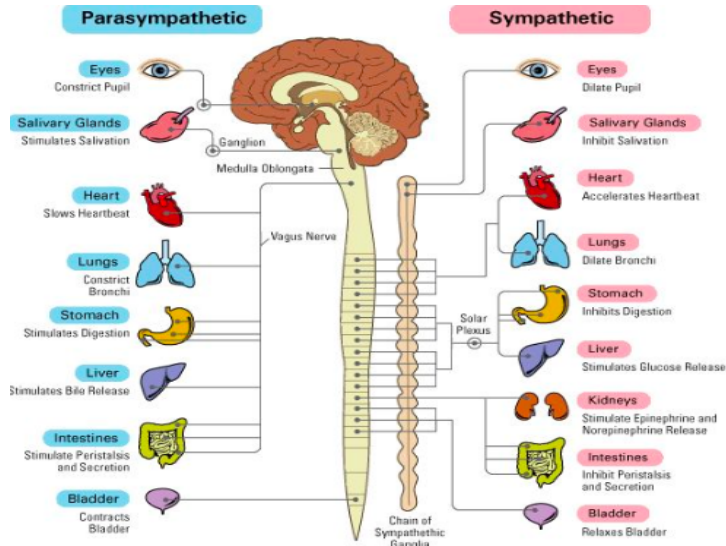


BEHAVIORAL SCIENCES HIGH YIELD GUIDE

By Zach Dereniowski

Nervous System: The three types of neurons are sensory (**afferent**), interneurons and motor (**efferent**).

Parasympathetic NS: Rest-and-digest. **Sympathetic NS:** Fight-or-flight.



Cerebral Cortex: Lobes and Functions

Frontal: Controls impulses, planning long-term (**prefrontal cortex**), motor function (**primary motor cortex**), speech production (**Broca's area**)

Parietal: sensation of touch, pressure, temperature, pain (**somatosensory cortex**), spatial processing, orientation, and manipulation

Occipital: Visual processing

Temporal: Processing sound (auditory cortex), speech perception (**Wernicke's area**), memory and emotion (**limbic system**)

BRAIN ORGANIZATION

Hindbrain: Cerebellum, medulla, oblongata, and reticular formation.

Midbrain: Inferior and superior colliculi.

Forebrain: Thalamus, hypothalamus, basal ganglia, limbic system, and cerebral cortex.

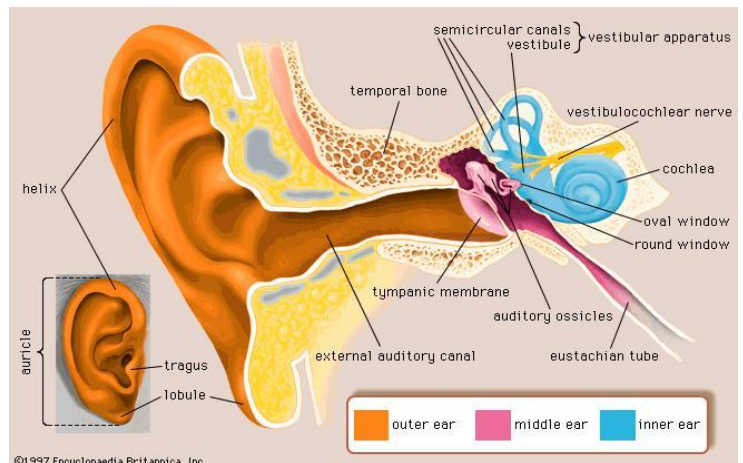
FOREBRAIN PARTS

Thalamus: Relay station for sensory information.

Hypothalamus: Homeostasis regulation and integrates with the endocrine system through the hypophyseal portal system that is connected with the anterior pituitary.

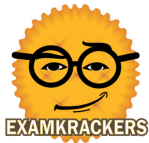
Basal Ganglia: Smoothens movements and helps maintain postural stability.

Limbic System: Memory and emotion regulation, which includes the septal nuclei (pressure-seeking), amygdala (aggression and fear), hippocampus (memory), and fornix (communication within the limbic system).



