Operant Conditioning
Unit 5 (textbook)

Learning Targets...

4.A Identify the contributions of key researchers in the psychology of learning.

- 4.A.3 Contributions of Robert Rescorla, key researcher in the psychology of learning.
- 4.A.7 Contributions of John B. Watson, key researcher in the psychology of learning.

4.B Interpret graphs that exhibit the results of learning experiments.

4.G Distinguish general differences between principles of classical conditioning, operant conditioning, and observational learning.

- 4.G.1 Contingencies

What's the Difference?

Classical Conditioning...

... forms associations between two stimuli.

Example responses:

- Blink
- Flinch
- Fear
- Nausea
- wince

Operant Conditioning

... forms associations between behaviors and resulting events.

Example responses:

- Sit behind on floor
- Do homework or chores
- Get good grades
- Meet curfew
- Don't miss a shot

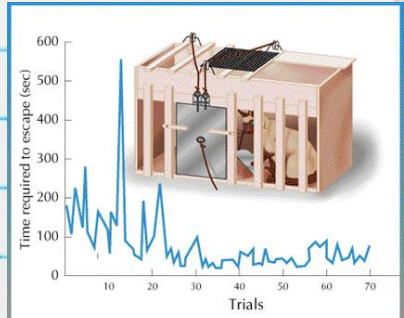
E.L. Thorndike

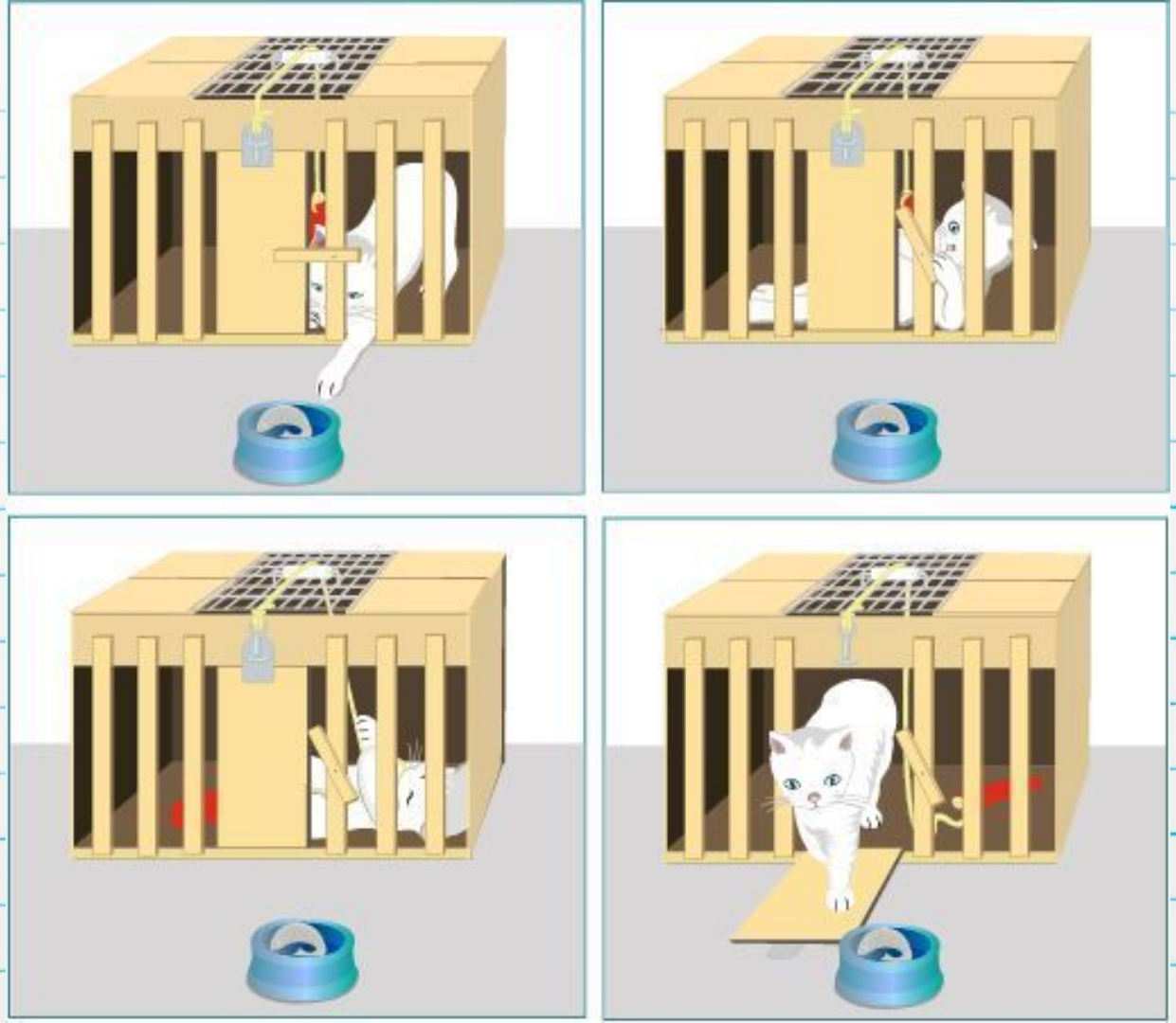
Law of Effect...

