Jon Hwang's IBSL Psychology Notes – Behavioristic Approach

Behaviorist Approach
- focuses on learning, changes in behavior because of experience
- Excluding changes due to fatigue, injury, drugs, etc.
- known for relationship between responses/stimuli (observable behavior/environmental events)
    - ex: fire catches kids eye, so he reaches for it (STIMULI), gets burned, and wets pants…no withdraws hand (RESPONSE)
    - ex: food looks tasty (STIMULI), Jon eats it (RESPONSE)

Basic Assumptions
- Beginnings: due to lack of technology and therefore limitations in research, William James thought about how behavior fits in (functionalism). so thanks to him, the idea of behaviorism arose because of limitations in technology and research was going nowhere.
- Majority of all behavior is learned from environment
- Only observable behaviors should be cared about (not feelings or other sympathetic shit, we don't care how you feel, damn you)
- PARSIMONY – simplest explanation of action/event. AKA Occam's razor.
- Behaviorism places emphasis on OPERATIONAL DEFINITIONS, defining concepts in terms of observable events
- ASSOCIATIONISM – mental processes, like learning, are based on associating one idea with another to connect ideas and events. Supported by Aristotle, David Hume, J.S. Mill
- Review: main ideas: parsimony – simplest explanation, and associationism – associating shit to learn

Psychologists, pioneers, whatever

EDWIN L. THORNDIKE (1874-1949)
- studied under William James at Harvard, transferred for financial reasons to Columbia university for PhD in psych dept.
- at Columbia he studied under James McKeen Cattell, very influential early psychologists
- he studied problem-solving in animals with puzzle-like tasks, like cat-in-box-needs-to-press-lever-to-get-out
- wrote <u>Animal Intelligence</u> in 1898
- known for "LAW OF EFFECT"
    - any response that the subject likes or is satisfying to will most likely be repeated, and vice versa
        - ex: I eat In 'n Out, I like, I go back for more. I eat stupid black mushrooms cooked Chinese style, I throw up, I don't go back for more. Get it, biatch?
    - Form of associationism, subject making connection and learning how to get what they like and what they don't like
    - Also associationism by contiguity, because it assumes response and consequence are 'closely related in time and space'
    - This idea extends back to Greeks, who first thought of reward and punishment
    - However, Thorndike supported it by EXPERIMENTS
- This idea was good, but was vague about how something was 'satisfying' enough to make you want to do it again…kind of like sex.
- Because there wasn't enough technology back in that day, they had to resort to "non-observable concepts"
- But this violated the law of PARSIMONY…fine not really a law, but you get the idea…but a more radical approach was given by…
- Also father of OPERANT CONDITIONING (cat-lever experiment)

JOHN B. WATSON (1878-1958)
- studied at U. of Chicago

- initially trained in introspectionism, didn't like it because it was too vague, esp. on its emphasis on mental processes
- got PhD, youngest graduate from university
- taught 4 years at Chicago
- went to JHU to become professor, then chairman of psych dept. there
- wrote Behaviorism (1930)
- specialist guy who thought he could train any kid into anything he wanted (p.101 of psych2 book)
- he was the REAL founder of Behaviorism
- Watson's extreme position known as "radical behaviorism"
- Ideas split into 3 categories:
    - Emphasis on response/stimuli (or stimuli/response, whatever)
    - Rejection of mentalistic concepts not grounded in direct observation (anything NOT behavioristic)
    - Focus on learning and experience

IVAN PAVLOV (1849-1936)

