Psychology Study Guide

考试形式：
- 总时长：100分钟
- 题型：50道MCQ，1道AAQ

Tips：
- 熟练掌握知识点
- 练习AP题型的题目
- 注意课上讲的examples
- MCQ用铅笔，AAQ用签字笔
- SODAS：
  - Space it
  - Order
  - Define
  - Apply
  - Synonyms

Unit 0 Research Methods

Part 1: Fundamentals

- Confirmation bias:
People tend to look for, interpret, or remember information in a way that confirms what they already believe.

- Hindsight bias:
People believe that they knew something was going to happen after it has already occurred, even if they didn't actually predict it beforehand.

- Overconfidence:
When people have too much faith in their own judgments or abilities, thinking they know more than they actually do.

- Empirical evidence:
Information that is obtained through observation, experimentation, or measurement.

- The scientific method:
A systematic approach used to study human behavior and mental processes.

- Hypothesis:

A specific, testable prediction or educated guess about the relationship between variables or the outcome of a research study (based on existing theories, observations, or previous research findings)

- Falsifiable:
A statement that can be tested and potentially proven false through observation or experimentation.

- Peer review:
A process where research articles and studies are evaluated by experts in the field before they are published in academic journals.

- Replication:
The process of repeating or reproducing a research study to determine if its findings can be consistently observed.

- Reliability:
A measure or test is considered reliable if it produces consistent results when administered repeatedly under similar conditions.

- Validity:
The extent to which a research study or measurement tool accurately measures what it intends to measure.

- The American Psychological Association (APA):
A leading professional organization dedicated to advancing the field of psychology and promoting the application of psychological knowledge to improve human welfare.

- Quantitative data:
Numbers-based information gathered from surveys, test, or experiments.
- Qualitative data:
Not about numbers but gives deeper insight into complex topics.

- Liberty Scales:
A measurement tool used in surveys and questionnaires to assess people's attitudes, opinions, or perceptions.

- Structured interviews:
Research method in which predetermined questions are asked to all participants in the same order.

- Survey technique:
Research method in psychology used to collect data from a sample of individuals through self-report measures.

- Wording effect:
Subtle changes in the phrasing or wording of survey questions can influence respondents' interpretations and responses.

- Social desirability bias:
The tendency of individuals to respond in a manner that is viewed favorably by others or conforms to social norms, rather than providing honest or accurate answers.

- Naturalistic observation:
Research method in psychology where researchers observe and record behavior in real-world settings without intervention or manipulation.

- Case study:
Research method in psychology that involves an in-depth examination of a single individual, group, or phenomenon.

Part 2: Correlation

- Correlational research:
Scientific method used in psychology to examine the relationship between two or more variables.

- Third variable problem:
The possibility that a third unmeasured variable may be influencing the relationship between the two variables of interest.

- Scatterplot:
A visual representation used in correlational research to display the relationship between two variables.

- Correlation coefficient:
Statistical measure used in correlational research to quantify the strength and direction of the relationship between two variables.

- **Positive correlation:**
  A correlation coefficient of +1 indicates a perfect positive relationship, one variable tends to decrease as the other variable decreases, or one variable tends to increase when the other increases.
- **Negative correlation:**
  A correlation coefficient of -1 indicates a perfect negative relationship, meaning that as one variable increases, the other variable decreases.

- Strength: show how strong the relationship is between the variables. A correlation coefficient close to 1 or -1 indicates a strong relationship.

Part 3: Techniques

- Experimental method:
A research technique used to investigate cause-and-effect relationship between variables.

- **Independent variable:**
  The variable that the research deliberately changes or manipulates in an experiment.
- **Dependent variable:**
  The variable that is observed and measured for changes in an experiment

- Confounding variables:
A variable that wasn't accounted for or controlled in the study but still affects the results.

- Operational definitions:
Specifies how a researcher will measure and manipulate variables in a study.

- **Experimental group**:
  The participants in the experimental group are indeed exposed to the independent variable, which is the variable manipulated by the researcher to observe its effect on the dependent variable.
- **Control group:**
  A group of participants who were not exposed to the independent variable, providing a baseline for comparison with the experimental group.

- Sample:
A subset of individuals or cases selected from a larger population for study.

- **Representative sample:**
  A sample that accurately reflects the demographics, characteristics, and diversity of the population as a whole.
- **Random sample:**
  Each participant in the study has an equal opportunity to be included, which helps to

minimize the influence of researcher bias and increase the generalizability of the findings to the population as a whole.

- Sample bias:
This bias occur when the sample is not representative of the larger population, leading to inaccurate or misleading results.

- Random assignment:
Research method used to assign participants to different groups in an experiment randomly.

- Placebo effect:
The phenomenon where individuals experience improvement in their condition solely because they believe they are receiving a beneficial treatment, rather than due to any active ingredient or physiological mechanism in the placebo itself.

- Single-blind study:
Research design where participants are unaware of whether they belong to the experimental or control group, but the researchers conducting the study are aware of this information.

- Double-blind study:
Research design where both the participants and the researchers conducting the study are unaware of who belongs to the experimental or control group

- Placebo condition:
Administering the placebo to one group of participants while the other group receives the actual treatment being tested.

- Generalizability:
The extent to which research findings obtained from a sample can be applied or generalized to a larger population.

Part 4: Stats and Ethics

- Statistics:
A branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data.

- Descriptive Statistics:
Statistics that summarize the data collected in a study.

