

hModule 1: Psychology's History

- I. How did psychology develop from its prescientific roots in early understanding of mind and body to the beginnings of modern science?**
 - A. India + China + Israel all had scholars (ex. Confucius, buddha, etc.)
 - B. Greece
 1. Plato + Socrates thought knowledge is innate; mind/body is separable
 2. Aristotle thought knowledge is not pre existing (experimental science)
 - C. France scholar Descartes agreed with Plato and Socrates (experimental science)
 - D. Britain
 1. Bacon + Locke created empiricism - knowledge comes from experience; science should rely on observation and experimentation
 2. Tabula Rasa- blank slate; coined by Locke to help explain impact experience has on shaping individual
 - E. Many debates between empiricism, innate ideas, and dualism (mind/body)
- II. What are some important milestones in psychology's early development?**
 - A. **Wilhelm Wundt** - Established first psych lab in which he measured reaction time between hearing a sound and pressing a button; structuralist
 - B. **G. Stanley Hall** - Student of Wundt, established first psych lab in U.S.
 - C. Structuralism
 1. Founded by **Edward Titchener** (Wundt's student)
 2. Used self-reflective introspection to learn about mind's structure
 3. Mind operates by combining subjective emotions and objective sensations
 4. Problems: required smart, verbal people , results vary
 - D. Functionalism
 1. Founded by **William James** and influenced by **Darwin** (evolution guy)
 2. James was a professor and wrote first psych textbook
 3. Explored how mental and behavioral processes function - how they enable the organism to adapt, survive, and flourish
 - E. Women in the field
 1. **Mary Whiton Calkins** - pioneering memory researcher and first woman to be president of American Psychological Association (APA)
 2. **Margaret Floy Washburn** - First woman to receive psych Ph.D.
- III. How did psychology continue to develop from the 1920s through today?**
 - A. Until 1920's, psych was defined as "the science of mental life"
 - B. **John B. Watson** + **B.F. Skinner** - redefined psych as "scientific study of observable behavior" (1920)
 1. John B. Watson - famous for "Little Albert"; conditioning- Behavior is influenced by learned associations
 2. B.F. Skinner studied how consequences shaped behavior

3. Behaviorists - The view that psych should be an (1) objective science that (2) studies behavior without reference to mental processes. (1) commonly agreed with but not so much (2) because of cognitive theorists.
- C. Freudian Psychology
1. Founded by Sigmund Freud (has no experimental evidence when founded)
 2. Emphasized ways our unconscious thought processes and our emotional responses to childhood experiences affect our behavior.
 3. Defense mechanisms- actions that protect the mind
 4. Dream analysis
 5. However, it is unscientific and unfalsifiable
- D. Humanistic Psychology
1. Redefined psych yet again to pay attention to ways that current environmental influences can nurture/limit our potential and how importance of need/love satisfaction.
 2. Founded by Carl Rogers and Abraham Maslow
 3. Known as the cognitive revolution
 4. Cognitive neuroscience - study of brain activity linked with cognition (perception, language, memory, and thinking)
- E. Psychology (current definition) - “science of behavior and mental processes.”

Module 2 + 3: Psychology’s Big Issues & Approaches/Careers In Psychology

I. What is psychology’s historic big issue?

A. Nature vs. Nurture

1. Natural selection - the principle that, among the range of inherited trait variations, those contributing to reproduction and survival will most likely be pass downed
2. Nurture works on what nature endows

II. What are psychology’s levels of analysis and related perspectives?

A. **Biopsychosocial approach** - incorporates many levels of analysis and offers more complete picture of any given behavior or mental process

1. Biological influences:
 - a) Natural selection of adaptive traits
 - b) Genetic predispositions responding to environment
 - c) Brain mechanisms
 - d) Hormonal influences
2. Psychological influences:
 - a) Learned fears and other learned expectations
 - b) Emotional responses
 - c) Cognitive processing and perceptual interpretations

3. Social-cultural influences:
 - a) Presence of others
 - b) Cultural, societal, and family expectations
 - c) Peer and other group influences
 - d) Compelling models (such as in media)

B. Psychology's Approaches Through Perspective

1. Behavioral- How we learn observable responses
2. Biological - How the body and brain enable emotions, memories, and sensory experiences; how genes combine with environment to influence individual differences
3. Cognitive - How we encode, process, store, and retrieve information
4. Evolutionary - How the natural selection of traits has promoted the survival of genes
5. Humanistic- How we meet our needs for love and acceptance and achieve self-fulfillment
6. Psychodynamic- How behavior springs from unconscious drives and conflicts
7. Sociocultural - How behavior and thinking vary across situations and cultures
8. Eclectic - Each perspective has valid opinions, no one right answer