- wanted to understand digestion
- worked with dogs, earned Nobel Prize in 1904
- he noticed first that dogs salivated when it was given food…called it 'psychic salivation' (they're BELEMIC)
- known for CLASSICAL CONDITIONING
    - study of learning which involves reflex responses where a neutral stimulus comes to elicit an existing reflex response due to learning
- did whole trick with bell followed by food, then bell without food but dog still salivates
- UNCONDITIONED RESPONSE (UCR)
    - REFLEX (involuntary) response produced by stimulus
    - Pavlov: salivation
- UNCONDITIONED STIMULUS (UCS)
    - Stimulus which elicits an UNCONDITIONED response
    - Pavlov: food
- NEUTRAL STIMULUS (NS)
    - Produces no specific response, but in time becomes the CONDITIONED STIMULUS because it's CONDITIONED
    - Pavlov: bell
- CONDITIONED STIMULUS (CS)
    - Starts neutral, but when repeatedly paired with UNCONDITIONED STIMULUS comes to elicit a CONDITIONED RESPONSE
    - Pavlov: bell, after being paired with food
- CONDITIONED RESPONSE (CR)
    - Response to previously NEUTRAL STIMULUS which became a CONDITIONED STIMULUS
    - Pavlov: salivation

LOUIS TWITMEYER

- did same experiment as Pavlov, around the same time, but died unrecognized

B.F. SKINNER (1904-90)

- father of OPERANT CONDITIONING
- trained as grad student at Harvard (Hah-vahd)
- influenced by Watson and found himself frustrated with psychology vocabulary. Found terms referring to mental sates as vague and unnecessary (like Watson)
- argued that if thoughts and mental states were open to study, they would lose all value in explaining behavior
- came up with RADICAL BEHAVIORISM
    - insisted that mental states were both inaccessible and irrelevant to studying behavior

- he actually coined the phrase OPERANT CONDITIONING to replace Thorndike's "instrumental learning"
- he called classical conditioning as "respondent conditioning"
- his work has been regarded as theoretical, as a "meta-theory", a theory of a theory
    - a theory of what makes a good theory of behavior
- in short, Skinner was a very deceptive man. Okay, so that wasn't important.

NEAL MILLER
- worked with DiCara, and wondered if it's possible to use OPERANT REINFORCEMENT with reflexes or involuntary responses
- after working with paralyzed rats, Miller realized it was possible
- discovered AUTONOMIC CONDITIONING
    - a.k.a. LEARNED OPERANT CONTROL OF AUTONOMIC FUNCTIONS
    - the conditioning of involuntary responses by providing operant reinforcement

LEO DiCARA
- worked with Miller
- was discredited by controversy of not being able to reproduce original experiments
- so he goes into history books as the forgotten pioneer

KONRAD LORENZ
- actually a biologist, discoverer of the approach of ETHOLOGY
- ETHOLOGY
    - study of animal behavior in their respective environments

MARTIN SELIGMAN
- developed PREPAREDNESS
    - the idea that some behaviors don't need to be learned, they are already 'prepared' at time of birth

Ideas

STIMULI AND RESPONSES
- if behaviorism focuses on just observable events, it can limit itself on what can be studied
- thoughts, feelings, mental states, are not empirical, and are not behavioristic
- genetic variation is also inaccessible
- ENVIRONMENT
    - Sights, sounds, smells, are all STIMULI (S)
    - Any event, object, situation, or factor that is measurable and may affect behavior (measurable change in environment)
    - Ex: tiger shit
    - Sometimes it's hard to decipher what actually is stimuli…is it the smell of the tiger shit? The look? The texture? In this regard, we need "operational definitions" of terms
- RESPONSE (R)
    - Different kinds of responses, researchers must look for meaningful value in situation
    - Often it requires specifying the rate, intensity, and/or other characteristics of response
    - 2 kinds of response: REFLEX, and VOLUNTARY RESPONSE
    - REFLEX
        - Unlearned response triggered by specific STIMULI
            - Ex: Burger make Jon salivate (the kind with the grilled onions)
    - VOLUNTARY RESPONSE
        - Response controlled by individual rather than being 'triggered'
            - Ex: Jon eats burger (the kind with the grilled onions) but still ends up with empty feeling in stomach…sounds like a monorail

