3. BIOLOGICAL BASIS TO CRIME

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3.1. INTRODUCTION

The biological basis to crime assumes that individuals who commit criminal acts are in some way different to the general population who does not commit such acts. This idea is appealing and has been so historically. For example, Lombroso in 1876 argued that criminals were a separate species between modern and primitive humans.

Research has become more sophisticated over time, and the search for physical differences between criminals and non-criminals has continued. The development of neuroimaging technology has led to the focus on differences in the structure or function of the brain.

3.2. CESARE LOMBROSO

In his book "L'Uomo Delinquente" (Criminal Man), Lombroso collected the physical measurements of Italian prisoners and non-criminal military personnel. He argued that the physical shape of the head and face determined the "born criminal" (or what he called "homo delinquens"). These people, he believed, were primitive and could not adapt to modern morality.

The underlying basis of the difference was genetic. The atavist (primitive genetic forms) had large jaws, high cheekbones, large ears, extra nipples, toes or fingers, and were insensitive to pain (figure 3.1).
Figure 3.1 - Examples of criminal faces.
The greatest challenge to any theory is the replication or not of the original findings. Goring (1913) compared the physical measurements of 3000 English convicts and 3000 non-convicts, and found no support for Lombroso. Both studies, though, had methodological flaws as we would view them today. For example, much of Lombroso’s criminal sample included individuals with severe learning difficulties. Furthermore, it ignored the fact that poverty could be the cause of the physical appearance rather than genetics.

One big problem with the hunt for the "criminal face" is the existence of stereotypes of what a criminal looks like. The most obvious stereotype is that physical unattractiveness equals criminal, though there may be little evidence for this in real life. However, studies have found disproportionately more facially unattractive individuals among the prison population. But here it could be social expectations that are causing this behaviour. For example, constantly being rejected and stereotyped in a negative way as a child with an unattractive face could cause this individual to become marginalised, and turn to crime for acceptance among a delinquent sub-culture (Brewer 2000).

The most recent variation on the constitutional theory of crime has focused on "minor physical anomalies" (MPAS). These anomalies would be, for example, asymmetrical ears or webbed toes. There is evidence of correlations between MPAS and behaviour problems in children.

Firstly, though, this is only a correlation and we cannot talk of causation. Secondly, many MPAS are caused by physical complications, which may influence the central nervous system, and this is what causes the behaviour problems (Brewer 2000).

3.3. BRAIN DIFFERENCES

Post-mortem examinations of violent criminals have looked for some difference in the structure of the brain (neurophysiology) to account for the violent behaviour. Usually there is no difference except for rare cases, like Charles Whitman, who shot sixteen passersby from a university tower. He was found to have a large tumour in the amygdala (Mark and Ervin 1970). This part of the brain is associated with emotions, and with aggression in animal studies. However, it is not clear whether the tumour was the cause of the violent behaviour.

In a large scale study of 2000 persistent offenders in Canada, it was found that 90% had some minor damage in
the frontal or temporal regions of the brain (Yeudall 1982). In another study involving the analysis of PET scans of the living brains of impulsive killers damage was found in the prefrontal cortex (which tends to control impulsive behaviour) (Raine 1994). The technique used is one of sustained attention. It involves watching a screen for 32 minutes and responding every time a zero appears. The lack of prefrontal activity can be seen on the PET scan while this task is being performed, plus the fact that impulsive individuals miss many of the zeros.

While elsewhere, Okasha et al (1975) found that around half of 76 Egyptian murderers had electroencephalography (EEG) abnormalities. This figure was over 70% for cases where the murder was apparently motiveless.

3.4. SEXUAL OFFENDING

3.4.1. Sexual Violence

Briken et al (2005) used forensic psychiatric court reports on 166 sexually motivated murderers. Fifty of the group had obvious brain abnormalities, and these individuals differed from the others on certain criteria:

- Higher incidence of childhood behaviour problems;
- Higher number of paraphilias, particularly diagnoses of transvestitic fetishism and paraphilias NOS (not otherwise specified);
- Younger victims, particularly six years old or below.

Briken et al (2006) looked at a similar population for the incidence of the chromosome abnormality XYY. The rate among sexually motivated homicide perpetrators was 1.8%, which is higher than the rate in male offenders generally and in the general population (0.01%) (Bradford 2006). The individuals with XYY were rated as sexually sadistic as well as psychopathic.

