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 18 Psychobiology

CENGAGE

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Learning Objectives

After reading and discussing Chapter 18, students should:

- Be familiar with the work of Karl Lashley.
- Be acquainted with the work of Donald Hebb.
- Be familiar with the split-brain research of Roger Sperry.
- Be acquainted with the research in behavioral genetics.
- Be familiar with the work of the Brelands' on what is called instinctual drift.
- Be aware of the recent research on the heritability of intelligence and personality.



Karl S. Lashley (1 of 2)

- Two important observations
 - Mass action
 - Loss of ability to perform a particular learned behavior following destruction of parts of the cortex is related more to the amount of destruction than to the location, the cortex appeared to work as a unified whole.
 - Equipotentiality
 - Any part of a functional area of the brain can perform the function associated with that area. If, following an ablation, any part of the area is spared the function would still be maintained.



Karl S. Lashley (2 of 2)

- Engram
 - The neurophysiological locus of memory and learning
 - Spent decades searching for it and eventually conceded that it was not possible to locate the engram



Donald O. Hebb (1 of 3)

- Neural interconnections
 - Develop with experience
 - Speculated that every environmental object we experience fires a complex package of neurons, called a cell assembly.
 - Reverberating neural activity allows neurons that were temporarily separated to become associated.
 - Cell assemblies become neurologically integrated to form phase sequences.
 - A phase sequence is "a temporally integrated series of assembly activities; it amounts to one current in the stream of thought."



Donald O. Hebb (2 of 3)

- Childhood learning involves the slow buildup of cell assemblies and phase sequences
 - This can be explained using associationistic terminology.
 - Adult learning, however, is characterized by insight and creativity and involves the rearrangement of already existing cell assemblies and phase sequences.
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Donald O. Hebb (3 of 3)

- Other findings
 - Animals reared in an enriched sensory environment were relatively better learners as adults
 - A relationship between level of activity in the reticular activating system (RAS) and cognitive and behavioral performance
 - Arousal theory
 - Reinforcement centers in the brain.



Roger W. Sperry (1 of 3)

- Split-brain preparation
 - Ablating (cutting) the corpus callosum and the optic chiasm essentially splits the brain into two separate brains with no exchange of information.
 - Much of the early work was with animals.



Roger W. Sperry (2 of 3)

- Work with humans
 - The cutting of the corpus callosum helps people suffering from severe, drug-resistant, intractable epilepsy by decreasing the intensity of the seizures by stopping the propagation of the seizure from one hemisphere to the other.
 - Research with these patients has contributed to knowledge regarding hemispheric specialization.
 - Research indicates caution in too much speculation regarding specialization and its impact on learning and educational practices.



Roger W. Sperry (3 of 3)

- Interactionist
 - Sperry was an interactionist concerning the mindbody problem
 - He believed that consciousness emerges from brain processes and once emerged has a causal relationship to behavior.



Ethology

- The study of instinctive animal behavior.
 - Ethologists study a specific category of behavior within an animal's natural environment and attempts to explain that behavior in terms of evolutionary theory.
 - Species-specific behavior
 - Examines how members of a species typically behave under specific environmental conditions.
 - Very important to ethologists



Evolutionary Approaches (1 of 3)

- Sociobiology
 - Attempts to explain complex social behavior in terms of evolutionary theory.
 - Biogrammar
 - Inherited structures that predisposes organisms toward certain kinds of social activities.
 - Leash Principle
 - There is a close relationship between culture and the satisfaction of biological needs
 - Biology holds culture on a leash



Evolutionary Approaches (2 of 3)

Terminology

- Sociobiology and evolutionary psychology are terms used interchangeably although not all researchers agree that they describe the same thing.
- Criticism for accepting adaptionism
- Exaptation, spandrels



Evolutionary Approaches (3 of 3)

- "Misbehavior" of organisms
 - Instinctual drift (continued)
 - Other researchers have found support for these views
 - Suggested that within a given species, some associations are easier to establish than others
 - Suggested that there are differences among species as to the ease with which different associations can be formed.
 - Preparedness continuum
 - This has been explained in terms that different animals are biologically prepared to form certain associations and contraprepared to form others and this has been selected for through evolutionary principles.



Behavioral Genetics (1 of 2)

- Behavioral Genetics
 - The branch of psychobiology that studies the genetic influence on cognition and behavior.
 - Thomas Bouchard
 - Twin research



Behavioral Genetics (2 of 2)

- Heritability
 - The extent to which variations on a trait or attribute is attributable to genetics
 - Research by various researchers have investigated the heritability of intelligence and personality characteristics.
 - There is still much argument and discussion regarding these highly sensitive subjects.

