What are the most influential factors on human behaviour from a biological perspective?
• The influential factors in biology:
  - Genes
  - Hormones
  - Neurology
  - Gender
  - Pathology (the study and diagnosis of disease)
  - Evolutionary explanations
Turning to Crime: Biology

• Phineas Gage – an example of brain damage resulting in behavioural change
Turning to Crime: **Biology**

- Three areas to study:
  - **Brain dysfunction**
  - Genes & Serotonin
  - Gender
Biology: Brain Dysfunction

• **Raine (2002)** Investigated the development of antisocial and aggressive behaviour.

• Believed that violent criminals: abnormal differences in metabolic activity in the brain.

• Like **Farrington**, Raine is looking for risk and protective factors in the development of criminal behaviour.
Biology: Brain Dysfunction

- **Key Study:** Raine (2002): *Biological predispositions to violence*
- **Aim:** Review study: Recent studies looking at biological risk factors for violence & crime
- **Method:** Review article that summarised the key findings of neuropsychological, neurological and brain-imaging studies relating to antisocial and aggressive behaviour through childhood.
  - PET scans used study brain metabolism
- **Correlational Study**

Turning to crime
Biology: Brain Dysfunction

- **Results:** Good predictors of criminal behaviour include:
  - A low resting heartbeat
  - Low activity in the prefrontal lobes during adolescence
  - Birth complications
  - Smoking and drinking during pregnancy
Biology: Brain Dysfunction

• **Conclusions:**
• Early intervention and prevention could be used to protect against these biological predispositions.

• **Evaluation:**
• This study focuses on biological factors in explaining why people turn to crime. *Why is it not reductionist?*

• **Ethics?**

• **Usefulness:** Findings suggest that an interaction of biological predispositions and poor environmental factors increase the risk of criminality. What does this suggest for crime prevention?
Biology: Genes and Serotonin

• Past Research:
• Genetic explanations of criminal behaviour have ranged from the “XYY Theory” of the 1960s to the twin studies of the 1970s.
• All have tried to find a link between genes and criminal behaviour, but research is flawed or evidence is contradictory.
Biology: Genes and Serotonin

• How do researchers investigate genetic links?
• What are the advantages and disadvantages of such an approach?
Biology: Genes and Serotonin

- **Aim**: To explain the behaviour of a large family in the Netherlands of which the males were affected by a syndrome of borderline mental retardation and abnormal violent behaviour.
- **Participants**: 5 affected males from the family
- **Method**: Data collected from urine samples over a 24 hour period.

Turning to crime
Biology: Genes and Serotonin

• **Results:** The samples showed disturbed **monoamine metabolism** associated with a deficit of the enzyme **monoamine oxidase A (MAOA).** A mutation was found in the X chromosome of the gene responsible for producing MAOA.

• **Conclusions:** As MAOA is involved in serotonin metabolism, the defect in the gene could be the cause of the mental retardation seen in this family; which in turn could lead to violent behaviour.
Biology: Genes and Serotonin

• **Conclusions:** Brunner concluded that this deficit resulted in a behavioural *phenotype* (i.e. A trait that is observable such as hair colour) that accounted for the aggression and lack of self-control.

An “evil” gene??
Biology: Genes and Serotonin

• Brunner et al (1993)

• Evaluation:
  • Sample? Generalisability....

• Reductionism...

• Determinism

Turning to crime
Biology: Gender

• Gender gives an *evolutionary* explanation for human behaviour.
• This assumes that behaviour has an *adaptive* quality (more likely that it will be passed on biologically as it is a quality that will aid survival.)
• Male violent crime far greater than female crime across all cultures (although recent changes: more girl gangs etc.)
• Two studies have referred to “*risk-taking*” in offenders. ??
• Why might risk-taking/impulsiveness be advantageous to survival?
Demographers find that young men are more likely to be appear in mortality statistics as a result of *external* causes such as homicide or accident (compared to internal causes such as disease/illness).
Biology: Gender

- Other research has found that young males are more likely to take risks in front of other men and women.
- This is seen as adaptive as men have to “win” women from other males.

Turning to crime
Biology: Gender

- **Key Study:** Daly and Wilson *(2001): Investigation of gender-related life expectancy*

- **Aim:** To find out if homicide rates would vary as a function of life-expectancy in Chicago

- **Sample:** local communities in Chicago. Males aged from 54 - 77 years

- **Method:** correlational study. Survey data from police records, school records, local demographic records
Biology: Gender

- **Daly & Wilson (2001)**
- **Results:**
  - Life expectancy: best predictor of neighborhood-specific homicide rates (strong negative correlation - 0.88)
  - Absenteeism from school negatively correlated with life expectancy (primary school -0.50, high school -0.32)
- **Explanations:**
  Shorter life expectancy increases risk-taking for short term rewards
  Inequality of wealth & resources - reckless behaviour

Turning to crime
Question: Biological explanations for turning to crime

1 a) Describe one biological explanation for criminal behaviour. (10)

2 b) Using the nature-nurture debate, evaluate explanations of why a person might turn to crime. [15]