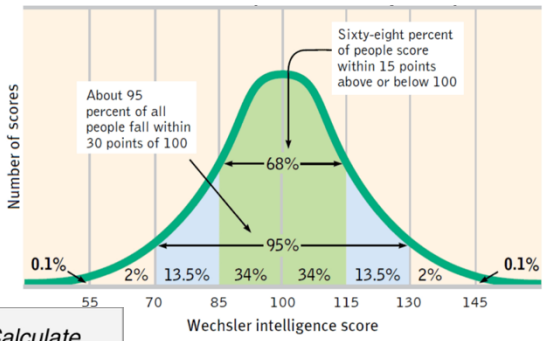
- Inferential Statistics:
Statistics that allow one to make predictions and inferences about a population based on a sample of data.

- Measure of Central Tendency:

A statistical measure that identifies a single value as representative of an entire distribution.

- Normal Curve:

A bell-shaped curve that represents a distribution of values, frequencies, or probabilities so that most measurements are concentrated around the middle.



- Special Numbers in Stats:

Statistic	*How to Calculate*
Mean	Add all numbers together and divide by the count of the numbers.
Median	Arrange numbers in order and find the middle number.
Mode	Identify the number that appears most frequently.
Range	Subtract the smallest number from the largest number in the set.

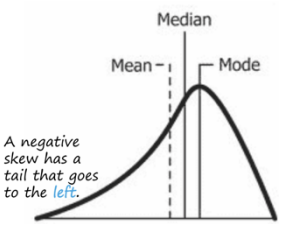
- Regression to the Mean:

The phenomenon that if a variable is extreme on its first measurement, it will tend to be closer to the average on its second measurement.

- Positive Skew:

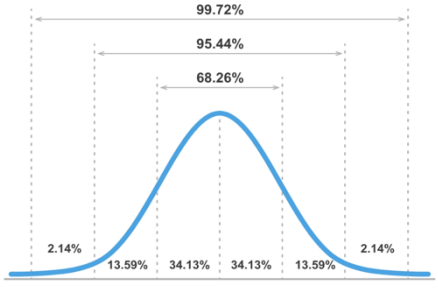
This happens when more numbers in a list are on the lower side, but a few really high numbers stretch the average higher.

- Negative Skew: This is when more numbers in a list are on the higher side, but a few really low numbers pull the average down



- Standard Deviation:

A measure of the amount of variation or dispersion in a set of values.

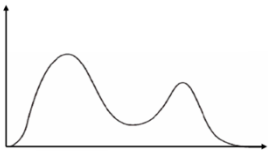


- Percentile Rank:

The percentage of scores in its frequency distribution that are equal to or lower than it.

Percentile rank tells you where you stand compared to others in the group

- Bimodal Distribution:



A distribution that shows two different peaks or modes in the frequency of occurrences

- Effect Sizes:

This measures how big the impact of something is in an experiment. For example, it tells us how much a medicine really helps compared to not using the medicine at all

- Meta Analysis:

A statistical analysis that combines the results of multiple scientific studies.

- Institutional Review Boards (IRB):

A committee that reviews and approves research involving human subjects, ensuring that ethical standards are met.

- Informed Consent:

Permission granted with the knowledge of the possible consequences, typically that which is given by a patient to a doctor for treatment with full knowledge of the possible risks and benefits.

- Informed Assent:

Agreement by a minor or other parties not able to give legal consent to participate in the activity.

- Confidentiality:

The requirement that private or sensitive information is not disclosed without the consent of the person who provided it.

- Deception:

The act of misleading or wrongly informing someone about the true nature of a situation.

- Confederates:

Individuals who appear to be participants in a study but are actually part of the research team.

- Debriefing:

Providing participants in a study with a full explanation of the study after its completion, including the purpose and any deceptions used

- Research Method Analysis:

Research Method	Description	Key Strengths (+)	Major Weaknesses (-)
Naturalistic Observation	Observations of subjects in their natural environments without any manipulation.	Allows observation of behavior in natural settings.	Limited control over variables; potential observer bias.
Case Study	Intensive study of a single individual or group to explore specific phenomena.	Provides detailed (qualitative) insight into specific cases.	May not be generalizable; cannot establish causality.
Survey Technique	Uses questionnaires to collect data on various aspects from a large group of people.	Efficient collection of data from a large number; economical.	Potential biases in responses; questions may lead answers.
Correlational Research	Examines the relationship between two or more variables to determine association.	Can identify relationships between variables.	Cannot determine causation; may have third variable issues.
Experimental Method	Manipulates one variable to determine its effect on another variable.	Can establish cause and effect relationships.	May not reflect real-world conditions; ethical concerns.

Unit 1 Biological Bases

Part1: brain

1).Heredity,environment and genetic

2).Brain structure,functions

3)Understanding of nervous system

4)Chemical message

5)Brain Plasticity& Specialization

1)

- Evolutionary perspective
The study of how psychological traits and behaviors have evolved over time to enhance survival and reproductive success.

- Natural Selection
The process by which organisms with traits that are better suited to their environment are more likely to survive and reproduce, passing on those advantageous traits to future generations.

- Nature
“Genes”, the inherent biological and genetic factors that influence an individual's psychological development, traits, behaviors, and cognitive abilities.

- Nurture
“Environment”, the environmental influences and experiences that shape an individual's psychological development, behaviors, and cognitive processes.

