PYSC 333: Psychology of Personality

Session 3 – Biological Perspective of Personality

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Session Overview

• The striking similarities in the personality of the Jim twins raised the question of how much of a person's personality is shaped by biological factors.

• The biological perspective of personality has existed since ancient times, with some new theories being added with the passage of time.

• This session provides information on some biological perspectives of personality by theorists, from ancient times till date.

• It also provides information on some research methods used to study the behavioural genetics in personality.
Session Goals and Objectives

At the end of this session, you should be able to

• Outline the biological perspective from ancient times to date
• Describe what these ancient theorists proposed about personality formation
• Describe the research methods used in studying this approach
• Discuss the behavioural genetics perspective of personality
The key topics to be covered in the session are as follows:

• Introduction - Jim twins
• Biological perspective of personality
• Behavioral genetics perspective
• Psychophysiological perspective
Reading List

• Carducci, B. J. (2009). *The Psychology of personality* (2nd ed.). Chichester: John Riley & Sons Ltd (Ch 8)


Topic One

INTRODUCTION: THE JIM TWINS
Biological Perspective of Personality

• Biological factors influencing personality formation
• Behavioural genetics and psychophysiological perspective of personality
The Jim twins

- Jim Springer and Jim Lewis
- Both weighed 180 lbs, 6 feet tall, married twice- first wives named Linda and second wives, Betty
- Had a son named James, worked part-time as a sheriff, smoked Salem cigarettes and drank Miller Lite beer
- Suffered from the same kind of headache syndrome, bit their fingernails, left love notes for their wives
The Jim twins

- Had the same favourite TV shows
- Used the same brand of toothpaste
- Owned the same breed of dog
- Shared many personality traits - being highly conscientious and emotionally stable
- Had remarkably similar personality scores on standardized tests (Segal, 1999)
The Jim twins

- However,
- One was a better writer, the other a better speaker
- One combed his hair down over his forehead, the other combed his hair back
Topic Two

BIOLOGICAL PERSPECTIVE OF PERSONALITY
Biological Perspective of Personality

• Different genes could influence physical characteristics - e.g. one’s height, colour of the eye as well as behavioural characteristics

• The biological perspective emphasizes the internal physiological and genetic factors that influence personality

• The role of biological factors in personality has been examined from different perspectives
Biological Perspective of Personality

- Hippocrates (460-377BC) and Galen (AD130-200) in the ancient beginnings
- Franz Joseph Gall (1758-1828) and Johann Gasper Spurzheim (1776-1832) in the late 18th century
- William Sheldon (1942, 1954) in the early 20th century
Biological Perspective of Personality

• Contemporary biological views of personality focused on
  • 1. Behavioural genetic perspective
  • 2. Psychophysiological perspective- e.g. Hans Eysenck
Accordingly, Hippocrates and Galen personality types were associated with four basic bodily fluid or humours:

- Blood, black bile, yellow bile and phlegm
- Correspond to the four basic cosmic elements of nature - air, earth, fire and water respectively
- A well-adjusted personality has a balance of all the four basic humours
Ancient beginnings

• An imbalance may lead to an individual having too much of a particular humour:
  • 1. Excessive blood- sanguine personality- being hopeful and excitable, warm-hearted, optimistic
  • 2. Excessive black bile- melancholic, personality- sadness, anxiety and depression
Ancient beginnings

• 3. Excessive yellow bile- choleric personality-being quick-tempered, irritability and assertive

• 4. Excessive phlegm- phlegmatic personality-calmness and apathy, being slow and lethargic
Biological perspective in the 19th Century

- Franz Joseph Gall (1758-1828) and his student Johann Gasper Spurzheim (1776-1832) proposed *phrenology*

- *Phren*’ meaning mind and ‘*logos*’ meaning knowledge (Greek)

- Phrenology- a person’s personality and mental abilities were determined by the bumps and contours on his/ her head
Biological Perspectives- early 20th century

• William Sheldon (1879-1977) (as cited in Carducci, 2009) established that personality type was determined by an individual’s physique or body type
• Sheldon (1942, 1954) proposed three dimensions of body type
• Based on outward characteristics and underlying bone structure
Perspectives from the early 20th century

1. Endomorphic – a large soft round body structure
2. Mesomorphic – a strong muscular body structure
3. Ectomorphic – a linear (in line, direct) fragile body structure

Sheldon developed a personality test to establish a link between body type and personality
Perspectives from the early 20th century

