



Chapter 3 – States of Mind

- I. States of Mind
 - a. Conscious
 - i. Brain forms a model of the world, combining external stimulation with internal experience.
 - b. Pre-conscious (Memories that can be retrieved by the conscious easily.)
 - c. Sub-Conscious (Processing background information to be sent to conscious if needed)
 - d. Un-Conscious
- II. Sleep
 - a. Theories of Sleep Function
 - i. Conserve Energy
 - ii. Avoid Predation
 - iii. Restore Depleted Resources
 - 1. Build-up neurotransmitters
 - 2. Protein Synthesis
 - 3. Muscle growth
 - iv. Clear excess info from CNS (Not enough resources for *everything*)
 - v. Consolidate memory (essentially same as above)
 - vi. Need to dream
 - b. Entrainment = Ability of light-dark cycle to regulate circadian cycle
 - c. Free-running-clock
 - i. Pattern that humans/animals follow when no light-dark cycle is present
 - ii. Humans shown to follow 25 hour cycles (not 24)
 - d. Suprachiasmatic nucleus (In hypothalamus, where visual signals cross to appropriate sides of the brain. Visual stimulation activates this, and affects Reticular formation.)
 - e. Stages of Sleep
 - i. REM and NREM. During REM, pontine reticular formation inhibits all voluntary muscle movements.
 - ii. Awake = Beta Waves. Low Amplitude, High frequency
 - iii. Drowsy = High Amplitude, Slower Frequency
 - iv. Stage 1 = Theta Waves (Low Amplitude, Low Frequency)
 - v. Stage 2 = Sleep Spindles, and K-complex <Refer to Figure 3.2, page 93)
 - vi. Stage 3 = Beginning of Delta waves (High amplitude, Low frequency)
 - vii. Stage 4 = Delta Waves increase
 - viii. REM = Occurs after we re-enter Stage 1, about 90 minutes after falling asleep.
 - f. Deprivation (Animals die after about 33 days of sleep deprivation)
 - g. Disorders
 - i. Insomnia (Difficulty Sleeping)
 - 1. Chronic
 - 2. Temporary or Situational
 - 3. Benzodiazapines (Valium, Ambien) = Drugs to treat
 - ii. Sleep Terrors
 - 1. Like nightmares, but *no* recollection of content!
 - 2. Occur in stages 3 and 4
 - iii. Narcolepsy
 - 1. Falling asleep outside of one's control
 - 2. 30 Seconds > Several Minutes
 - 3. Problem in RAS.
- III. Dreaming
 - a. Theories of Dream Function
 - i. Activation-Synthesis Theory: Random electrical activity in the brain acts as stimulus. Dreams = Brain trying to interpret.
 - ii. Mental Reprogramming: Dreams help reorganize memory system to accommodate new information.

- iii. Problem Resolution
 - iv. Expression of unconscious (psychoanalytic theory from Sigmund Freud)
 - 1. Manifest Content (Example: "A snake")
 - 2. Latent Content (Example: "A penis")
 - 3. Freud's Solution to Everything = "Penis" [Not directly from lecture, but a darn good observation]
- IV. Drugs
- a. Agonist = Mimic/Help neurotransmitters
 - b. Antagonist = Hinder/reduce affect of neurotransmitters
 - c. Blood-Brain Barrier: Ability of drugs to permeate this barrier affects their psychoactive properties.
 - d. Stimulants
 - i. Cocaine, amphetamine (methamphetamine, MDMA) – Agonist of dopamine & others (Ecstasy = MDMA?)
 - ii. Nicotine > Nicotinic acetylcholine agonist
 - iii. Caffeine > Adenosine antagonist. (Adenosine is a neurotransmitter used to shut off OTHER neurotransmitters.)
 - e. Opiates (Natural Pain Killers)
 - i. Morphine (comes directly from Opium)
 - ii. Codeine (Comes directly from Opium)
 - iii. Heroin = Much Faster Acting (permeates blood-brain barrier faster)
 - f. Hallucinogens
 - i. LSD, Psilocybin > Serotonin (mixed effects as agonist, antagonist)
 - ii. PCP > Glutamate antagonist (uncommonly toxic/lethal. Glutamate = Primary neurotransmitter in brain)
 - iii. Mescaline > Serotonin & Others
 - iv. Cannabis > Anandamide Agonist
 - g. Depressants (GABA / gamma-aminobutyric acid agonists)
 - i. Barbiturates (Valium – anti-anxiety – easy to OD)
 - ii. Benzodiazapines
 - iii. Alcohol
 - h. Definitions used in Drug Research
 - i. Dependence: How difficult to quit
 - ii. Withdrawal: Specific symptoms when quitting.
 - iii. Tolerance: How much is needed to satisfy increasing cravings, and the level of stable need eventually reached.
 - iv. Reinforcement: Ability to maintain behavior (take it repeatedly) in preference to other substances
 - v. Intoxication: Degree to which being on the drug impairs ability to function normally.