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NEUROTRANSMITTERS & BEHAVIORS

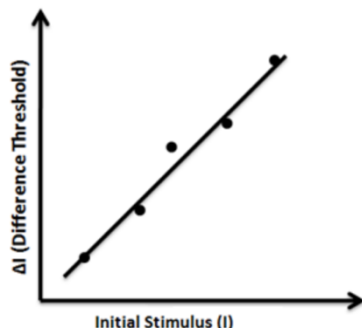


Acetylcholine	Voluntary muscle control, parasympathetic nervous system, attention, alertness
Epinephrine and Norepinephrine	Fight-or-flight responsiveness, wakefulness, alertness
Dopamine	Smooth movements, postural stability
Serotonin	Mood, sleep, eating, dreaming
Endorphins	Natural painkillers

SENSATION VS. PERCEPTION

Sensation: Physical Stimuli -> Neurological Signals

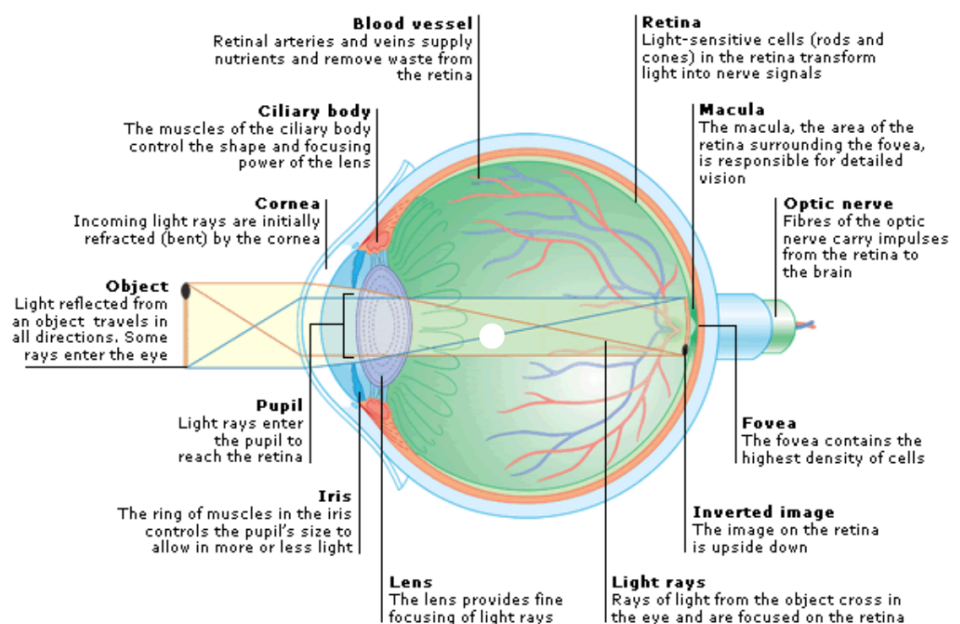
Perception: Processing of sensory information to make sense of its significance.

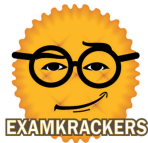
Weber's Law	Signal Detection Theory									
<p>Just-noticeable-difference for a stimulus is proportional to stimulus magnitude.</p> <div>$\frac{\Delta I}{I} = k$</div>	<p>Effects of non-sensory factors (experiences, motives, expectations) on stimuli perception.</p> <div><p>Forced choice: four possible outcomes</p><table><tr><th></th><th>Doctor responds "yes"</th><th>Doctor responds "no"</th></tr><tr><th>Tumor present</th><td>Hit</td><td>Miss</td></tr><tr><th>Tumor absent</th><td>False alarm</td><td>Correct reject</td></tr></table></div>		Doctor responds "yes"	Doctor responds "no"	Tumor present	Hit	Miss	Tumor absent	False alarm	Correct reject
	Doctor responds "yes"	Doctor responds "no"								
Tumor present	Hit	Miss								
Tumor absent	False alarm	Correct reject								

VISION

The eye is an organ specialized to detect the light in the form of photons.

Visual Pathway: Retina -> Optic Nerve -> Optic Chiasm -> Optic Tracts -> LGN of Thalamus -> Visual Radiations -> Visual Cortex





HEARING & VESTIBULAR SENSE

Ear: Sound Waves -> Electrical Signals interpreted by the brain.

Auditory Pathway: Cochlea -> Vestibulocochlear Nerve -> MGN -> Auditory Cortex

Cochlea: Detects sound.

Utricle/Saccule: Detects **linear** acceleration.

Semicircular Canals: Detects **rotational** acceleration.