III. What are psychology's main subfields? (Module 2 + 3)

- A. Basic Research- pure science that aims to increase the scientific knowledge base
 1. Developmental psychologists - Studies physical, cognitive, and social change throughout life span
 2. Educational psychologists- Studies how psychological processes affect and enhance learning and teaching
 3. Personality psychologists- Studies individual's' characteristic pattern of thinking, feeling, and acting
 4. Social psychologists- Studies how we think about, influence, and relate to one another
 5. Psychometric psychologists - Studies measurement of our abilities, attitudes, and traits
- B. Applied Research - Scientific study that tackles practical problems
 1. Industrial-Organizational (I/O) psychologists- apply psych concept and methods to optimize human behavior in workspaces
 2. Human factors psychologists- focus on interacting of people, machines, and physical environment
 3. Counseling psychologists- Assists people with problems in living
 4. Clinical psychologists- Helps people cope with crisis and psychological disorders

5. Psychiatrists - Deals with psychological disorders, are M.D., can prescribe drugs
6. Positive Psychology - scientifically study of human functioning with the goals of discovering and promoting strengths and virtues that help individuals and communities to thrive
7. Community Psychologists- Studies how people interact with their social environments and how social institutions affect individuals and groups.
8. Forensic Psychologists - apply psychological principles to legal issues

IV. How can psychological principles help you learn and remember?

- A. Testing effect - enhanced memory after retrieving, rather than simply rereading, information.
- B. SQ3R - Study method incorporation 5 steps: survey, question, read, retrieve, review
- C. Additional tips
 1. Distribute your study time
 2. Learn to think critically
 3. Process class information actively
 4. Overlearn
 5. Be a smart test-taker

Module 4: The Need for Psychological Science

I. How do hindsight bias, overconfidence, and the tendency to perceive order in random events illustrate why science-based answers are more valid than those based on intuition and common sense?

- A. Hindsight bias - tendency to believe, after learning an outcome, that one would have foreseen it. (I-knew-it-all-along phenomenon).
- B. Overconfidence - We tend to think we know more than we do
- C. We perceive order in random events

II. How do the scientific attitude's three main components relate to critical thinking?

- A. Curiosity - Study anything
- B. Skepticism - Can reveal which of differing ideas best matches the facts
- C. Humility - awareness of own vulnerability to error and openness to other ideas
- D. Critical thinking - thinking that doesn't blindly accept arguments and conclusions

Module 5: The Scientific Method & Description

I. How do theories advance psychological science?

- A. Scientific Method

1. Theory - an explanation using an integrated set of principles that organizes observations and predicts behaviors or events
 - a) Effectively organizes a range of self-reports and observations
 - b) Leads to clear hypotheses that anyone can use to check the theory
 - c) Often stimulates research that leads to revised theory which better organizes and predicts what we know. Or, research may be replicated and supported by similar finding.
2. Hypothesis- a testable, prediction often implied by a theory
 - a) Descriptive methods - describe behaviors, often by using case studies, surveys, or naturalistic observations
 - (1) *Positives*: Case studies require only one participant; naturalistic observations doesn't violate ethics; surveys may be done quickly and inexpensively
 - (2) *Negatives*: Uncontrolled variables; may be misleading
 - b) Correlational methods - Associate different factors (variables)
 - (1) *Positives*: Works with large groups of datas; not limited to only experimental situations
 - (2) *Negatives*: Does not specify cause and effect
 - c) Experimental methods - Manipulate variables to discover effects
 - (1) *Positives*: Specifies cause and effect and variables
 - (2) *Negatives*: Sometimes not feasible, results may not generalize to other contexts; not ethical to manipulate certain variables
3. Operational definitions - Carefully worded statement of the exact procedures (operations) used in a research study
4. Replicate - Repeating essence of research study, usually with different participants in different situations, to see whether the basic finding extends to other participants and circumstances

II. How do psychologists use case studies, naturalistic observation, and surveys to observe and describe behavior, and why is random sampling important?

