*Exam #2 Review – The Science of Psychology*

***Memory!***

Implicit versus Explicit memory.

**Implicit memory:** memory without conscious awareness: **procedural** (riding a bike) and **priming** (fill in the word). Not hippocampal dependent.

**Explicit memory:** memory with conscious awareness. **Semantic** (general knowledge) and **episodic** (event based, hippocampal dependent)

Remember the scrub jays! Episode memory in birds. Worms vs. pine nuts.

Memory errors: **transience** (forgetting stuff over time) and **interference** (both proactive—new blocked by old—and retroactive—old blocked by new). **Absentmindedness. Blocking. Misattribution. Suggestibility. Bias** (consistency, change, egocentric). **Persistence** (extinction failure, flashbulb memories).

***Learning!***

Differentiating between learning and memory. **Learning** is the acquisition of information. **Memory** is the storage and retrieval of information.

**Basic Learning:** cues for biologically relevant events, ignoring the irrelevant.

**Habituation** ensures we attend to novel stimuli more closely than familiar stimuli, simplest form of learning. Learning as an **experience that causes a permanent change**

Other non-associative learning: **dishabituation** and **sensitization**

We learn by **associating** one idea with another. More complex learning = more associations

**Classical Conditioning** (Pavlov): learning to predict biologically relevant events. Conditional stimulus, unconditional stimulus, unconditional response, conditional response. **US -> UR, CS->US->UR times N, CS->CR**. Also second-order conditioning (second CS) and extinction (not forgetting! Think spontaneous recovery). Stimulus generalization and discrimination also occur (similar CSs can elicit the CR/specific stimuli only elicit the CR). You can do this to emotions, to. It’s the establishment of compensatory responses.

***More LEARNING***

**Conditioned taste aversion & GARCIA EFFECT** (think tasty water versus bright/noisy water)

**Extinction** is not forgetting. Remember spontaneous recovery. Think PTSD and relapse.

**Behaviorism** focused on observable, quantifiable behavior. Mental activity as irrelevant and unknowable.

**Instrumental Condition** (or operant learning): Thorndike’s **Law of Effect,** first formal examination of the phenomenon. B.F. Skinner and the **Skinner Box,** distinguished between classical and operant conditioning.

A **reinforcer** increases the probably of performing a behavior again. A **punisher** decreases the probability of performing it again. However, don’t forget about **intrinsic motivation**.

Remember: definitions of reinforce and punisher are based on outcomes, not on what you think they SHOULD do.

***Learning and Emotion***

Reinforcers and punishers can be **positive** (giving) or **negative** (taking away).

Reinforcement schedules can differ. They can be either **fixed** or **variable**. They can also be either **ratio** or **interval** (based on the number of behaviors that have occurred/based on the amount of time that has elapsed since last reinforced behavior)

Tolman’s **latent learning** during operant conditioning paradigms. Behavior changes during instrumental conditioning.

**Observational learning** – learning without direct experience. Think Bandura’s Bobo dolls. Also, social learning, cultural norms, viewing media violence, mirror neurons

**Emotion** encompasses changes in behavior, changes in subjective experience, and changes in physiology. What *isn’t* emotion? **Mood, affect, temperament, motivation.** Emotion is universal. There are basic and complex emotions (compound).

**James-Lange Theory of Emotion:**  emotional experiences cause emotional behavior. Attacking bear 🡪 pounding heart 🡪 fear. Support: facial feedback theory (smile and you’ll feel happy!)

**Cannon-Bard Theory of Emotion:** bodily experiences happen too slowly to be the source of our emotions. Physiological and experiential responses occur simultaneously and both are triggered by changes in brain-state.

***Emotion and Motivation!***

**Two-Factor Theory of Emotion:** interpretation of changes in our physiology are crucial to our labeling and experiences of our emotions. If it’s a bear you’re running from, you’re scared. If it’s a fellow racer, you’re excited.

**See classic experiment in slides.**

**Functions** of emotion: fight or flight, help recover from stress, aid in marking important memories, signal social intent/connection

The **amygdala** can make a rapid appraisal of stimuli and produce emotion. The **cortex** does a slower appraisal. The **amygdala** is an **emotional area – think Kluver-Bucy Syndrom** (stealing bananas from a scary fellow primate due to damage to the amygdala).

Two main forms of emotion regulation: **cognitive reappraisal** (decrease emotional response by the re-interpretation of stimuli) and **suppression** (decrease in emotional reaction by the denial of appropriate behavior).

**Emotional pop-out effects** and **selective attention.**

How can emotions influence decisions? **Anticipatory, expected, immediate*.***

**Somatic Marker Hypothesis**: reasoning is guided by emotional evaluation of the consequences of an action (Damasio). Gut feelings. Emotionally market memories.