CLASSICAL CONDITIONING

- See Ivan Pavlov, father of classical conditioning
- Review. You pair NS with UCS to condition, so that the NS becomes the CS to produce the same response that the UCS did.
- But what if a new stimulus was used that was SIMILAR to the CS?
    - STIMULUS GENERALIZATION – the tendency to produce a CR to both CS and things similar to the CS
- If similar enough to the CS, then CR will be produced
    - Ex: hot stove, or anything that's glowing and red is hot and will burn
- But if CS_1 produces a strong CR, and CS_2 produces a weak CR, then they are not very similar, vice versa
    - Ex: Pavlov used the presence of a black square to make dog salivate, and dog also salivated at sight of grey square
- STIMULUS DISCRIMINATION
    - Subject is conditioned to distinguish or discriminate between a CS and a similar S
    - Ex: Pavlov made black square followed by food, grey square not followed by food, dog eventually figures out that black square=food
- STIMULUS DISCRIMINATION always requires TRAINING…without it, subjects will GENERALIZE
- Though WHAT we discriminate is based on experience, the CAPACITY to discriminate is crucial to survival and adaptation
    - Ex: jobs that require color blindness
- However, as Russian researcher W.H. Gantt commented on, sometimes CR will continue so long and become detrimental
- EXTINCTION
    - The cessation of the CR when the CS is paired WITHOUT the UCS
        - Ex: Pavlov and co. no longer provided food (UCS) with the sound of the bell (CS) so that the dog no longer salivated (CR)
    - To make EXTINCTION occur, there needs to be 'active training' in extinction
        - Ex: fear of dentist's drill will persist if nothing is done to prevent fear in between visits
    - Time affects EXTINCTION, and reverses process…kind of
        - Ex: Pavlov waited a few hours before ringing bell again, and so the dog once again salivated, but not as strongly as before
- Pavlov called this SPONTANEOUS RECOVERY
    - The reoccurrence of the CR when the CS is presented after some time has elapsed since extinction training
    - This implies that anything learned is never completely forgotten
- What if the CS has no relation or connection to the UCS? Then we have…
- HIGHER-ORDER CONDITIONING
    - Previous CS is used as a UCS to create more conditioning to a new stimulus
        - Ex: Pavlov presented black square when he sounded the food buzzer, and black square made dog salivate. However, the buzzer wasn't presented with food so it served as an extinction also. So many frickin' connections!
    - Pavlov called this SECOND-ORDER CONDITIONING (the extinction part)
    - Then using the black square as a UCS to link a new stimulus was the THIRD-ORDER CONDITIONING
- WATSON saw in Pavlov's work the possibility of emotions in behaviorist studies
- Watson went about it by believing that emotions represented observable responses
- He tried to create emotional responses experimentally
- Best known case was done with Rosalie Rayner (NOT mother, just partner-in-crime), with little ALBERT
    - Watson and Rayner 1920
- ALBERT: 11-month boy in hospital for reasons other than research
    - WATSON observed ALBERT and tested his responses to various STIMULI
    - WATSON/RAYNER associated a white rat with the sound of a loud metal gong
    - Loud noise elicited UCR of being startled and begin crying

