Operant Conditioning

Module 22

Operant Conditioning

- Skinner’s Experiments
- Extending Skinner’s Understanding
- Skinner’s Legacy
- Contrasting Classical & Operant Conditioning
Operant & Classical Conditioning

1. Classical conditioning forms associations between stimuli (CS and US). Operant conditioning on the other hand forms association between behaviors and resulting events.

2. Classical conditioning involves respondent behavior that occurs as an automatic response to some stimulus. Operant conditioning involves operant behavior, a behavior that operates on the environment producing rewarding or punishing stimuli.

Skinner’s Experiments

Skinner’s experiments extend Thorndike’s thinking especially his law of effect which states that rewarded behavior is likely to recur.

OBJECTIVE 22-1| Identify the two major characteristics that distinguish classical conditioning from operant conditioning.

OBJECTIVE 22-2| State Thorndike’s law of effect, and explain its connection to Skinner’s research on operant conditioning.
Operant Chamber

Using Thorndike's law of effect as a starting point Skinner developed the Operant chamber or the Skinner box to study operant conditioning.

Operant Chamber

Operant chamber or Skinner box comes with a bar or key that an animal manipulates to obtain a food or water reinforcer. It is connected to devices that record the animal's responses.

Shaping

Operant conditioning procedure in which reinforcers guide behavior closer towards target behavior through successive approximations.

OBJECTIVE 22-3 Describe the shaping procedure, and how it can increase our understanding of what animals and babies can discriminate.
Types of Reinforcers

Any event that strengthens the behavior it follows. A heat lamp positively reinforces a meerkat’s behavior in cold.

**WAYS TO INCREASE BEHAVIOR**

<table>
<thead>
<tr>
<th>Operant Conditioning</th>
<th>Description</th>
<th>Possible Examples</th>
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</thead>
<tbody>
<tr>
<td>Positive reinforcer event</td>
<td>Add a desirable stimulus</td>
<td>Getting a a hat, involving a paycheck</td>
</tr>
<tr>
<td>Negative reinforcer event</td>
<td>Remove an aversive stimulus</td>
<td>Fastening cufflinks, be turned off, daydreaming</td>
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**OBJECTIVE 22-4|** Compare positive and negative reinforcement, and give one example each of a primary reinforcer, a conditioned, an immediate, and a delayed reinforcer.

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**Primary & Secondary Reinforcers**

1. **Primary Reinforcer:** Innately reinforcing stimulus like food or drink.

2. **Conditioned Reinforcer:** Is a learned reinforcer. It gets its reinforcing power through its association with primary reinforcer.

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**Immediate & Delayed Reinforcers**

1. **Immediate Reinforcer:** A reinforcer that occurs closely to a behavior in time. Rat gets a food pellet for a bar press.

2. **Delayed Reinforcer:** A reinforcer that is delayed in time for a certain behavior. A paycheck that comes at the end of a week.

We may be more inclined to engage in small immediate reinforcers (watching TV) than large delayed reinforcers (Getting A in a course) which requires consistent study.
Reinforcement Schedules

1. **Continuous Reinforcement**: Reinforcing the desired response each time it occurs.

2. **Partial Reinforcement**: Reinforcing a response only part of the time. Though results in slower acquisition in the beginning, shows greater resistance to extinction later on. Partial reinforcements can be.

Ratio Schedules

1. **Fixed-ratio schedule**: Reinforces a response only after a specified number of responses e.g., like piecework pay.

2. **Variable-ratio schedule**: Reinforces a response after an unpredictable number of responses. Hard to extinguish because of unpredictability, e.g., behaviors like gambling, fishing.

Interval Schedules

1. **Fixed-interval schedule**: Reinforces a response only after a specified time has elapsed e.g., preparing for an exam only when the exam draws close.

2. **Variable-interval schedule**: Reinforces a response at unpredictable time intervals, produces slow steady responding, e.g., like pop quiz.

**OBJECTIVE 22-5** | Discuss the strengths and weaknesses of continuous and partial reinforcement schedules, and identify four schedules of partial reinforcements.
OBJECTIVE 22-6 | Discuss the ways negative punishment, positive punishment, and negative reinforcement differ, and list some drawbacks of punishment as a behavior-control technique.