3.4.2. Paedophiles/Child Sex Offenders

There is interest in finding the brain differences (or neuroanatomical basis) in paedophiles, especially males. Two areas of focus exist (Cantor et al 2008):

- Frontal-Dysexecutive Theories – the problem relates to the frontal cortex, and thus poor behaviour inhibition and control.
• Temporal-Limbic Theories - damage to areas deep in the temporal lobe and in the limbic system linked to sexual urges.

The Dual Dysfunction Theories combine both of the above.

Cantor et al (2008) compared sixty-five men with sexual interest towards children and sixty-two men who had committed non-sexual offences in Toronto, Canada. All the men underwent magnetic resonance imaging (MRI) which showed the grey and white matter in the brain 5 (ie: differences in brain structure. The paedophile men showed lower white matter volume in certain areas of the brain (ie: smaller, less connections). Such differences would manifest as lower IQ and poorer memory, for example, which was the case as compared to the control group. The MRI produced a correlation between physiological differences and behaviour, but this could have three possible explanations:

i) Brain abnormality causes behaviour (ie: low white matter causes paedophilia) - Cantor et al (2008) argued that the brain abnormality related to interconnections of brain regions which respond to sexual stimuli, and, specifically, insufficient connections in the brain.

A hard or deterministic version of this idea sees the malfunctioning of the brain as the cause of paedophilia, while a softer version accepts that a susceptibility to developing paedophilia is created which requires environmental triggers, like experiencing childhood sexual abuse.

ii) The behaviour causes the brain abnormality (ie: paedophilia causes low white matter) - White matter can be reduced by alcoholism as well as ageing. However, Cantor et al (2008) argued that the paedophilic men showed behaviours associated with the brain abnormality in early life (ie: before alcoholism or ageing could be involved).

iii) Both the brain abnormality and the behaviour are caused by a third variable - For example, a pathogen while in the womb could cause the brain abnormality and the sexual interest in children. However, Cantor et al (2008) argued that other brain differences should be evident if this was the case.

5 Grey matter refers to the densely packed cell bodies, and the white matter is the connections between the cells (axons) (Romero 2004).
3.5. IMPLICATIONS OF BIOLOGICAL BASIS TO CRIME

If criminals are physiologically or biologically different to non-criminals, then there are implications of these theories.

1. The most important implication is that of determinism, and thus responsibility. If the smaller brain volume, for example, causes the behaviour, can the offender be held responsible for their actions which they had no conscious control over?

Hughes (2010) reported on the increasing use of neuroimaging evidence in US courts, if not to show innocence, to use as mitigating circumstances against the death penalty in murder cases.

2. How to conceptualise criminals and non-criminals?

   i) Two separate clearly distinct groups (figure 3.2a) - Biological theories would suggest that criminals and non-criminals are entirely different, and only through a brain injury, for example, could a non-criminal become a criminal.

   ii) Two clearly distinctive groups with overlapping (figure 3.2b) - This conceptualisation allows for some common ground between criminals and non-criminals. For example, physiological differences that need environmental triggers to cause criminal behaviour.

   iii) A continuum from non-criminal to criminal (figure 3.2c) - This idea challenges the above conceptualisations and suggests that criminal behaviour is a version of non-criminal behaviour. So criminals and non-criminals are not that different, and it may be environmental and social factors that make the difference.
3. The nature of the relationship between biology and behaviour. There is evidence that violent individuals are biologically different to the rest of the population, but it may be the environment that leads to those biological differences. For example, violence experienced leads to "footprints" (changes) in the brain (possibly short term, possibly long term) (Brewer 2000).

4. Social implications of the biological basis to crime. It should be noted that biological explanations fit with the views of the time that the individual is responsible for their own behaviour. In other words, the family, poverty or the environment are of limited importance. It is also easier politically to give drugs to solve problem...
behaviour than to face the fact that it is poverty which causes crime. This is particularly the case in the USA (Brewer 2000).

Many people are concerned with the implications of finding a biological basis to crime. This reminds many of eugenics, which was popular at the beginning of the 20th century, and formed the philosophical basis of Nazi ideas. It suggested that controlling who could have children (and for the Nazis even killing), would make society a better place. In the first half of the 20th century, in the USA, there were approximately 70 000 sterilisations of mothers with low IQ. By 1931, 27 US states had compulsory sterilisation laws for "feeble-minded", insane and habitual criminals (Gibbs 1995).

5. A biological approach is reductionist ignoring the complexity of behaviour and the multiple causes for criminal behaviour.

3.6. REFERENCES


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