    - ALBERT first cried at sound of gong, then cried at site of rat
    - RAT – NS (neutral)
    - FEAR – CONDITIONED EMOTIONAL RESPONSE
        - Emotional response (fear) established through classical conditioning
    - Many objects resembling the white, fluffy rat coat caused the same EMOTIONAL RESPONSE because of GENERALIZATION (oh-ho! Didn't see that one coming did you?)
    - WATSON/RAYNER attempted to extinguish fear/emotion by presenting rat without gong
    - 3 weeks passed, didn't work. ALBERT was discharged from hospital. Experiment ended.
- 2 reasons for failure of EXTINCTION
    - Fears and other responses of nervous system are hard to extinguish (Gantt 1966)
    - Occurrence of GENERALIZATION must be extinguished which is very difficult
- Nowadays that experiment would be considered unethical, if you care
- Conditioning can also be related to responses to bodily processes such as drugs or disease
- PAVLOV made sound of tone paired with drug that induced vomiting (UCS). After conditioning, as expected, dog vomited to sound of tone without drug
- This is interesting because a drug can have it's effects WITHOUT having to actually consume it
    - More recent work has showed that with some drugs, the CR is the OPPOSITE of the normal effect of the drug
        - Ex: rats put in environment while injected morphine. Morphine normally reduces pain, but here after conditioning it increased sensitivity to pain when placed in the right environment
        - Ex: diabetics will become numb to their insulin over time
- Why does this variation in response occur?
    - Possibility of being related to type of drug and body's response
    - Some reactions that are strong, like the vomiting, gradually diminish as drug dissipates
    - Some reactions that are biological and strive to maintain homeostasis/equilibrium in the body, the body creates an opposite reaction to counter it
- Experiment of rats and saccharine-water done by ADER and COHEN, 1975
- Experiment gave water to rats same time a drug that inhibits immune-system responses was given
    - Result: anything sugar-sweet inhibited immune-system response

OPERANT CONDITIONING

- Most of our behavior is voluntary, responses are not made by conditioned stimuli, they are EMITTED
- EMITTED – generated by environment
- From this, we get OPERANT CONDITIONING
    - Form of learning dealing with changes in emitted responses as a function of their consequences
        - Ex: Jon eats shit (voluntary response) and throws up (consequence), he may not eat shit thereafter
- OPERANT CONDITIONING comes from EDWIN THORNDIKE
    - Experiment: cats were put in 'puzzle box' and had to free itself by pressing a lever. But Thorndike added food outside of the puzzle box, incentive was even greater to get out so cats learned to press lever so they could escape and get food. Mmmm…donuts…
- Two conclusions came from this experiment
    - If time was measured, time would gradually decline with repeated trials
    - The satisfying outcome would be food, and that's what led to the behavior being repeated. Other actions such as scratching at walls, which did not lead to satisfaction, declined.
    - From this, Thorndike formulated the LAW OF EFFECT (yeah!)
        - Behavior which leads to good effect will be repeated, and vice versa.
- This experiment laid foundation for study of non-reflex behavior. Depending on consequences, action may or may not repeat in the future

- Also known as “COMMON SENSE” (no that wasn’t sarcasm)
- Another key aspect of OPERANT CONDITIONING is the interaction between the CONCEPTS and PROCEDURES used
- Skinner found that puzzles, tasks, mazes, etc., all required extensive labor
- He decided to simplify and allowed a running of continuous trials. He called this apparatus AUTO-ENVIRONMENTAL CHAMBER
- Since it was a simple small box with a lever, they called it the SKINNER BOX
- OPERANT CONDITIONING largely considered the FREQUENCY of behavior
    - Ignoring such aspects as intensity, duration, or quality of responses
- Skinner attempted to address Thordike’s LAW OF EFFECT (anything that produces a satisfying reaction will be repeated, and vice versa)
    - Skinner was bothered by the term “satisfying”
    - So he coined the new term, REINFORCER
        - A stimulus, after a certain response, which will result in an increase in the probability of the response recurring, or “reinforcing the probability”
        - In contrast to ‘satisfaction’, a REINFORCER becomes an observable environmental event
        - In simplest terms, a REINFORCER is a reward
    - REINFORCEMENT
        - How a REINFORCER increases the probability of a response
    - Basic REINFORCERS are known as PRIMARY REINFORCERS
        - Such as food, water, things that have an innate biological significance
        - Ex: baby cries when hungry, when it gets food (the REINFORCER in this case) it will stop crying. As a result, when baby wants food, it cries
    - CONDITIONED REINFORCERS
        - These are environmental events that are REINFORCERS but are not based on biological survival.
        - Ex: money, praise, attention, etc.
        - They are stimuli which have reinforcing properties because of association with a PRIMARY REINFORCER
        - Ex: baby cries, mom comes and baby receives attention, but also receives food or something, which is the PRIMARY REINFORCER
        - Probably money is the most powerful CONDITIONED REINFORCER in our society
        - CONTIGUITY is very important. Praise should be given immediately
        - Ex: Jon uses toilet instead of wetting pants. He is burning a bible when his mom rewards him for the good deed of using the toilet. He may associate it in the future with burning bibles.
    - NEGATIVE REINFORCER
        - A stimulus that follows a response and decreases probability of response in future
        - They can be PRIMARY
            - Physical blow, electric shock, etc.
        - They can be CONDITIONED
            - Criticism, ignoring, fines, etc.
    - POTITIVE REINFORCER
        - Opposite of above, increases probability of response in future
    - CONTINGENCY OF REINFORCEMENT
        - Relationship between response and reinforcer
            - Ex: Jon gets sexual favors for using toilet and not wetting pants.
                - Response: using toilet instead of underwear
                - Reinforcer: sexual favors
        - Contingency describes how something depends on another event. One kind of contingency is reinforcement
        - 2 kinds of CONTINGENCY
            - POSITIVE REINFORCER