- A. Case studies - analyses of special individuals; descriptive technique in which one individual or group is studied in depth in hope of revealing universal principles.
- B. Naturalistic Observation - watching and recording the natural behavior of many individuals without attempting to manipulate or control the situation
- C. Surveys and interviews- a technique for ascertaining the behaviors of a particular group, usually by questioning a representative, random sample of the group.
 1. Wording effect- The way we phrase a question affects meaning
 2. Sampling bias- flawed sampling process → unrepresentative sample
 3. Population- all those in a group being studied from which samples may be drawn

4. Hawthorne effect- the attention of behavior by the subjects of a study due to awareness of being observed; leads to an experiment producing results regardless of it is caused by the independent variable
 5. Random sample- sample that fairly represents a population because each member has an equal chance of inclusion
- D. Descriptive methods describe but do not explain behavior, because these methods do not control for the many variables that can affect behavior.

Module 6: Correlation & Experimentation

I. What are positive and negative correlations, and why do they enable prediction but not cause-effect explanation? (+ II- What are illusory correlations?)

- A. Correlation - a measure of the extent to which two variables change together, and thus of how well either variable predicts the other
 1. Correlation coefficient - Statistical index of relationship between two variables (from -1.0 to 1.0)
 2. Scatter plots- graphed cluster of dots, each of which represents the value of two variables. The slope of the points suggests the direction of the relationship between the two variables. The amount of scatter suggests the strength of the correlation (little scatter indicated high correlation).
- B. The closer the correlation coefficient is to -1 or 1, the stronger the correlation.
 1. A correlation is negative if two sets of scores relate inversely.
 2. A correlation is positive if two sets of scores relate directly.
 3. There is no relationship if the correlation coefficient is 0.
- C. **Correlation does not mean causation**
- D. Illusory correlations - the perception of a relationship where none exists
 1. When we notice random coincidences, we may forget that they are random and instead seem them as correlated.

II. What are the characteristics of experimentation that make it possible to isolate cause and effect?

- A. Random assignment- assigning participants to experimental and control groups by chance, thus minimizing preexisting differences between the different groups
- B. Stratified sampling- Allows researcher to ensure sample represents population on some criteria; uses proportions = to population size
- C. Double-blind procedure - Experimental procedure in which both the researcher participants are ignorant about whether the research participants have received the treatment or a placebo. Commonly used in drug-evaluation studies.
- D. Placebo effect- experimental results caused by expectations alone; any effect on behavior caused by the administration of an inert substance or condition, which the recipient assumes is an active agent
- E. Confounding variables - Other factors that can influence the results

- F. Validity- The extent to which a test or experiment measures or predicts what it is supposed to

Module 7: Statistical Reasoning in Everyday Life

I. How do we describe data using three measures of central tendency, and what is the relative usefulness of two measures of variation?

A. Descriptive statistics- Numerical data used to measure and describe characteristics of groups. Includes measures of central tendency and measures of variation.

1. Histograms - Bar graph depicting frequency distribution

2. **Mean, median, mode**

3. Skewed distribution- A representation of scores that lack symmetry around their average value; when data is skewed, follow the median

a) *Positive skew*- Graph shifted to right; mean > median > mode

b) *Negative skew* - Graph shifted to left; mode > median > mean

4. Normal curve- Bell curve that describes distribution of many types of data

II. How do we know whether an observed difference can be generalized to other populations?

A. Inferential Statistics- Numerical data that allow one to generalize

B. When is an observed difference reliable?

1. Representative samples are better than biased samples

2. Less-variable observations are more reliable than those that are more.

3. More cases are better than fewer.

C. Statistical significance - statistical statement of how likely it is that an obtained result occurred by chance. Not making much of a finding unless the odds of its occurring by chance, if no real effect exists, are less than 5%

Module 8: Frequently Asked Questions about Psychology

I. Can laboratory experiments illuminate everyday life?

A. It is the resulting principles - not the specific findings - that help explain everyday behaviors. (Ex. pushing a button delivering a shock vs slapping someone irl)

B. Researchers intentionally create a controlled, artificial environment in the laboratory in order to test general theoretical principles.

II. Does behavior depend on one's culture and gender?

A. Attitudes and behaviors vary somewhat by gender or across cultures, but because of shared human kinship, the underlying processes and principles are more similar than different.

III. Why do psychologists study animals, and is it ethical to experiment on animals?

A. Some psychologists are primarily interested in animal behavior; others want to better understand the physiological and psychological processes shared by humans and other species

- B. Government agencies have established standards for animal care and housing. Professional associations and funding agencies also establish guidelines for protections animals' well being lives.