- Twin Studies
Examines similarities and differences between identical (monozygotic) and fraternal (dizygotic) twins to assess the relative influence of genetics and environment on traits and behaviors.

- Adoption studies
Investigates similarities between adopted children and their biological and adoptive families to assess the impact of genetics versus environment on various traits and behaviors.

- Family Studies
Analyzes similarities and differences among family members, including parents and siblings, to understand the interplay of genetics and environment in shaping traits and behaviors within a family unit.

- Heredity
The transmission of genetic information from biological parents to offspring.

- Heritability
Heritability in psychology helps us figure out how much of our traits come from our genes and how much comes from our environment. (The percentage means the likelihood of genes contributing to the difference)

- Genetic predisposition
The inherited likelihood of developing specific traits or conditions due to genetic factors from biological parents.

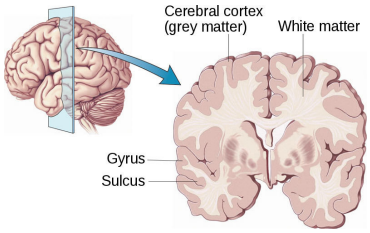
- Eugenics
The belief in improving the genetic quality of a human population by controlling reproduction to increase

desirable traits and decrease undesirable ones.

2)

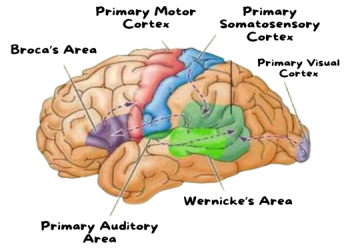
- Cerebral Cortex

The outer layer of the brain, responsible for higher-level cognitive functions, including thinking, perceiving, and decision-making.



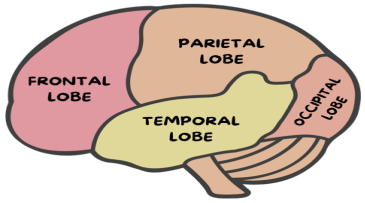
- Association Areas

They're parts of the brain that take information from all over the place—like what we see, hear, smell, and touch—and put it together to help us understand the world around us.



- Lobes of the Brain

The lobes of the brain refer to the four main regions or sections into which the cerebral cortex, the outer layer of the brain, is divided.



- Frontal Lobes

Functions:higher-level cognitive functions, including decision-making, problem-solving, planning, and personality expression.

- Eg. As the chef prepares dishes, their frontal lobe helps them make quick decisions about ingredient quantities, cooking times, and plating arrangements.

-Prefrontal Cortex

Located in the frontal lobe, responsible for higher-level cognitive functions and executive functioning.

Eg.A student study:

Before:create a study schedule, prioritize topics, and set goals for each study session.
During: focus their attention, inhibit distractions, and regulate their emotions to stay motivated and on task. Facing challenge: assists in problem-solving and critical thinking,

-Executive functioning
A set of cognitive processes that enable individuals to plan, organize, strategize, focus attention, regulate emotions, and manage time effectively.

-Motor Cortex
Located in the frontal lobe, responsible for planning, executing, and controlling voluntary movements of the body. It sends signals to the muscles, enabling us to perform actions such as walking, talking, and grasping objects.

Eg. a basketball player dribbling the ball down the court.
Signals from the motor cortex travel down the spinal cord and into the muscles, coordinating precise dribbling, pivoting, and acceleration to outmaneuver opponents and make their way towards the basket.

- Parietal Lobes
Function: primarily responsible for processing sensory information from the body, such as touch, temperature, and spatial awareness.

When you catch the ball, your parietal lobes are crucial for coordinating your hand movements, processing the sensation of the ball in your hand, and integrating visual cues to successfully complete the catch.

-Somatosensory Cortex
located in the parietal lobe, responsible for processing sensations from the skin, muscles, and joints.
It interprets touch, pressure, temperature, and pain signals from different parts of the body, allowing us to perceive and respond to sensory stimuli.

- Occipital Lobes

Functions: primarily responsible for processing visual information received from the eyes.
Eg. The occipital lobes analyze the colors, shapes, and movements of the sunset, allowing you to perceive its beauty.

- Temporal Lobes

Functions: involved in processing auditory information, language comprehension, and memory formation.

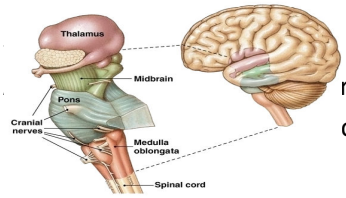
Eg. It breaks down the melody, rhythm, and lyrics of the song, allowing you to recognize the tune and understand the lyrics.
Besides, hearing a particular song may evoke memories of a significant event or stir up feelings of happiness or nostalgia.

- Corpus Callosum

Thick band of nerve fibers that connects the left and right hemispheres of the brain, facilitating communication and information sharing between the two hemispheres.

- Brainstem

The oldest and most primitive part of the brain, responsible for basic life-sustaining functions such as breathing, heart rate, and sleep-wake cycles. The pathway,connecting the cerebral cortex to the spinal cord.



regulating essential autonomic functions such as heartbeat, breathing, and oluntary bodily processes crucial for survival.

- Reticular Activating system

Regulating arousal, attention, and consciousness.

- maintain wakefulness and alertness

Eg. When you are peacefully asleep and suddenly awaken to the sound of a smoke alarm in your house. Your RAS quickly becomes activated, increasing your arousal levels and alertness to respond to the potential danger.