        - Used to increase probability of response
    - NEGATIVE REINFORCER
        - Done to decrease probability of response
- NEGATIVE REINFORCER is also PUNISHMENT
- POSITIVE REINFORCER is POSTIVE REINFORCEMENT
- NEGATIVE REINFORCER is NOT NEGATIVE REINFORCEMENT
- NEGATIVE REINFORCEMENT
    - Terminating or withholding a NEGATIVE REINFORCER, not the same as NEGATIVE REINFORCEMENT
    - Terminating as in stopping NEGATIVE REINFORCER when desired response is given
    - Or withholding as in not giving NEGATIVE REINFORCER to hopefully produce the desired response
- NEGATIVE REINFORCEMENT has 2 variations, escape and avoidance
    - Escape: to give desired response to eliminate negative reinforcer
    - Avoidance: to give desired response to prevent negative reinforcer
- Also a possibility of terminating and/or withholding a POSITIVE REINFORCER
    - This is called OMISSION, similar to PUNISHMENT, because they both DECREASE RESPONSE by giving something undesirable or withholding something desirable
- Final note on reinforcement
    - Value of REINFORCEMENT is determined by organism
        - Ex: if you sing, you get a milkshake. If you sing again, you get another one. If you sing yet again you get a third one. But after the third or so milkshake, which used to be the POSITIVE REINFORCER, it has become a NEGATIVE REINFORCER because you become nauseous at the thought of having another fucking milkshake. It wouldn't matter at all if you were lactose intolerant. But you aren't, are you?

- SHAPING
    - The process of reinforcing successive approximations to the desired response
        - Basically taking baby steps to the main goal, with each baby step being positively reinforced
        - Ex: language learning, physical therapy, smoking rehab, animal training, etc.
- EXTINCTION
    - The drop in responding when reinforcement is discontinued
        - Relates to classical conditioning when no longer pairing CS with UCS which results in termination of CR
    - EXTINCTION implies that to be effective, reinforcement must be given after every response
        - However, students only receive praise after the occasional test
        - Also, people only get monthly/occasional pay
    - TRUE EXTINCTION
        - No reinforcement at all
- CONTINUOUS REINFORCEMENT
    - Reinforcement given after every response
- Both EXTINCTION and CONTINUOUS REINFORCEMENT are highly unlikely in the real world
- So we usually have PARTIAL REINFORCEMENT
    - Reinforcement doesn't follow every response, but some, just at varying intervals
    - The frequency is the SCHEDULE OF REINFORCEMENT
        - A description of the conditions which determine when a response will be followed by a reinforcer, or frequency, etc.
        - SCHEDULES can be described 2 ways
            - RATIO SCHEDULES
                - Number of responses between reinforcers
            - INTERVAL SCHEDULES