IV. What ethical guidelines safeguard human participants? (APA)

- A. Obtain potential participants informed consent - ethical principle that research participants be told enough to enable them to choose if they wish to participate
 - 1. Participants must be competent
 - 2. Must volunteer
 - 3. Intentional deception allowed if:
 - a) Study has sufficient scientific/educational importance
 - b) Not possible without deception
 - c) Did not deceive participants to participate
 - d) Doesn't cause trauma
 - e) Cannot invalidated informed consent
 - f) Full debriefing
- B. Protect them from physical or emotional harm and discomfort
- C. Keep information about individual participants confidential
- D. Fully debrief people (explain the research afterward)
 - 1. Must be told if they were lied to
 - 2. Must be provided with ways to contact the researcher
- E. IRB- Institutional Review Board
- F. Experiments with ethically questionable guidelines:
 - 1. Watson- Little Albert (kid exposed to snake till he freaks out)
 - 2. Stanford - Prison Experiment (prisoners and prison guards acting)
 - 3. Milgram- Obedience study (shock actor with researcher)

V. Is psychology free of value judgement?

- A. Psychologists' values influence their choice of research topics, their theories and observations, their labels for behavior, and their professional advice
- B. Application of psych's principles have been used mainly in service of humanity

Module 9: Biological Psychology & Neurotransmission

I. Why are psychologists concerned with human biology?

- A. Phrenology - Study of shape/size of cranium as supposed indication of person's mental abilities and character traits
 - 1. Proposed by Franz Gall; however not true
 - 2. Did lead to *localization of function* - diff parts of brain have specific f(x)
- B. Biological Psychology- study of links between bio and psych processes

II. What are the parts of a neuron, and how are neural impulses generated?

A. Discovery

1. Squid nerve cells were used to discover this, since their diameter is in mm.
2. Microelectrode (single - unit recordings) - Records rate of change in voltage (volts - SI unit of electric potential) with respect to time

B. The building blocks are neurons, otherwise known as nerve cells.

1. Cell body (soma)- life support center, with mitochondria, nucleus, etc.
2. Dendrites- Branching fibers on soma that receive info & conduct it to axon
3. Axon - Cell's lengthy fiber that passes message from cell body → other neurons, effector cells (muscles or glands) through action potential
4. Myelin Sheath- Layer of fatty tissue that insulates and speeds impulses.
 - a) Multiple Sclerosis - If myelin sheath degenerates, communication to muscle slows with eventual loss of muscle control.
 - b) Axon will be myelinated depending on function of neuron
5. Terminal branches of axon - Form junctions with other cells
6. Terminal buttons- stores neurotransmitters

C. Neural Impulses

1. Signal (sense or chemical) → Response (action potential)
2. Action Potential - Brief electrical charge (electricity created by sodium potassium ion movements) that travels down axon
 - a) Resting Potential - Positively charged ions outside of axon / Negatively charged ions inside of axon (In humans, -70MV)
 - (1) Membrane Potential - Electrical difference between in/out of neuron measured in microvolts
 - (2) Selectively Permeable- allow somethings but not everything (axon)
 - b) Depolarization- Neuron stimulation causes brief change in electrical charge when (K⁻) ions flow out & (NA⁺) ions flow in→ another axon opens further down line and repeats process
 - c) Repolarization - (NA⁺) pumped outside and (K⁻) pumped inside.
 - d) Refractory Period - Period of inactivity after neuron has fired.
3. All or None Response- Neurons fires or don't fire.
 - a) Signal must exceed threshold, the level of stimulation required to trigger a neural response, to activate action potential.
 - (1) Excitatory signals- Increase probability of an action potential in a postsynaptic cell
 - (2) Inhibitory signals - Decrease probability of an action potential in a postsynaptic cell
 - (3) Excitatory signals > Inhibitory signals for action potential

- b) Stronger stimulus can trigger more neurons to fire, and fire more often, but doesn't affect strength or speed

III. How do nerve cells communicate with other nerve cells?

A. Synapse- Meeting place between neurons

1. Synaptic gap (cleft)- Space where axon terminal of one neuron separated from receiving neuron

B. Neurotransmission

1. Process whereby the action potential initiates release of neurotransmitters (chem messengers)
2. Neurotransmitters then bind to receptors on adjoining postsynaptic neuron
3. Reuptake- Excess neurotransmitters reabsorbed by presynaptic neuron

