Chapter 4
Biological Roots of Criminal Behavior
Introduction

• Biological theories have been advanced to explain criminality

• Criminology has been slow to consider biological theories of deviance
  – It is grounded in the social sciences
  – The link between biology and crime is rarely clear
Major Principles of Biological Theories

- The brain is the organ of the mind and the locus of the personality
- Basic determinants of human behavior are constitutionally or genetically based
- Observed gender/racial differences in rates/types of criminality may be at least partially the result of biological differences
- Basic determinants of behavior may be inherited
Major Principles of Biological Theories

• Much human conduct is rooted in instinct

• Biological roots of human conduct have become increasingly disguised

• Some behavior is the result of biological propensities inherited from more primitive developmental stages

• The interplay among heredity, biology, and the social environment must be considered
Biological Roots of Human Aggression

• Charles Darwin
  Interspecies aggression favors the strongest and best animals in the reproductive process

• Konrad Lorenz – *On Aggression* (1966)
  – Human aggression serves other purposes but takes on covert forms (drive to acquire wealth and power)
  – Human behavior is adapted instinctive behavior
Early Biological Theories

- **Criminal anthropology:** The scientific study of the relationship between human physical characteristics and criminality

- Franz Joseph Gall
  - Phrenology: The shape of the skull indicates the personality and can be used to predict criminality
  - Located the roots of personality in the brain
  - Theory of phrenology accepted because it was a move away from theology toward scientific understanding

- Johann Gaspar Spurzheim brought phrenology to America
Positivist School

- Positivism was built on two principles
  - Acceptance of social determinism
  - Application of scientific techniques to the study of crime and criminology

- Rooted in the work of Auguste Comte

- Social phenomena are observable, explainable, and measurable in quantitative terms

- Reality consists of a world of objectively defined facts that can be scientifically measured and, ultimately, controlled
Cesare Lombroso (1836-1909)

• Developed concept of **atavism**:
  – Criminality is the result of primitive urges that survived the evolutionary process
  – Atavistic individuals are throwbacks to a more primitive biological state

• Criminaloids – “occasional criminals,” people enticed into crime by environmental influences

• Also believed criminal behavior among women derived from atavistic foundations

• Masculinity hypothesis: Criminal women exhibited masculine features and mannerisms
Evaluations of Atavism

- Charles Buckman Goring (1901)
  - Measured correlation between physiological features and criminal history – concluded atavism unsound

- Earnest A. Hooton (1927-1939)
  - Found physical differences between offenders and non-offenders, said criminals are physiologically inferior

- Stephen Schafer
  - Criticized Hooton’s methodology

- Canadian atavism study in 2000 found subtle physical abnormalities were associated with an increased risk of behavioral and psychiatric problems among boys
Body Types

- Constitutional theories/somatotyping
  Body types indicative of criminal tendencies

- Ernst Kretschmer – relationship between body build and personality type
  - Cycloid: heavyset, soft body; commit nonviolent property crimes
  - Schizoid: athletic, muscular body; commit violent crimes
  - Displastics – emotional, out of control; commit sexual offenses, crimes of passion
Body Types

• William H. Sheldon outlined four body types and associated temperaments
  – Endomorph: soft, round, overweight, sociable
  – Mesomorph: athletic, muscular; most likely to be associated with delinquency
  – Ectomorph: thin, fragile, shy, inhibited
  – Balanced type: average build

• Later research by Sheldon and Eleanor Glueck also supported mesomorph/delinquency link
Hypoglycemia

• Early research linked murder to hypoglycemia
  – Low blood sugar reduced the mind’s ability to reason effectively

• Recent research has linked excess sugar consumption to hyperactivity, aggressiveness, etc.

• Current evidence on sugar/behavior link unclear

• PET scans found lower glucose levels in prefrontal cortex of murderers
Food Allergies and Additives

• Allergic reactions may cause brain swelling
  – Impede higher faculties, reduce sense of morality
  – May reduce learning during childhood, contribute to delinquency, adult crime

• Some food additives (MSG, dyes, artificial flavorings) may be linked to violence

• Caffeine and sugar may trigger antisocial behavior

• Vitamins, other nutrients may have behavioral impact
Environmental Pollution

• Several studies have found a link between industrial and environmental pollution and violent behavior

• Correlation between juvenile crime and high environmental levels of lead and manganese

• Toxic pollutant may cause learning disabilities, an increase in aggressive behavior, loss of control over impulsive behavior
Other Environmental Factors

• Exposure to the color pink may have a calming effect on people experiencing anger and agitation

• Prenatal exposure to marijuana, tobacco, alcohol may lead to higher rates of conduct disorders, delinquency, psychiatric problems
Hormones and Criminality

- Testosterone – male sex hormone
  - Relationship between high blood levels of testosterone and increased male aggressiveness
  - Effect may be moderated by social environment
  - Small changes in female testosterone levels also linked to personality changes

- Androgens – male hormones
  - High blood levels linked to aggression in boys but not girls

- Female hormone fluctuations may also be linked to crime
  - Drop in brain serotonin levels before menstruation may be linked to PMS
  - Evidence linking PMS to violent or criminal behavior far from clear
Hormones and Criminality

• Serotonin – behavior-regulating chemical
  – Elevated blood levels/lower brain levels linked to violence in men
  – Imbalance between levels of serotonin and dopamine highly associated with psychopathic traits

