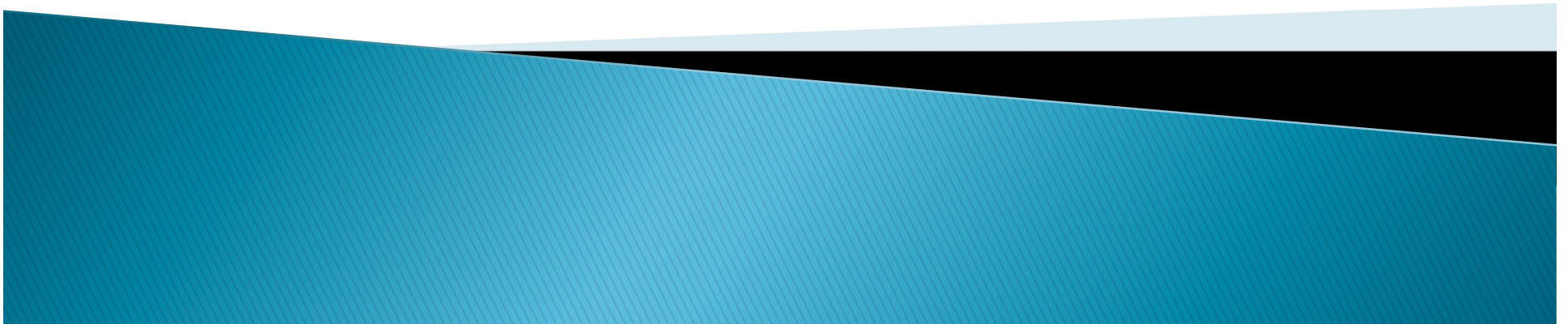


Theories of Human Development

Chapter 2: Evolutionary Theory

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Chapter Topics

- ▶ Historical context
- ▶ Key concepts
 - Natural selection
 - Adaptation
 - Evolution and the human species
- ▶ New directions
 - Ethology
 - Evolutionary psychology
- ▶ Research example: Attachment
- ▶ Application: The free-rider problem
- ▶ Strengths
- ▶ Weaknesses



Historical Context

- ▶ Charles Darwin, 1809–1882.
- ▶ Resident naturalist on the Beagle, 1831–1836.
 - Sail to South America, survey the coast and islands of the Pacific, map the region, and document plant and animal life.
 - He collected numerous samples of fossils and kept detailed observations of plant and animal species.
 - 1859, he published “The Origin of Species” which introduced the notion of natural selection to account for the process through which diverse species emerge over long periods of time.

For more details about Darwin’s life and works visit: About Darwin. www.aboutdarwin.com

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Key Concepts: Natural Selection

- ▶ Behavior is adapted to the environment in which it occurs.
- ▶ Reproductive success \equiv Fitness.
- ▶ Every species produces more offspring than can survive to reproduce.
- ▶ Variability in the species results in differences in reproductive success in different environments.
- ▶ Over long periods of time, those members of the species with reproductive success were more likely to survive, mate, and produce offspring that have characteristics appropriate to their location.

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Key Concepts: Natural Selection

- ▶ When Darwin was writing, he did not know about DNA, or the principles of genetics that account for how characteristics are passed from the parent to the offspring.
- ▶ His theory was based on his detailed observations of variability among members of the species in a given location, and a comparison of similar species in different locations.
- ▶ He theorized two different forms of evolution: one in which a species is modified over long periods of time; and one in which new species break away from their lineage and form a new phylogenetic branch.

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Key Concepts: Adaptation

- ▶ A process by which living things develop structures and problem-solving mechanisms that enable them to thrive in a particular environment.
- ▶ Biological adaptation: change in physical features like coloration, sensory systems, or body structures.
- ▶ Behavioral adaptation: change in a behavior like mating, nest building, or pair bonding.

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Key Concepts: Evolution and the Human Species

- ▶ Humans are mammals.
- ▶ Humans are primates.
- ▶ Humans are a unique species:
 - Modern homo sapiens, roughly 200,000 years old.
 - Origins in Africa.
 - This reminds us of how young our contemporary way of life really is.

Fossil evidence suggests that there were a variety of hominids alive at the same time.

Questions still remain about how modern humans dominated other hominids.