Other Senses

Smell: Olfactory chemoreceptors

Taste: Taste buds in papillae

Somatosensation: Four touch modalities (pressure, vibration, pain, and temperature).

Kinesthetic Sense (Proprioception): Tell where one's body is in space.

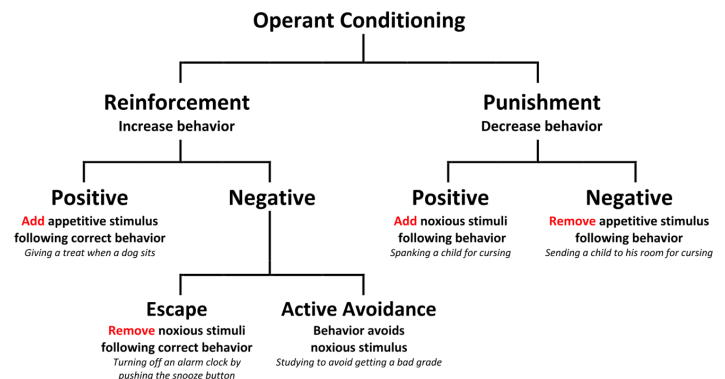
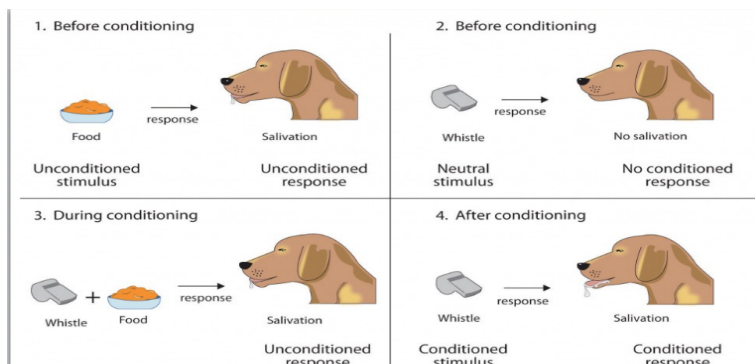
OBJECT RECOGNITION

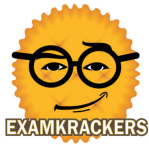
Bottom-Up (Data Driven)	Top-Down (Conceptually Driven)	Gestalt Principles
Parallel processing and feature detection. Slower, but less prone to mistakes.	Memories and expectations. Little attention to detail. Faster, but more prone to mistakes.	Brain infers missing parts of an image when it's incomplete.

LEARNING & MEMORY

Habituation	Adapting to stimuli that do not change.
Dishabituation	Reappearance of original response when stimulus changes.
Sensitization	Increase in responsiveness to a stimuli.

CLASSICAL CONDITIONING OPERANT CONDITIONING





CONSCIOUSNESS, COGNITION & LANGUAGE

CONSCIOUSNESS

Stage	EEG Waves	Features
Awake	Beta & Alpha	Able to perceive, process, access, and express information.
1	Theta	Light Sleep
2	Theta	Sleep spindles and K Complexes
3/4	Delta	Slow-wave sleep
REM	Mostly Beta	Appears awake physiologically, dreams – paralyzed and some sleep disorders.

Sleep Disorders:

- i) **Dyssomnias:** Insomnia, narcolepsy, sleep apnea, and sleep deprivation.
- ii) **Parasomnias:** Night terrors and sleepwalking (somnambulism).

Consciousness-Altering Drugs

Drug addiction is mediated by the **Mesolimbic Pathway** (nucleus accumbens, medial forebrain bundle, and VTA).

Drug Group	Function
Depressants (alcohol, barbiturates, benzodiazepines)	Relaxation and reduced anxiety.
Stimulants (amphetamines, cocaine, ecstasy)	Increased arousal
Opiates/Opioids (heroin, morphine, opium, pain pills)	Decreased reaction to pain & euphoria.
Hallucinogens (LSD, mushrooms)	Distortion of reality and fantasy – introspection.