• Other hormones implicated in delinquency and poor impulse control include cortisol and $T_3$ (thyroid hormone)
Weather and Crime

• Temperature is the only weather variable consistently related to crime

• Relationship moderated by temporal factors

• Consistent with routine activities theory

• Possible link between barometric pressure and violent crime
Genetics and Crime

• Criminal families
  – The Kallikak family – Henry H. Goddard

• Eugenic criminology
  – Root causes of criminality were passed down in the form of “bad genes.”
  – Eugenics movement: 1920s – 1930s
  – Buck v. Bell (1927)
The XYY “Supermale”

• Research in 1965 led to concept of “supermale” with XYY chromosome – considered potentially violent

• Common characteristics
  – Taller than average
  – Acne
  – Less than average intelligence
  – Overrepresented in prisons, mental hospitals
  – Above-average family history of crime, mental illness

• Recent research demonstrates conclusively that XYY males are not predictably aggressive
Chromosomes and Modern-Day Criminal Families

- Dutch research found male descendants of a “criminal family” had high proportion of violent crime arrests

- **Monoamine oxidase A (MAOA):**
  - Enzyme that breaks down serotonin and noradrenaline, chemicals linked to aggressive behavior
  - Excess amounts of MAOA linked to aggression
Behavioral Genetics

• Behavioral genetics
  – Study of genetic and environmental contributions to individual variations on human behavior
  – Sir Francis Galton

• Twin studies compare MZ and DZ twins
  – Research supports relationship between heredity and risk of criminality
  – Minnesota Twin Family Study
  – So-called “criminal genes” may be genetic predispositions to respond in certain ways to a criminogenic environment
The Human Genome Project (HGP)

- International research project mapping the human genome
  - HGP may support concept of behavioral genetic determinism
  - Belief that genes are major determining factor in human behavior

- Dominant view today holds that the interaction of genes and the behavioral possibilities they represent, with environmental features, produce meaningful human activity

- Recent research suggests the explanatory power of heritability limited by the fact that it may only apply to specific environments existing at the time of given study
Male-Female Differences in Criminality

- Males are much more criminalistic
  - Number of crimes committed by men much greater than those committed by women
  - When women commit crimes, are more likely to be followers
  - Extent of male/female criminality consistent over time

- Explanations
  - Culture and social environment
  - Biology and genetics
Sociobiology

- Theoretical synthesis of biology, behavior, and evolutionary ecology

- Introduced by Edward O. Wilson in 1975

- A new paradigm in criminological theories
Sociobiology

• The main determinant of behavior is the need to ensure the survival and continuity of genetic material throughout generations

• Territoriality as an explanation of human conflict

• Altruism facilitates the continuity of the gene pool
Criticisms of Sociobiology

• Fails to consider the significance of culture, social learning, individual experiences

• Fundamentally wrong in its depiction of basic human nature

• Rationalizes the labeling and stigmatization of minorities

• Humans are too different from other animal species to apply findings from animal studies to human behavior
Biosocial and Psychosocial Criminology

• *Crime and Human Nature*
  – 1985, James Q. Wilson and Richard Herrnstein
  – Comprehensive theory of crime that included constitutional factors
  – Constitutional factors predispose one to specific types of behavior; societal reactions to these predispositions determine the form of continued behavior

• Biosocial criminology – Anthony Walsh
  – Biological factors do not operate in an environmental vacuum, environmental factors do not operate in a biological vacuum
Biosocial and Psychosocial Criminology

- **Neuroplasticity**
  - The brain can alter its structure and function in response to experience
  - Explains why some people experience personality changes when undergoing new experiences
  - Brain also changes in response to internal stimuli

- Biosocial theorists suggest interplay among heredity, biology, the social and physical environments may be much more complex than first believed – may be key in understanding crime causation
Moffitt’s Biosocial Theory

- Moffitt’s two-path (dual taxonomic) theory
  - Life course persisters (LCP): display constant patterns of misbehavior throughout life
  - Adolescence-limited offenders (AL): led into offending by structural disadvantages

- Moffitt and Caspi suggest the development of antisocial behavior is mediated by interaction between a gene responsible for MAOA production and maltreatment (environmental variable)

- In some cases, genetic predispositions and their interactions with the environment combine to produce delinquency
Psychosocial Criminology

• Hans Eysenck – *Crime and Personality* (1964)
  – Crime as the result of fundamental personality characteristics

• Described three personality dimensions
  – Psychotics – most likely to be criminal
  – Extroverts
  – Neurotics
Policy Implications of Biological Theories

- Steven Pinker claims social scientists unjustly ignore the biological basis of human behavior.

- Identifies three myths that make up the modern social science model:
  - Myth of the blank slate
  - Myth of the Noble Savage
  - Ghost in the machine myth
Policy Implications of Biological Theories

• C. Ray Jeffrey’s proposed biologically based crime prevention program
  – Pre- and post-natal care
  – Monitoring children through development
  – Neurological examinations
  – Biological research in prisons and treatment facilities

• One concern is possible re-emergence of the eugenics movement

• Potential links between race and crime especially lead to criticisms of biological criminology
Critiques of Biological Theories

• Rafter argues against possible development of a contemporary eugenics movement

• Walters and White listed shortcomings of genetic research
  – Conceptualization of criminality is inadequate
  – Twin studies misclassify twins as MZ/DZ
  – Hard to estimate degree of criminality among sample populations
  – Many methodological problems
  – Research conducted outside the US may not be applicable within this country