

Biological Psychology



Understanding Biological Psychology

- Biological Psychology is the study of the physiological, evolutionary and developmental mechanisms of behavior and experience
 - Particularly focused on brain function



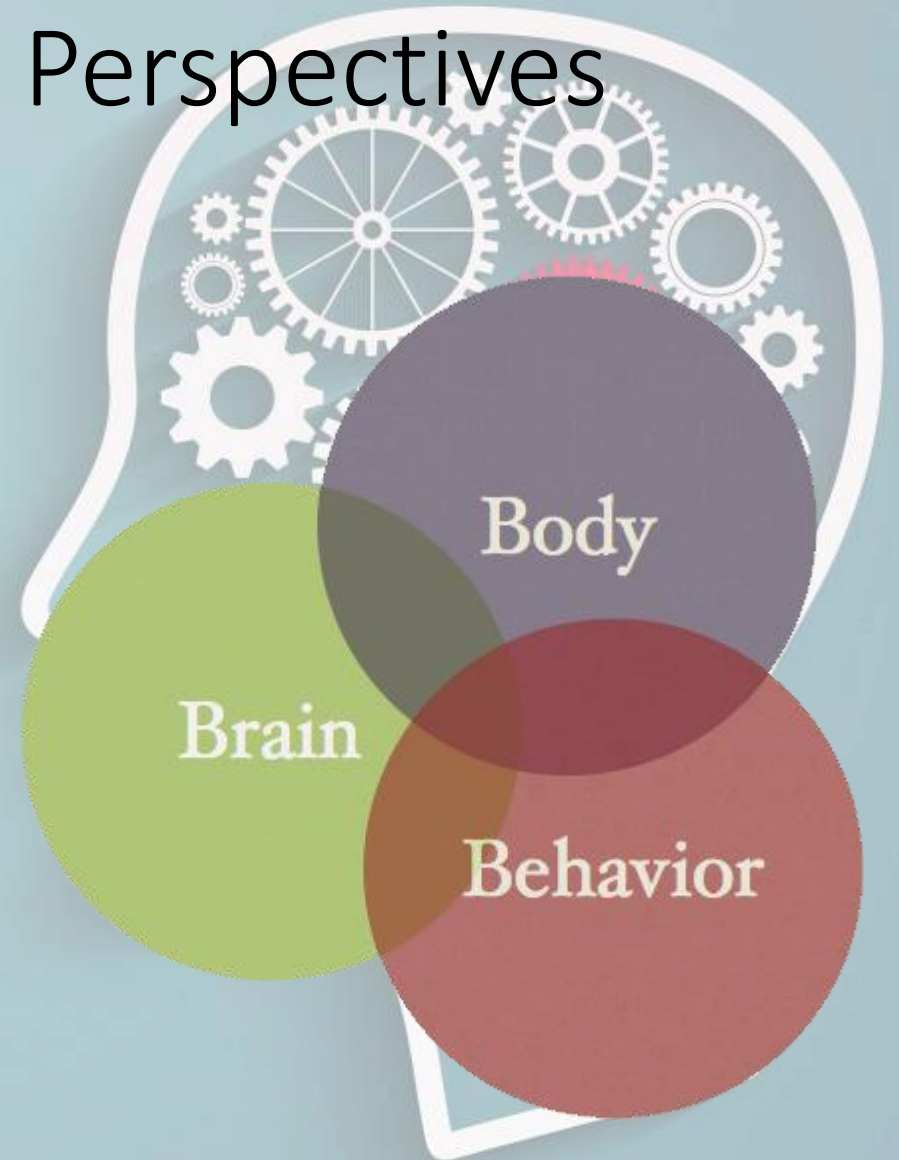
The Mind-Brain Relationship

- Biological explanations of behavior raise the issue of the relationship between the mind and the brain also known as the “mind-body” or “mind-brain problem”



