
MODULE 24

Operant Conditioning

Module Preview

While in classical conditioning we learn to associate two stimuli, in operant conditioning we learn to associate a response and its consequence. Skinner showed that rats and pigeons could be shaped through reinforcement to display successively closer approximations of a desired behavior. Researchers have also studied the effects of positive and negative reinforcers, primary and conditioned reinforcers, and immediate and delayed reinforcers. Critics point to research on latent learning to support their claim that Skinner underestimated the importance of cognitive constraints. Although Skinner's emphasis on external control also stimulated much debate regarding human freedom and the ethics of managing people, his operant principles are being applied in schools, sports, the workplace, and homes.

Module Guide

Introduction

24-1. *Identify the two major characteristics that distinguish classical conditioning from operant conditioning.*

Classical and operant conditioning are both types of **associative learning**. The two characteristics that help us distinguish the two forms of conditioning are the following: In classical conditioning, the organism learns associations between two stimuli, and its behavior is **respondent**, that is, automatic. In **operant conditioning**, the organism learns associations between its behavior and resulting events; the organism **operates** on the environment.

Skinner's Experiments

- ▶ Exercise: Consideration of Future Consequences Scale
- ▶ Exercise/Project: A Build-It-Yourself Skinner Box
- ▶ Lecture: Dolphins Clear Mines in Persian Gulf
- ▶ Videos: Video Clip 8 of *Digital Media Archive: Psychology*, 1st ed.: *Thorndike's Puzzle Box*; Module 11 of *Psychology: The Human Experience: Operant Conditioning*; Video Clip 9 of *Digital Media Archive: Psychology*, 1st ed.: *B. F. Skinner Interview*; Program 3 of *Moving Images: Exploring Psychology Through Film: Brain and Behavior: A Contemporary Phineas Gage*
- ▶ PsychSim 5: Operant Conditioning
- ▶ ActivePsych: *Digital Media Archive*, 2nd ed.: *The Research of Carolyn Rovee-Collier: Learning and Memory in Preverbal Infants*

24-2. *Describe the process of operant conditioning, including the shaping procedure.*

Edward Thorndike's **law of effect** states that rewarded behavior is likely to recur. Using this as his starting point, Skinner developed a *behavioral technology* that revealed principles of *behavior control*. He explored the principles and conditions of learning through operant conditioning, in which behavior operates on the environment to produce rewarding or punishing stimuli. Skinner used an **operant chamber** (*Skinner box*) in his pioneering studies with rats and pigeons. These experiments have explored the precise conditions that foster efficient and enduring **learning**.

In his experiments, Skinner used **shaping**, a procedure in which *reinforcers*, such as food, guide an animal's natural behavior toward a desired behavior. By rewarding responses that are ever closer to the final desired behavior (*successive approximations*) and ignoring all other responses, researchers can gradually shape complex behaviors. Because nonverbal animals and babies can respond only to what they perceive, their reactions demonstrate which events they can discriminate.

- ▶ Exercise: Partial Reinforcement Schedules
- ▶ Lecture: Examples of Negative Reinforcement
- ▶ Video: Program 3 of *Moving Images: Exploring Psychology Through Film: Brain and Behavior: A Contemporary Phineas Gage*

24-3. *Identify the different types of reinforcers, and describe the major schedules of partial reinforcement.*

A **reinforcer** is any event that increases the frequency of a preceding response. Reinforcers can be **positive** (presenting a pleasant stimulus after a response) or **negative** (reducing or removing an unpleasant stimulus). **Primary reinforcers**, such as food when we are hungry, are innately satisfying. **Conditioned (secondary) reinforcers**, such as cash, are satisfying because we have learned to associate them with more basic rewards. Immediate reinforcers, such as the enjoyment of watching late-night TV, offer immediate payback. Delayed reinforcers, such as a weekly paycheck, require the ability to delay gratification.

When the desired response is reinforced every time it occurs, **continuous reinforcement** is involved. Learning is rapid but so is extinction if rewards cease. **Partial (intermittent) reinforcement** produces slower acquisition of the target behavior than does continuous reinforcement, but the learning is more resistant to extinction. Reinforcement schedules may vary according to the number of responses rewarded or the time gap between responses.

Fixed-ratio schedules reinforce behavior after a set number of responses; **variable-ratio schedules** provide reinforcers after an unpredictable number of responses. **Fixed-interval schedules** reinforce the first response after a fixed time interval, and **variable-interval schedules** reinforce the first response after varying time intervals. Reinforcement linked to number of responses produces a higher response rate than reinforcement linked to time. Variable (unpredictable) schedules produce more consistent responding than fixed (predictable) schedules.

