

Week 5: February 6, 2017

Learning and Conditioning

AGENDA

- Test #1: 6:30pm-8:00pm
- Lecture: 8:10pm-9:20pm
 - Classical Conditioning – Pavlov
 - Operant Conditioning – Skinner
 - Observational Learning – Bandura
 - Cognitive Learning

Learning

Enduring changes in behaviour
that occur with experience

Associative Learning:

- linking two events that occur close together

Types of Learning

Classical Conditioning

- learn to associate two stimuli, thus anticipate events

Operant Conditioning

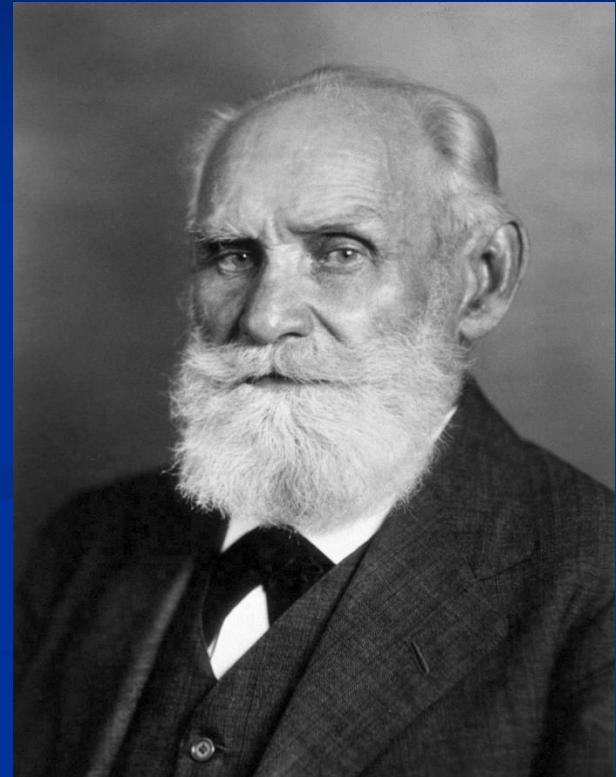
- learn to associate response and its consequence

Observational Learning

- learn from other people's experiences and examples

Classical Conditioning

- Ivan Pavlov
- Studied digestion in dogs
- Discovered classical conditioning accidentally
- Stimulus → Response



Classical Conditioning

Unconditioned Stimulus (UCS)

- Automatically triggers a response (e.g., food)

Unconditioned Response (UCR)

- Unlearned response (e.g., salivation)