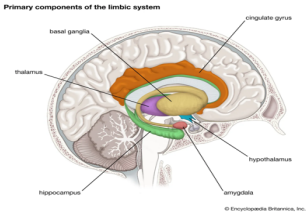
- Cerebellum

located at the back of the brain, below the cerebral hemispheres, responsible for coordinating movement, balance, and posture.

Eg. If you suddenly encounter a rough patch of terrain, your cerebellum quickly adjusts your muscle movements to stabilize your body and prevent you from losing balance.

- Limbic System

The limbic system, located beneath the cerebral cortex, is a set of brain structures involved in emotions, memory, and motivation.

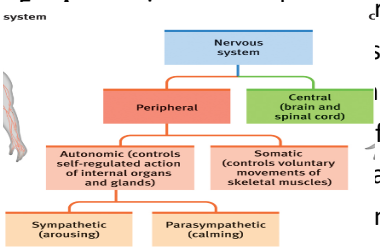


- Reward Center

Network of brain structures, processing pleasurable experiences and reinforces behaviors associated with them.

- Thalamus

A relay station in the brain that processes and relays sensory information, such as sight, sound, touch, and taste, to the cerebral cortex. It directing signals to the appropriate areas of the brain for further processing.



r body begins to prepare for sleep. Signals from the environment, such as smitted to the thalamus. The thalamus processes these signals and relays then releases the hormone melatonin. Melatonin helps regulate your feelings of drowsiness and initiating the transition to sleep. In the morning, amus receives signals indicating the start of a new day, leading to n and a shift towards wakefulness.

- Hypothalamus

Responsible for regulating various essential bodily functions, including hunger, thirst, body temperature, and the sleep-wake cycle. A control center helping to maintain homeostasis 体内平衡 in the body

Eg. You're exposed to cold temperatures, the hypothalamus triggers responses to conserve heat, such as shivering and constriction of blood vessels to reduce heat loss

- Pituitary Gland

Pea-sized gland, often referred to as the "master gland" due to its central role in regulating hormone production and secretion throughout the body.

-coordinating hormonal activity and maintaining homeostasis in the body.

- Hippocampus

curved structure located within the brain's temporal lobes, primarily responsible for forming and consolidating new memories.

-Transforming short memory into long-term memory.

- Amygdala

Almond-shaped structure located within the brain’s temporal lobes, involved in processing emotions, particularly fear and aggression.

- “Fight-or flight response to perceived danger”

Eg. Upon seeing the snake, your amygdala quickly assesses the situation, triggering a fear response--increased heart rate, heightened alertness, and the urge to flee or defend yourself.

Part2: Nervous system

- Nervous System

Body's communication network, consisting of a complex system of nerves, neurons, and specialized cells.

- Central Nervous system
The (CNS) consists of the brain and spinal cord. It serves as the command center of the body, responsible for processing information, coordinating responses, and regulating bodily functions.

- Peripheral Nervous system
(PNS) consists of all the nerves and ganglia outside the brain and spinal cord.
It serves as a communication network, transmitting sensory information from the body to the central nervous system (CNS).

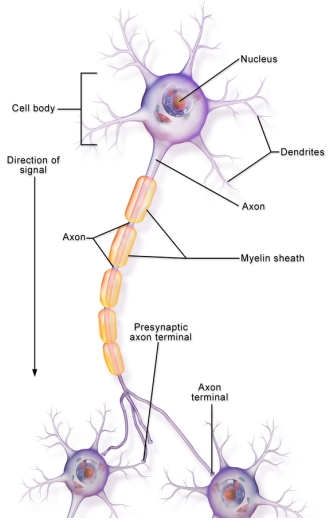
-Autonomic Nervous system
Division of the peripheral nervous system that regulates involuntary bodily functions, without conscious control.

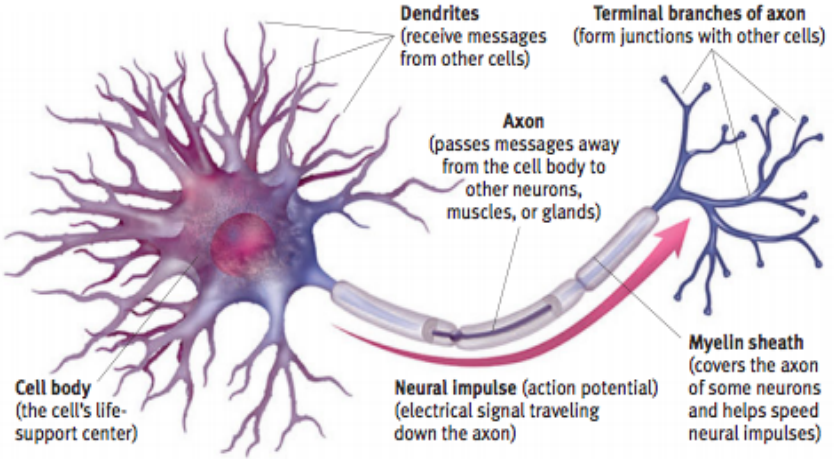
--Sympathetic Nervous system
Activating the body's "fight or flight" response in times of stress or danger.
Increases heart rate, dilates airways, and redirects blood flow to essential organs, preparing the body to respond to perceived threats.