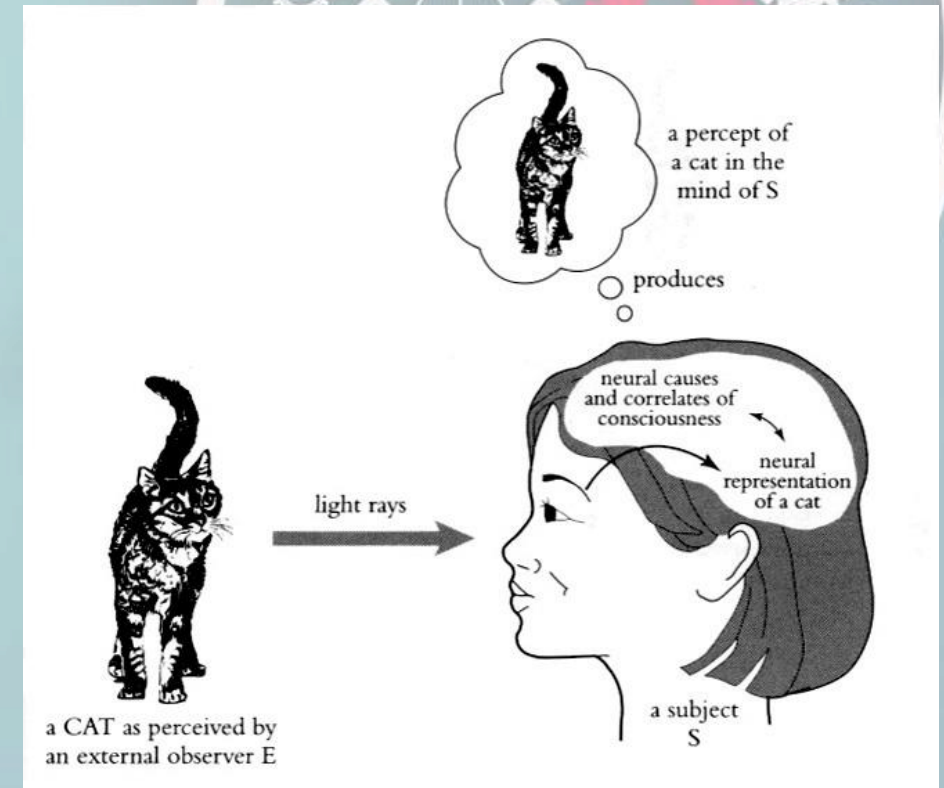
The Mind-Brain Relationship Perspectives

- Deep understanding of a particular behavior is tied to being able to explain the behavior from each of the perspectives below
- Biological explanations of behavior fall into four categories:
 - **Physiological**-relates a behavior to the activity of the brain and other organs.
 - **Ontogenetic**- describes the development of a structure or behavior.
 - **Evolutionary**- reconstructs evolutionary history of a behavior or structure.
 - **Functional**- describes *why* a structure or behavior evolved as it did.



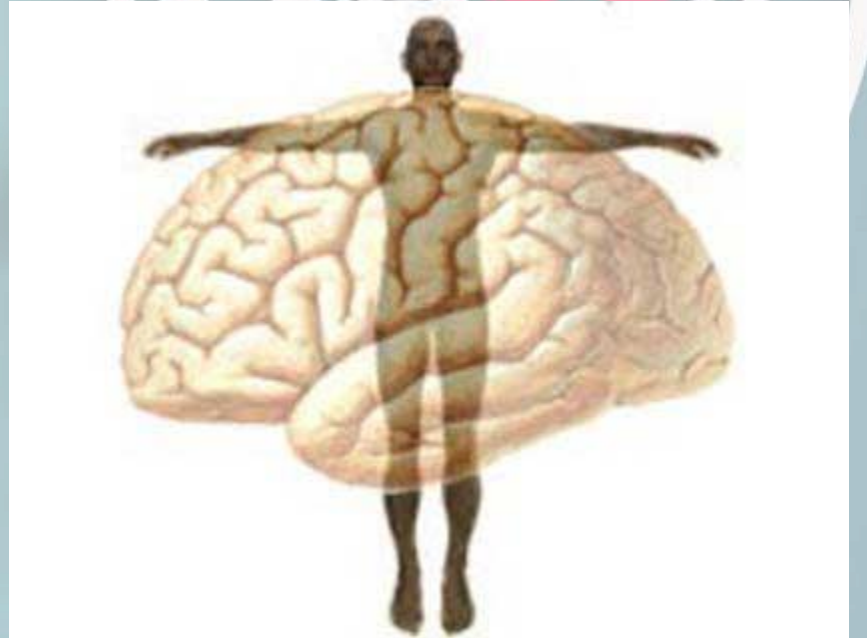
Explanations of Mind-Brain Relationship: Dualism