IV. How do neurotransmitters influence behavior, and how do drugs and other chemicals affect neurotransmission?

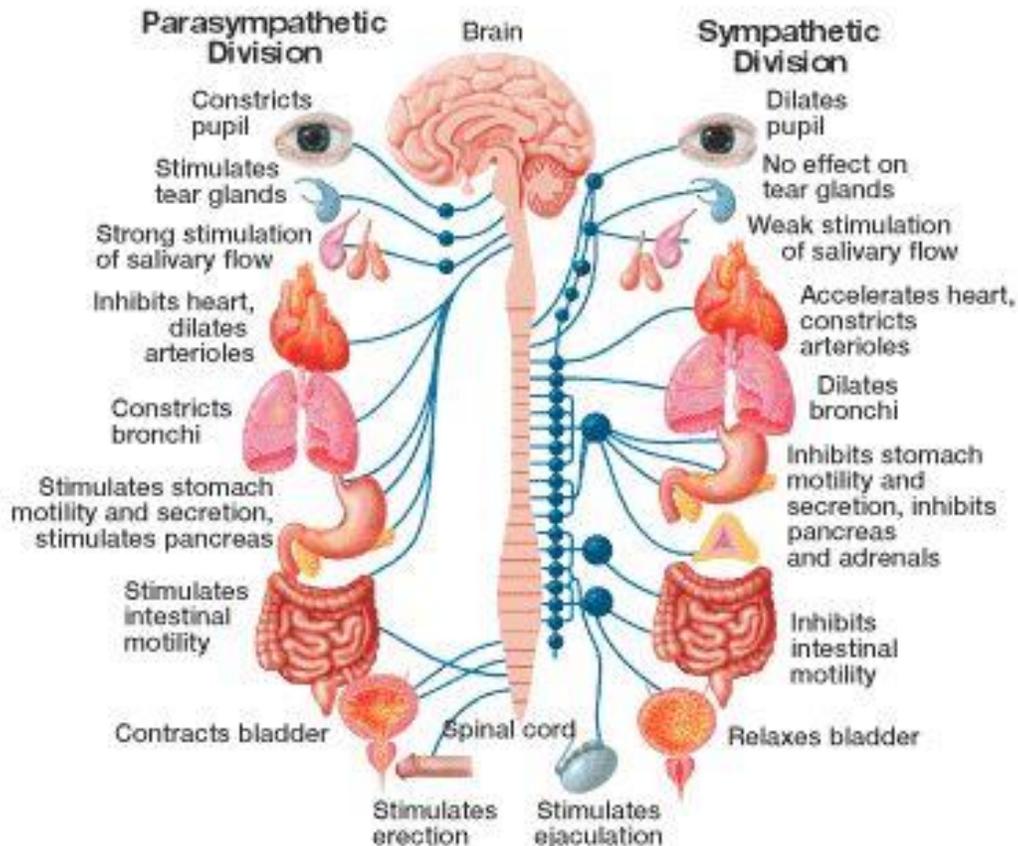
A.

Neurotransmitter	Function	Ex. of Malfunction
Acetylcholine (ACh)	Enables muscle action, learning, memory	Alzheimer's disease - ACh-producing neurons deteriorate
Dopamine	Influences movement, learning, attention, and emotion	Oversupply (OS) linked to schizophrenia Undersupply (US) linked to tremors and decreased mobility in Parkinson's disease
Serotonin	Affects mood, hunger, sleep, and arousal	US linked to depression
Norepinephrine	Helps control alertness and arousal	US can depress mood
GABA (gamma aminobutyric acid)	Major inhibitory neurotransmitter	US linked to seizures, tremors, and insomnia
Glutamate	Major excitatory neurotransmitter involved in memory	OS can overstimulate brain, producing migraines or seizures
Endorphins (natural opiates like morphine)	Pain control and pleasure	Indifference to severely injured people

- B. Agonists - A molecule that is similar enough to a neurotransmitter so that it can bind to a receptor site and stimulate a response

1. Ex. Morphine to endorphins, but may cause body to stop naturally producing natural opiates
- C. Antagonists- A molecule that, by binding to a receptor site, inhibits a response
1. Ex. Botulin/Botox, a poison, can cause paralysis by blocking ACh release
 2. Ex. Curare, a poison also blocks ACh receptor sites producing paralysis