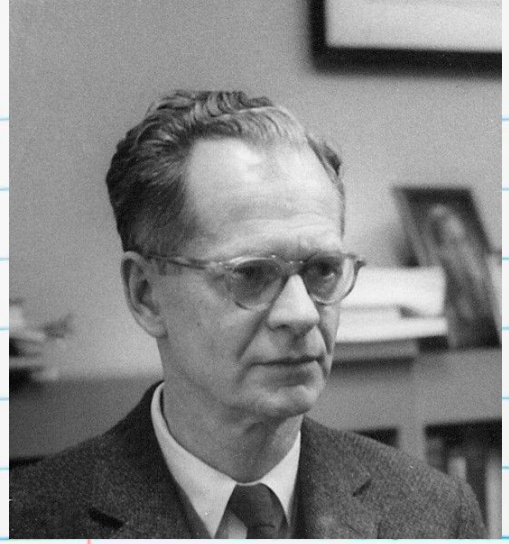
responses that produce desirable results will be learned, or "stamped" into the organism

- Found that hungry cats in a puzzle box would work diligently to solve the puzzle by trial-and-error to obtain the food reward outside the box.
- Gradually, on succeeding trials, erroneous responses were eliminated & effective responses were "stamped in."

Thorndike's Puzzle Box

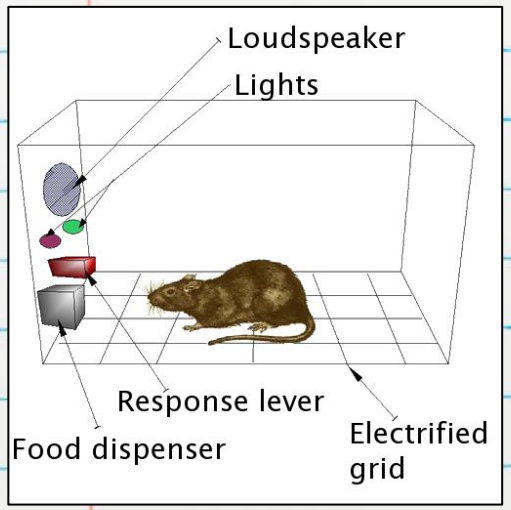






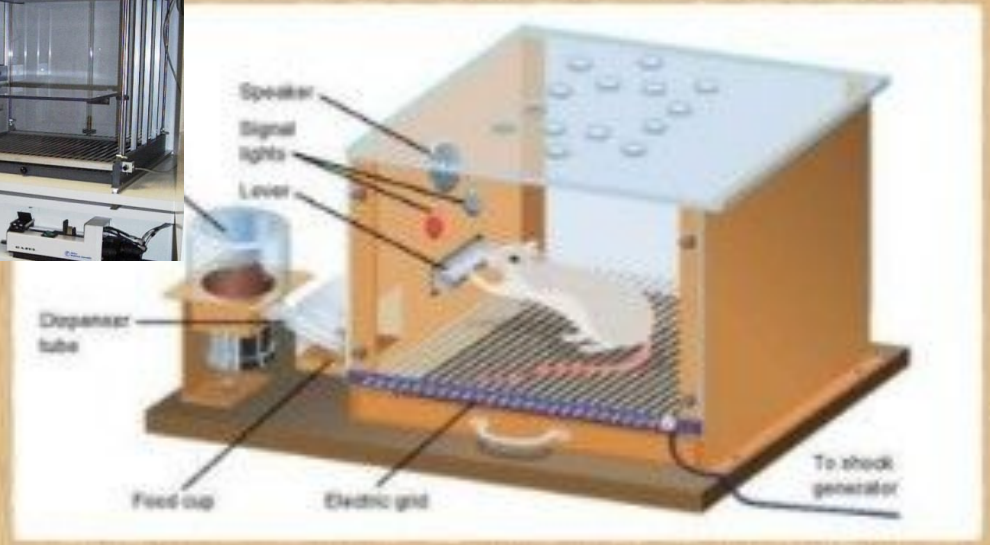
HELLO!