        - Amount of time between reinforces
        - FIXED SCHEDULES have regular intervals; they have fixed intervals
        - VARIABLE SCHEDULES are unpredictable and random; they vary
    - FIXED RATIO SCHEDULE
        - Number of responses organism must make for a reinforcer, which is defined or measured as FR x, where x is number of responses required
        - FR 1 is CONTINUOUS REINFORCEMENT
            - Applies to everyday life, especially to commission. Bookseller might get $10 for every 3 books sold
            - FR 3, with a $10 reinforcer
        - Increasing ratio tends to increase the rate of responding
    - VARIABLE RATIO SCHEDULE
        - Since it is unpredictable, the average number of responses which leads to a reinforcer is measured
        - VR 5, on average every 5th response is reinforced. On AVERAGE!!
        - Ratio is predictable over long periods of time usually
            - Ex: slot machine, with chance to win percentages
        - VARIABLE SCHEDULES are slightly better because the chances are random and the organism tends to be optimistic, hoping the next response will give a reinforcer
    - FIXED INTERVAL SCHEDULE
        - Defined by amount of time between reinforcers, measured as FI x, where x is required time
        - Time is not only requirement for reinforcer in this case, response still needs to be made, only after designated interval has elapsed, only then will you get a prize
            - Ex: bus stop. You don't get to ride the bus until a certain amount of time has passed. But if you're not at the bus stop when this happens, no matter how many times you checked it before, you don't get to ride the bus. Loser.
        - A special characteristic is that they only require a single response. The result of this is that FIXED INTERVAL SCHEDULES tend to produce rather low rates of responding compared to ratio schedules
            - Ex: one can procrastinate until the last minute. Usually no responses are given immediately after reinforcer, and very few inbetween. Then at the last few moments a surge of responses are given.
        - In conclusion, this schedule is not good to encourage steady responding
    - VARIABLE INTERVAL SCHEDULE
        - Defined as average time interval required over a long term, similar to how the VR (variable ratio) is also required over a term because an average is being taken. Measured as VI x, where x is the average amount of time measured
        - Again, like the VR, it's unpredictable and random
        - Ex: Pinkerton guard hired to watch loafers. At a regular interval, the loafer could work only when he is checked on because the intervals are predictable and planned. However, with variable intervals, they have to work continuously because the guard visits are random and unpredictable.
    - In generable, variable schedules (partial reinforcement) produce higher response rates and are more persistent than continuous reinforcement
    - When reinforcers are no longer available, it's called "resistance to extinction"
- DISCRIMINATIVE STIMULI
    - Stimulus which signals the contingency of reinforcement available
        - In other words, it help discriminate which type of reinforcement will be used
        - Ex: Johnny eats with fingers in front of dad, with fork in front of mom
        - Ex: Jon studies with parents around, Jon plays DDR when parents not around
- What about completely random reinforcement to possibly no response? i.e. finding money on the ground?

- NON-CONTINGENT REINFORCEMENT
    - No relation, reinforcers sometimes occur independently of any specific response; chance forms of reinforcement
        - Skinner put pigeons in Skinner box, and gave food pellets every 15 seconds, no relation to what the pigeon did. 6 of the 8 pigeons had developed elaborate, stereotyped response sequences
        - Skinner called these behaviors superstitious because they had to real effect on the availability of reinforcement
        - Superstitious behavior has no actual affect on outcome. i.e. wearing a lucky pair of boxers to play DDR