Module 10: The Nervous & Endocrine Systems



I. What are the functions of the nervous system's main divisions, and what are the three main types of neurons?

- A. Nervous System- Body's slow electrochem communication network, consisting of all the nerve cells of the peripheral (PNS) and central nervous systems (CNS).
1. CNS- Brain + Spinal Cord
 2. PNS- Sensory and motor neurons that connect the CNS to rest of body
 - a) Nerves - Bundle axons that form neural "cables" connecting CNS to muscles, glands, and sense organs
 3. Neurons
 - a) Sensory (afferent)- Carry messages from body's tissues and sensory receptors inward to CNS for processing
 - b) Motor (efferent) - Carry info from CNS to muscles and glands

- c) Interneurons- Neurons within CNS that communicate internally and intervene between sensory inputs and motor outputs
- d) Neurons cluster into working networks

B. PNS

- 1. Somatic NS - Voluntary control of our skeletal muscles
- 2. Autonomic NS (ANS)- Control of glands and muscles of internal organs
 - a) Sympathetic NS- Arouses and expends energy
 - b) Parasympathetic NS- Calms and conserves energy

C. CNS

- 1. Reflexes- Simple, automatic response to a sensory stimulus
 - a) Performed by spinal cord, AKA why feels like we don't have choice in jerking hand away from a flame source

II. What is the nature and what are the functions of the endocrine system, and how does it interact with the nervous system?

- A. Endocrine System- Body's "slow" chemical communication system; a set of glands that secrete hormones into the bloodstream
- B. Hormones - Chem messengers manufactured by endocrine glands that travel through the bloodstream and affect other tissues
- C. Endocrine messages tend to outlast effects of neural messages
- D. Adrenal Glands- Controlled by ANS, it is a pair of endocrine glands that sit just above the kidneys and secrete hormones (epinephrine and norepinephrine) that help arouse the body in times of stress ; fight - flight response
- E. Pituitary Glands- Controlled by hypothalamus, it is the most influential gland. The pituitary regulates growth and controls other endocrine glands (such as oxytocin for contractions)
 - 1. Brain → Pituitary → Other glands → Hormones → Body and brain

Module 11:

Lesion - Tissue destruction.

<https://drive.google.com/open?id=0BwnZMjdbdBQgZ1NuSVdzTHpKb0JQb1JLeDQzU2p3ZFpXT05v>

I. What structures make up the brainstem, and what are the functions of the brainstem, thalamus, and cerebellum?

- A. Brain stem- The oldest part and central core of the brain, beginning where the spinal cord swells as it enters the skull; the brainstem is responsible for automatic survival functions
 - 1. Medulla- Base of the brainstem; controls heartbeat and breathing
 - 2. Pons- Above the medulla, helps coordinate movement

- B. Thalamus- Pair of egg-shaped structures that sit at the top of the brainstem and act as the brain's sensory control center that sends information to different parts of the brain. The second oldest part.
- C. Reticular Formation- Nerve network that travels through brainstem & thalamus & plays important role in controlling arousal + consciousness. The 2nd newest part.
- D. Cerebellum- The "little brain" at the rear of the brainstem; functions include processing sensory input such as time, sounds, textures, and emotions, coordinating movement output and balance, and enabling nonverbal learning and memory. The newest part.

II. What are the limbic system's structures and functions?

- A. Limbic system- Neural system located below cerebral hemispheres; associated with emotions and drives and reward systems
 - 1. Hippocampus- Processes conscious memories
 - 2. Amygdala- Two bean sized neural clusters linked to aggression & fear
 - 3. Hypothalamus- Neural structure lying below (hypo) the thalamus; directs homeostasis (eating, drinking, body temp), helps govern endocrine system via pituitary gland, and is linked to emotion and reward

Module 12:

I. What are the functions of the various cerebral cortex regions?

- A. Cerebrum - The hemispheres that contribute 85% of the brain's weight
 - 1. Cerebral cortex- A thin surface layer of interconnected neural cells covering the cerebral hemispheres; the body's ultimate control and information-processing center
 - 2. Glial cells- Cells in the NS that support, nourish, and protect neurons; also plays roles in learning/thinking
- B. Lobes
 - 1. Frontal- Lies just behind forehead; involved in speaking and muscle movements and in making plans and judgements
 - 2. Parietal- Lies at top of head by rear and receives sensory input for touch and body position
 - 3. Occipital - Lies at back of head; includes areas that receive info from visual fields
 - 4. Temporal - Lies roughly above ears; includes auditory areas each receiving info primarily from other ear
- C. Motor Functions
 - 1. 1870 - Fritsch and Hitzig (Germany)
 - a) Mild electrical stimulation to animal's cortex moves parts of body
 - b) Stimulation moves part of body on opposite side of affected hemisphere