Marijuana (THC – Active Ingredient): Depressant + Stimulant + Hallucinogen

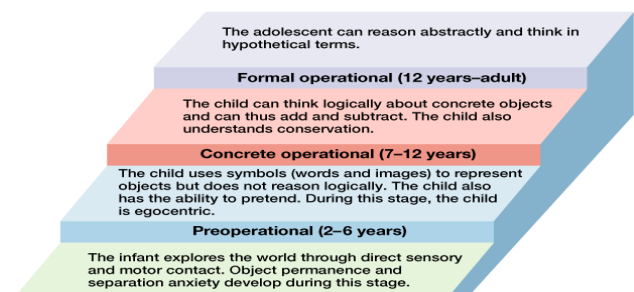
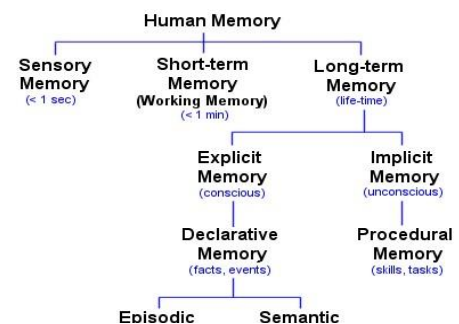
MEMORY

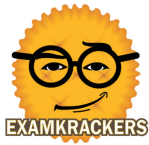
Encoding: Process of putting new info into memory.

Facts are stored in **semantic networks**.

Retrieval of information is based on **priming** of interconnected points of the semantic network.

Recognition of information is stronger than **recall**.





PIAGET STAGES OF COGNITIVE DEVELOPMENT

ATTENTION

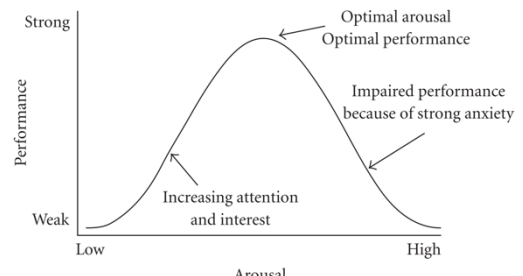
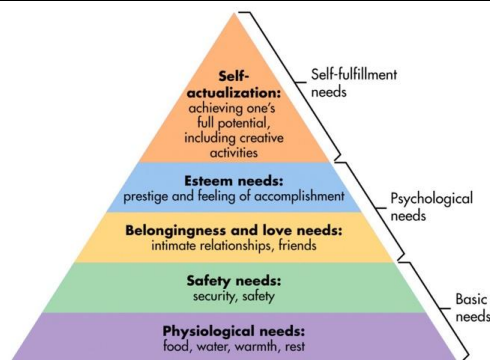
Selective Attention	Divided Attention
Pay attention to a particular stimulus and capable of ignoring background stimuli.	Pay attention to multiple activities at one time. Uses automatic processing.

LANGUAGE AREAS IN THE BRAIN

Wernicke's Area	Language comprehension
Broca's Areas	Motor function of speech
Arcuate Fasciculus	Connects Wernicke's & Broca's areas. Incapable of repeating words despite speech generation (Broca's) being intact and capability of comprehending (Wernicke's).

MOTIVATION, EMOTION, AND STRESS

Motivational Theories:

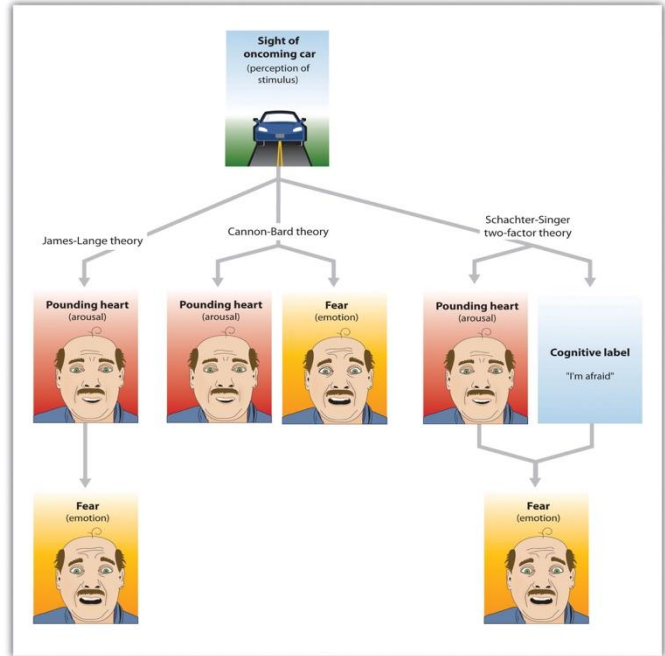
Instinct Theory	Innate, fixed patterns of behavior in response to stimuli.
Arousal Theory	<p>State of being awake and reactive to stimuli – aim for optimal level of arousal for a given task using Yerkes-Dodson Law</p> 
Drive Reduction Theory	Individuals act to relieve internal states of tension.
Maslow's Hierarchy of Needs	