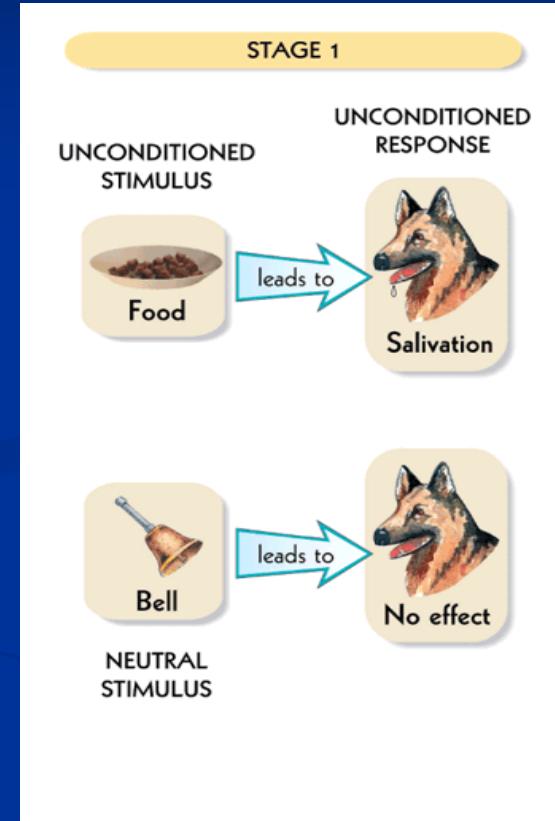
Step 1: Before Conditioning

UCS →

(food in mouth) → **UCR**

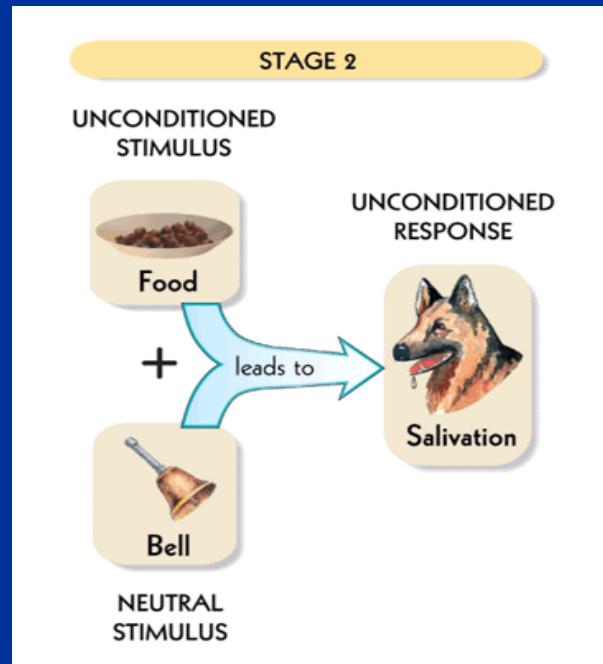
(salivation)

Neutral Stimulus → **No response**
(bell) → (no salivation)



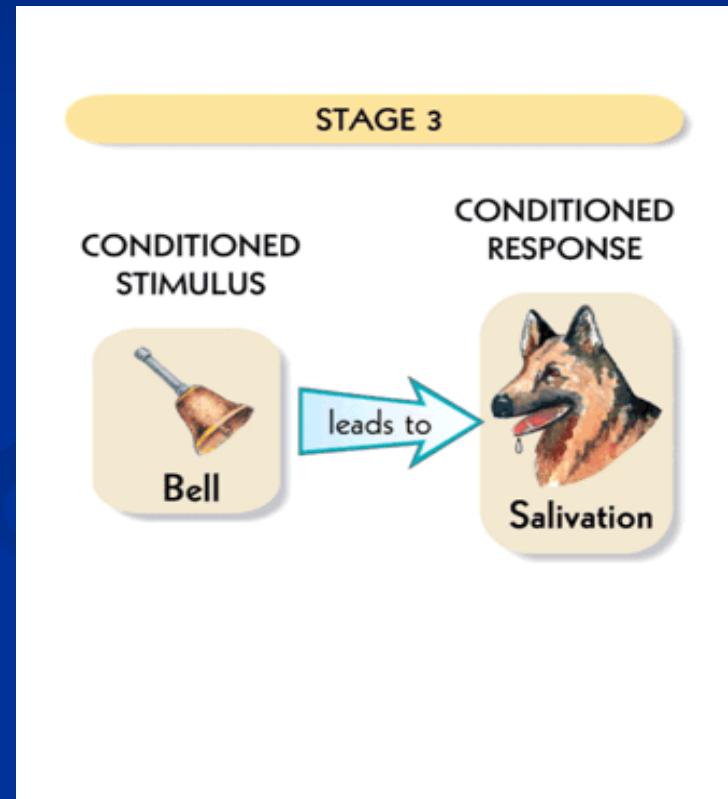
Step 2: During Conditioning

Neutral Stimulus + UCS → UCR
(bell) (food in mouth) (salivation)



Step 3: After Conditioning

CS → CR
(bell) (salivation)



Classical Conditioning

Conditioned Stimulus (CS)

- One has learned to associate something with this stimulus

Conditioned Response (CR)

- Learned response to a stimulus (has become the conditioned stimulus)

A Contemporary Example of Classical Conditioning

- Video Clip

5 MAJOR CONDITIONING PROCESSES

1. Acquisition

- timing
- contingency/predictability

2. Extinction

- weakening of conditioned response in absence of UCS

Major Conditioning Processes cont'd

3. Spontaneous Recovery

- conditioned response can recur after time delay without further conditioning

4. Generalization

- tendency of new stimulus similar to original (CS) to elicit response similar to CR

5. Discrimination

- process of learning to respond to certain stimuli and not respond to others

Key Variables in Classical Conditioning

- The **strength** of the UCS
- The **timing** of the UCS
- The **frequency** of pairings (multiple pairings)

Conditioning: Cognition & Biology

- John Garcia's taste aversion experiments with rats
 - Animals' capacity for conditioning is constrained by biology
 - Makes adaptive sense: rats → taste birds → sight

Classical Conditioning in Humans: Fears and Phobias

Little Albert Study: Watson & Rayner (1920)

- Based on Pavlov's work
- Human emotions and behaviour, though biologically influenced, are mainly conditioned responses
- Conditioned infant ("little Albert") to fear white rats
- Fear generalized to rabbit, dog, fur coat
- Little Albert Clip

Counterconditioning

- Using classical conditioning to “un” condition fears
- E.G. Mary Cover Jones (1924) eliminated fears of a 3-yr old boy with milk and cookies!