- The belief that there are two different kinds of substance that exist independently
 - Divided into Physical and Mental
 - Defended by French philosopher Rene Descartes
 - “Cogito ergo sum” -> “I think therefor I am”
 - Most common belief among nonscientists
 - Rejected by most neuroscientists



Explanations of Mind-Brain Relationship: Monism

- The belief that the universe is only comprised of one type of substance.
- Forms of monism include:
 - Materialism- everything that exists is physical by nature
 - Mentalism- only the mind truly exists
 - Identity position- mental processes and some brain processes are the same but described in different terms



DUALISM vs MONISM

Cartesian Duality:
MATTER-MIND



KEY:

Physical and Mental substance
is either fundamental or derivative.
(solid line) (dashed line)

Physicalism:
MATTER > Mind



Idealism:
Matter < MIND

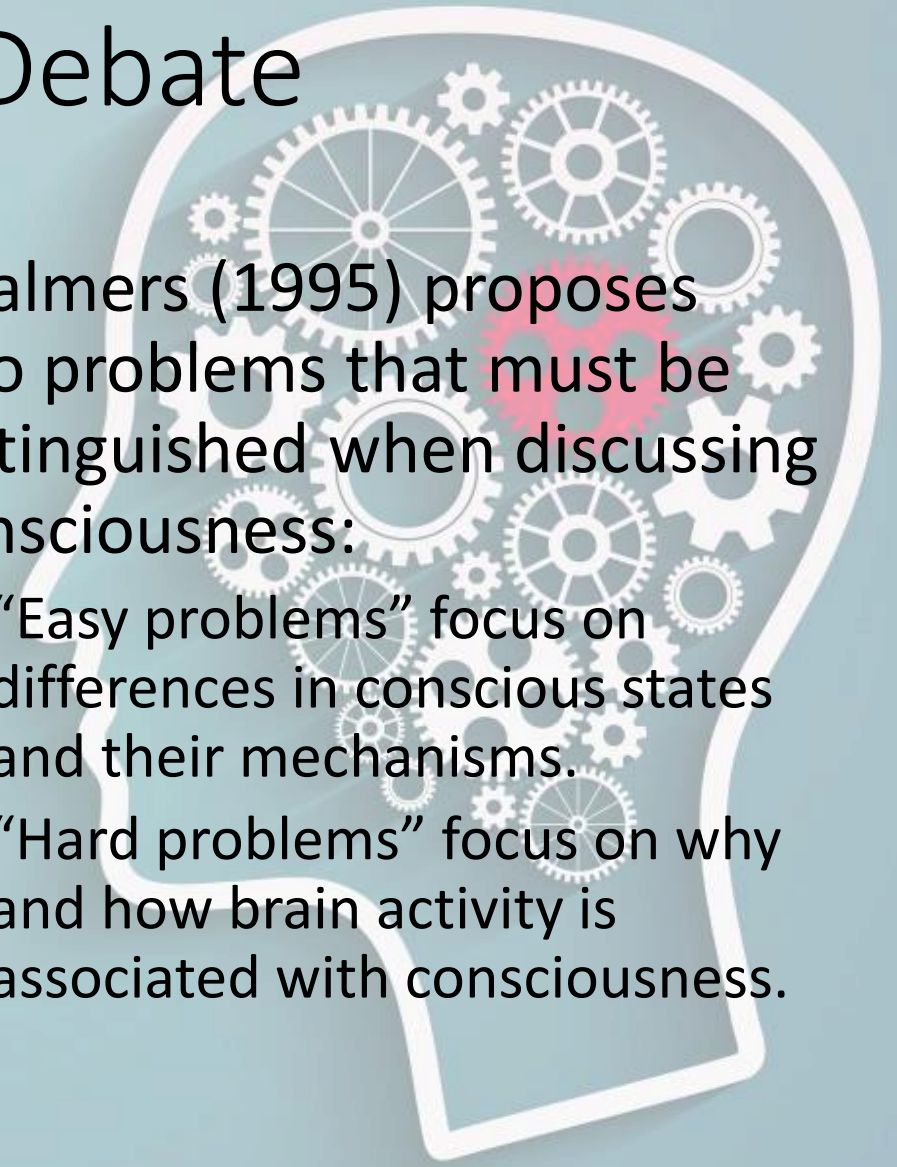


Neutral Monism:
3rd SUBSTANCE
> Matter & Mind



Complexities of Mind-Brain Debate

- Because “consciousness” is not observable, its function is often difficult to define and/ or explain.
- Solipsism- suggests that “I alone am conscious”
 - Difficulty of knowing if others have conscious experiences is known as the “problem of other minds”.
- Chalmers (1995) proposes two problems that must be distinguished when discussing consciousness:
 - “Easy problems” focus on differences in conscious states and their mechanisms.
 - “Hard problems” focus on why and how brain activity is associated with consciousness.