Emotions

Seven Universal Emotions

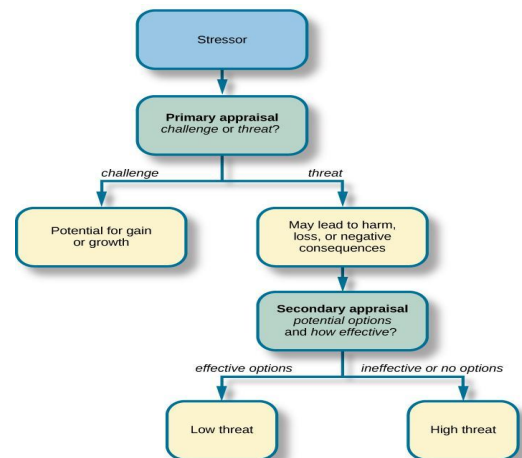
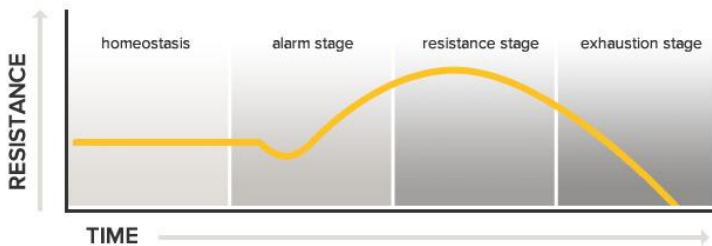


Theories of Emotion



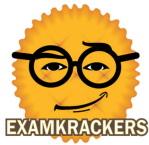
Stress:

Selye's General Adaptation Syndrome



IDENTITY AND PERSONALITY

Self Concept	How we describe ourselves.
Identities	Individual components of our self-concept related to the groups we belong to.



Self-Esteem	Our evaluation of ourselves as sufficient or insufficient.
Self-Efficacy	Degree to which we are confident in our abilities – situation-specific confidence.

Locus of Control:

Internal: I will succeed on the MCAT because of my own actions.

External: I will fail on the MCAT because I had an unfair test.

PSYCHOLOGICAL DISORDERS

DSM: Guide by which most psychological disorders are characterized, described, and diagnosed.

Schizophrenia: Distortions of reality and disturbances in content and form of thought, perception and behavior.

Negative	Positive
Alogia	Hallucinations
Affective flattening	Delusions
Avolition-apathy	Bizarre behaviour
Anhedonia-asociality	Positive formal thought disorder
Attentional impairment	

Depressive Disorders:

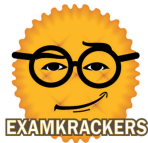
Major Depressive Disorder	At least one major depressive episode.
Pervasive Depressive Disorder	A depressed mood (either dysthymia or major depression) for at least two years.
Seasonal Affective Disorder	Seasonal onset of major depressive disorder – usually winter months.

Bipolar & Related Disorders:

Bipolar I Disorder	At least one manic episode.
Bipolar II Disorder	At least one hypomanic episode and at least one major depressive episode.
Cyclothymic Disorder	Contains hypomanic episodes with dysthymia.

Anxiety Disorders:

Generalized Anxiety Disorder	Constant disproportionate and persistent worry.
Specific Phobias	Irrational fears of specific objects.
Social Anxiety Disorder	Anxiety due to social or performance settings.
Agoraphobia	Fear of places or situations where it's hard to escape (ex. Elevators)
Panic Disorder	Recurrent attacks of intense, overwhelming fear with no clear stimulus. May lead to agoraphobia.
Obsessive-Compulsive Disorder	Obsessions: Persistent, intrusive thoughts and impulses. Compulsions: Repetitive tasks that relieve tension but cause significant impairment.
Body Dysmorphic Disorder	Unrealistic negative evaluation of physical appearance or specific body part.