APPLICATIONS AND IMPLICATIONS OF CONDITIONING

- Behaviorists tend to be very interested in applying their understanding in the real world
- BEHAVIOR MODIFICATION
    - Behaviorist methods have been applied to many aspects of human behavior. These are the applications
    - Also, the application of conditioning techniques to altering human behavior, esp. abnormal behaviors
- AVERSIVE CONTROL OF BEHAVIOR
    - Fancy name for NEGATIVE REINFORCERS
- PUNISHMENT is probably most used method in society, but has several limitations
    - It depends on CONTIGUITY between response and reinforcer; reinforcer must immediately follow response
        - This is true with ANY operant reinforcement
        - Delayed punishment will be ineffective in regards to response
    - Second, it tends to encourage AVOIDANCE behaviors
        - The avoidance behaviors could be directed at the situation (and give desired response), or just to avoid the negative reinforcer (to hide in a corner and eat cheese)
    - Punishment tends to suppress behavior, not extinguish it
    - Punishment must be continuous in order to suppress behavior effectively
        - Whereas positive reinforcement can be highly effective with only partial reinforcement
    - Negative reinforcement in often more effective then punishment
        - Its focus is on increasing a desired response, no suppression is associated
        - Negative reinforcement is effective because it signals what is the desired response, whereas punishment simply indicates what is NOT desired
    - One consequence of AVERSIVE CONTROL is that it tends to promote anxiety, resentment, and even aggression
        - This is associated with use of ANY negative reinforcers
- Interrelations of OPERANT and CLASSICAL CONDITIONINGS
    - Mainly they are both occurring together simultaneously
        - Examples aren't available, too damn complicated, p. 138 of Psych 2 book
- Miller discovers AUTONOMIC CONDITIONING
    - See Neal Miller
    - How it works
        - For every voluntary muscle movement, brain receives PROPRIOCEPTIVE FEEDBACK (the information which tells what the function to be done is)
        - DiCARA and MILLER used technology to monitor this 'hidden process' to determine when to deliver a reinforcer
            - Almost like shaping the desired response
        - Now it's called BIOFEEDBACK
            - General term for applications of AUTONOMIC process. Refers to information (feedback) about physiological processes (bio) in the body
                - EMG – Electromyograph

        - Used to detect muscle relaxation, by measuring electrical activity in the motor neurons which control the muscles
    - ECG – Electrocardiograph
        - Used to measure heart activity, by basically the same thing
- BIOFEEDBACK is good for medical treatment, such as relaxation of voluntary muscles for tension control, reducing hypertension/high blood pressure, overall heart rate, etc.

- Situations and examples of behaviorist concepts are fairly artificial
    - What in God's name does manipulating a lever or ringing a bell have to do with an animal obtaining food in the real world?
- So there must be assumptions when generalizing from laboratory to the real world
    - One assumption is the EQUIPOTENTIALITY PREMISE
        - This premise is the assumption in which all principles of conditioning should apply to any type of response in all species (pigeons to cats to humans, etc.)
    - Next is ETHOLOGY
        - This comes from biology instead of psychology, esp. those biologists that have studied animal behavior, why? Because ETHOLOGY is the study of animal behavior in their respective environments
        - Founder of ETHOLOGY is Konrad Lorenz
        - SPECIES-SPECIFIC BEHAVIORS
            - Obviously, behaviors which are characteristic of all members of a particular species
            - These response patterns, called INSTINCTS, apply to such behaviors as mating, finding food, defense, and raising offspring
            - These tend to be genetically shaped behaviors
                - Ex: IMPRINTING
                    - A child, when born, immediately attaches itself to the closest moving object
    - Ethologists and behaviorists used to study independently of each other. However more recently they have correlated their studies
        - One of the common interests is interaction of hereditary and environmental influences on learning
    - Ethologists tend to believe that behaviors are governed by genetic make-up of a species
    - Behaviorists see it as completely malleable, based on conditioning, obviously
    - CRITICAL PERIODS
        - The concept of optimal periods for learning certain behaviors in the development of an organism in an species
            - Ex: language is best learned as pre-toddlers
    - PREPAREDNESS
        - Developed by MARTIN SELIGMAN (1970)
        - Concept to describe how physiological structure influences the occurrence of behavior
            - Ex: some behaviors develop with little or no experience required, like instincts. They are 'prepared' behaviors
            - So in this sense, SPECIES-SPECIFIC BEHAVIORS belongs in this category
        - In contrast, those behaviors that we need to learn are UNPREPARED
            - Ex: riding a bicycle
        - Then there are those behaviors which are impossible to even learn
            - Ex: flying. We just can't do it dammit.