Test 2 Study Guide

Chapter 10 Section 2 Notes (only section on the test)

- Consciousness (varying degrees; not fully distinct from unconsciousness) : The subjective experience of perceiving self and other entities – brain activity and consciousness are inextricably related (Lazarus effect) – Neurological activity is not entirely consciousness (reflexes and processes originating in the spinal cord)
- Brain Death (No activity or response to stimuli) – Coma (slow, steady rate of activity with no response to stimuli) – Vegetative states (limited response to stimuli but no purposeful activity) – sleep contains movement (twitching) (babies do to identify body parts and how they work)
- Circadian Rhythm (24hr cycle) – occurs without light cues – degree of alertness depends on your circadian rhythm
- Light → eyes → **SUPRACHIASMATIC NUCLEAUS (works without light) (your internal clock)** → pineal gland → melatonin release
- Darkness = melatonin = sleep – suprachiasmatic nucleus is the body's clock – if your eyes do not detect light the suprachiasmatic nucleus activates and initiates the release of melatonin – suprachiasmatic does more than this (also regulates sleep, feeding, alertness, core body temp, brain activity, glucose and insulin release, and growth)
- Sites of action of melatonin – pretty much everywhere – anti-cancer hormone – more risk of diabetes with inadequate sleep
- How much sleep do you need? Adults (17+) 7 – 9; Teenagers (10 – 17 yrs.) 8.5 – 9.25; School aged Children 10 – 11; Preschool (3 – 5 yrs.) 11 – 13; Toddlers (1 – 3 yrs.) 12 – 14; Infants (3 – 11 mos.) 14 -15; Newborns (0 mos. – 2 mos.) 12 - 18
- Why do we sleep? – Save energy (mammals and birds lower core body temp) – Restorative functions in the brain (sleep dep. Causes irritability, impaired attention & weakened immune system) – Learning and memory strengthened (motor and language; memories are reanalyzed; dendrites grow) – before artificial light we would get 10.5 hrs. of sleep. Now about 7.5
- Sleep is not valued in our society – students are woefully sleep deprived – 100,000 accidents per yr. related to sleep
- Sleep Debt – grows and takes you down – it will collect – growing weight over us – cannot muscle through it – memory, learning and creativity are impaired – less motivation – reduces coordination – pain (headaches and aches in general) – obesity – psychiatric (depression and substance abuse) – cannot be repaid with a weekend marathon (must gradually repay; consistent sleep) – When you finish your payments (more alert; helps with control)
- Good sleep habits – unplug – cut out light at night (esp. Blue light) – not enough light during day – routine – stop caffeine at 2 pm –don't work in bed
- Stages of sleep – cycles during the night – REM 25% - NREM 75% (four stages) – 1, 2, 3, 4, 3, 2, REM, 2, 3, 4, 3, 2, REM, 2, REM
- Stages of sleep NREM – 75% of the night – Stages one through four – Stage 1 (4-5%) between being awake and falling asleep; little eye movement; Non-rhythmic brain activity – Stage 2 (44-55%) onset of sleep; disengaged from surrounding; breathing rate and heart rate are regular; body temperature is down; begins gradual transition to sync slow wave states – Stages 3 (4-6%) & 4 (12-15%) long, slow waves marking brain waves marking less brain activity; eyes are relatively inactive; deepest and most restorative sleep; blood pressure and breathing rate down; muscles are relaxed; blood supply that goes to muscle is up; hormones are released (especially growth hormone); sleeper moves back through stages two and three and during the nights first REM episode
- Stages of Sleep – REM – research started in the 1950's (found in France and US independently) – Rapid Eye Movement – sleepers closed eyes move rapidly beneath the eyelids – paradoxical sleep (there is physiological and brain wave activity indistinguishable from waking states; large muscle groups are relaxed enough to be paralyzed)
- Stages of sleep pattern overnight – A healthy adult has 90-100 minute sleep cycles at night – after first cycle REM replaces stage one – stages three and four diminish overnight – last cycles are alterations between stage 2 and REM sleep (less dreaming first four hours of sleep; more in the last four)
- Functions of REM Sleep – brains of sleep deprived to REM sleep will attempt to make more of it – those deprived of REM will become irritable, anxious, and distracted – when allowed to rebound they will indulge – patterns of REM change as you age – infants get more REM than children and children get more than adults – REM has a role in CNS development – longer sleep = more REM – improves memory
- REM and Dreaming – vivid dreams reported upon waking up from REM – Adults report dreams 85 – 90% of the time for REM; 50 – 60% for NREM (stage 2 at the end of the night) – Children less than 5 rarely report dreams
- Abnormalities of Sleep – Insomnia (inability to fall asleep or stay asleep; serious/chronic insomnia accompanies disorders such as depression) – Sleep Apnea (A lapse of breathing for a minute or more while sleeping; Obese middle age and elderly men are more vulnerable; other cases associated with abnormalities in the medulla) – Narcolepsy (sudden attacks of extreme irresistible sleepiness) – Hypersomnia (too much sleep with no refreshing aspect) – Restless Leg Syndrome (unable to keep legs still at night)