I am B.F. Skinner



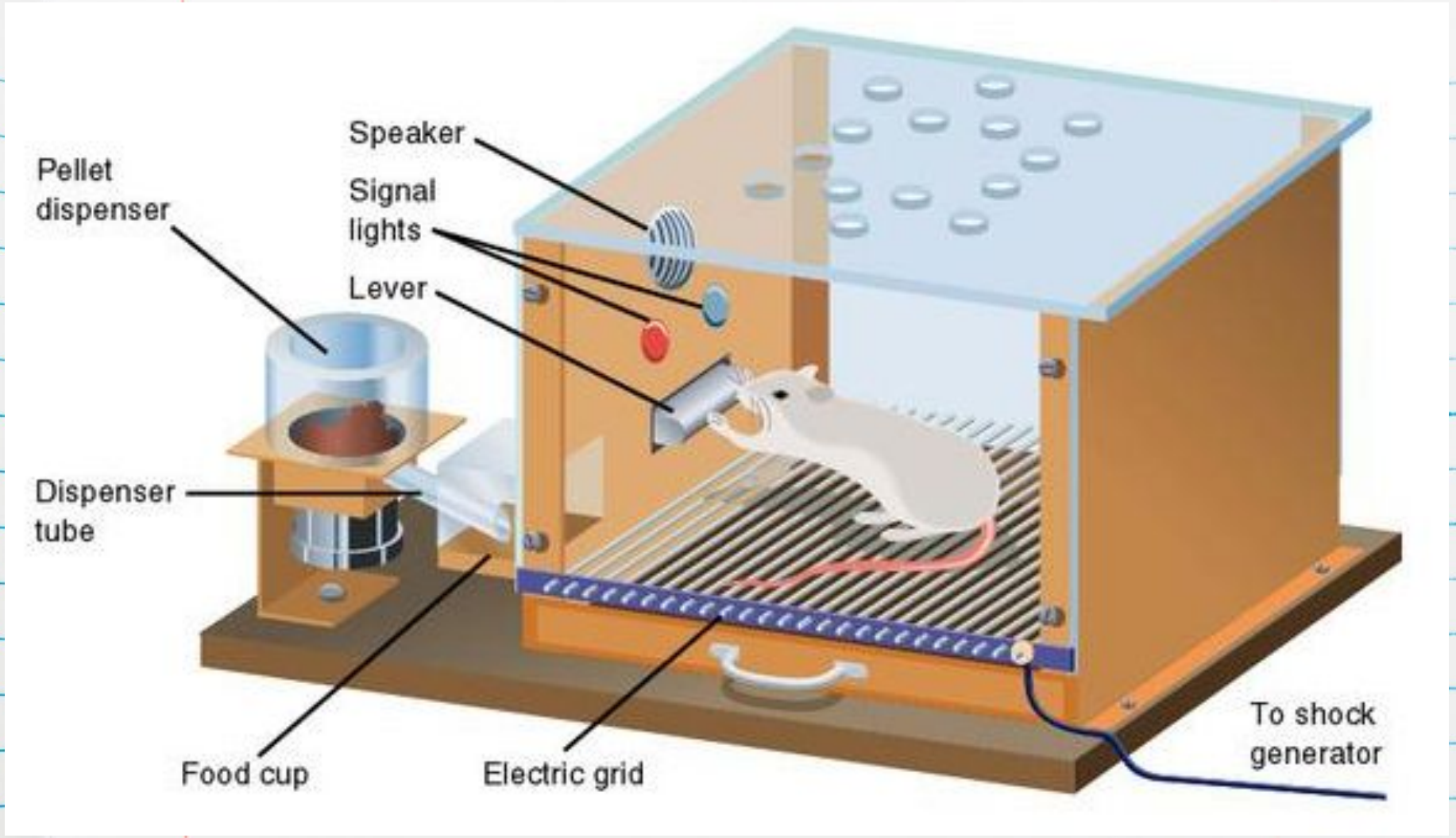
Using Thorndike's law of effect as a starting point, Skinner developed the Operant chamber or the "Skinner box" to study operant conditioning.

