

Reductionism in the explanation of behaviour.

Psychological explanations of behaviour are often reductionist: complex things are explained in terms of simpler/more fundamental processes. Not everyone agrees that reductionism is a sound approach to psychology.

Early explanations of the link between atypical chromosomes and crime were highly reductionist. Jacobs (1965) and Telfer (1968) assumed that criminal behaviour, which is a complex, social phenomenon, could be explained by more fundamental biological processes. This is an example of biological reductionism, where behaviour is reduced to physical processes such as the activity of neurons and synapses in different brain areas and the influence of neurochemicals such as neurotransmitters and hormones.

In the case of 47,XYY it was assumed that the presence of an additional Y chromosome affected the development of the brain in ways that gave rise to criminal behaviour. This might be because the brain was structured differently (e.g. in the prefrontal cortex or amygdala) or because the brain functioned differently (e.g. under the influence of testosterone, which is coded for by the Y chromosome).

Research failed to find support for such structural and functional differences and it is now recognised that the link between 47,XYY and crime was exaggerated by flaws in the early studies. Researchers now believe that 47,XYY acts as a minor risk factor for criminality due to the interaction between biological (e.g. aggression), psychological (e.g. learning difficulties) and social processes (e.g. labelling by others). This represents a much less reductionistic viewpoint.

The role of both nature and nurture in psychology.

Psychologists disagree on the reasons for individual variation: nature (caused by innate influences e.g. genes), nurture (caused by environmental influences) or an interaction between both.

47,XYY can be used to illustrate the nature-nurture debate about criminal behaviour. Nativists take the view that differences between people in criminal behaviour are due to innate factors. In the case of 47,XYY, Jacobs (1965) and Telfer (1968) believed that the Y chromosome was responsible for 'masculine' traits such as aggression and sexual dominance. They reasoned that the presence of an additional Y chromosome would result in a hyper-masculine individual whose excessive aggression and sexual drives would lead to criminal behaviour. This represents a nativist view as the environment is not considered an important influence.

Subsequently, researchers have questioned the assumptions Telfer and Jacobs made about the behavioural traits of 47,XYY males and the link between 47,XYY and offending. Large scale literature reviews and meta analyses by Stochholm et al (2012) and Re and Birkoff (2015) have shown that the link between 47,XYY and offending is much weaker than originally thought.

Whilst the link remains, these researchers take an interactionist view, suggesting that 47,XYY gives rise to certain psychological traits which then interact with the environment to produce criminal outcomes in some people. For example, 47,XYY seems to increase the risk of learning and social difficulties. This makes it harder for an individual to do well at school and fit in with their peer group. As a consequence their opportunities for legitimate progression in society are limited, making them more likely to get involved with crime instead.

Issues related to socially-sensitive research.

Some psychological research raises ethical issues that go beyond the immediate study; research may have an impact on the PPs, the groups they belong to or the wider society.

According to Sieber and Stanley (1988), people or groups potentially affected by SSR include:

- The PPs who took part in the research;
- Their families or other people who are close to them;
- Subgroups or cultures within society;
- The researchers and their institution.

SSR issues come to the fore when:

- Research findings may lead to stigma;
- People are treated differently because how research is reported.

At the heart of this issue is a cost-benefit analysis: do the benefits in terms of (1) enhanced knowledge and (2) giving people better lives outweigh the potential negative impacts on the PPs and the groups they represent.

Research into 47,XYY could be regarded as socially sensitive because it has consequences for people with 47,XYY as a group within society. If researchers such as Jasper (1965) and Telfer (1968) make the claim that 47,XYY is a cause of criminal behaviour, those who have it are likely to experience consequences. People identified as XYY carriers may be stigmatised as 'potential criminals' even if they have done nothing wrong. Differential treatment may limit their life chances. 47,XYY carriers who do get into trouble with the law - as many young men do - may be treated more harshly by the judicial system, and denied opportunities for rehabilitation as they are regarded as 'born criminals'.

Walzer and Gerald (1965) started a screening programme to identify all the XYY males born in a particular area. Walzer and Gerald wanted to obtain accurate scientific data about the prevalence of the 47,XYY karyotype in the population because very little was known about it and they thought there were many misconceptions about it. However, critics were afraid that the data obtained by the researchers could be very harmful to the individuals concerned and their families. The programme was shut down amidst great controversy.

An understanding of how psychological understanding has developed over time.

The use of scientific methods means that psychological understanding progresses over time as some theories/practices are overturned by evidence and new ones developed to replace them.

The earliest reports of people with the 47,XYY syndrome were case studies of small numbers of individuals. Most of these were carried out in hospitals and prisons. These led to the idea that XYY was a factor in deviant or criminal behaviour. One problem with these studies is that the samples were very small, so generalisation was unwise. Another problem was that if you only look for the the XYY karyotype in prisons, what you are going to find is that all the 47,XYY people you identify are offenders but this will be because of sampling bias, not because 47,XYY is actually associated with criminality.

Researchers responded to this problem by designing studies that obtained much larger samples and which sampled from the general population, not just the prison population. For example, Witkin et al (1976) examined around 4500 men looking for 47,XYY individuals. Their research confirmed an association between 47,XYY and criminality but it was much weaker than the earlier studies had implied. The better sampling and the more sophisticated statistical analyses possible with larger samples showed that many earlier researchers had been quite wrong about the syndrome.

A problem with these studies is that the findings were often inconsistent, with some studies showing that XYY was a factor in crime and others suggesting not. In the late 1980s and early 1990s, psychologists started adopting the technique of meta-analysis. This allowed researchers to combine together the results of large numbers of studies as if they were one big study. This made it possible to judge whether trends identified in the smaller studies were meaningful or just freak findings attributable to chance or poor methodology. As a consequence of large scale meta-analyses like those of Stochholm et al (2012) and Re and Birkoff (2015) psychologists have now largely abandoned 47,XYY as a topic of interest in criminological psychology as there is little or no evidence to suggest it plays anything other than a minor role in offending and has no direct biological influence on crime.

This shows how the development of more sophisticated research methods and analytical tools underlies the development of psychological knowledge over time.