Dissociative Disorders:

Dissociative Amnesia	Inability to recall past experience. May involve dissociative fugue – a sudden change in location that can involve the assumption of a new identity.
Dissociative Identity Disorder	2+ personalities that take control of behavior (Ex. Movie “Split”)
Depersonalization/De-Realization Disorder	Feelings of detachment from the mind, body or environment.

FORMATION OF IDENTITY (FREUD, ERIKSON, KOHLBERG, PIAGET)

Approximate Age Range	Freud (Psychosexual)	Erikson (Psychosocial)	Piaget (Cognitive)	Kohlberg (Moral)
Infancy: Birth – 2 Years	Oral Stage	Trust vs Mistrust	Sensorimotor Period	N/A
Toddler: 1 1/2 – 3 Years	Anal Stage	Autonomy vs Shame & Doubt	N/A	N/A
Preschool: 3-6 Years	Phallic Stage	Initiative vs Guilt	Pre-Operational	Pre-Conventional
Middle Childhood: 7-11 Years	Latency	Industry vs Inferiority	Concrete Operation	Conventional Level
Adolescence: 12-18 Years	Genital Stage	Identity vs Role Confusion	Formal Operations	Post-Conventional
Adulthood: 18-40 Years	N/A	Intimacy vs Isolation	N/A	N/A
Middle Years: 40-65 Years	N/A	Generativity vs Stagnation	N/A	N/A
Late Adulthood: 65+	N/A	Integrity vs Despair	N/A	N/A

PERSONALITY THEORIES:

Big Five (OCEAN): Openness, conscientiousness, extraversion, agreeableness, and neuroticism.

Allport's Three Basic Types of Traits: Cardinal, central & secondary.

SOMATIC SYMPTOMS & RELATED DISORDERS

Somatic Symptom Disorder	At least one somatic symptom, which may or may not be linked to an underlying medical condition – disproportionate concern.
Illness Anxiety Disorder	Preoccupied with having or coming down with a serious medical condition (WebMD)
Conversion Disorder	Unexplained symptoms affecting motor/sensory function.

PERSONALITY DISORDERS

Inflexible/maladaptive behavior Distress & impaired functioning.

Cluster A (Weird)	Paranoid, schizotypal and schizoid
Cluster B (Wild)	Antisocial, borderline, histrionic, narcissistic.
Cluster C (Worried)	Avoidant, dependent, obsessive-compulsive.



SOCIAL PROCESSES, ATTITUDES, AND BEHAVIOR

GROUP PSYCHOLOGY

Social Facilitation	Tendency to perform at a different level (better or worse) when others are around.
De-Individuation	Lose self-awareness in large groups. Lead to drastic changes in behavior (riots).
Bystander Effect	In a group, individuals are less likely to respond to a person in need.
Peer Pressure	Social influence on an individual by other individuals they consider equals.
Group Polarization	Tendency towards making decisions in a group that are more extreme than the thoughts of the individual group members.
Groupthink	Tendency to make decisions based on ideas and solutions that arise within the group without considering outside ideas.

CULTURE

Assimilation	One culture begins to melt into another.
Multiculturalism	Multiple cultures in one community – enhances diversity.
Subculture	Group that distinguishes itself from the primary culture it belongs to.

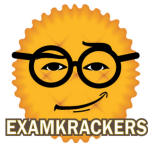
SOCIALIZATION

Socialization	Developing and spreading norms, customs, and beliefs.
Norms	Acceptable behavior within a society.
Stigma	Extreme disapproval of a person/group based on perceived differences.
Deviance	Any violation of norms, rules or expectations within a society.
Conformity	Changing beliefs or behaviors in order to fit into a group/society
Compliance	Change behavior based on request of others – foot in the door, door in the face, low-ball, and that's-not-all
Obedience	Change behavior on a command from someone seen with authority.

ELEMENTS OF SOCIAL INTERACTION

Status	Ascribed: Involuntarily assigned Achieved: Voluntarily earned Master: Primary Identity
Role	Set of beliefs, values and norms that define expectations of a specific status.
Group	2+ individuals with similar characteristics and share unity.
Network	Observable pattern of social relationships between groups.
Organization	Group with structure/culture designed to achieve specific goals – exist outside each individual's membership within organization.

Front Stage Behavior	Back Stage Behavior
Behaviors that are part of the role being played.	Behaviors that are not part of the role being played.