--Parasympathetic Nervous system
Responsible for promoting relaxation and restoring the body to a calm state after experiencing stress or danger.
It slows heart rate, constricts airways, and enhances digestion, allowing the body to conserve energy and recover from stressors.

-Somatic Nervous System
Division of the peripheral nervous system responsible for controlling voluntary movements and relaying sensory information from the body to the central nervous system.

- Neurons
Specialized cell that serves as the building block of the nervous system, transmitting electrical and chemical signals throughout the body.
Three main parts: the cell body (soma), dendrites, and axon.





- Glial Cells

Support cells" of the nervous system, provide structural support, insulation, and nourishment to neurons. Play essential roles in maintaining brain health and supporting neuronal function.

- Motor Neurons

Nerve cells that transmit signals from the central nervous system (brain and spinal cord) to muscles, glands, and organs, initiating and controlling voluntary and involuntary movements.

- Sensory Neurons

Specialized nerve cells that transmit sensory information from sensory receptors, such as those in the skin, muscles, and organs, to the central nervous system (brain and spinal cord).

- Interneurons

Serve as connectors within the central nervous system, relaying signals between sensory neurons and motor neurons.

- Reflex Arc

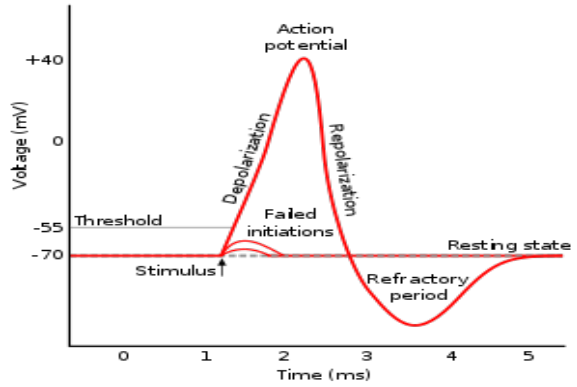
Neural pathway that controls reflex actions, allowing for rapid, automatic responses to sensory stimuli without conscious thought (primitive reflexes).

-Sensory neurons detect stimuli and send signals to the spinal cord. Interneurons relay this information to motor neurons, which trigger reflexive muscle or gland responses, such as withdrawing a hand from a hot surface.

-They protect the body and enable quick reactions to potential dangers.

- Neural Transmission

The process by which neurons communicate with each other through electrical and chemical signals.



- Threshold
The level of stimulation required to trigger an action potential in a neuron. It is the minimum amount of stimulation necessary to produce a response.

- Action Potential
Brief electrical impulse that travels along the axon of a neuron. Occurs when receives a stimulus that causes inside of the cell to become more positively charged than the outside

- All-or-Nothing Principle
If the stimulus is strong enough to trigger an action potential, the neuron will respond with a full-strength impulse.
If the stimulus is below the threshold, the neuron will not fire an action potential at all.

- Depolarization
The phase of action potential where the inside of the neuron becomes less negative compared to the outside due to the influx of positively charged ions, such as sodium ions, through ion channels in the cell membrane.
This change in electrical charge triggers the neuron to fire an action potential.

- Refractory Period
Brief period following an action potential during which a neuron is unable to generate another action potential, as neuron's sodium channels are temporarily inactivated and the cell membrane returns to its resting state

- Resting Potential
The stable, negative electrical charge that exists across the cell membrane of a neuron when it is not actively transmitting signals.

- Reuptake
Process in which neurotransmitters that have been released into the synapse are reabsorbed by the presynaptic neuron from which they were originally released.

- Multiple Sclerosis “MS”

Chronic autoimmune disease that affects the central nervous system, including the brain and spinal cord.
Myelin sheath is mistakenly attacked, causing inflammation and damage.

- Myasthenia Gravis
Chronic autoimmune disorder that affects the neuromuscular junction, where nerve impulses are transmitted to muscles.
Antibodies that block or destroy the receptors for acetylcholine.

Part3 Chemical matters

- Neurotransmitters
Chemical messengers that transmit signals between neurons, allowing for communication within the nervous system.

Excitatory Neurotransmitters
Increase the likelihood of an action potential

Excitatory Neurotransmitters	Increase the likelihood of an action potential

Glutamate

Function	Surplus	Deficit
Excites the body and is involved in memory	Overstimulation of the brain, producing migraines or seizures (which is why some people avoid foods with high MSG)	**Depression** and other mood disorders

Acetylcholine (Ach)

Function	Surplus	Deficit
Motor movement, memory and learning	Muscle spasms, possibly death	Paralysis, Alzheimer's disease - a progressive dementia that results in memory loss

Dopamine

Function	Surplus	Deficit
Motor movement and feeling alert (alertness)	Schizophrenia (feelings of paranoia, visual/auditory hallucinations)	Parkinson's disease (where you cannot control your muscle movements)

Norepinephrine

Function	Surplus	Deficit
Helps control alertness and arousal (used in	-	Linked to **depr**

	ADHD medication)		**ession**

Substance P	Function	Surplus	Deficit
	Motor movement and feeling alert (alertness)	**Schizophrenia (feelings of paranoia, visual/auditory hallucinations)**	**Parkinson's disease (where you cannot control your muscle movements)**

Inhibitory Neurotransmitters	decrease the likelihood of an action potential

Serotonin	Function	Surplus	Deficit
	Mood, hunger, sleep and arousal control	Happier moods (**mania**)	**Depression**

GABA	Function	Surplus	Deficit
	produces a state of calm	-	Seizures, tremors, and **insomnia (inability to sleep)**

Endorphins	Function	Surplus	Deficit

	Released when your body feels pain or stress	**Euphoria (“runner’s high”)**	-

Hormones
chemical messengers produced by glands in the endocrine system that travel through the bloodstream to target cells or organs, where they regulate various physiological processes and behaviors.