Chapter 6 – Learning

- Learning – what is it? (Obtaining Knowledge; Understanding what's being taught and being able to retain and use it properly) – How does it happen? (Conditioned responses by producing a reaction to certain stimuli) – Definition (Any relatively permanent change in behavior that occurs through experience; Internal and external factors influence (help or hinder) an organism's learning – Theories of Learning (Classical Conditioning; Operant Conditioning; Various Others)
- Learning and Behaviorism – Watson – Ignored mental focus on behavior – from observing an animal's actions in the presence of certain stimuli, a behavior, you may infer the presences of an intervening variable (rabbit example) – Variable cannot be directly observed (examine response and determine possible stimuli) – learning to behaviorists (ALL animals and human behavior could be understood as a stimuli-response psychology (flinch from blow)) – Early Behaviorism (complex behaviors are a product of change of speed and direction by various stimuli) – Modern Behaviorism (Stimuli plus responses plus natural physiological state (hunger, fatigue, internal)) – Types of behaviorism (Methodological; Strict; Cognitive) – Behaviorists can infer fear based on responses (can infer other emotions as well based on their responses)
- Assumptions of Behaviorism – Deterministic (Universe run by cause and effect; behavior must have a cause) – The environment predominates strong influence on outcomes) – mental explanations are ineffective and lead to circular reasoning
- Pavlov (Russian Physiologist; Nobel Prize winner in 1904 for research on Digestion; by product of this was classical conditioning) and Learning – we respond to stimuli – we can learn the meaning of a cue if it and the stimulus are paired – Classical Conditioning (When dogs saw workers who brought their food they began to salivate) – Before Conditioning (Food (Unconditioned Stimulus) = Salivation (Unconditioned Response)) – Before Conditioning (Bell (Neutral) = no response) – During Conditioning (Food (Unconditioned Response) + Bell (Conditioned Stimulus) = Salvation (Unconditioned Response) – After (Bell (Conditioned Stimulus) = Salvation (Conditioned Response))
- Drugs and Classical Conditioning – Body knows that when you are at a certain place you're going to take this drug – UCS (Drug) – UCR (you get high) – CS (Certain Locations) – CR (Your body gets ready for the drug) – UCS (different location; body doesn't response)
- Enhancing Classical Conditioning – Unfamiliar stimulus results in rapid conditioning – familiar stimulus takes longer to adjust to – Stimulus needs to stand out – Preparation plays an important role (if you are aware of the connection between the CR & UCS makes better connection) – Acquisition (establishment of a conditioned response) – Extinction (to remove or extinguish a conditioned response; NOT FORGETTING) – forgetting is loss of learning – Spontaneous Recovery (temporary return of an extinguished response) – **EXTINCTION DOES NOT FULLY ERASE THE CONNECTION BETWEEN CS AND CR**
- Explaining Classical Conditioning – the CS is a signal to an organism (it prepares them; signals the likelihood of events) – Stimulus generalization (inability to distinguish between stimuli) – Discrimination (ability to distinguish between stimuli)
    - Conditioning – CS Contiguity and contingency – A CR develops if there is predictability (CONTINGENCY – presence of one thing depends on (signals) the presence of another) – CONTINGUITY (how close the two things come together) (when the CS occurs relative to the UCS matters too) – Temporal Contiguity (Closeness in time aids the process of conditioning; the sooner the UCS occurs after the CS the better you pick it up) – Forward conditioning (CS 1st then UCS (best for conditioning) – Simultaneous Conditioning (CS & UCS at same time) – Trace Conditioning (CS way later than UCS) – Backwards (UCS then CS)
- Redundant Contingency – Blocking (Add another stimuli; if you do it at the same time the second learned will not take)

