Chapter 5

Learning
Classical Conditioning

- **Learning** – relatively permanent change in behavior due to experience
- **Behaviorism** – emphasizes the study of observable behavior and the role of the environment as determinant of behavior
- **Conditioning** – learning that involves association between environmental stimuli and the organism’s response
- **Pavlov** – Russian physiologist - salivation in dogs
  Why salivate to other things? How did they *know*?
Classical Conditioning

- **Unconditioned Stimulus (US)** - stimulus that elicits a reflective response without learning / automatic
  
  Uncondioned Response (UR) - a reflexive response elicited by a stimulus without learning / automatic

![Diagram of Classical Conditioning with US and UR]
Classical Conditioning

- **Neutral Stimulus** – a stimulus that does not yet produce a particular response (salivation)

The neutral stimulus is paired with the Unconditioned Stimulus (US)
Classical Conditioning

• **Conditioned Stimulus (CS)** – an initially neutral stimulus that elicits a conditioned response (CR) after being associated w/ unconditioned response (UR)

  *(food dish)*

• **Conditioned Response (CR)** – response that is elicited by an associated conditioned stimulus (CS); it occurs after the conditioned stimulus is associated w/ an unconditioned stimulus (UR)

  *(salivation)*
Classical Conditioning

- **Classical Conditioning** – process where a previously neutral stimulus elicits a response through association with a stimulus that already elicits a similar or related response. (*Pavlovian or Respondent*)

- Learning occurs when the neutral stimulus paired w/ US & becomes the CS which elicits a learned or CR
Classical Conditioning

- **Unconditioned Stimulus (US)** - stimulus that elicits a reflective response w/o learning / automatic
  - (food)

- **Unconditioned Response (UR)** – a reflexive response elicited by a stimulus w/o learning / automatic
  - (salivation)

- **Conditioned Stimulus (CS)** – an initially neutral stimulus that elicits a conditioned response (CR) after being associated w/ unconditioned response (UR)
  - (food dish)

- **Conditioned Response (CR)** – response that is elicited by an associated conditioned stimulus (CS); it occurs after the conditioned stimulus is associated w/ an unconditioned stimulus (US)
  - (salivation)

- **Neutral Stimulus** – a stimulus that does not yet produce a particular response (salivation)
  - (food dish)
Classical Conditioning

Carol has a certain song as her ring tone for her boyfriend so she knows when he is calling. Carol enjoys talking to her boyfriend because he always says funny things that make her smile and laugh. Now she notices that when she hears that song on the radio she smiles.

US —
UR —
Neutral Stimulus —
CS —
CR -
Classical Conditioning

Suzie has a cat named Max. She brags about Max’s intelligence. She reports that every time Max hears her open the cabinet door to get the cat food, he comes running.

US
UR
Neutral Stimulus
CS
CR
Classical Conditioning

John is a high school student taking a course in speech at 7:00 am. On the day of his first speech he was nervous and felt he was going to vomit. John tells his friends that he must be getting sick because every morning he gets to class he feels like he is going to vomit.

US
UR
Neutral Stimulus
CS
CR
Classical Conditioning

5 year old Kate is watching a storm from her window. A huge bolt of lightning (sight) is followed by a tremendous thunderclap (sound). Kate jumps at the noise. This happens several more times. There is a brief lull and then another lightning bolt. Kate jumps in response to seeing the bolt.

US
UR
Neutral Stimulus
CS
CR
Classical Conditioning

- **Extinction** – weakening the disappearance of a learned response when the CS is no longer paired with UC.
  - Food no longer paired with food dish
  - Change ringtone for boyfriend

- **Spontaneous recovery** – reappearance of learned response after extinction need more than 1 extinction session

- **Higher–order conditioning** – Neutral stimulus becomes a CS by being paired with an already established CS.
  
  words = response; birthday = presents; prejudice
Classical Conditioning

• **Stimulus generalization** – respond to a stimulus that resembles the one in the original conditioning; when stimulus resembles the CS elicits the CR
  - Dog salivate to food dish, bowl, cup
  - Fear snake = fear rope

• **Stimulus discrimination** – respond differently to 2 similar stimuli; when stimulus similar to CS fails to evoke the CR
  - Dog only salivate to metal food dish

• **CS should precede the US**
  - Food dish set out before food in it
  - Buzzer before food delivered

• The neutral stimulus predicts the US
Classical Conditioning

• John B. Watson
  – Real life application
  – Link to emotional responses
  – Advertisers; background scene/music

• Learning fear
  – “Little Albert”
  – Placid child never cried; fear loud noise
Classical Conditioning

- Mary Clover Jones
- “Little Peter” experiment
  - Undo “Little Albert”
    - Fear generalized to other furry objects;
    - White rabbit, cotton, Santa mask, Watson’s beard

- **Counter Conditioning** – pairing a CS with a stimulus that elicits a response that is incompatible with an unwanted CR

- Enjoyment of cookies & milk incompatible with fear of furry object
Quick Quiz

1) After a child learns to fear spiders, he also responds with fear to ants, beetles, and other crawling bugs.