- ▶ Exercises: Negative Reinforcement Versus Punishment; The Sensitivity to Punishment and Sensitivity to Reward Questionnaire
- ▶ Lectures: Physical Punishment; The Self-Injurious Behavior Inhibiting System; Using Reinforcement Versus Punishment in the Classroom

24-4. *Discuss how punishment and negative reinforcement differ, and list some drawbacks of punishment as a behavior-control technique.*

Punishment attempts to decrease the frequency of a behavior. Punishment administers an undesirable consequence, for example, spanking or withdrawing something desirable, such as taking away a favorite toy. Negative reinforcement removes an aversive event (an annoying beeping sound) to increase the frequency of a behavior (fastening a seatbelt).

Punishment is not simply the logical opposite of reinforcement, for it can have several drawbacks, including suppressing rather than changing unwanted behaviors, teaching discrimination and fear, and increasing aggressiveness.

Extending Skinner's Understanding

- ▶ Exercise: The Work Preference Inventory
- ▶ Lectures: The Overjustification Effect; Mindful Learning
- ▶ Project: Modifying an Existing Behavior
- ▶ Project/Exercise: Conditioning the Instructor's Behavior
- ▶ Videos: Module 12 of *Psychology: The Human Experience: Cognitive Processes in Learning*; Video Clip 10 of *Digital Media Archive: Psychology*, 1st ed.: *Cognitive Maps*
- ▶ PsychSim 5: Maze Learning

24-5. *Explain the importance of cognitive processes and biological predispositions in operant conditioning.*

Rats exploring a maze seem to develop a mental representation (a **cognitive map**) of the maze even in the absence of reward. Their **latent learning** becomes evident only when there is some incentive to demonstrate it.

Research indicates that people may come to see rewards, rather than intrinsic interest, as the motivation for performing a task. Again, this finding demonstrates the importance of cognitive processing in learning. By undermining **intrinsic motivation**—the desire to perform a behavior effectively and for its own sake—rewards can carry hidden costs. **Extrinsic motivation** is the desire to perform a behavior to receive external rewards or avoid threatened punishment. A person's interest often survives when a reward is used neither to bribe nor to coerce but to signal a job well done.

As with classical conditioning, an animal's natural predispositions constrain its capacity for operant conditioning. Biological constraints predispose organisms to learn associations that are naturally adaptive. Training that attempts to override these tendencies will probably not endure because the animals will revert to their biologically predisposed patterns.

Skinner's Legacy

- ▶ Exercises: A Token Economy; Assessing Self-Reinforcement
- ▶ Lectures: Skinner's Last Days; Beyond Freedom and Dignity; Transforming Couch Potatoes With Operant Conditioning; Remote-Controlled Rats; Superstitious Behavior; Walden Two and the Twin Oaks Community

24-6. *Describe the controversy over Skinner's views of human behavior, and identify some ways to apply operant conditioning principles at school, in sports, at work, and at home.*

Skinner has been criticized for repeatedly insisting that external influences, not internal thoughts and feelings, shape behavior and for urging the use of operant principles to control people's behavior. Critics argue that he dehumanized people by neglecting their personal freedom and by seeking to control their actions. Skinner countered: People's behavior is already controlled by external reinforcers, so why not administer those consequences for human betterment?

Operant principles have been applied in a variety of settings. For example, in schools, Web-based learning, online testing systems, and interactive student software embody the operant ideal of individualized shaping and immediate reinforcement. In sports, performance is enhanced by first reinforcing small successes and then gradually increasing the challenge. In the workplace, positive reinforcement for jobs well done has boosted employee productivity. At home, parents can reward their children's desirable behaviors and not reward those that are undesirable. To reach our personal goals, we can monitor and reinforce our own desired behaviors and cut back on incentives as the behaviors become habitual.

Contrasting Classical and Operant Conditioning

- ▶ Exercise: Conditioning Honeybees, Wasps, and Fish
- ▶ TV Episode: *The Office: Jim Conditions Dwight*

24-7. *Identify the major similarities and differences between classical and operant conditioning.*

Both classical and operant conditioning are forms of associative learning. They both involve acquisition, extinction, spontaneous recovery, generalization, and discrimination. Both classical and operant conditioning are influenced by biological and cognitive predispositions. The two forms of learning differ in an important way. In classical conditioning, organisms associate different stimuli that they do not control and respond automatically. In operant conditioning, organisms associate their own behaviors with their consequences.