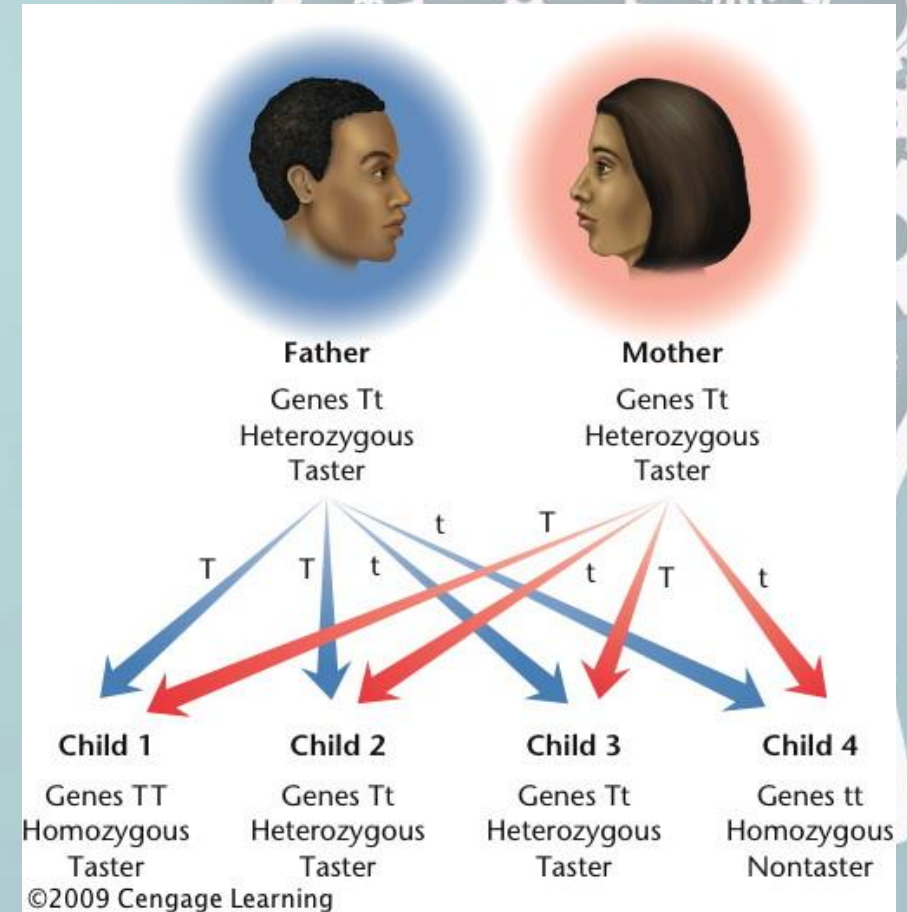
Genetics and Behavior

- Both genes and environment interact to shape human behavior
- Genes are basic units of heredity that maintain their structural identity from one generation to another.
- Genes are aligned along chromosomes (strands of genes) and come in pairs
 - A gene is a portion of a chromosome and is composed of deoxyribonucleic acid (DNA).
 - DNA serves as a model for the synthesis of ribonucleic acid (RNA).



Impact of Genes on Behavior

- Almost all behaviors have both a genetic component and an environmental component.