Key Concepts: Evolution and the Human Species

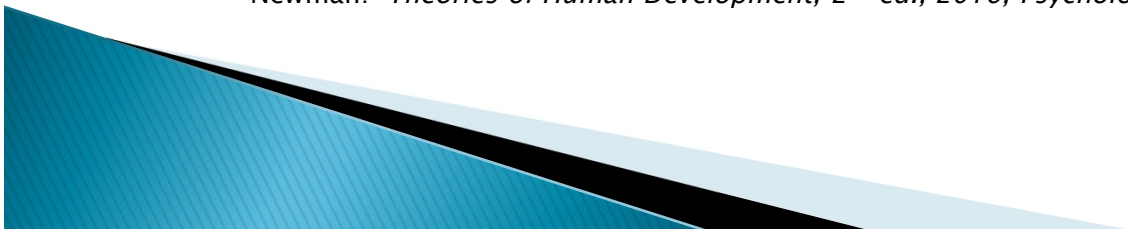
- ▶ How modern humans came to dominate other hominids:
 - Powerful mental evolution.
 - Cultural evolution.
 - Complex tool development.
 - Advanced techniques for hunting and gathering
 - The invention of agriculture.
 - The eventual growth of tribes, chiefdoms, and political states.

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Key Concepts: Evolution and the Human Species

- ▶ The Autocatalysis model: a capacity that emerges in evolution accelerates the change process.
- ▶ One example is bipedalism:
 - Hands are freed.
 - Manufacture of tools and artifacts becomes easier.
 - Mental abilities are stimulated and new tools are invented.
 - Cooperative efforts to hunt big game using these tools stimulates even more social intelligence and complex social groups.



Key Concepts: Evolution and the Human Species

- ▶ **Common features of human nature that tie them together as a species:**
 - They share a common body shape and specific organs such as eyes, nose, ears, hands, and feet, which can be recognized as human despite individual differences.
 - They can mate and produce living children who in turn are capable of reproducing.
 - Critical among the characteristics of humans is bipedalism as a primary means of locomotion, which leaves the hands free for tool use, holding, carrying, and gesturing.
 - The structure of human hands permits the flexible manipulation of objects as tools.
 - Reduced reliance on smell and relatively greater reliance on vision influence the human mode of exploring the environment.
 - Because of the prolonged period of prenatal and postnatal development characteristic of human infants, humans are highly social; they are oriented toward social stimuli and have highly developed capacities for solving social problems.
 - Perhaps the most critical aspect of human nature is the size, structure, and complexity of the brain. As a result of this brain, humans have extensive symbolic capacities and a remarkable ability to learn. They produce spoken symbolic language. They store information and pass it on from one generation to the next.
 - Humans are self-conscious; they raise questions about their origin and anticipate their death.
 - Humans are aware of what others are feeling and thinking. This social intelligence allows them to coordinate complex group activities and to form enduring social bonds.

The list gives us a lot to think about in relation to the study of human development.

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New Directions: Ethology

- ▶ The study of the functional significance of animal behavior in the natural environment from an evolutionary perspective.
- ▶ Ethology examines how a particular behavior contributes not just to the future growth and development of the individual but to the adaptation and continuation of the species.
- ▶ The study of evolutionarily significant behaviors that appear to be innate and specific to a particular species; behaviors commonly associated with eating, mating, and protecting a species from harm.
- ▶ Ethology typically employs the study of behavior in natural settings with experimentation used to address questions derived from these observations.

New Directions: Ethology

Potential targets of study in the field of ethology:

- ▶ Reproductive strategies, such as having few or many sex partners.
- ▶ Infant immaturity requiring prolonged care.
- ▶ Infant-caregiver attachment.
- ▶ Parent-child conflicts.
- ▶ Sibling rivalry.
- ▶ Peer group formation and functions, especially cooperation, competition, dominance, and submission.
- ▶ Pair-bonding and mate selection.
- ▶ Helping behavior and altruism.
- ▶ Learning as adaptive behavior.
- ▶ Individual creation and modification of the environment.
- ▶ Elaboration of rites, rituals, and religions.

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New Directions: Evolutionary Psychology

- ▶ The application of principles of evolution to explain the nature of the human mind.
- ▶ Evolutionary psychologists view adaptation as resulting in the formation of functionally specific capacities as well as structures that can integrate information from a variety of sources.
- ▶ Each mental structure is a tool designed to perform a specific task.

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New Directions: Evolutionary Psychology

- ▶ The mind is structured to solve adaptive problems.
- ▶ These problems were likely to have been faced repeatedly over human history.
- ▶ The solution to these problems influenced reproductive success.
- ▶ Examples:
 - How to tell if someone is a friend or a threat.
 - How to select a mate.
 - How to select a good dwelling.
 - How to collaborate in order to hunt large game.
- ▶ A person has to recognize the nature of the problem and apply the best tool to solve it.
- ▶ A person has to evaluate how much energy to use in order to solve the problem, or stop and move on to another goal.

