Learning

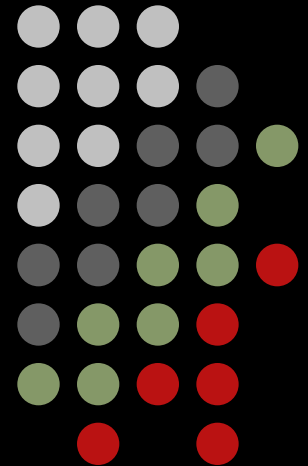## Principals and Applications

Chapter Nine

Classical Conditioning

- Purple and green pens experiment

- Pleasant sensations associated with product placement

Classical Conditioning

- Conditioning – old responses become attached to new stimuli.

- Ivan Pavlov – Russian physiologist discovered accidentally while studying digestion.

- Pavlov is now famous for his study.

Classical Conditioning

- Classical conditioning is a procedure where associations are made between a natural stimulus and a neutral stimulus

- Learning is a permanent change in behavior from experience

Pavlov's discovery

- Accidental
- Was actually studying digestion

- Became fascinated that dogs salivated before food was presented

Classical Conditioning

- Pavlov began by ringing a tuning fork and then placing meat powder on the dog's tongue.

- The tuning fork is the neutral stimulus, it has nothing to do with meat powder or salivation.

- After a few times, the dog began to salivate after the tuning fork, regardless of food or not.

Classical Conditioning

- An unconditioned stimulus is an event that brings a predictable response without training.
  - Ex. You stub your toe
  - Ex. Illness

Classical Conditioning

- The unconditioned response is an automatic, or natural response to a unconditioned stimulus.
  - Ex. You yell "Ouch"!
  - Ex. You vomit

What is the conditioned response?

Classical Conditioning

- The neutral stimulus is the stimulus that has nothing to do with either the unconditioned stimulus or the unconditioned response.

  - Ex. Carrying your laundry basket
  - Ex. Pretzels

Classical Conditioning

- The conditioned stimulus is the event that used to be neutral (often the NS) that gives a certain response after training has occurred.
  - Ex. Carrying your laundry basket you stub your toe walking around your furniture
  - Ex. You eat pretzels
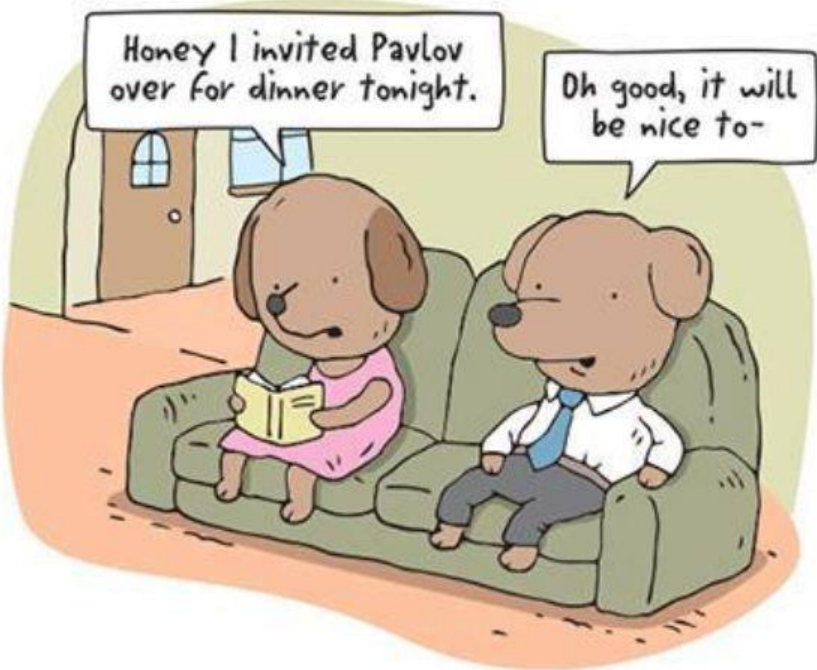
Classical Conditioning

- Conditioned response – the learned reaction to the conditioned stimulus.