- The test identified three main dimensions of temperaments consisting of clusters of traits
  - Viscerotonia— a love of food, comfort, sociable, easy going and affection
  - Somatotonia— a high desire for physical adventure, risk taking activities, bold, assertive and muscular activity
  - Cerebrotonia— emotional restraints, being shy, self-conscious and a preference for solitude and privacy
Topic Three

BEHAVIORAL GENETICS PERSPECTIVE
Behavioural genetics perspective

- Behavioural genetics is the study of the relationship between heredity and behaviour.
- The role of genetic factors in the development of personality has been demonstrated with twins studies.
• Zuckerman’s (2005, in Carducci, 2009), twin studies suggest that 30% to 50% of the difference in personality results from genetic factors
• Tellegen and colleagues- examined personality traits of identical twins reared apart
• Findings- to a large extent, the twins were similar in personality
• Certain traits such as social potency were influenced more by genetics (Feldman, 1999)
Research methods

- Selective breeding
- Family studies
- Twin studies, and
- Adoption studies
Research methods

1. **Selective breeding**
   - Organism with specific characteristics are selected and they mate and breed
   - Example - Dog studies - investigated physical characteristics such as size, ear length, wrinkle skin, fur texture, eye colour etc.
   - Behavioural characteristics - sociability, agreeableness and desire to please
2. Family studies

• To determine how certain personality characteristics occur more often among family members with greater genetic relatedness (parent and child share 50%) than those with less genetic relatedness (1st cousins – share 12.5% genes)
3. **Twin studies**

- Studies compared identical (monozygotic) and non-identical (dizygotic) twins
- Concluded that identical twins are more similar in for instance dominance, and height (Plomin et al, 1990) than non-identical or fraternal twins (Eysenck, 1990b)
Research methods

• Dominance- identical twins correlated +.57
• fraternal twins +.12 (Loehlin & Nicholas 1976)
• Height- identical twins = +.93
• fraternal = +.48 (Mittle, 1971)
4. **Adoption studies**

- Compared twins reared by adopted parents with their adopted parents and biological parents
- Similarity in the personality traits of children and adopted parents is strong evidence for environment influence on the personality traits
Personality traits

• Studies for major personality traits have showed heritability estimates of about 50% (Bouchin & Loehlin, 2001, Caspi, Roberts & Shinere, 2005)

• These studies have suggested a substantial portion of variance in personality traits is attributed to environmental factors (Larsen & Buss, 2008)
Research findings

- Concluded that correlations for extraversion were +.51 for identical twins and +.21 for fraternal twins.
- On neurotic correlated for identical twins was +.50 and +.23 for fraternal twins.
Research findings

- Adoption studies suggest lower heritability (Larsen & Buss, 2008)
- Pedersen (1993) compared adoptees and their biological parents and reported 40% heritability for extraversion and 30% for neuroticism
- Correlated with their adopted parents showed heritability was zero
• Other studies investigated and demonstrated genetic contribution to

• Happiness and Health, Aggression and Hostility, Attitude and preferences, Adolescent personality adjustment, Drinking and smoking, Marriage etc. (Carducci, 2009)
Topic Four

PSYCHOPHYSIOLOGICAL PERSPECTIVE
Cortical influence on personality

• Emphasises the role of specific neurological structures in the brain and how they are expressed in many aspects of personality (Carducci, 2009)

• Eysenck proposed that individuals differed by heredity in the way their brains and central nervous systems reacted and processed stimulation from the environment
Cortical influences on personality

- The focus of his biological perspective was the Ascending Reticular Activating System (ARAS)
- The ARAS are nerve fibers found at the base of the spinal cord and the lower part of the brain (Carducci, 2009)
- It helps to regulate arousal level in the brain so a person can function effectively
Cortical influence on personality

• He concluded that introverts have higher levels of cortical arousal (over stimulated) in the ARAS than extroverts

• Example- In extroverts, cortical excitation levels are low (under stimulated), thus they tend to seek stimulation

• Introverts avoid additional stimulation due to high excitation levels
Hans Eysenck (1916-1997)

- Example- a person with a low level of arousal will be less sensitive to effects of reward and punishment
- People with excessive arousal levels in the nervous system will be affected by rewards and punishments
END OF SESSION 3
References

• Carducci, B. J. (2009). *The Psychology of personality* (2nd ed.). Chichester: John Riley & Sons Ltd.


• Segal.

• Plomin et al, 1990 (Bouchin & Loehlin, 2001, Caspi, Roberts & Shinere, 2005)

• Pedersen (1993)