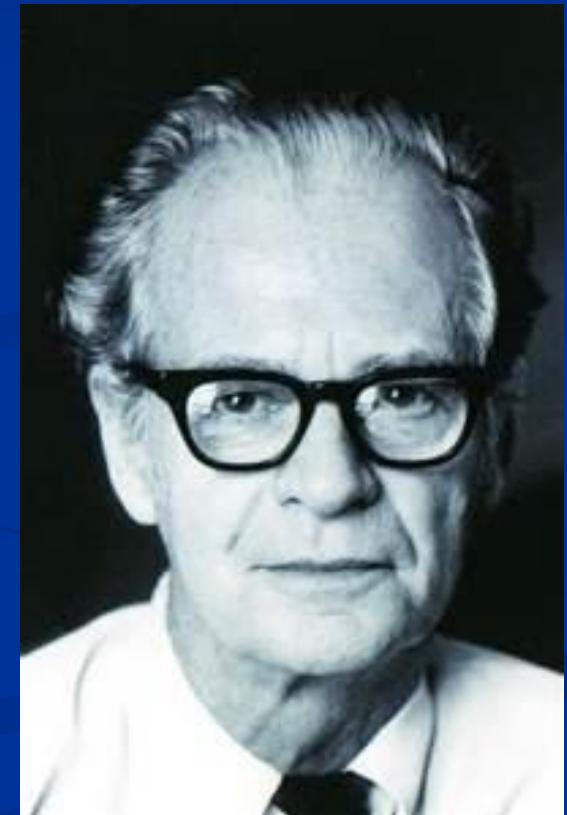
Operant Conditioning

Began with Edward Thorndike (early 1900's),
then B. F. Skinner (1930's)

Association between behaviours and
their consequences

Thorndike's Law of Effect

- The consequences of a behaviour increase or decrease the likelihood that the behaviour will be repeated



Operant Conditioning cont'd

B.F. Skinner's work

- Studied organisms under precisely controlled conditions
- created the Operant Chamber or “Skinner Box”

Operant Conditioning cont'd

Shaping

- Process of rewarding approximations of the behaviour
 - training animals
 - toilet training human infants
 - education

Reinforcement

When a behaviour is increased
by the responses (reinforcers)
that follow it

Positive and Negative Reinforcement

Positive Reinforcement

Frequency of behaviour increases when **stimulus added**

- E.g., Rat receives food for pressing lever, repeats lever-pressing

Negative Reinforcement

Frequency of behaviour increases when **stimulus removed**

- E.g. Taking 2 aspirin is negatively reinforced by the reduction of headache pain

Principles of Reinforcement

Reinforcer: Any environmental stimulus that increases a behaviour

- **Primary Reinforcers**
 - Not learned; innate; satisfy biological needs (e.g., food when hungry)
- **Secondary (or conditioned) Reinforcers**
 - Value is learned; Acquire positive value through experience
- **Immediate**
- **Delayed**

Pos've and Neg've Reinforcement: Summary

POSITIVE and NEGATIVE

are not about

“GOOD” OR “BAD”

Behaviour is reinforced (increased, repeated) when:

SOMETHING IS ADDED (positive reinforcement)

or

TAKEN AWAY / REMOVED (neg. reinforcement)

Punishment: Weakening Responses

Punishment – opposite of reinforcement:

When a behaviour is weakened (decreased)
by the outcomes that follow it

Positive & Negative Punishment

Positive Punishment

- when unpleasant **stimulus is added** in an effort to decrease an undesirable behaviour (e.g., scolding a child, pain)

Negative Punishment

- when a pleasant **stimulus is taken away** in an effort to decrease a behaviour (e.g., \$ fines, loss of privilege, ‘grounding’)

Principles of Punishment:

Primary punisher:

- Stimulus that is naturally painful or unpleasant

Secondary punisher:

- Neutral stimulus that initially has no negative value
- Value is learned

Analyze this Video Clip

- What is happening here in terms of OPERANT conditioning?