- c) Motor Cortex- an area at the rear of the frontal lobes that controls voluntary movement
- 2. Foerster and Penfield
 - a) Mapped motor cortex
 - b) Body areas requiring precise control occupied greatest amount of space
 - c) Somatosensory cortex- Area at the front of the parietal lobes that registers and processes body touch and movement sensations. The more sensitive a body region, the larger the cortex area.
- D. Association Areas - Areas of cerebral cortex not involved in primary motor or sensory functions. Instead, involved in higher mental functions (learning, remembering, thinking, speaking, etc.)
 - 1. Prefrontal cortex - judgment, planning, processing of new memories
 - a) May retain memories, but cannot begin new activities easily
 - b) Frontal lobe damage can alter personality and inhibitions
 - c) Moral judgments can be unrestrained by emotions
 - 2. Parietal lobes - mathematical and spatial reasoning
 - a) Increased stimulation caused false belief of movement.
 - b) Suggests that perception of movement comes from intention and expected results of movement
 - 3. Right temporal lobes - facial recognition
 - a) If damaged, we could describe facial features and recognize gender and approximate age but not identify person

II. TWE can a damaged brain reorganize itself, and what is neurogenesis?

- 1. Plasticity - The brain's ability to change, especially during childhood, by reorganizing after damage or by building new pathways based on exp.
 - a) Restrictions:
 - (1) Severed neurons cannot be replaced
 - (2) Some brain functions preassigned to specific areas
 - b) Brain tissue can reorganize after damage, such as trauma
 - c) Constraint-induced therapy helps rewire brains and improve dexterity of the brain
 - d) Unused brain area is made available for other uses i.e. sense of touch may invade visual cortex area of blind person
- 2. Neurogenesis - production of new neurons
 - a) Baby neurons originate deep in brain and migrate to form new connections with existing neurons
 - b) Neural stem cells may be able to replace lost brain cells

Module 13: Brain Hemispheric Organization & the Biology of Consciousness

I. What do split brains reveal about the functions of our two brain hemispheres?

A. Brain Hemispheres

1. Corpus callosum- the large band of neural fibers connecting the two brain hemispheres and carrying messages between them
2. Split brain- condition resulting from surgery that isolates the brain's two hemispheres by cutting the fibers connecting them
 - a) Sperry and Gazzaniga experiment concludes that left hemisphere is an "interpreter" which constructs theories to explain behavior
3. Right and Left Differences
 - a) Right - perceptual tasks; Left - speaking, calculating
 - b) Left hemisphere - quick literal interpretations of language
 - c) Right hemisphere - makes inferences, modulates speech, orchestrates sense of self

II. What is the dual processing being revealed by today's cognitive neuroscience?

A. Consciousness- Our awareness of ourselves and our environment

1. Cognitive neuroscience- study of brain activity linked with cognition
2. Helps act in long-term interests and anticipates actions and behavior
3. Even in motionless bodies, the brain and mind are still active
4. Some see conscious experiences as produced by synchronized activity in brain, where a stimulus can surpass a threshold for consciousness

B. Dual Processing- The principle that info is often simultaneously processed on separate conscious and unconscious tracks

1. Brain works both consciously and unconsciously
2. Ex. the eye sends informations simultaneously to different areas for different tasks
3. Much of everyday thinking, feeling, acting is outside of conscious awareness; body functions as "an automatic point-and-shoot camera", with a manual override

Module 14: Behavior Genetics: Predicting Individual Differences

I. What are genes, and how do behavior geneticists explain our individual differences?

A. Genes: Our Codes for Life

1. Behavior geneticists- Scientists who study our differences and the effects of heredity and environment on these differences
2. Chromosomes- Threadlike structures (46 in humans) made of DNA
3. DNA (deoxyribonucleic acid)- double helix molecule w/ genetic info
4. Genes- Segments of DNA capable of synthesizing proteins (~20,000 to 25,000 in humans) ; can be turned on (active/expressed) or off (inactive)
5. Genome- All the genetic material in an organism's chromosomes