

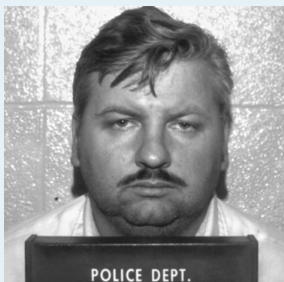
# Biological Theories – Genetic Theories

## LO1 – DESCRIBE BIOLOGICAL THEORIES OF CRIMINALITY

Assessment Criterion	Content	Amplification
AC1.1 Describe Biological Theories of Criminality	<b>Criminal Behaviour</b> <ul style="list-style-type: none"> <li>• <b>Genetic Theories</b></li> <li>• Physiological Theories</li> </ul>	You should have knowledge and understanding of: <ul style="list-style-type: none"> <li>✓ <b>Jacob's XYY Theory</b></li> <li>✓ <b>Twin and Adoption Studies</b></li> <li>✓ Lombroso's Physiological Theory</li> <li>✓ Sheldon's Type Theory.</li> <li>✓ Brain Abnormalities</li> </ul>

### XYY THEORY – SUPERMALES

This theory suggests that criminality might be caused by chromosomal abnormalities in the cells of criminals. A person's biological sex is determined by the paired sex chromosome, XX for a female and ZY for males – XYY men have an extra Y chromosomes are sometimes called **super males**



Some studies that suggest XYY men are over-represented in the prison population. There are 15 sufferers per 1,000 in prisons and one per 1,000 in the general population. The serial killer John Wayne Gacy (left) is said to have XYY syndrome. He sexually assaulted, tortured and killed at least 33 men in the USA.

### CONCORDANCE RATE

The rate of agreement (match) between on a trait between pairs of twins – normally expressed as a percentage. The concordance rates for MZ twins should be higher than DZ twins if genes play a part.

### TWIN STUDIES

Identical twins are **monozygotic**, that is both of the twins develop from the same fertilised egg. Non-identical (fraternal) twins are **dizygotic**, that is the develop from two separate eggs which are fertilised by two different sperm.

	Monozygotic Twins	Dizygotic Twins
<b>AKA</b>	Identical Twins	Fraternal Twins or Non-Identical Twins
<b>Genes Shared</b>	100%	50%

The logic of twin studies is that both MZ and DZ twins grow up in the same household, with the same family, at the same time. They often go to the same schools and share some of the same friends. In short, their environment is very similar. However, there is a difference, MZ twins are 100% genetically identical, whereas DZ twins only share 50% of their genes.

What this means is that if we look at some aspect of behaviour such as whether the twins smoke, drink, like football or are attracted to people of the same sex. If there is a difference between how often we see that behaviour in monozygotic twins and dizygotic twins, that difference is very likely due to genetic factors. That is because MZ twin share 100% of their genes whereas DZ twins share just 50% of their genes but importantly, they share very similar environments.

### BIOLOGICAL THEORIES

Biological theories focus on the idea that physical characteristics make some people more likely to commit crime than others. Such criminal tendencies can be genetic and therefore inherited. Hence, it could be said that the person is

### CHROMOSOMES

Chromosomes are structures found in all cell nuclei, they carry the DNA, which is the genetic information that all living things are based on.



Humans have 22 pairs of chromosomes plus the two sex chromosomes (XX in females and XY in males) for a total of 46.

These boys are identical or monozygotic twins (MZ) - they share 100% of the same genes. The girls on the other hand are dizygotic (DZ) and only share only 50% of their genes.



If the boys are more similar than the girls on some measure, that is likely to be because of the extra genes by shared by both of them, as the amount of environment shared by both sets of twins is 100%

### TWIN STUDIES AND CRIMINALITY

One of the earliest twins' studies was reported by the German physician **Johannes Lange** (1929). He found that MZ twins showed a much higher degrees of concordance for criminal behaviour than DZ twins. **Christiansen** (1977) also studied twin. He found that concordance rates of 35% for MZ twins and only 13% for DZ twins in 3,586 pairs of twins.

### ADOPTION STUDIES

Another way to examine the influence of genes and environment is to look at what happens when children are adopted. Adopted children have a genetic link with their biological parents but (nature) but the environmental link (nurture) is broken as they grow up in a new family.

One study **Hutchings and Mednick** (1975) looked at over 14,000 adopted boys. They found that a large number of the boys who had criminal convictions had biological parents with criminal convictions.