

# Hergenhahn's An Introduction to the History of Psychology

## Eighth Edition

EIGHTH EDITION

HERGENHAHN'S  
An Introduction to the  
History of Psychology



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## Chapter 10

### Evolution and Individual Differences

# Learning Objectives (1 of 2)

After reading and discussing Chapter 10, students should:

- Be familiar with the ideas regarding evolutionary principles prior to Darwin's theory.
- Be acquainted with the ideas of Herbert Spencer including his views on evolution, the Spencer—Bain principle, and the concept of social Darwinism.
- Be familiar with the ideas which influenced Darwin in the development of his theory and understand the tenets of the theory of evolution and its influence.

# Learning Objectives (2 of 2)

- Be acquainted with Galton's work in measurement of human abilities, eugenics, the nature vs. nurture controversy, and correlation.
- Be familiar with the development of intelligence tests and issues related to intelligence testing.

# Evolutionary Theory before Darwin (1 of 3)

- Jean-Baptiste Lamarck
  - The theory of inheritance of acquired characteristics stated that environmental changes during the lifetime of the organism resulted in structural changes in plants and animals
    - These changes would be passed on to the offspring, which in turn enhanced their chance for survival.
- Herbert Spencer
  - Spencer applied his view of evolution to everything in the universe, including the human mind and societies.

# Evolutionary Theory before Darwin (2 of 3)

- Through evolution, differentiation occurs and systems become increasingly complex and move toward perfection.
- Applied evolutionary theory to selection of behavior in what was called the Spencer–Bain Principle.
- Proposed that the probability of a behavior occurring in the future is a function of whether it is followed by a pleasurable event or a painful event.
  - This became the cornerstone of Thorndike's connectionism and Skinner's operant behavior.
- Went on to propose that these propensities for various behavioral responses could be passed on to offspring.

# Evolutionary Theory before Darwin (3 of 3)

- Applied the notion of survival of the fittest to societies and entities within societies. This is the concept of social Darwinism.
  - Societies and entities within societies, for example, businesses and companies, evolve and those which are “more perfected” survive and those which do not, do not survive.
  - This was obviously compatible with the capitalist and individualistic philosophy in the United States at this time in history and social Darwinism was accepted wholeheartedly.

# Charles Darwin (1 of 6)

- Influences
  - The voyage of the Beagle
    - Darwin was hired as a naturalist/scientist for a five-year expedition to collect scientific facts to support the Biblical account of the creation.
    - During the voyage he collected hundreds of specimens and made hundreds of observations.
    - He also read the book ***Principles of Geology***, which made him start doubting the Biblical account.

# Charles Darwin (2 of 6)

- Thomas Malthus's *Essay on the Principles of Population*
  - With all of these observations, his ideas of evolution were in their infancy.
  - The reading of Thomas Malthus's *Essay on the Principles of Population* provided him with the mechanism/principle to complete the formulation of the theory.
    - The essay proposed that food supply and populations size were kept in balance by events such as war, starvation, and disease.
  - In other words, natural events could and do select who will survive and have children and who will not survive.



# Charles Darwin (3 of 6)

- Darwin's Theory of Evolution
  - Natural struggle for survival
    - Within a species there is variability, which produces vast individual differences in characteristics.
      - Some of these characteristics are more conducive to the organism's survival within particular environmental conditions (environmental pressure) than others.
  - Struggle for survival results in the survival of the fittest
    - Therefore, a natural selection occurs.

# Charles Darwin (4 of 6)

- Evolution, in other words, results from the natural selection (selection by environmental pressures) of those accidental variations among members of a species that prove to have survival value.
- Fitness defined solely in terms of ability to survive and reproduce
  - Darwin said nothing about progression toward a goal or perfection; evolution just happens due to natural environmental pressures
- Conflict with the church
  - Mainly due to Darwin's estimates of the earth's age.

# Charles Darwin (5 of 6)

- Evolution's role in psychology
  - Darwin's book, *The Expressions of Emotions in Man and Animals* is most directly related to psychology.
    - In the book, he argues that human emotions are remnants of animal emotions that had once been necessary for survival.
    - These comparisons launched modern comparative psychology.

# Charles Darwin (6 of 6)

- Darwin's influence
  - The theory was revolutionary
  - Still affects the behavior of scientists and philosophers today
  - Changed the traditional view of human nature and the view of our place in the universe.
  - The theory has influenced all areas of psychology.
  - It also played a significant role in the development of functionalism and subsequently behaviorism.  
Evolutionary psychology has also used Darwin's definitions to account for human social behaviors.

# Sir Francis Galton (1 of 5)

- Darwin's Cousin
  - Became interested in studying the inheritance of human abilities and individual differences.
- Many interesting achievements
  - Invented the weather map
  - Was the first to suggest using fingerprints for identification.
- The measurement of intelligence
  - Believed that intelligence was inherited
  - Led to the formation of the eugenics movement

# Sir Francis Galton (2 of 5)

- The nature-nurture controversy
  - Galton revised his position: the potential for high intelligence was inherited but it must be nurtured by a proper environment
    - Popularized research on twins
- Words and images
  - Developed the first word-association test
  - Among the first to study imagery

# Sir Francis Galton (3 of 5)

- Anthropometry
  - Developed in response to his desire to measure the individual differences among humans
  - Collected data on more than 9,000 humans.
  - Believed sensory acuity was related to intelligence and could therefore be used as a means to measure intelligence.
- Developed data analytic techniques
  - Collected vast amounts of data and needed a way to analyze it.

