

Modern psychology

- Explores **behavior and mental processes**
- These include: perception, thought, attention, emotion, intelligence, subjective experiences, motivation, personality and more
- Studies conscious **and** unconscious phenomena
- Analysis from **individual as well as social** perspectives

Modern psychology

- Focuses on **cognition** (*cognitive science*)
- Uses **neuroscience** to inform the study of the mind
- Frequently explains psychological phenomena in terms of their **evolutionary fitness**
- Is also a practical discipline, focused on assessment and treatment of mental health problems, counselling, education etc.

Cognition

What is cognition

“The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses”

(Oxford English Dictionary)

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What is cognition

- Attention
- The formation of knowledge
- Memory
- Judgment and evaluation
- Reasoning and "computation"
- Problem solving and decision making
- Comprehension and production of language

Cognitive psychology

- Behaviorism, language and cognitive revolution
- 1959 – Noam Chomsky, critique of Verbal Behavior by Skinner
- Behaviorist theory struggles with explaining language
- A new paradigm in psychology – cognitive psychology



The computer metaphor

- The mind is a "computer" that is physically implemented by neural activity in the brain
- Input via perception, output via behavior

Evolutionary psychology

What is evolution? (after Wikipedia)

- Evolution is change in the heritable characteristics of biological populations over successive generations
- These characteristics are the expressions of genes that are passed on from parent to offspring during reproduction
- Different characteristics tend to exist within any given population as a result of mutation, genetic recombination and other sources of genetic variation

What is evolution? (after Wikipedia)

- Evolution occurs when evolutionary processes such as natural selection (including sexual selection) and genetic drift act on this variation, resulting in certain characteristics becoming more common or rare within a population
- It is this process of evolution that has given rise to biodiversity at every level of biological organisation, including the levels of species, individual organisms and molecules

Evolution & psychology

- Modern psychology is grounded in evolutionary thinking
- Evolutionary principles apply to all animals (including people)
- Psychological processes have been shaped by evolution the same way as anatomy and physiology
- *"Evolutionary psychology is the radical notion that human behavior is part of the natural world"*

Mechanisms of evolution

- Natural selection
- Sexual selection
- Kin selection / inclusive fitness
- Reciprocity
- Genetic drift

Natural selection

- Traits that increase the chance of **reproductive success** (RS) are selected for and kept during evolution
- These traits have high evolutionary **fitness** (they fit into the environment)

Sexual selection



Sexual selection

- Why the tail? Does it increase the chance of survival?
- Does it increase the chance of RS?
- Why?
- If a peacock has everything other peacocks have PLUS a huge, colorful tail, it's a sign of great genes

Kin selection / inclusive fitness

- Increase RS of kin, even at own expense
- Altruism is proportional to % of shared genes:
 - Identical twins - 100%
 - Siblings - 50%
 - Cousins - 12.5% etc.

Reciprocity

- Organism A decreases chance of RS, increasing the RS of organism B
- A does this because it expects B to do the same
- If B cheats, A stops helping
- More complex scenarios play out on the basis of game theory

Others

- Genetic drift
- Spandrels

The most wide spread myth about evolution

Animals do stuff *for the good of the species*

Environment of evolutionary adaptedness

- Environment that formed evolutionary adaptations
- Homo sapiens spent 99% of their evolutionary time in hunter-gatherer groups of about 150 closely related people
- *"Our modern skulls house a Stone Age mind"* - Cosmides & Tooby, 1997

Examples

- Social bonding and behaviors
- Mating behavior
- Eating habits
- Stress, coping and *lifestyle disease*