Ghrelin
produced primarily by the stomach and small intestine that stimulates appetite and promotes hunger.
“hunger hormone”

Leptin
produced primarily by fat cells that regulates energy balance and appetite. It acts on the hypothalamus in the brain to suppress appetite and increase energy expenditure.

Melatonin
hormone that regulates the sleep-wake cycle and circadian rhythms in the body.
maintaining the body's internal clock and ensuring restful sleep.

Oxytocin
involvement in forming emotional connections, trust, and intimacy.
“love hormone” or “bonding hormone”

Adrenaline
plays a key role in the body's stress response, often referred to as the "fight or flight" response. It plays a key role in the body's stress response, often referred to as the "fight or flight" response.

Norepinephrine
It is involved in the body's "fight or flight" response, regulating arousal, attention, and stress. During times of stress or danger.

Plasticity
brain's ability to reorganize and adapt throughout life in response to experiences, learning, and environmental changes. New functions.

Split Brain Research

studies individuals who have undergone a surgical procedure called corpus callosotomy, which disconnects the two hemispheres of the brain.
Primarily done as a treatment for severe epilepsy, a neurological disorder characterized by recurrent seizures.

Contralateral Hemispheric Organization
the phenomenon where each hemisphere of the brain controls the opposite side of the body.

Hemispheric Specialization
Each hemisphere of the brain has specialized functions and abilities.

Linguistic Processing
the complex cognitive processes involved in understanding and producing language

Broca’s Area
located in the left hemisphere of the brain, specifically in the frontal lobe, that is responsible for speech production and language processing.
a crucial role in the formation of grammatically correct sentences and the coordination of the muscles involved in speech.

Broca’s Aphasia
Have difficulty producing fluent speech and forming grammatically correct sentences.
Speech may be slow, effortful, and characterized by shortened phrases or words.

Wernicke’s Area
region located in the left hemisphere of the brain, specifically in the temporal lobe, that is involved in language comprehension and understanding spoken and written language.

Wernicke's Aphasia
Exhibit fluent speech but have difficulty understanding spoken and written language, as well as producing meaningful and coherent speech.
They may use nonsensical or inappropriate words and sentences, making communication challenging.

Electroencephalogram “EEG”
non-invasive neuroimaging technique used to record the electrical activity of the brain.

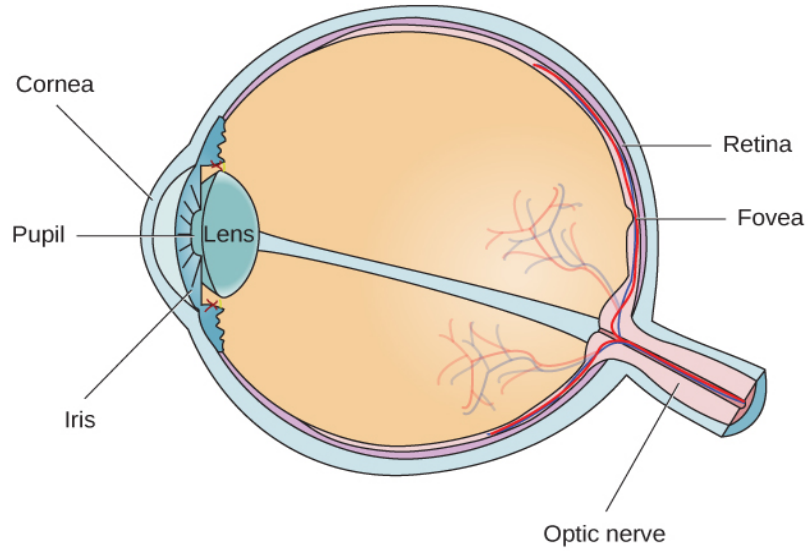
“fMRI”

measure brain activity by detecting changes in blood flow and oxygen levels.

How we study brain
EEG – for sleep studies
CT (or CAT) – quick, easy way to look for problems
MRI – can see tissue damage
PET – measures activity
fMRI – MRI + PET (very expensive)

Lesioning
research technique used to study brain function by intentionally damaging or destroying specific areas of the brain in experimental animals.

Part 3 Eyes and Ear



❑Retina
The light-sensitive inner surface of the eye containing photoreceptor cells that convert light into neural signals.
❑Blind spot
Area on the retina where the optic nerve exits the eye, lacking photoreceptor cells. It's a spot where vision is absent, as there are no light-sensitive cells to detect visual stimuli.
❑Lens
Transparent structure in the eye that focuses light onto the retina. It adjusts its shape to help the eye properly refract light, enabling clear vision at different distances.

❑Accommodation
The process by which the lens of the eye changes its shape to focus on objects at different distances. Both nearby and distant objects, by adjusting curvature.

❑Nearsightedness

where close objects appear clear, but distant objects appear blurry.

the eyeball is too long or the cornea is too curved, causing light to focus in front of the retina instead of on it.

❑Farsightedness

distant objects are seen more clearly than close ones

the eyeball is too short or the cornea is too flat, causing light to focus behind the retina rather than directly on it.

