Chapter Outline

- Types of Learning
- Classical Conditioning
- Operant Conditioning
- Observational Learning

Learning

Learning: Relatively permanent change in behavior (or potential behavior) resulting from experience

- How do classical and operant conditioning differ?
- How do phobias develop?
- How do we learn to perform complex behaviors?
- Does watching TV violence lead to aggression?
Classical Conditioning (CC)

Classical Conditioning: Learning by associating two stimuli together
- cat learns to salivate at sound of can opener
- adult learns to salivate at sight of “Golden Arches”
- child learns to fear the nurse giving shots
- addict learns to avoid places associated with drugs

Learning occurs when organism recognizes that one event predicts another
Cerebellum plays key role in associating stimuli together

CC Terminology
- UCS- stimulus that automatically triggers a reflexive response
  - food, pain, shock, predators, needles
- UCR- unlearned, natural response elicited by UCS
  - salivation, HR, fear, avoidance
- CS- originally neutral stimulus (NS; produces no reaction), which after association with UCS, triggers a learned response
  - bell, tone, lights, waiting room
- CR- learned response to a CS
  - salivation, HR, fear, avoidance

Note: conditioned = learned; unconditioned = unlearned

CC Examples
- Pavlov
  - food (UCS) ⇒ salivation (UCR)
  - tone (NS) ⇒ no salivation
  - tone (NS) + food (UCS) ⇒ salivation (UCR)
  - tone (CS) ⇒ salivation (CR)

- Getting Shots
  - long needles (UCS) ⇒ fear (UCR)
  - nurse (NS) ⇒ no fear
  - nurse (NS) + long needles (UCS) ⇒ fear (UCR)
  - nurse (CS) ⇒ fear (CR)
CC: Basic Principles

- Acquisition - gradual strengthening of a CR
  - forward conditioning (delayed and trace) - CS precedes UCS
  - simultaneous conditioning - CS and UCS occur at same time
  - backward conditioning - UCS preceded CS
- Extinction - weakening of a CR by presenting CS without UCS
- Spontaneous recovery - reappearance of an extinguished CR after a pause
- Generalization - learning to respond to stimuli similar to CS
  - child learns to fear wasps then hornets and bumble bees
- Discrimination - learning to distinguish stimuli similar to CS
  - child learns to discriminate friendly dogs from mean dogs

CC Exceptions

- Biological constraints on learning
  - degree of conditioning depends on stimulus and species
- Taste Aversions
  - strong CS-UCS association after only one trial
- Role of Cognition
  - expectations
  - forming representations

CC Applications

- Treating Phobias
  - Flooding - high exposure to feared stimulus
  - Systematic Desensitization - progressive technique designed to replace anxiety with relaxation
- Treating Unwanted Behaviors (alcoholism)
  - Aversive Conditioning - associate unpleasant state with unwanted behavior
- Enhance Immune System Functioning
Operant Conditioning (OC)

Operant Conditioning: Learning by associating a behavior with its consequences

- **Reinforcement**: strengthens behavior it follows
  - Positive: present positive stimulus
  - Negative: remove or avoid unpleasant stimulus

- **Punishment**: weakens behavior it follows
  - Positive: present aversive stimulus
  - Negative: remove pleasant stimulus

*Note: neg. reinforcement strengthens behavior, whereas punishment weakens the behavior it follows.*

Types of Reinforcement

- **Primary**: food, water, sex
- **Conditioned**: money, status, praise

- **Continuous**: use to develop new behaviors
- **Partial**: use to maintain behaviors
  
  *(see reinforcement schedules)*

Operant Conditioning

Using operant conditioning to solve “real” problems

- **Shaping**: reward behavior as it successfully approximates desired behavior
  - Teaching infant to say “Mama”

- **Chaining**: reward behavior after completing a sequence of responses
  - Training dolphins to jump through hoops
Schedules of Reinforcement

- **fixed interval** - reinforce after fixed amount of time
  - reduced studying after each exam
- **variable interval** - reinforce after variable amount of time
  - pop quizzes
- **fixed ratio** - reinforce after fixed number of responses
  - frequent flier miles (25,000)
- **variable ratio** - reinforce after variable number of responses
  - slot machines

Role of Cognition and Applications of OC

- **Role of Cognition**
  - Learned Helplessness
  - Beliefs about reinforcement
  - Contrast effects
  - Cognitive maps - memory of reward events
- **Applications**
  - Improving classroom teaching, employee performance
  - Solving community-based problems (crime)
  - Using stimulus control (Mr. Yuk sticker)
Observational Learning

Observational Learning: Learning by observing and imitating others

Key Factors in Observational Learning
- pay attention to the model
- remember the modeled behavior
- possess ability to do the observed behavior
- motivation to do the observed behavior

Applications

Negative Effects of Observational Learning
- Aggression
  - “Bobo Doll” studies
  - Media violence
- Smoking

Positive Effects of Observational Learning
- Helping handicapped learn new skills
- Appreciating cultural diversity