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- Operate (Instrumental) Conditioning – Thorndike (Cats; Graphed Learning Curve; Recorded speed (Cat's lucked into it didn't learn it) – The escape acted as a reinforcement (Reinforcement is any experience that rewards you for something; the response that reinforces it will be chosen more even with the rest of the variables the same (S → pleasure → increased responses; S → nothing → no change; S → pain → decreased response)
- Operant/instrumental response – changes behavior because of reinforcements – subjective behavior determines and is effected by certain outcomes – Positive (giving something to someone (jail time (P); a treat ®)) – Negative (taking something away (No Homework®; no Xbox(P)) – most people respond better to immediate response and immediate punishment – Best = super harsh immediately – mild, logical, and consistent punishment can be informative and helpful
- BF Skinner (Deterministic; lots of work) – operant conditioning – 1950s professor at Harvard – Skinner box (Lever and cue; work according to when cue is given) – Train an animal to tap a lever according to a cue for an award (how do you teach them?) – Shaping (teach and reward for close to correct behavior and getting closer to exact behavior as you go) – Punishers are not good for teaching – Chaining (comes after shaping; trying together a sequence of shaped events)
- Types of reinforcements and punishers – Reinforcement (anything that makes a behavior continue) – Primary Reinforcement (Anything biologically necessary – ex. Food, sleep, companionship) – Secondary (anything considered a want – ex. Privileges, sex, praise, money) – Punisher (anything that makes a behavior cease)
- Schedules of Reinforcement – ratio (amount of responses) – Interval (elapsed time) – Fixed (same every time) – Variable (varies

	Ratio	Interval
Fixed	Responses	minutes
Variable	R, 10 R, 12 R, 2 R, 189 R	3 min, 4 min, 7 min, 40 min, 2 min

- Variable ratio – Results in the highest number of responses over shortest amount of time - Gambling
- Continuous Response – lowest number of responses over longest period of time
- Order from most effective to least effective
    - Variable Ratio
    - Fixed Ratio
    - Variable Interval – pop quizzes
    - Fixed Interval – tests in college
    - Continuous Response
- Reinforcement → Increased behavior – Escape learning or Active Avoidance Learning (Negative Reinforcement)
- Punishment → decreased behavior – (Operant Conditioning with punishment – Passive Avoidance Learning) – Omission Training (Negative Punishment)
- What constitutes reinforcement? – Premark Principle (States that the opportunity to engage in a preferred behavior will reinforce us for preferred behavior) (Ex. A person who loves movies but doesn't like museums will go to a museum if told they can get free movie passes for going) – Disequilibrium principle (each person has a preferred pattern of dividing time between various activities) (if one is unable to engage in that pattern a return to it will be reinforcing) – Discriminative stimulus (A stimulus that indicates which response is appropriate)

	Classical Conditioning	Operant Conditioning
Nature of Responses	Involuntary (reflexive)	Voluntary (usually) can be both
Timing of Stimulus	Precedes the response	After the response
Timing of Response	After the stimulus	Before the response
Role of learner	Passive	Active (awareness)
	Two stimuli are paired	A response is followed by a reinforcement

- Variations of learning – conditioned taste aversion (If learning occurs reliably after just one trial it is hard to know if the learning was the result of CC or OC; occurs after single trial; ex. Wendy's) – Birdsong learning (Resembles the human language learning in some way; requires social context; has optimal period for learning really early in life; starts kind of with babbling; deteriorates with clearness; Not cc (no -visceral response); Not oc (no reinforcement) – Social Learning (Albert Bandura – this is the idea that we learn a lot of behaviors before we attempt them; modeling and intimidation; results from observing others then weighing the consequences) (Experiment with Bobo dolls by Bandura; children who saw aggressive behavior were more likely to behave violently; vice versa with good natured behaviors; hypothesized that the children were imitating the behaviors they'd just seen; great interest in this; violence in media affecting children?; determining appropriate behavior) – Self Efficacy in Social Learning (Imitate those who we admire; must be achievable; Me becoming Lil Wayne is not achievable) – Vicarious reinforcement and punishment (learning from mistakes we see other's make; appears to be super effective in ways (reinforcement works better than punishment)

Chapter 7 – Memory

- Memory – storage, retention and recall of events, information and procedures – varies in quality based on the nature of the information retained and recalled – level of interest and significance to the individual – memory is not a single store of information which we place the sum of our knowledge and experience
- Types of Memory – Short Term/Working Memory – Long Term Memory (Consolidation) (Implicit – skills, tasks (Procedural)) (Explicit – Declarative (Semantic (what you learn in class)) (Episodic (Your memory of the class and how it went))
    - **Human Memory – Sensory (Less than one second) – Short term (Less than one minute) – Long Term (Lifetime) (Explicit (Consciousness) (Declarative (Facts; Events) (Episodic (Events; Experiences)) (Semantic (Facts; concept)) (Implicit (Unconsciousness) (Procedural (Skills; Tasks))**
- Back to Ch. 6 – Classical conditioning is an implicit memory – Operant conditioning is both implicit and explicit depending on the behavior
- How do we get things from our sense to our memory?
    - World → sensory (sensing) – (Attention Selection) → Short term (thinking) – storing/retrieving → Long term (Memory Bank)
    - Or World → Sensory ----→ implicit long term
- **Ebbinghaus** Pioneering Studies of Memory – Studied his own ability to memorize new material – invented nonsense syllables and organized them into random lists – noticed difference between memory and recall – constantly forgetting – discovered that meaning and distinctiveness helps memory – Distinct and unusual information is easier to retain (Von Restorff Effect) – created learning curve
- Dependence on memory depends on how you test it – Free Recall (Recall) (Easiest to give; hardest to recall; information must be produced with little to no hint provided; essay with no prep) – Cued Recall (Gives the test-taker significant hints about correct answer) – Recognition memory (Multiple Choice) – Hints that bring forth long term memory (Retrieval Cue) – Saving (Relearning) Method (Compares the speed that new material is learned at to the speed of relearning old material
- Meaningful storage of memory – Lists of serial order and effect – the beginnings and ends (Primary effect – better memory for the items at the beginning) (Recency effect – better memory for items at the end of a list)