❑Rods

Photoreceptor cells in the retina responsible for vision in low light conditions and detecting motion. They provide black-and-white vision and are highly sensitive to light, allowing us to see in dim environments.

❑Cones (blue, green, red)

Photoreceptor cells in the retina responsible for color vision and detail in bright light. They enable us to perceive colors and fine visual details, such as reading text or distinguishing between different hues.

❑Trichromatic theory

color vision is based on t  one receptors, each sensitive to different wavelengths of light (red, green, and blue). The bra gnals from these cones to create the perception of a wide range of colors.

❑Opponent-process theory

A theory proposing that color vision is based on pairs of opposing color processes (red-green, blue-yellow, and black-white).

Activation of one color in the pair inhibits the other, leading to the perception of color afterimages and explaining certain aspects of color vision.

❑Fovea

Central area of the retina responsible for sharp central vision. It contains a high concentration of cone cells (no rods), enabling detailed and color vision.

❑Afterimages

Visual sensations that persist after a stimulus is removed. “temporary overstimulation”

❑Ganglion cells

Neurons in the retina that receive visual information from bipolar cells and transmit it to the brain via the optic nerve. They play a crucial role in processing visual signals and relaying them to the brain for further interpretation.

❑Dichromatism

A type of color vision deficiency where an individual has only two types of functioning cone cells instead of the normal three. This condition typically results in difficulty distinguishing between certain colors,

especially reds and greens.

❑Monochromatism
A rare form of color blindness where an individual has only one type of functioning cone cell, or none at all. This results in the inability to perceive colors, seeing the world in shades of gray.

❑Prosopagnosia
A neurological condition characterized by the inability to recognize familiar faces.
❑Blindsight
A phenomenon where individuals with damage to their visual cortex can respond to visual stimuli without consciously perceiving them.
❑Wavelength
The distance between sound wave peaks.
Shorter--high-pitched
Longer--lower-pitched
❑Pitch
❑Amplitude
The measure of the intensity or loudness of a sound wave, represented by the height of its peaks.
❑Loudness
❑Pitch perception
The brain's interpretation of the frequency of sound waves, determining whether a sound is high or low in tone.
❑Place theory
Idea that different parts of the inner ear detect different sound frequencies. High pitches are sensed near the entrance, low pitches near the end.

❑Volley theory
A theory of pitch perception proposing that groups of auditory neurons fire in rapid succession, or "volleys", to encode the frequency of sounds above 1000 Hz.
❑Frequency theory
A theory of pitch perception proposing that the frequency of a sound wave directly corresponds to the rate at which auditory nerve fibers fire.
Higher frequency--faster firing rates--higher perceived pitches
Vice versa

❑Sound localization
the brain's ability to determine the location of a sound source in space.
❑Conduction deafness
Hearing impairment caused by problems with the outer or middle ear, such as damage to the ear canal, eardrum, or middle ear bones.
❑Sensorineural deafness
Hearing loss caused by damage to the inner ear or auditory nerve.
It results in difficulty hearing soft sounds and understanding speech, and is often permanent.

Part 4: Sleep

- Consciousness:
The state of being aware of and able to perceive one's thoughts, feelings, sensations, and surroundings.

- Circadian Rhythm:
The natural, internal process that regulates the sleep-wake cycle and repeats roughly every 24 hours.

- Jet Lag:
A temporary disruption of the body's circadian rhythm due to rapid travel across multiple time zones.

- Employment:
Schedules that require working outside of typical daytime hours, often disrupting the body's natural circadian rhythm.

- NREM Stage 1:
The first stage of non-rapid eye movement sleep characterized by drifting in and out of sleep, lasting only a few minutes.

- NREM Stage 2:
The second stage of non-rapid eye movement sleep characterized by light sleep, lasting about 20 minutes.

- NREM Stage 3:
The deepest stage of non-rapid eye movement sleep characterized by the presence of predominantly delta waves.

- REM (Rapid Eye Movement) Sleep:
A stage of sleep characterized by rapid eye movements, vivid dreams, and muscle paralysis.

- REM Rebound:
The phenomenon where the body increases the time spent in REM sleep after a period of REM deprivation.

- Activation-Synthesis (Dreams):
A theory proposing that dreams are the result of random neural activity in the brainstem during REM sleep, which is then interpreted and synthesized by the cerebral cortex into a narrative or story.

- Consolidation Theory (Dreams):
A theory suggesting that dreams play a role in the memory consolidation and processing of

memories.

- Insomnia:
A sleep disorder characterized by difficulty falling asleep, staying asleep, or experiencing restorative sleep, leading to daytime impairment such as fatigue, mood disturbances, and decreased cognitive function.

- Narcolepsy:
A sleep disorder characterized by excessive daytime sleepiness, sudden episodes of muscle weakness (cataplexy), sleep paralysis, and hallucinations during sleep onset or awakening.

- Sleep Apnea:
A sleep disorder characterized by pauses in breathing or shallow breathing during sleep, leading to disrupted sleep patterns, daytime fatigue, and other health problems.

- REM Sleep Behavior Disorder:
A sleep disorder where individuals physically act out their dreams during REM sleep, potentially causing injury to themselves or others due to loss of muscle paralysis.

- Somnambulism:
A sleep disorder commonly known as sleepwalking, characterized by walking or performing other activities while still asleep.