- Researchers study **monozygotic** (“from one egg”) and **fraternal** (“from two eggs”) twins to infer contributions of heredity and environment
- Researchers also study adopted children and their resemblance to their biological parents to infer hereditary influences



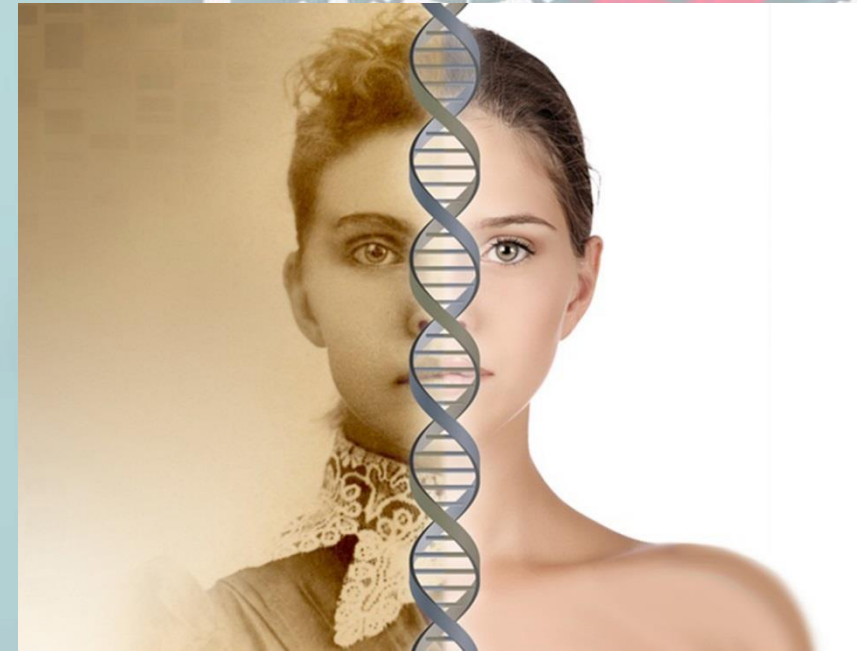
Impact of Genes on Behavior

- **Heritability** refers to how much characteristics depend on genetic differences.
 - Estimates of hereditary influences are often difficult to infer and are prone to error
 - Traits with a strong hereditary influence can be modified by environmental intervention



