic explanation for offending is weakened.  **(Can you think of any other issues with twin studies?)** | **Support for the diathesis-stress model of crime**  P: A strength for the diathesis-stress model of crime is that it has evidence to support it.  E: Mednick et al conducted a study using 13,000 adoptees. The researchers defined criminal behaviour as being in possession of at least one court conviction and this was checked against Danish police records for each of the adoptees. When neither the biological nor adoptive parents had convictions, the percentage of adoptees that did was 13.5%. This figure rose to 20% when either of the biological parents had convictions, and 24.5% when both adoptive and biological parents had convictions.  E: This data suggest that although genetic inheritance plays an important role in offending , environmental influence cannot be disregarded  L: This therefore, strengthens the explanatory power for the diathesis stress model as an explanation for offending. | **Biological reductionism**  P: One weakness of the genetic and neural explanation for offending is that it is biologically reductionist and criminality is complex and this is just narrowing it down to biology.  E: For example, crime does run in families, but so does emotional instability, mental illness, social deprivation and poverty.  E: This is a weakness as it makes it difficult to disentangle the effects of genes and neural influences from other possible factors.  L: As a result this weakens the credibility of genetic and neural explanations for offending. | **MAID** |