Impression Management – Dramaturgical Approach: A person creates images of themselves in the same way that actors perform a role in front of an audience.

ATTRIBUTION THEORY – DISPOSITIONAL VS. SITUATIONAL

Dispositional Attributions = Internal

Situational Attributions = External

Correspondent Inference Theory: Describes attributions made by observing intentional behaviors performed by another person.

Fundamental Attribution Error: Bias toward making dispositional attributions rather than situational attributions.

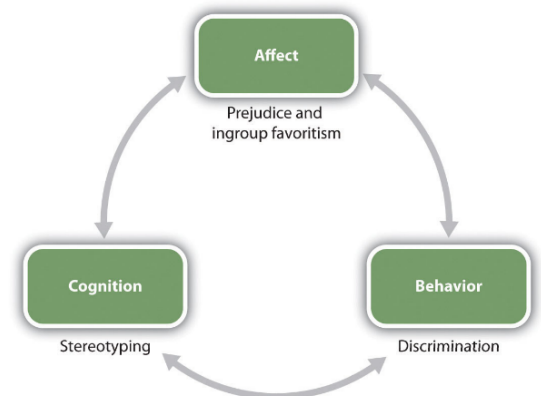
STEREOTYPES, PREJUDICE & DISCRIMINATION

Self-Fulfilling Prophecy: A stereotype creating an expectation of a particular group – creates conditions to confirm this stereotype.

Stereotype Threat: Feeling anxiety about confirming to a negative stereotype.

Ethnocentrism: Making judgments about other cultures based on the values/beliefs of your own (in vs out groups).

Cultural Relativism: Studying social groups/cultures on their own terms.

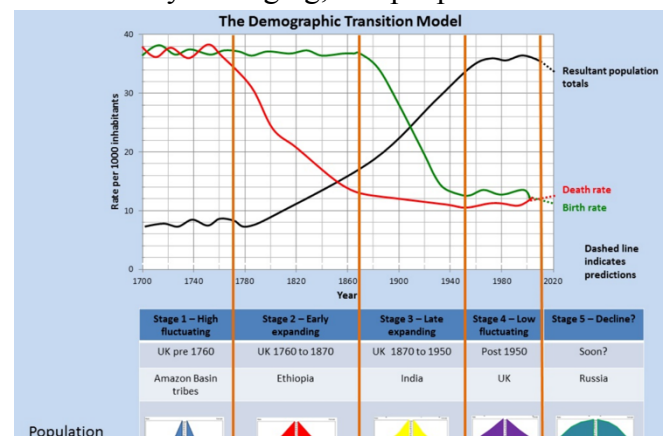


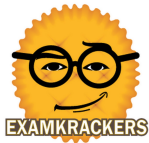
SOCIAL STRUCTURE AND DEMOGRAPHICS

SOCIOLOGICAL THEORIES:

1. **Structural Functionalism:** A social system composed of parts that work together to benefit the whole.
2. **Conflict Theory:** Groups competing with one another within the same social system.
3. **Symbolic Interactionism:** People's patterns of behavior always changing, and people give meaning to behaviors.
4. **Social Constructionism:** Meanings we attach to objects are the result of collective social agreement & conventions.

Material Culture: Physical items – art, clothing, foods, etc.,





Symbolic Culture: Ideas associated with cultural group

DEMOGRAPHICS

Demographics: Statistical arm of sociology.

Migration: Movement of people into (immigration) or out of (emigration) a geographical location.

Demographical Transition Model: Used to represent drops in birth and death rates as a result of industrialization.

SOCIAL CLASS

Based on socioeconomic status (SES).

Class	Category of people with shared SES characteristics.
Power	Capacity to influence people through real/perceived rewards & punishments.
Social Capital	Investment people make in society in return for economic or collective rewards.
Social Reproduction	Passing on of social inequality, especially poverty, to the next generation.
Poverty	Relative: Households receive 50% less income than average median incomes. Absolute: Conditions where household income is insufficient to afford basic life necessities (food, shelter, clothing).

EPIDEMIOLOGY:

Morbidity: Burden/degree of illness associated with given disease.

Mortality: Deaths caused by a given disease.

Incidence rate (Incidence density) =

$$\frac{\text{number of new cases of disease}}{\text{person-time at risk}}$$

Prevalence (%) =

$$\frac{\text{number of people with disease}}{\text{number of people in the population}} \times 100\%$$