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Research Example: Attachment

- ▶ From an ethological perspective, the coordinated attachment and caregiving systems form a pattern of mutual regulation through which the infant alerts the caregiver to distress, and the caregiver provides protection, comfort, and care.
- ▶ Over time, the infant forms a mental representation of the caregiver and uses this mental representation to anticipate the nature of other close, relationships.
- ▶ The quality of attachment has implications for the child's ability to explore the environment, to engage in satisfying social relationships, and to form close, intimate bonds in friendship and romantic relationships as an adolescent and adult.


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Stages in the Development of Attachment

STAGE	AGE	CHARACTERISTICS
1	Birth to 3 months	Infant uses sucking, rooting, grasping, smiling, gazing, cuddling, crying, and visual tracking to maintain closeness with caregivers.
2	3 to 6 months	Infant is more responsive to familiar figures than to strangers.
3	6 to 9 months	Infant seeks physical proximity and contact with objects of attachment.
4	9 to 12 months	Infant forms internal mental representation of object of attachment, including expectations about the caregiver's typical responses to signals of distress.
5	12 months and older	Child uses a variety of behaviors to influence the behavior of the objects of attachment in ways that will satisfy needs for safety and closeness.

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Four Patterns of Attachment

- ▶ **Secure Attachment:** Babies have a working model of attachment in which they expect their caregiver to be accessible and responsive. They actively explore their environments; are readily comforted following distress. Caregivers are responsive and sensitive to infant cues.
- ▶ **Anxious–Avoidant Attachment:** Babies cry a lot, they are not readily soothed by contact with the caregiver, and yet they appear to be quite distressed by separations. Caregivers of these babies seem to be angry or rejecting in their response to infant distress.
- ▶ **Anxious–Resistant Attachment:** These babies try to maintain proximity and to avoid unfamiliar situations that increase uncertainty about accessibility to their caregivers. Caregivers of these babies seem to be inconsistent in their responses to infant distress
- ▶ **Disorganized Attachment:** Babies behave in contradictory, unpredictable ways that seem to convey feelings of extreme fear or utter confusion; Some mothers are negative, intrusive, and frighten their babies in bursts of intense hostility. Other mothers are passive, helpless, and rarely show positive or comforting behaviors.

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Application: The Free-Rider Problem

- ▶ A free-rider is a person who does not contribute his/her fair share to the production of a resource but shares equally in the benefits.
- ▶ In the life of a group, cooperators must be protected from the exploitation of free-riders.
- ▶ There appears to be a mental structure that allows people to recognize and categorize others as free-riders.
- ▶ When free-riders have been identified, cooperators must find strategies to punish them or exclude them from sharing the benefits or create incentives to encourage their cooperation.
- ▶ Educational applications: Given the growing emphasis on group projects and collaborative problem-solving, educators are introducing many opportunities for students to work together.
- ▶ Free-riders undermine the effectiveness of these experiences. Educators must incorporate features of group assignments that will discourage free-riding and reward equity in effort.

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Strengths of Evolutionary Theory

Places individual development in the context of species development.

Explains species development and the origins of species using the basic mechanism of natural selection.

Integrates research from many fields.

Stimulates research into the adaptive value of individual differences.

Stimulates research into a wide range of human thought and behavior including: cognitive problem-solving strategies; social competence; motives for mate selection and fidelity; reproductive strategies; childrearing; the role of emotions in guiding behavior.

Stimulates research into universal features of “human nature.”

Stimulates research about how humans assess critical features of their environments and make use of this information to guide action.

Propositions generated by the theory are testable.

Weaknesses of Evolutionary Theory

Assumptions regarding the challenges faced by human ancestors thousands of years ago is a matter of speculation.

The view of the human mind as pre-adapted to conditions of the evolutionary past fails to incorporate the adaptive and flexible nature of human cognition.

The theory fails to integrate information that is transmitted from one generation to the next, which contributes to an individual's assessment of the environment and adaptive strategies.

Science and technology are co-evolving with the mechanism of natural selection to introduce new processes that may alter the human genome and are not incorporated into the theory.

The theory is primarily explanatory; not predictive. It does not offer hypotheses about new directions of human evolution.

Evolutionary theory has highlighted the role of men more than the role of women in the adaptive process; that weakness is being addressed in current research.

The focus on fitness and reproductive success, while important to species survival, does not encompass many other aspects of the social, cognitive, physical, and emotional development relevant for optimal growth over the life span.