Punishment

An aversive event that decreases the behavior that it follows.

WAYS TO DECREASE BEHAVIOR

<table>
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<tr>
<th>Type of Punisher</th>
<th>Description</th>
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<tr>
<td>Positive punishment</td>
<td>Administer an aversive stimulus</td>
<td>Spanking, a parking ticket</td>
</tr>
<tr>
<td>Negative punishment</td>
<td>Withdraw a desirable stimulus</td>
<td>Time-out from privileges (such as time with friends), revoked driver's license</td>
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Punishment

Although there may be some justification for occasional punishment (Larzelare & Baumrind, 2002), it usually leads to negative effects.

1. Punishment can result in unwanted fears.
2. Conveys no information to the organism.
3. Justifies pain to others.
4. Unwanted behaviors reappear in its absence.
5. Aggression towards the agent.
6. One unwanted behavior appears in place of another.
Extending Skinner’s Understanding

Skinner believed in inner thought processes and biological underpinnings, but many psychologists criticize him for discounting them.

Cognition & Operant Conditioning

Evidence of cognitive processes during operant learning comes from rats during maze exploration, where they navigate it without an obvious reward. Rats seem to develop cognitive maps or mental representation of the layout of the maze (environment).

Latent Learning

Such cognitive maps are based on latent learning which becomes apparent when incentive is given (Tolman & Honzik, 1930).

OBJECTIVE 22-7: Explain how latent learning and the effect of external rewards demonstrate that cognitive processing is an important part of learning.
Motivation

**Intrinsic Motivation:**
The desire to perform a behavior for its own sake.

**Extrinsic Motivation:**
The desire to perform a behavior due to promised rewards or threats of punishments.

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Biological Predisposition

Biological constraints predispose organisms to learn associations that are naturally adaptive. Breland and Breland (1961) showed that animals drifted towards their biologically predisposed instinctive behaviors.

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Skinner’s Legacy

Skinner argued that behaviors were shaped by external influences and not inner thoughts and feelings. Critics argued that Skinner dehumanized people by neglecting their free will.

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**OBJECTIVE 22-8** Explain how biological predisposition place limits on what can be achieved through operant conditioning.

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**OBJECTIVE 22-9** Describe the controversy over Skinner’s views of human behavior.
Applications of Operant Conditioning

Skinner introduced the concept of teaching machines that would shape learning in small steps and provide reinforcements for correct rewards.

In School

OBJECTIVE 22-10 Describe some ways to apply operant conditioning principles at school, at work and at home.

Applications of Operant Conditioning

Reinforcement principles can enhance athletic performance.

In Sports

Applications of Operant Conditioning

Reinforcers affect productivity. Many companies now enable employees to share profits and participate in company ownership.

At work

Reinforcement principles can enhance athletic performance.

Reinforcers affect productivity. Many companies now enable employees to share profits and participate in company ownership.
Applications of Operant Conditioning

In children reinforcing (good) behaviors increase their occurrence. Ignoring unwanted behaviors decrease their occurrence.

Operant vs. Classical Conditioning

<table>
<thead>
<tr>
<th>COMPARISON OF CLASSICAL AND OPERANT CONDITIONING</th>
<th>Classical Conditioning</th>
<th>Operant Conditioning</th>
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<tbody>
<tr>
<td>response</td>
<td>involuntary, automatic</td>
<td>voluntary, purposeful</td>
</tr>
<tr>
<td>Acquisition</td>
<td>Association: CS, CR association</td>
<td>Rewarding responses to desired behaviors</td>
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<tr>
<td>Extinction</td>
<td>CS occurs when CS is repeatedly presented</td>
<td>Responding decreases when stimuli are absent</td>
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<tr>
<td>Cognitive processes</td>
<td>Organisms develop expectation that CS signals the onset of US</td>
<td>Organisms develop expectation that a stimulus will be followed by an outcome, then avoid or escape</td>
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<tr>
<td>Behavioral predictions</td>
<td>Natural responses continue, what occurs + responses can modify (environment)</td>
<td>Responses most often behavior similar to their natural behaviors, unless cues indicate otherwise and feedback natural events</td>
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OBJECTIVE 22-11 | Identify the major similarities and differences between classical and operant conditioning.