  - Ex. You walk an extra wide path around your furniture.
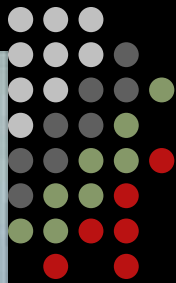
  - Ex. Pretzels now make you nauseous.

Parts of classical cond.

- Neutral stimulus
- Unconditioned stimulus (ucs)
- Unconditioned response (ucr)
- Conditioned stimulus (cs)
- Conditioned response (cr)

# Pavlov's Dogs Experiment

- Ringing bell dogs have no salivation
- Ringing bell + meat powder = salivation
- After a few times, ringing bell = salivation

- Unconditioned response=salivation
- Unconditioned stimulus=meat powder
- Conditioned response=salivation
- Conditioned stimulus=ringing bell

General Principles

- CC helps animals and humans adapt to the environment and avoid danger.
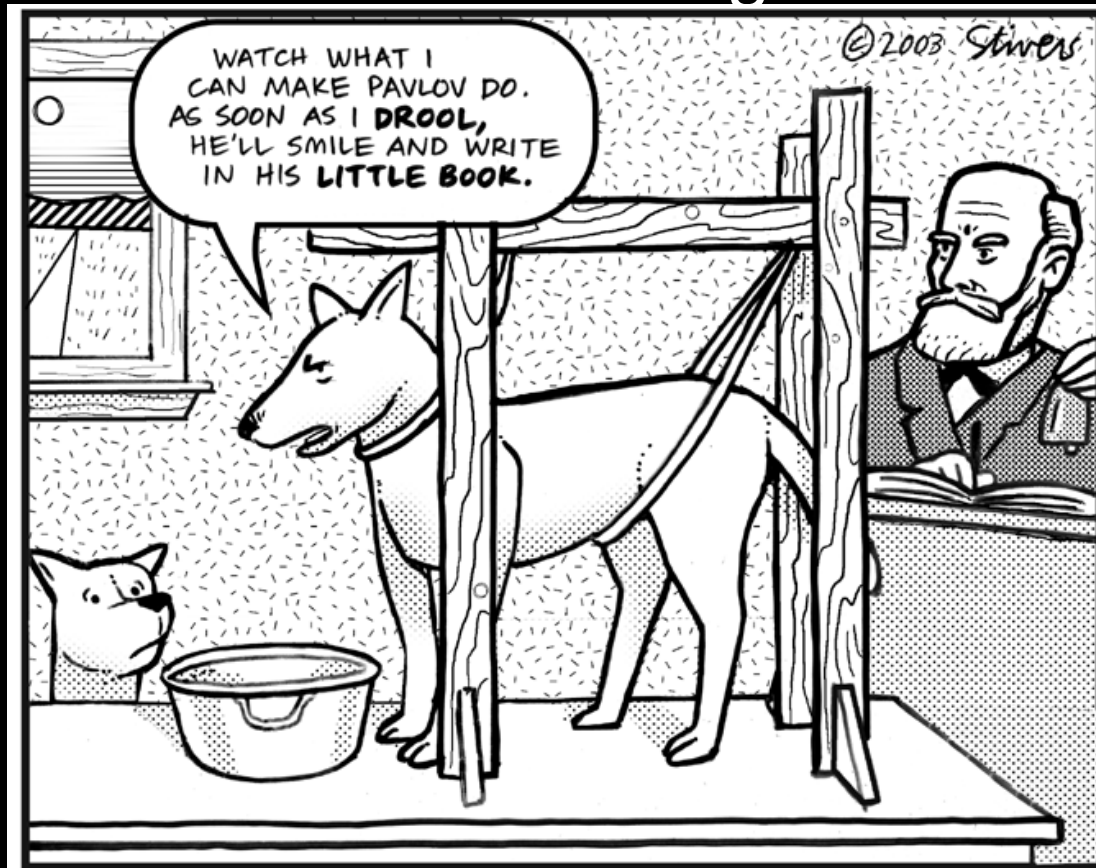
1. Before conditioning