2) A toddler is afraid of the bath, so her father puts just a little water in the tub and gives the child a lollipop to suck on while she is being washed. Soon the little girl loses her fear of the bath.

3) A factory worker notices that his mouth waters whenever a noontime bell signals the beginning of his lunch break. One day, the bell goes haywire and rings every half hour. By the end of the day, the worker has stopped salivating to the bell.
Quick Review
Classical Conditioning

• Every time someone flushes a toilet in the apartment building, the shower becomes very hot and causes the person to jump back. Over time, the person begins to jump back automatically after hearing the flush, before the water temperature changes.

• US
• UR
• Neutral Stimulus
• CS
• CR
Classical Conditioning

• An individual receives frequent injections of drugs, which are administered in a small examination room at a clinic. The drug itself causes increased heart rate but after several trips to the clinic, simply being in a small room causes an increased heart rate.

  • US
  • UR
  • Neutral Stimulus
  • CS
  • CR
Operant Conditioning

- **Operant Conditioning** – response becomes more or less likely to happen dependent on its consequences; complex not reflexive (**instrumental conditioning**)

- **Reinforcement** – stimulus or events that strengthens or increases probability of response

- **Punishment** – stimulus or event that weakens or reduces the probability of the response that it follows
3 Consequences of Behavior

1. A neutral consequence neither increases nor decreased the probability that the response will occur.
   - Squeak in door not change if open or not

2. Reinforcement strengthens the response / makes it more likely to recur.
   - Dog begs for food at table; give
   - Reinforces are like rewards

3. Punishment weakens the response or makes it less likely to recur.
   - Punishment = any unpleasant stimulus or event
Operant Conditioning

- **Primary Reinforcer** – inherently reinforcing; satisfy physiologic need (food)
- **Primary Punisher** – inherently punishing; electric shock
- **Secondary Reinforcer** – acquired reinforcing properties through association w/ other reinforcers
- **Secondary Punisher** – acquired punishing properties through association w/ other punishers

“Oh, not bad. The light comes on, I press the bar, they write me a check. How about you?”
Operant Conditioning

- **Positive Reinforcement** – response is followed by the presentation of or *increase* in intensity of a reinforcing stimulus; as a result the response becomes stronger or more likely to occur (*good grades*)

- **Negative Reinforcement** – response is follow by the removal, delay or decrease in intensity of an unpleasant stimulus; as a result the *response becomes stronger* or more *likely to occur* (*nagging stops*)
Operant Conditioning

• Things to remember:
  – Positive and negative NOT related to good or bad
  – They are giving something and taking away something

• Reinforcement
  – Increase behavior
  – Positive reinforcement = something added or obtained (+)
  – Negative reinforcement = something to escape from or avoid (-)

• Punishment
  – Decrease behavior
  – Positive punishment – something unpleasant added (+)
  – Negative punishment – something pleasant taken away (-)
Operant Conditioning

Punishment

Decrease behavior

Positive punishment – something unpleasant added (+)
Negative punishment – something pleasant taken away (-)

Start here
Operant Conditioning

**Reinforcement**
- Positive reinforcer: Good grade
- Behavior: Studying
- Result: Studying increases
- Negative reinforcer: Nagging ceases

**Punishment**
- Positive punishment: Ridicule by friends
- Behavior: Studying
- Result: Studying decreases
- Negative punishment: Loss of time with friends
Operant Conditioning

1) A child nags her father for a cookie; he keeps refusing. Finally, unable to stand the nagging any longer, he hands over the cookie.

- For him ending the child’s pleading is
- For the child, the cookie is a
Operant Conditioning

2) A student is pressured by her parents to have a 4.0 GPA. To achieve this, the student must study every evening and on weekends and has no time for friends.

• The parental pressure is
• The loss of time with friends is
3) An able bodied driver is careful not to park in a handicapped space any more after pay a large fine for doing so.

• The loss of money is a
3) During late afternoon “happy hours” bars and restaurants sell drinks at a reduced price and appetizers are often free.

- What undesirable behavior may be rewarded
4) Which are primary and secondary reinforcers; quarters spilling from a slot machine; a winner’s blue ribbon, a piece of candy; an A on an exam, frequent flyer miles.
Operant Conditioning

4) Which are primary and secondary reinforcers; quarters spilling from a slot machine; a winner’s blue ribbon, a piece of candy; an A on an exam, frequent flyer miles.

