

A photograph of a classroom. In the foreground, a young boy with dark skin and short hair sits at a desk, looking towards the right. Behind him, a girl with long brown hair stands in the aisle. To the right, another child is partially visible with their hand raised. In the background, a chalkboard displays several math problems, including long division: $\begin{array}{r} 13 \\ 9 \overline{) 117} \\ \underline{9} \\ 27 \\ \underline{27} \\ 0 \end{array}$ and $\begin{array}{r} 7 \\ 6 \overline{) 42} \\ \underline{42} \\ 0 \end{array}$. The text "Chapter 7" is overlaid on the right side of the image.

Chapter 7

***Behavioral
Learning
Theory:
Operant
Conditioning***



Overview

- Operant Conditioning
- Educational Applications of Operant Conditioning Principles
- Using Computer-Based Instruction in Your Classroom

Operant Conditioning

- Major Theorist
 - B. F. Skinner
- Basic View
 - Voluntary responses are strengthened or weakened as a result of their consequences
- Original Research
 - Rats in Skinner boxes

Operant Conditioning

- Assumptions
 - Human behavior can be explained by a set of laws
 - Behavior should be studied at its simplest, most fundamental level
 - Principles of learning derived from research with animals *should* apply to humans
 - A change in behavior is the only basis for concluding that learning has occurred

Operant Conditioning

- Basic Principles of Operant Conditioning
 - Positive Reinforcement
 - Strengthening a behavior (increasing the probability that it will reoccur) by presenting a positive stimulus immediately after the behavior has occurred
 - Negative Reinforcement
 - Strengthening a behavior (increasing the probability that it will reoccur) by removing a negative stimulus immediately after the behavior has occurred

Operant Conditioning

- Basic Principles of Operant Conditioning
 - Presentation Punishment (Type I)
 - Weakening a behavior (decreasing) the probability that it will reoccur) by presenting an aversive stimulus immediately after the behavior has occurred
 - Removal Punishment (Type II, or time-out)
 - Weakening a behavior (decreasing the probability that it will reoccur) by removing a positive stimulus immediately after the behavior has occurred

Operant Conditioning

- Basic Principles of Operant Conditioning
 - Extinction
 - When a previously reinforced behavior decreases in frequency and eventually ceases altogether because reinforcement is withheld
 - Spontaneous Recovery
 - When an extinguished behavior reappears without having been reinforced

Operant Conditioning

- Basic Principles of Operant Conditioning
 - Generalization
 - When an individual learns to make a particular response to a particular stimulus and then makes the same or a similar response in a slightly different situation
 - Discrimination
 - When an individual learns to notice the unique aspects of seemingly similar situations and thus responds differently

Operant Conditioning Concepts

- Basic Principles of Operant Conditioning
 - Shaping
 - Reducing complex behaviors into a sequence of more simple behaviors
 - Reinforcing successive approximations to the complex behavior

Operant Conditioning

- Schedules of Reinforcement
 - Fixed Interval Schedule
 - Reinforcement of a desired behavior occurs only after a specific amount of time has elapsed
 - Variable Interval Schedule
 - Reinforcement of a desired behavior occurs only after variable intervals of time have elapsed
 - Fixed Ratio Schedule
 - Reinforcement of a desired behavior occurs only after a specific number of those responses are made
 - Variable Ratio Schedule
 - Reinforcement of a desired behavior occurs only after variable numbers of responses are made

Educational Applications of Operant Conditioning Principles

- Computer-Based Instruction (CBI)
 - Drill-and-practice programs
 - Tutorial programs
 - Problem-solving programs: simulations and games

Educational Applications of Operant Conditioning Principles

Type of Program	Purpose
Drill and Practice	Practice knowledge and skills learned earlier to produce fast and accurate responses
Tutorial	Teach new information (e.g., facts, definitions, concepts) and skills
Problem-Solving Programs: Simulations and Games	Teach new information and skills and provide an opportunity to apply what was learned in a meaningful context that would otherwise be unavailable because of cost, physical danger, and time constraints

Educational Applications of Operant Conditioning Principles

- Research on the Effects of CBI
 - Students who learn from tutorial and simulation programs score moderately higher (13-20 percentile ranks) on achievement tests than do students who are conventionally taught
 - Recent studies reported even stronger effects
 - Performance at school moderately related to computer use at home
 - Integrated learning systems produce small to moderate positive effects on mathematics, reading, and science achievement

Educational Applications of Operant Conditioning Principles

- Integrated Learning Systems (ILS)
 - A computerized system that combines tutorial programs with programs that track student performance and provide feedback to both student and teacher
 - Produce moderately positive results, particularly for low-achieving students

Educational Applications of Operant Conditioning Principles

- Evaluation of Computer-Based Instruction
 - When properly used can effectively supplement rather than replace what the teacher does

Educational Applications of Operant Conditioning Principles

- Behavior modification
 - Shaping
 - Token economies
 - Contingency contracts
 - Extinction, time-out, and response cost
 - Punishment

Video: Classroom Management: Handling a Student with Behavior Problems



Educational Applications of Operant Conditioning Principles

- Behavior Modification
 - Shaping
 - Select the target behavior
 - Obtain realistic baseline data
 - Select potential reinforcers (e.g., Premack Principle)
 - Reinforce successive approximations for the target behavior each time they occur
 - Reinforce the newly established target behavior each time it occurs
 - Reinforce the target behavior on a variable reinforcement schedule

Educational Applications of Operant Conditioning Principles

- Behavior Modification (cont'd)
 - Token Economies
 - Use of items that have no intrinsic value but can be redeemed at some future time for valued items or activities to shape and reinforce desired behavior
 - More flexible than traditional reinforcers
 - Contingency Contracting
 - A written or oral agreement in which the student agrees to exhibit certain behaviors under particular conditions and the teacher agrees to provide an acceptable form of reinforcement

Educational Applications of Operant Conditioning Principles

- Behavior Modification (cont'd)
 - Extinction, Time-Out, and Response Cost
 - Extinction involves ignoring an undesired behavior
 - Time-out involves placing a student in an environment in which he or she cannot obtain reinforcement after an undesired behavior has occurred
 - Response cost, which is usually used with token economies, involves taking away a certain amount of previously earned tokens after an undesired behavior

Educational Applications of Operant Conditioning Principles

- Behavior Modification (cont'd)
 - Punishment
 - The application of an aversive stimulus immediately after an undesired behavior
 - Although still used, corporal punishment is ineffective at producing desired behavior and has several possible negative consequences
 - Corporal punishment in schools banned in 29 states

Educational Applications of Operant Conditioning Principles

- Behavior Modification (cont'd)
 - Should You Use Behavior Modification?
 - Many students will eventually catch on to the fact that they get reinforced only when they do what the teacher wants them to do
 - Behavior modification methods, because of their potential power, may lend themselves to inappropriate or even unethical uses