# Sir Francis Galton (4 of 5)

- Initially looked at the data using scatter plots to observe the correlation between variables.
  - Later, Karl Pearson developed the mathematical formulation for the correlation coefficient to give a mathematical expression of relationships between variables.
  - With the data, he also observed a regression toward the mean
    - This states that data points on a particular variable will tend to cluster around the mean for that characteristic.



# Sir Francis Galton (5 of 5)

- Contributions of Galton
  - Include a list of firsts:
    - 1) The study of the nature-nurture question
    - 2) The use of questionnaires in research
    - 3) The use of word-association tests
    - 4) The conduction of twin studies
    - 5) The study of imagery
    - 6) The development of correlational techniques

# Intelligence Testing after Galton

- James Cattell
  - Developed early Galtonian-type tests in the United States
  - First to use the term mental test
  - Correlational analysis indicated little intercorrelation among the tests and little correlation between the tests and success in college
  - With these negative findings, the interest in mental testing faded.

# Individual Differences in Intelligence

## (1 of 5)

- Alfred Binet
  - Interested in what makes people different, not their similarities.
    - For Binet, the important variables on which people differ are complex, higher-order processes that vary according to age.
    - His study of these differences was called individual psychology.

# Individual Differences in Intelligence

## (2 of 5)

- He and Theodore Simon developed the Binet-Simon intelligence scale as a valid means to distinguish between normal children and children with mental deficiencies.
  - The scale was revised several times.
  - Binet believed that intelligence is not a single ability but several.
- William Stern introduced the term mental age, which was to be divided by chronological age yielding the intelligence quotient.

# Individual Differences in Intelligence

## (3 of 5)

- Binet urged extreme caution in interpreting intelligence test scores
- Believed that mental orthopedics could prepare disadvantaged children for school.
  - The orthopedics consisted of exercises that improve a child's will, attention, and discipline—all abilities that Binet thought were necessary for effective education.

# Individual Differences in Intelligence

## (4 of 5)

- Charles Spearman
  - Using factor analysis (a complex statistical technique based on correlations), he proposed a two-factor theory of intelligence consisting of a specific factor and a general factor.
  - His conclusions about the nature of intelligence are important for two main reasons:
    - 1) He emphasized the unitary nature of intelligence in contrast to Binet's emphasis on diversity.
    - 2) He was a pioneer in the area of statistics that are used by psychologists

# Individual Differences in Intelligence

## (5 of 5)

- Cyril Burt
  - His “research findings” caused a scandal in the area of heritability of intelligence.
  - He was accused of fabricating his data, although his conclusions have been confirmed by others such as Cattell and Bouchard.

# Intelligence Testing in the United States (1 of 3)

- The Binet–Simon Scale in the United States
  - Henry Goddard
    - Translated the Binet–Simon scale into English.
    - He studied the relationship between family background and intelligence. As a result of the research (which was questionable), Goddard and several leading scientists urged that those with mental deficiencies be sterilized and/or segregated from the rest of society.
      - States actually passed sterilization laws and some had them up until the 1970s.
      - This also led to the mental testing of immigrants, which in turn was very controversial.
      - It also led to an increase in deportation.



# Intelligence Testing in the United States (2 of 3)

- Lewis Terman
  - He and his colleagues adapted the Binet–Simon test to develop the Stanford–Binet test.
    - The development resulted in an average score for children of different ages to be 100.
    - Also suggested the intelligence ratio (mental age/chronicle age) be multiplied by 100 to delete the decimal and called it the intelligence Quotient (IQ).
  - Throughout his career he contended that intelligence was largely inherited
  - Agreed with many of the ideas of Goddard.

# Intelligence Testing in the United States (3 of 3)

- Conducted a longitudinal study on gifted children that continued for more than 80 years.
  - The primary results were: *The gifted child becomes a gifted adult.*
- Leta Stetter Hollingworth
  - Challenged the belief that intelligence is largely inherited and that women are intellectually inferior to males
  - Proposed improved education for gifted children

# Intelligence Testing in the Army

- Robert Yerkes
  - Proposed that points be given for questions on the intelligence test and analyzed in this manner without respect to age.
  - He organized the testing program for the army in World War I.
    - Developed the Army Alpha test for literate people and the Army Beta for those who were illiterate.

# The Deterioration of National Intelligence

## (1 of 3)

- Concern following WWI
  - Nation's intelligence level was deteriorating
  - Yerkes, along with Goddard and Terman, thought that this problem was caused by immigration and that “intellectually inferior” people were reproducing at a faster rate than normal or above-normal people.
    - This view was challenged
      - It was suggested that intelligence tests could be measuring, at least partially, the effects of early experience and education.

# The Deterioration of National Intelligence

## (2 of 3)

- *The Bell Curve: Intelligence and Class Structure in American Life*
  - Proposes six points that they claim are “beyond dispute”
    - 1) There is a general factor of cognitive ability on which humans differ.
    - 2) All standardized tests of academic aptitude or achievement measure this general factor to some degree. IQ tests designed for this purpose measure it more accurately.

# The Deterioration of National Intelligence

## (3 of 3)

- 3) IQ scores match, to a first degree, whatever people mean when they use the word intelligence or smart in ordinary language.
- 4) IQ scores are stable, although not perfectly so, over much of the lifespan.
- 5) Properly administered IQ tests are not demonstrably biased against social, economic, ethnic, or racial groups.
- 6) Cognitive ability is substantially heritable, apparently no less than 40% and nor more than 80%.

# Modern Testing

- Psychometrics
  - Quinn McNemar
  - Anne Anastasi
  - Paul Meehl
- David Wechsler
  - Developed a new intelligence test to better understand adult intelligence.
  - WAIS and WISC