Skinner's operant conditioning chamber (also called a Skinner Box) was designed to teach rats how to push a lever. This behavior is not natural to rats, so operant conditioning with positive and negative reinforcement were performed in order to teach the behavior.



Positive Reinforcement:
A rat was awarded with food when he pressed the lever.

Negative Reinforcement:
A rat was able to turn off electric shocks produced by the floor by pressing the lever.


Speaker
Pellet dispenser
Signal lights
Lever
Dispenser tube
Food cup
Electric grid
To shock generator

Shaping

To achieve a desired behavior, step-by-step trials are used to direct the participant towards the end goal.

Skinner noticed that the pigeons in the skinner box were not accidentally pushing the button that would release food. How could he teach the pigeon that pressing the button would result in a positive outcome?

In other words: breaking down behavior into small steps, and giving positive reinforcement along the way can result in the learning of more complex behaviors.

Shaping

Step 1: give the pigeon food when it turns toward the button.

Step 2: give the pigeon food when it walks toward the button.

Step 3: give the pigeon food when raises its head to the height of the button.

Step 4: give the pigeon food when it taps the button with its beak.

Shaping Humans

EXAMPLES

Learning to write. You might begin by tracing letters. Next, by connecting dots or dashes. Next, by looking at letters and copying them below. Finally, by writing the letters from memory.

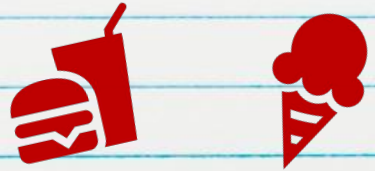
Learning to eat with a spoon. First you need to pick up the spoon. Next you need to put the spoon in the bowl. Next you need to scoop the food into the spoon. Next you need to lift the spoonful out of the bowl. Finally, you need to put the spoon into your mouth. Encouragement from parents along the way can reinforce these movements.

Types of Reinforcers

Types of Reinforcers

Primary Reinforcer:

Innately reinforcing stimulus that usually **satisfy some biological need** like food or drink.



Conditioned (Secondary) Reinforcer:

Is a learned reinforcer. It gets its reinforcing power through its **association with primary reinforcer.** Examples...

- Grades, praise, smiles of approval and applause

Primary

- Food
- Sexual pleasure
- Water
- Warmth
- Physical activity
- Novel stimulation
- Sleep
- Entertainment
- Oxygen

Secondary

- Money
- Grades
- Attention
- Praise
- Success
- Performance
- Feedback
- Prestige

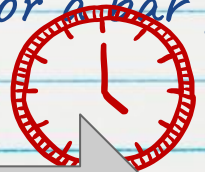
Types of Reinforcers

Immediate Reinforcer:

A reinforcer that occurs closely to a behavior in time. Rat gets a food pellet for a bar press.

Delayed Gratification:

A reinforcer that is delayed in time for a certain behavior. A paycheck that comes at the end of a week.



Our tendency to engage in behavior that's followed by an immediate reinforcer (moving up a level in a video game) rather than one that's delayed (working hard for an A in a course) is our need for instant gratification.

Think about cell phone games.

Operant Conditioning Principles

Reinforcement

Increases behavior

Punishment

Decreases behavior

Operant Conditioning Principles

Positive

Does NOT mean good.

It's the adding of a stimuli or consequence.

Negative

Does NOT mean bad.

It's the taking away of a stimuli or consequence.

Positive Reinforcement

Reinforcement = Do it again!

Positive = Adding something (good)

Positive Punishment

Punishment = Don't do it again!

Positive = Adding something (bad)

Negative Reinforcement

Reinforcement = Do it again!

Negative = Taking something (bad) away

Negative Punishment

Punishment = Don't do it again!

Negative = Taking something (good) away

Would this work?

Your mom wants you to clean your room more often. She plans to negatively reinforce you once you clean it. So when you

What could she take away that would increase your cleaning your room?

behavior of cleaning your room.

Would this work?

Your teacher wants you to complete your homework. He plans to positively reinforce you once you do. When you do your

What could he add that would increase your homework completion?

Would this work?

Your dad wants you to stop yelling at your sister. He plans to negatively punish your yelling.