- Psychoactive Drugs:
Substances that alter brain function, leading to changes in perception, mood, consciousness, cognition, or behavior.

- Agonists:
Substances that bind to neurotransmitter receptors and mimic their effects, enhancing neural activity.

- Antagonists:
Substances that bind to neurotransmitter receptors without activating them, blocking the effects of neurotransmitters

- Reuptake Inhibitors:
Medications that block the reabsorption of neurotransmitters by the sending neuron, thereby increasing the concentration of neurotransmitters in the synaptic cleft and enhancing neurotransmission.

- Stimulants:

Drugs that increase neural activity and arousal, leading to heightened alertness, attention, and energy levels.

- Depressants:

Drugs that slow down neural activity and bodily functions.

- Caffeine:

A natural stimulant found in coffee, tea, and some sodas. It acts on the central nervous system, increasing alertness and reducing fatigue by blocking the neurotransmitter adenosine.

- Cocaine:

A powerful stimulant derived from the coca plant. It increases neural activity, leading to euphoria, increased energy, and alertness.

- Alcohol:

Depressant drug that slows down neural activity in the central nervous system.

- Hallucinogens:

Drugs that alter perception, mood, and cognitive processes, often causing hallucinations or profound changes in consciousness.

- Marijuana:

Psychoactive drug derived from the cannabis plant.

- Opioids:

Psychoactive drugs that act on opioid receptors in the brain and body, producing pain relief, euphoria, and sedation.

- Heroin:

A highly addictive opioid drug derived from morphine.

- Tolerance:

A condition where increasing amounts of a psychoactive substance are needed to achieve the same effects.

- Withdrawal:

The onset of symptoms when a person stops using a psychoactive substance after prolonged use.

- Addiction:

A chronic brain disorder characterized by compulsive drug seeking and use, despite harmful consequences.

Unit 2 Cognition

Part 1: Perception

- Perception:
The process by which our brain organizes and interprets sensory information, transforming it into meaningful objects and events.

- Bottom-Up Processing:
"Details to Big Picture" is a way our brain makes sense of information by starting with the small details and then building up to a complete perception.

- Top-Down Processing:
"Big Picture to Details" involves interpreting sensory information based on the larger context, prior knowledge, and expectations.

- Selective Attention:
The process of focusing on a specific aspect of information while ignoring others.

- Cocktail Party Effect:
Our ability to focus on a single conversation in a noisy environment, like a crowded party, while turning out other stimuli.

- Inattentional Blindness:
An individual fails to notice an unexpected stimulus in their visual field when their attention is focused on something else.

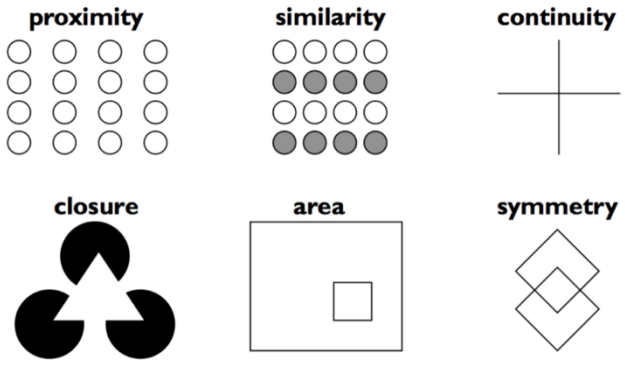
- Change Blindness:
The failure to notice large changes in one's environment when the change occurs simultaneously with a visual disruption.

- Schemas:
Mental frameworks that help us organize and interpret information in the role around us.

- Perceptual Set:
A tendency to perceive or notice some aspects of the available sensory data and ignore others.

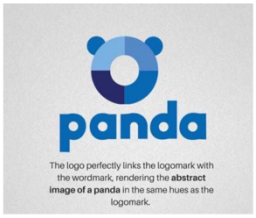
- Gestalt Psychology:
We perceive whole objects or figures (gestalts) rather than just a collection of parts.

- Distribution of Shapes:



- Figure-Ground:
The ability to distinguish an object (figure) from its surroundings (ground).

SIMILARITY



PROXIMITY

ɔth Cues:
ation that requires both eyes to perceive depth and

- Retinal Disparit
When each eye s eir separate positions on our face.

- Convergence:
When our eyes move inward toward each other to focus on a close object.

- Monocular Depth Cues:
Visual indicators of distance and space that can be perceived using just one eye.

- Relative Clarity:
A depth cue where objects that are clearer and more detailed are perceived as closer, while objects that are hazier or less clear seem farther away.

- Relative Size:
Aa visual cue where objects closer to us appear larger, while objects further away appear smaller.

- Texture Gradient:
The way we perceive texture to become denser and finer as it recedes into the distance.

- Linear Perspective:
A depth cue where parallel lines appear to converge as they recede into the distance.

- Interposition:
Occurs when one object overlaps another, leading us to perceive the overlapping object as closer

- Perceptual Constancy:
Our brain's ability to see objects as unchanging, even when the image on our retina (like size, shape, or color) changes.

- Shape Constancy:
Our ability to perceive an object as having the same shape, even when our angle of view or the distance from which we see the object changes.

- Size Constancy:

Our perception that an object remains the same size, even when its distance from us changes, causing the image on our retina to grow or shrink.

- Color Constancy:

Ability to perceive colors of objects as stable under varying lighting conditions.

- Apparent Movement:

The perception of motion when there isn't any actual movement.