Food
Unconditioned stimulus

response

Salivation
Unconditioned response

2. Before conditioning

Tuning fork
Neutral stimulus

response

No salivation
No conditioned response

3. During conditioning
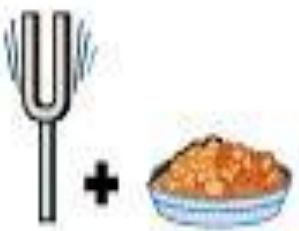
Tuning fork + Food

response

Salivation
Unconditioned response

4. After conditioning

Tuning fork
Conditioned stimulus

response

Salivation
Conditioned response

General Principals

- Acquisition

- Generalization

- Discrimination

Acquisition

- How quickly and how strongly the conditioned response is learned.

- CC is most reliable and effective when the conditioned stimulus is presented just before the unconditioned stimulus.
  - Ex. Tuning fork followed immediately by the meat powder.

Generalization

- Occurs when you respond similarly to similar stimuli.
  - Ex. Tuning fork, bell, horn, all get the same response.
  - Ex. Pretzels, chips, and snack chips all make someone gag.

  - Pavlov trained dog to salivate at a circle, but dog also salivated at an oval
  - Failure to distinguish between similar stimuli

Discrimination

- The ability to respond differently to different stimuli.

- Knowing the difference between the circle and oval, pretzels and chips, bell and tuning fork.

- Discrimination and generalization are complimentary.
  - Can happen spontaneously or be taught (drill)

General Principals

- Extinction

- Spontaneous recovery

Extinction

- The gradual disappearance of a CR when the CS is presented without the UCS.

- The salivation disappears when the tuning fork is repeatedly rung without any presentation of meat powder.

Spontaneous Recovery

- The CR may be extinguished, that is it is no longer occurring, but occasionally there may be a reappearance of the CR.

  - This can happen in real life, too. Car crash example.

CC and Human Behavior

- Little Albert
- Bed wetting solution
- Taste aversions
- Teaching infants
- Songs in movies

Classical conditioning

- Part of behaviorism theory

- Dependent on observable actions

- Not concerned with thoughts

Classical Conditioning Rules

- Always a specific UCS that brings desired response.

- UCS not dependent on learner's response

- Learner responds to its environment

Operant Conditioning

- Learning from consequences

  - Dog wandering the neighborhood – gets a bone

  - Depressed woman in hospital

Operant Conditioning

- Learning in which a certain action is reinforced or punished, resulting in corresponding increases or decreases in occurrence.

- How voluntary behavior is affected by its consequences.

Reinforcement

- B.F. Skinner
- Behavior based on rewards and punishments
- Reinforcers (- and +)
- Laboratory rats and skinner box – food appeared in a cup after behavior was presented

Reinforcers

- Reinforcers can be positive or negative.

- Positive reinforcers are something that is added after an action.
  - Allowance, treats, rewards.

- Negative reinforcers are something unpleasant that is taken away after the action.
  - Pain reduction, leaving earlier in traffic, sunscreen

Reinforcers

- Primary reinforcer
  - Satisfies biological need
    - Hunger, thirst, sleep
- Secondary reinforcer
  - Acquires value in reinforcement
    - Money, poker chips, praise
- Chimps and poker chips

Schedules of Reinforcement

- Continuous schedule – rewarded each time behavior occurs

- Partial schedule – intermittent rewards
  - Ratio schedule – based on the number of correct responses made between reinforcements

  - Interval schedule – based on the amount of time that elapses before reinforcement is given.

Schedules of Reinforcement

- Fixed-ratio – reinforcement in which a specific number of correct responses is required before reinforcement is obtained.
  - Paid by amount of work done, every 4th answer, bonus' paid for every x amount of sales
- Variable-ratio – pattern of reinforcement in which an unpredictable number of responses are required before reinforcement is obtained
  - Ex. Slot machines work on this basis and it works very well in the real world. Also, door-to-door salesmen work on this basis.

Schedules of Reinforcement

- Fixed-interval – pattern of reinforcement in which a specific amount of time must lapse before a response will earn reinforcement
  - Test schedules, picking up your check from job
- Variable-interval – pattern of reinforcement in which varying time intervals must pass before action will earn reinforcement.
  - Calling a busy number, pop quizzes, usually this is the slowest method to use for training.