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- How much can we remember? – STM (most adults can repeat a list of 5-9 bits (bit- parts of information) 7 bits is typical) (Increased by practice or chunking – putting together into large, meaningful units) (Susceptible to the passage of time) – LTM (Capacity can't be measured) (Constantly dump and remove stored information through disuse – not just a passage of time) (Info stored in LTM susceptible to interference)
- Nature of memory – memory is complex and its properties depend on number of factors (Types of memory; method of testing; length of time since material was previously seen or attempted)
- Consolidation/Encoding – formation of LTM – more likely to happen with meaningful info
- Encoding – short term memory to long term memory – same as consolidation – memory is broken down and components are stored – what helps us encode? (Encoding enhancers – meaningfulness and salience (Emotional intensity – Traumatic stands out where as good may run together) (Primacy and Recency) (Depth of Processing – numbers and types of links you make the information to other things you know; begin active in thinking about information) (Repetition; spaced review) (Retrieval cues; e.g. Location; mnemonic)
- Meaningful storage and levels of processing – Levels of processing principle (Levels of processing are – superficial (Repeating the material you are memorizing) – Deeper (think about each item or each part of the material) – Still deeper (note association between the items or parts of the material)
- Consolidation (the biological side of encoding) and storage – Spines are made and they then come together as the brain realizes they relate – Certain Areas of the brain work on memory: Cortex (Declarative memory), Thalamus, Striatum (Procedural Memory), Prefrontal Cortex (working memory), Mammillary body (Declarative), Amygdala (emotional memory), Hippocampus (Memory acquisition), cerebellum (Procedural memory)
- Retrieval enhancer – encoding a retrieval cue (bits of association information that helps us regain complex memories – many factors associate with learning information can act as retrieval for later) – Attempting to retrieve/recall several times (Hypernesia)
- How to forget – make info meaningless – one big cram session – huge gap between studying and test – do it as mindlessly as possible
- Retrieval and interference – understandable reasons for forgetting (interference – memories block each other) (Decay – memories are subjected to the combined effects of time and interference) (Loss of retrieval cues) (Source amnesia – semantic and episodic memory – can remember information but cannot remember where you heard it
- Reconstruction and interference – bringing something from LTM to STM makes it vulnerable – new memories overlap – rewriting a memory – consolidation brings a memory from an unstable environment to a stable environment – reactivity brings a memory from a stable environment back to an unstable environment and then back into the stable environment – sadly this can lead to improper encoding (reconstructing stories – can't remember so we fill in the blanks with what is likely) (hindsight bias – we often remember our past thoughts or behaviors as aligning with the present happenings or information – may not be conscious) – can be good for people with traumatic experiences and PTSD
- Repression and disassociation – repression is unconsciously not retrieving memories (defense mechanism) – disassociation is the inability to retrieve memories due to improper storage at the time of the even due to trauma (not organized) – depending on where you have physical trauma you may lose certain memories or functions
- Amnesia – severe loss of deterioration of memory – much can be learned from case studies – HM Case (hippocampus and surrounding areas of the temporal lobe of this man's brain were removed to control his epilepsy – we learned that explicit long term memory involves the hippocampus but isn't stored there; the more difficult the task the harder it is to remember depending on the hippocampus; Implicit memory doesn't seem to involve conscious processing (Typing skills got better every time HM was "taught" without him actually learning)
- Alzheimer's – first described symptoms (brain shrinkage – plaques (beta-amyloid proteins) – tangles (tau proteins)) – this disease is not a normal part of aging (dementia – loss of intellectual ability) – starts with gradual memory loss and progresses to eventually effect every type of memory and behavior until the person in unable to take care of themselves and require around the clock care until the brain is unable to continue regulating life sustaining processes and the person dies
- Infant Amnesia – Freud thought that this was repression – some cognitive psychologists believe that this is because early memories are nonverbal and later memories are verbal- biological explanation is that the hippocampus is not fully developed – lasting memories require a sense of self that isn't fully developed until someone is 3 or 4