What could he take away that would decrease your yelling?

Would this work?

Your principal wants students to stop misbehaving at lunch. She plans to positively punish students

What could she add that would decrease the misbehavior?


BREAK
TIME !!

Punishment

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

- **Punishment can result in unwanted fears.**
- Conveys no information to the organism.
- **Justifies pain to others.**
- Unwanted behaviors reappear in its absence.
- **Aggression** towards the agent or aggression seen as "ok" or "right."
- **One unwanted behavior appears in place of another.**

Death Penalty?

Reinforcement Schedules

Continuous Reinforcement:
Reinforcing the desired response each time it occurs. Needs to be used when initial learning is taking place.

Partial (Intermittent) Reinforcement:
Reinforcing a response only part of the time. Though results in slower acquisition in the beginning, shows greater resistance to extinction later on.

Ratio: #
Number of times desired behavior is performed

Interval:
Amount of time desired behavior is performed

INTERVAL SCHEDULES

Schedule	Examples
Fixed-Interval Schedule An exact amount of time passes between each reinforcement.	• Studying for a weekly quiz • Getting your paycheck every two weeks
Variable-Interval Schedule A varying amount of time passes between each reinforcement.	• Checking e-mail • Winning a video game

RATIO SCHEDULES

FACTS

Schedule	Examples
Fixed-Ratio Schedule Reinforcement occurs after a fixed number of responses.	• Getting one free meal after the purchase of ten • Losing your driver's license after five violations
Variable-Ratio Schedule Reinforcement occurs after a varying number of responses.	• Playing the lottery • The number of shots to score a goal in a soccer game

Uncertainty

Time vs. Quantity Based

Fixed Ratio

Variable Ratio

promote habits

Fixed Interval

Variable Interval

inter

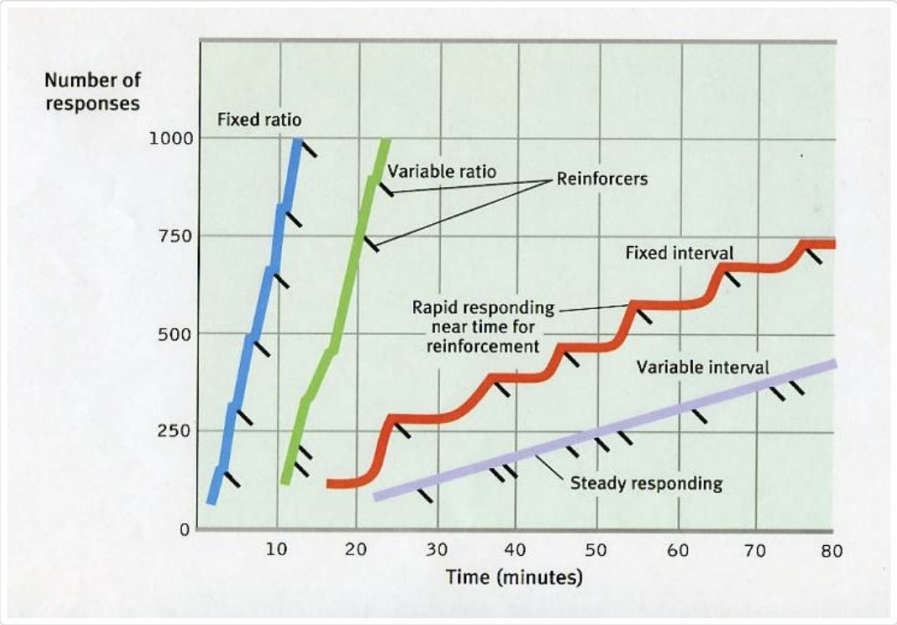
ratio

fixed

Response Rates of Different Reinforcement Schedules

Ratio schedules – those linked to number of responses – produce higher response rates compared to interval schedules.

As well, variable schedules produce more consistent behavior than fixed schedules; unpredictability of reinforcement results in more consistent responses than predictable reinforcement (Myers, 2011).



Classical Conditioning	vs.	Operant Conditioning
Occurs when we associate something formerly neutral with something that produces a **natural** reaction.		Occurs when we make conscious **choices** to behave in a certain way based on the association of our behaviors with positive or negative consequences.
Example: Albert feels fear when he pets a rabbit because he associates the rabbit with a painful noise.		*Example: Emily hides from her grandma's cat because the cat usually bites her feet.*