Shaping

- Shaping – reinforcement used to get new responses

  - Rat pulling rope with flag
  - Behavior is "molded"

Chaining

- Chaining – reactions follow in sequence, one producing the other; make response patterns
  - Response chain – learned actions follow one another in sequence.
    - Swimming: arms, legs, breathing
    - Learning smaller skills builds to performing larger skills

Reinforcement

- Anything that increases the frequency of a preceding behavior.

- Aversive consequences or unpleasant consequences affect you each day.
  - 2 ways aversive control affects your behavior
    - Negative reinforcement
    - Punishment

Aversive Control

- Influencing behavior with unpleasant stimuli

- Negative reinforcement
  - Disapproval, unwelcome behavior
  - Stone in your shoe, you take it out

Negative Reinforcement

- Escape conditioning
  - Remove unpleasant stimulus
  - Children whining at dinner table
- Avoidance conditioning
  - Prevent stimulus before it starts
  - Children whining when parent says liver is for dinner

Punishment

- Unpleasant consequence decreases behavior that produced it

- Action is called punisher

- Be careful what you think is punishment

Disadvantages of punishment

- Unwanted side affects
- Avoid person who punishes, cannot correct behavior
- Alone it does not teach correct behavior

Social Learning

- Process of altering behavior by observing and imitating others

Cognitive Learning

- Altering behavior that involves mental processes and may result from observation or imitation.

- Tolman and the rat maze. The rat always took the shortest route to the food.

- Tolman believed the rat had made a mental map of the maze.

Latent Learning and Maps

- Cognitive Map – mental map

- Latent learning – learning not demonstrated by an immediate change in behavior
  - Learning not intended, but occurs and is used later.

Learned Helplessness

- A condition in which repeated attempts to control a situation fail, resulting in the belief that the situation is uncontrollable.
  - In order to try hard, people must learn that their actions do make a difference.
  - Seligman believes this is one cause of depression, because people respond in 1 of 3 ways
    - Less motivated to act, then stop trying
    - May have low self esteem and think negatively of self
    - They may feel depressed

Learned Helplessness

- Rewards without effort cause learned laziness

- College students and music

Learned Helplessness

- 3 elements
  - Stability
  - Globality
  - Internality

Stability

- The belief that the state of helplessness is a permanent characteristic
  - A student that fails a math test
    - The problem is temporary (I did poorly because I was sick).
    - **The problem is stable (I have never done well on math tests and never will).**

Globality

- The belief that the problem is either specific (I'm not good at math tests) or global (I'm just dumb).

- Both globality and stability focus on *internal* reasons for failure.

- The student could decide the problem is external (This was a bad test, the teacher hates me, etc.).

Modeling

- Learning by imitating
  - 3 kinds

  - Modeling

  - Observational learning

  - Disinhibition

Modeling

- Behavior of others increases the chances that we will do the same thing.

    - Clap when others clap
    - Look up when others look up
    - Copy styles and expressions of peers

Observational Learning

- Watch someone perform a behavior and you are able to reproduce it later.

  - Albert Bandura and the Bobo doll
  - This is the problem people find with video games

  - PARENTS ARE A CHILD'S MODEL!!!!

Behavior Modification

- Using learning principles to change actions and feelings
- Steps
  - Identify behavior
  - Choose method to follow
    - CC, operant cond., social learning

Computer assisted inst.

- Constant reinforcement – operant conditioning

- Response chains are learned

- Computer records what student has learned and how they have responded

Token Economies

- Conditioning in which desired behavior is reinforced with valueless objects which can be exchanged for valued rewards

- Boys school, prisons, hospitals, classrooms etc.

Self-Control

- Personal systems of rewards and punishments
- Keep track of behavior
- Behavioral contract
- Helps many people with bad habits

Improving study habits

- Study same room, bored, fidgety, read one more page, leave

- Longer, better studying

- All learning forms interact in our lives to determine what we learn