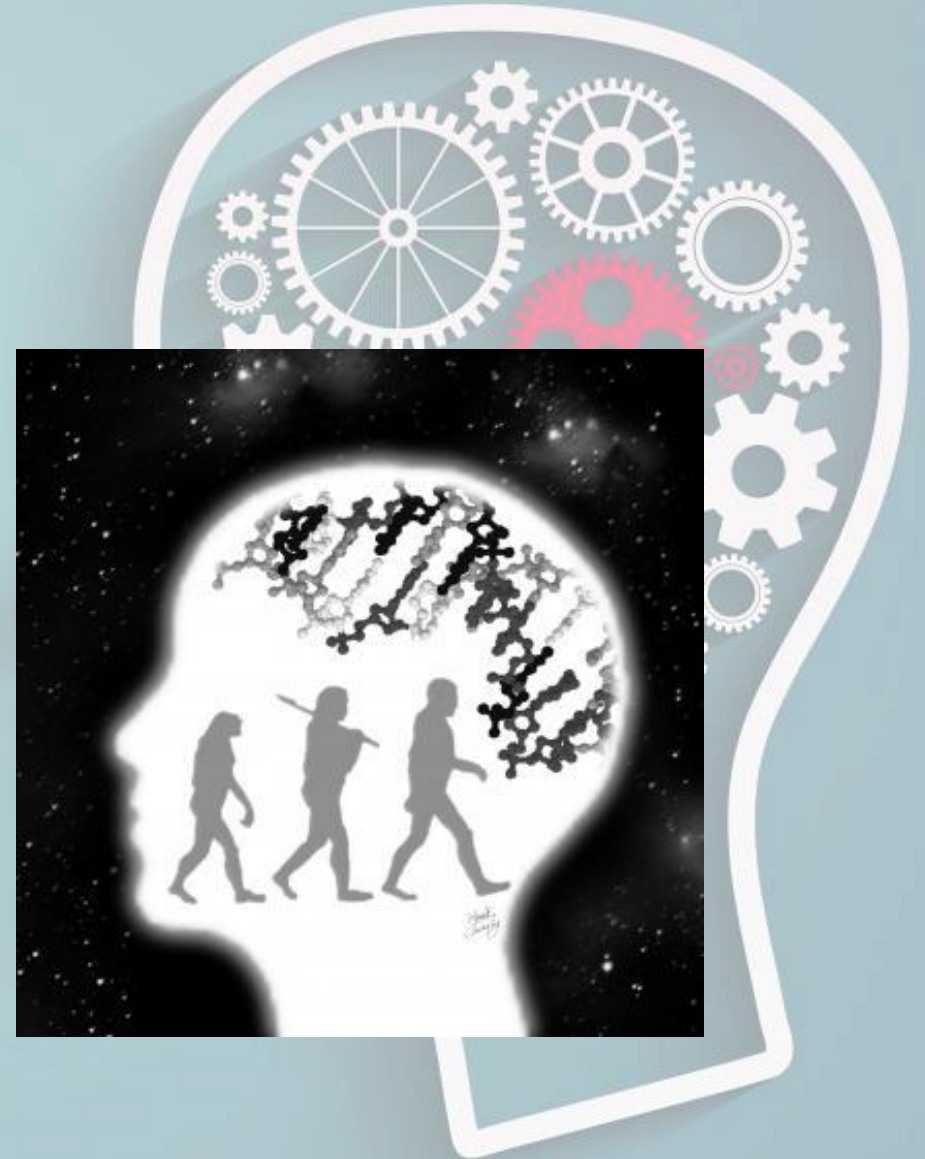
Genes and Behavior Development

- Genes do not directly produce behaviors.
 - Genes produce proteins that increase the probability that a behavior will develop under certain circumstances.
- Genes can also have an indirect affect.
 - Genes can alter your environment by producing behaviors or traits that alter how people in your environment react to you



Evolutionary Psychology

- Refers to the idea that humans with more desirable traits are more fit to pass on genes
- Assumes that behaviors characteristic of a species have arisen through natural selection and provide a survival advantage
 - Ex. Human behavior helps it survive
- Human behavior is driven by desire to find a mate and pass on genes
 - Ex. Trying to appear macho by peeling out in the high school parking lot



Sources

- LeBlanc, Ginger M., Bakersfield College, Department of Behavioral Science

