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Psychology: Study of mind and behavior

- Theories of how the brain works with real-world applications

Five sub-sections of how we study psychology: Neuroscience (neurons and the brain), developmental (from child to adult), clinical (mental health in illness), social (relating to others and to society), and cognitive (basic computations)

Applications of psychology: Industrial design, counseling, technology, cognitive therapy, education, law, economics, health

Communication:

Attribution Studies - Self-Handicapping: A strategy for dealing with prospective failure (in the future) which a person engages in actions that produce obstacles to success. By arranging an excuse for failure beforehand, people preserve their self-esteem in case of a later failure.

I-Knew-It-All-Along Phenomenon: Subjective bias, cognitive errors, counterintuitive

Cramming:

More knowledge in the beginning and end but not in the middle (primacy and recency) on a serial position curve

Decreasing speed of word presentation helps the primacy

Decreasing the space between the exam and the word presentation helps the recency

Audio-Visual Integration in Speech Perceptions:

McGurk Effect

Synesthesia – Condition where stimulation of one sense leads to a blended percept with another sense

Statistics:

Interrater Reliability: Two subjects get the same results

Inferential Statistics: Make inferences based on their data with testing between two groups. High statistical significance with p-values.

Observational studies are often uninformative about causation

Third-Variable Problem: Might be something you're not "seeing"

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Operational Definition – A definition that translates the variable we want to assess into a specific procedure or measurement

Demand Characteristics – Cues in a study that might tell a research participant what behaviors are expected or desirable in that setting

> Good Participant - the participant attempts to discern the experimenter's hypotheses and to confirm them
>
> Negative participant - the participant attempts to discern the experimenter's hypotheses, but only in order to destroy the credibility of the study
>
> Faithful participant - the participant follows the instructions given by the experimenter to the letter
>
> Apprehensive participant - the participant is so concerned about evaluation of their answers by the experimenter that the participant behaves in a socially desirable way

Descriptive statistics – Mathematical procedures that allow a researcher to characterize a data pattern

Inferential statistics – Mathematical procedure that allows a researcher to draw further claims from a data pattern (what happened in one sample in reference to other samples)

Effect size – Magnitude of the difference between groups in a study

Quasi-experiment – A comparison that relies on already-existing groups

Within-subject comparison – Within a study, comparing the data about each participant in one situation to data about the same participant in another situation

Between-subject comparison – Within a study, comparing one group of individuals to a different group

Internal validity – The characteristic of a study that allows us to conclude that the manipulation of independent variables caused the observed changes in the dependent variable

Meta-analysis – A statistical technique for combining the results of many studies

Andrew Rosen - Chapter 3: The Brain and Nervous System

Intro:

- Brain is made up of numerous, complex parts
    - Frontal lobes by forehead are the brain's executive center
    - Parietal lobes wave sensory information together (maps feeling on body)
    - Temporal lobes interpret sound and speech
    - Occipital lobes interpret visual information from eyes
- Neurons are cells that make up the nervous system

The Organism as a Machine:

- Descartes - Behaviors, thoughts, and feelings are a product of the brain
    - Every action is the response to an event in the world (said soul controlled the pathways that the nervous responses took)
        - Reflex - Something excites a sense which excites a nerve to the brain which diverts excitation to a muscle making it contract

Building Blocks of the Nervous System:

- Neuroscience – Understanding the nature, function, and origins of the nervous system
- Neurons – Individual cells that act as the main information processors of the nervous system (100 billion)
- Glia cells – Another brain cell outnumbering neurons 10:1
- Nerve impulse – Means through which individual neurons communicate with one another

Neurons:

- Neuron – A cell that specializes in sending and receiving information
    - Consist of dendrites, cell body (soma), and axon
    - Dendrites (input) receive signals from many other neurons and are branched
    - Cell body contains the nucleus and elements needed for metabolic activity
    - Axon (output) extends outward and forks
- Motor neurons have the largest axons
- Efferent neurons – Allows the brain to control the muscles by carrying information from the brain to a destination outside of the brain (Away from CNS)
- Afferent neurons carry information towards the brain and keeps the nervous system informed about the external and internal environments (Toward CNS)
    - Have receptor cells that transduce physical stimuli into electrical changes which triggers other nerve impulses
- 99% of nerve cells in the brain are neither afferent or efferent and make connections within the CNS
    - Projection neurons – Link one area of the CNS to another area with long axons
    - Interneurons – Make local connections within the nervous system with short (or no) axons

Glia:

- Holds neurons in place and supplies (and *control*) them with nutrients and oxygen
- Convert glucose into lactate that feeds the neurons
- Sensitive to activity level in each neuron and increase blood flow whenever the neurons in one area become more active
- Control brain development
- When new neurons are made during development, they migrate from one position to another, and this is controlled by glia
    - Glia produce chemicals to shut down neural growth when necessary
- Increase speed of neuronal communication
    - Composed of a lot of myelin
    - Glia wrap themselves around axons (especially longer ones)
        - This composes the myelin sheath
        - Leaves behind gaps that are known as the nodes of Ranvier
        - This combination speeds up nerve impulses on myelinated axons
- White matter – Myelinated axons
- Gray matter – Cell bodies, dendrites, and unmyelinated axons