**Primary**: Candy

**Secondary**: Money, blue ribbon, “A”, flyer miles
Operant Conditioning

Principles of Operant Conditioning

- B.F. Skinner
- Skinner Box

**FIGURE 7.5 The Skinner Box**
When a rat in a Skinner box presses a bar, a food pellet or drop of water is automatically released. The photo shows Skinner at work on one of the boxes.
Operant Conditioning

- **Extinction** – weakening and disappearance of learned response; occurs when response is no longer followed by reinforcer (coin in vending machine NO candy)

- **Stimulus Generalization** – response reinforced (or punished) in the presence of one stimulus to occur (or suppressed) in the presence of other similar stimuli (bird peck at circle and oval)

- **Stimulus Discrimination** – response to occur in the presence of one stimulus but not another similar stimuli that differ (peck only at circle)

- **Discriminative stimulus** – stimulus that signals when a particular response is likely to be followed by a certain type of consequence (verbal – store hours / nonverbal – facial expression)
Operant Conditioning

Learning on schedule

• **Continuous reinforcement** - when response is always rewarded
  *(needed to acquired learning)*

• **Intermittent (partial) reinforcement** – response sometimes but not always reinforced
  *(once behavior learned; best)*
  gambling; “lucky …”, charm
  “superstitious pigeons”

  To get rid of behavior =
  must be continuous
  *(parents & child’s tantrum)*
Operant Conditioning

- **Shaping** – successive approximations of a desired response are reinforced

- **Successive approximations** – procedure of shaping; behaviors that are ordered in increasing similarity or closeness to desired response.
  - pigeons to bowl and play ping pong
  - humans to cure phobias; fear of flying
    1) show pictures of plane
    2) guided imagery
    3) movie with plane
    4) go to airport

- **Behavior Modification** – teach new response or to reduce or eliminate maladaptive or problematic behavior *(applied behavior analysis)*
Operant Conditioning

When punishment fails

1. People often administer inappropriately or mindlessly.
   – So broad and with anger not make sense

2. Recipient of punishment often respond with anxiety, fear or rage.
   – DV- resentful

3. Effectiveness of punishment is often temporary, depending heavily on the presence of the punishing person or circumstances.
   – Learn how to get away with it

4. Most misbehavior is hard to punish immediately.
   – Must quickly follow behavior

5. Punishment conveys little information.
   – Tell what not to do but not what to do

6. Action intended to punish may instead reinforce due to attention.
   – tantrum
Operant Conditioning

Problem with rewards

**Intrinsic** - from within; reinforcers inherently related to activity reinforced
   - Enjoyment of task, satisfaction of accomplishment

**Extrinsic** – external; reinforcers not inherently related to activity reinforced
   - Money, praise, gold stars, applause

“That is the correct answer, Billy,” but I’m afraid you don’t win anything for it.
Social – Cognitive Learning Theories

• **Social – cognitive learning theories** – behavior is learned and maintained through observation and imitation of other, positive consequences & cognitive process such as plans expectation & beliefs.

• **Observational learning** - learning by observing the behavior of another (model) not direct experience (*vicarious conditioning*)

**Albert Bandura** – *people’s perceptions, beliefs & observations*

  – Shown short film
  – Johnny does not refused to share his toys – dejected in corner
  – Rocky hit him – rewarded by toy
  – Children alone in room for 20 minutes w/ a rubber doll and other toys from film
  – Children who viewed the film were more aggressive than those who had not seen

• **Impact of violence in media**
  – TV, movies; video games – Mortal Kombat; Grand Theft Auto
Quick Quiz

1) A friend asks you to meet her at a new restaurant across town. You have never been to this specific address, but you find your way there anyway because you have experienced _______________ learning.

2) To social-cognitive theorist, the fact that we can learn without being reinforced for any obvious response shows that we do not learn specific responses but rather ____ .

3) After watching her teenage sister put on lipstick, a little girl takes a lipstick and applies it her own lips. She has acquired this behavior through a process of ________ .
Quick Review
Operant Conditioning

• Reinforcers (do what to) behavior?

• Punishers (do what to) behavior?
Operant Conditioning

- Reinforcers **INCREASE** behavior

- Punishers **DECREASE** behavior
Operant Conditioning

• Positive reinforcers do what?

• Negative reinforcers do what?
Operant Conditioning

• Positive reinforcers do what?
  – Add or increase something you want / pleasant

• Negative reinforcers do what?
  – Remove / avoid something you don’t want / unpleasant
Operant Conditioning

• Positive Punishment does what?

• Negative Punishment does what?
Quick Review

• In a weight management class, participants earn points for every healthy meal they eat and every period of exercise they complete. Later these points result in refunds of their class fees.

• Behavior being conditioned

• How so?
Operant Conditioning

• When I first start teaching about a concept, I’ll praise any answer that is close to the right answer.

• What is this?
Operant Conditioning

• You check the coin return slot in a vending machine and find a quarter. You find yourself checking other vending machines over the next few days.

• What is this an example of?
Operant Conditioning

• Your hands are cold so you put your gloves on. In future, you are more likely to put gloves on when it’s cold.

• What is this an example of?
Operant Conditioning

• A professor has a policy of exempting students from the final exam if they maintain perfect attendance during the semester. His students’ attendance increases dramatically.

• What is this an example of?