Expression of emotion: **deceptive expression!** Also, **intensification, deintensification, masking, neutralizing.** Sincere? Here’s how you know: **morphology, symmetry, duration, temporal patterning.** We’re not very good at detecting those who are lying. Some ways of trying are the **polygraph** and measuring the **blood flow in the brain**.

***Language and Thought***

Structure of human language: **phoneme** (smallest unit of sounds), **morpheme** (smallest unit of meaning), **grammar** (rules for meaning)

**Deep structure** versus **surface structure:** surface = wording, deep = meaning. Think Noam Chomsky.

**Language milestones:** fast mapping, telegraphic speech, overgeneralizing.

**Behaviorist explanations:** principles of operant conditioning, learn to talk through reinforcement, shaping, and extinction. Some issues are: parents don’t spend much time teaching grammar, children generate more grammatical sentences than they here, errors children make do not duplicate what they hear.

**Nativist explanations:** language acquisition device (LAD), we’re wired to learn grammar, genetic dysphasia is when someone cannot grasp grammar

**Interactionist explanations**: how does innate, biological capacity for language combine with environmental experience? Parents tailor verbal interactions with children in ways that simplify language acquisition. Kids developing sign language independently.

**Linguistic relativity hypothesis:** Whorf. Language shapes the nature of thoughts. Newer studies cast doubt on this.

Also, perceptions of variations in color and perception of time.

Concepts and categories! **Prototype theory:** best example, **exemplar theory:** specific example. Concepts are fundamental to our ability to think. Some mental damage results in category-specific deficits

**Rational people** are consistent in their decisions, make decisions based on conscious evaluation of circumstances, keep to those evaluations in all contexts, and make decisions that are immune to whim. We are not rational.

A **heuristic** is a rule of thumb for judgment and decision making, fast and efficient but prone to error.

The **availability heuristic** is a mental shortcut in which items that are more readily available in memory are judged as having occurred more frequently. Availability can be influenced by frequency, familiarity, vividness, and recency.

The **representative heuristic** is classifying something based on how similar you perceive it to be to the typical case or category. A probability judgment by comparing an object or event to a prototype. Stereotypes are a negative implication of this.

**Anchoring and adjustment** is a mental shortcut that involves using a rought estimation as a starting point, and then adjusting this estimate to take into account unique characteristics of the situation.

Don’t forget the **framing effect** : when people give different answers to the same problem depending on how it is phrased. From this, we get **risk aversion and risk seeking**.

**Sunk cost fallacy.** (thank you Econ). People make decisions about a current situation based on what they have previously invested in it.

**Expected utility!**

***Language, Thought, and Intelligence***

**Prospect theory:** people make decisions based on anticipated gains and losses. People choose to take on a risk when evaluating potential losses and avoid risks when evaluating potential gains.

Note the issues with the representativeness heuristic and probability! This is the **conjunction fallacy**.

Reasoning is occurring mostly in the prefrontal cortex and the frontal lobe. With damage to the prefrontal cortex, people have been shown to make more risky decisions!

**Game theory! Prisoner’s Dilemma! Know them!**

Define **intelligence**: a hypothetical mental ability that enables people to direct their thinking, adapt to their circumstances, and learn from experiences

The **intelligence quotient (IQ).** Used to estimate an individual’s mental level. **Ratio IQ.** **Deviation IQ.**

**Three-level hierarchy** general factor, group factors, specific factors. Hard to define what lies between general intelligence and specific abilities (bottom-up/top-down)

**Bottom-up approach**: 8 independent middle-level abilities: memory and learning, visual perception, auditory perception, retrieval ability, cognitive speediness, processing speed, crystallized intelligence, fluid intelligence

**Top-down approach:** analyze people’s responses to questions on intelligence tests, three kinds of intelligence: **analytic, creative, and practical**

Intelligence and genes, certain level of heritability

***DEVELOPMENT!***

Developmental psychology focuses on continuity and change

Physical development starts from conception. XX = girl, XY = boy

Prenatal environment is important (think Fetal Alcohol Syndrome)

There are **sensitive/critical periods** for development. More complex behaviors seem to occur during specific times of development. Not necessarily a closed window, though.

**Piagetian Stages: Sensorimotor Stage** (from birth to 2, children experience the world through movement and senses, object permanence, assimilation & accommodation), **Preoperational Stage** (from 2 to 7, acquisition of motor skills, conservation), **Concrete Operational Stage** (from 7 to11, logical thinking about concrete events), **Formal Operation Stage** (after age 11, development of abstract reasoning). Piaget was right and wrong, not quite as step-wise as he thought, babies may comprehend more, some claims are unsupported.

N.B. with the development of object permanence comes **representational thought**, new schemas, etc.

**Conservation** is the concept of transformation processes, required for concrete and formal operations, during preoperational stage