Key Variables in Operant Conditioning

- **Strength** of the consequences
- **Timing** or interval between behaviour and its consequences
- **Frequency** of consequence

Schedules of Reinforcement

Continuous Reinforcement

- Reinforce every occurrence

Partial Reinforcement

- Occasional, intermittent reinforcement
- Based on interval (time) and ratio (# responses)

Schedules of Reinforcement

123 - John R. Doe		Pay Period 06/02/06 to 06/16/06		Required Deductions							
Earnings											
Hours 50	Rate 9.00	This Period 450.00	YTD 900.00	Federal Income Tax 0.00	0.00						
Gross Pay		450.00	900.00	FICA - Medicare 06.08	12.16						
				WI State Income Tax 0.00	0.00						
				FICA - Social Security 25.92	51.84						
		Other Deductions									
		Health Insurance 401k Parking	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00						
		NET PAY	\$418.00	\$836.00							
Your Employer 1234 Some Street Milwaukee, WI ZIPCODE		Check Number: XXXXX Pay Date: 06/19/06									
PAY ***Four hundred eighteen dollars and 00 cents*****\$418.00											
To the Order of John R. Doe 555 Some Street Milwaukee, WI ZIP CODE											

Fixed interval schedule

- specified interval of time

Variable interval schedule

- predetermined but varying interval of time

Schedules of Reinforcement



Fixed-ratio schedule

- specified number of responses

Variable ratio schedule

- predetermined but variable number of responses

Conditioning Processes

Occur in operant conditioning, just as they do in classical conditioning

- Acquisition
- Extinction
- Spontaneous Recovery
- Generalization
- Discrimination

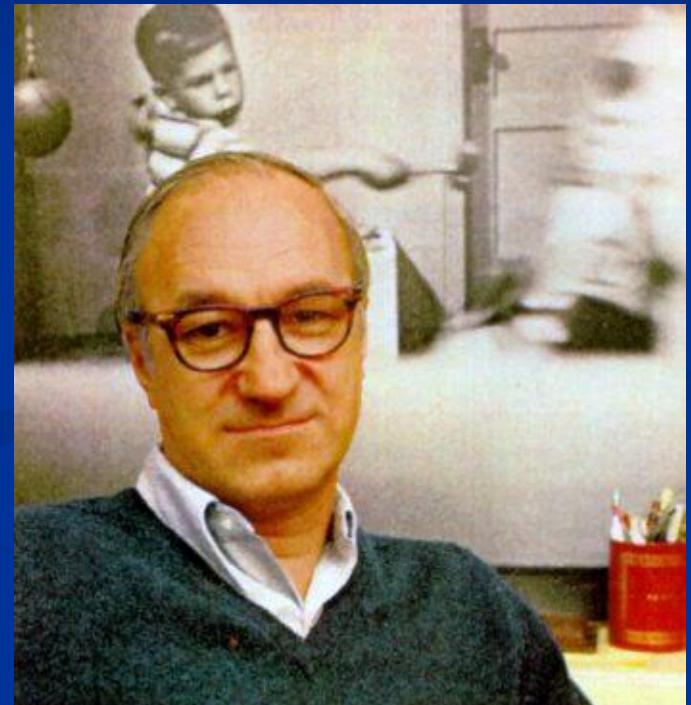
Operant Conditioning in Daily Life

- Superstitious behaviours learned
- Behaviour modification in home/schools
- Gender roles are learned (and reinforced)

Observational Learning

Albert Bandura: Social Learning Theory

- An environmentalist theory
- Views children as active participants in their development



Observational Learning

- Learn through observation, imitation and modelling
- Modelling: 4 processes involved
 1. Attention
 2. Retention
 3. Production
 4. Reinforcement

Observational Learning (cont'd)

Bandura's classic study:

- “Bobo doll” experiment



Models

- Not everyone is a “good model” ...
- Children are selective when choosing models
 - Four criteria for model-selection
- Other factors to consider:
 - Learner factors
 - Motivational and situational factors

Types of Cognitive Learning

Insight

- Understanding relationships between events or parts
- Is this solely a human ability?

Cognitive Maps

- Mental representations of layout of environment
- Used to navigate
- e.g., Tolman's experiments with rats in a maze

Is this insight?



- Wolfgang Kohler
- WW I-- work with primates; discovered creative means to acquire food
- Chimps would stack boxes to reach food
- Video Clip

Teaching/Learning Take-Home

Best way to shape behaviour:
REINFORCE (reward) behaviours you
want to increase.

Attention is the strongest reinforcer.