Learning Theories - Behaviourism -

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Outline
- What is Learning?
  - Classical Conditioning
    - Pavlov
    - Watson
  - Operant Conditioning
    - Thorndike
    - Skinner
  - Observational Learning
    - Bandura

What is Learning?
- Evolution
  - The changes in behaviour that accumulate across generations are stored in the genes
- Learning
  - The changes in behaviour that accumulate over a lifetime are stored in the central nervous system.
The Behaviourists

- Must study observable behaviour
  - Ignore unobservable phenomena
    - They aren’t necessary for an understanding of human nature
- Knowledge is learned
  - Experience shapes growth

Classical Conditioning

- Learning by associating two stimuli together
  - Cat learns to expect food at sound of can opener
  - Dog learns that the leash means they are going outside
  - Child learns to fear the nurse giving shots
- Learning occurs when you recognize that one event predicts another

Summary
The Terminology Game

- Indicate the UCS, CS, and CR for the following examples:
- Every time Robert’s wife flushes the toilet when he’s in the shower, the water becomes painfully hot. One day, as Robert is stepping into the shower, he hears a flushing sound and flinches.
- Sara has had a lot of dental work done recently (fillings, root canals). Now, just walking into the reception room at the dentist makes her palms sweaty.
- Rob’s first girlfriend loved to eat onions. Whenever they kissed, he could faintly taste onion on her breath. Now, the very scent of onions “turns him on”

Other Important Terms

- Acquisition
- Extinction
- Spontaneous Recovery
- Generalization
- Discrimination
Learning Phobias

- Applied classical conditioning principles to humans
  - Acquisition of phobias
    - Little Albert
  - Development is simply learned responses from our environment
- Ethical concerns…

Little Albert

- Acquisition of Phobias
  - Classical Conditioning of Fear

Generalization in Action

Now Little Albert fears rabbits as well as rats
Other Applications

- Inspiration from Classical Conditioning
  - Systematic Desensitization
    - Progressive technique designed to replace anxiety with relaxation
    - Baby steps!
  - Aversive Conditioning
    - Associate unpleasant state with unwanted behaviour
    - Reduces the unwanted behaviour

Systematic Desensitization

Treating a spider phobia with systematic desensitization

Aversive Conditioning
Operant Conditioning

- Learning by associating a behavior with its consequences
  - Child learns that they are praised for picking up after themselves and ignored for throwing temper tantrums
- Learning occurs when you recognize that one event predicts another

Edward Thorndike

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Thorndike’s Experiment

Puzzle Box

Learning Curve

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First Trial

- Tendency to perform
  - Exploring
  - Sniffing
  - Grooming
  - Reaching
  - Scratching
  - Reaching with paw
  - Lever-Pressing
  - Reward

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Later Trial

Tendency to perform

- Lever-pressing
- Exploring
- Grooming
- Reaching
- Scratching
- Reaching with paw
- Sniffing

Shaping Behaviour

B.F. Skinner

Operant Conditioning Terms

- Reinforcement
  - Reward for desired behaviour
  - Strengthens behavioural response
    - positive or negative
    - primary vs. secondary
- Punishment
  - Penalty for undesired behaviour
  - Weakens behavioural response
    - positive or negative
### Reinforcement vs. Punishment

<table>
<thead>
<tr>
<th></th>
<th>Reinforcement</th>
<th>Punishment</th>
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</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Give Candy</td>
<td>Give Shock</td>
</tr>
<tr>
<td>Negative</td>
<td>Take away Shock</td>
<td>Take away Candy</td>
</tr>
</tbody>
</table>

### Things to Consider
- Is the consequence increasing or decreasing the likelihood the behavior will occur again in the future?
  - Increasing → reinforcement
  - Decreasing → punishment
- Is something being presented or taken away?
  - Given → positive
  - Taken away → negative

### Practice
- If you bring your umbrella, you won’t get rained on.
- A parent tells a child they can watch TV if they finish their homework.
- If you get out of bed, your roommate will stop yelling at you to get up.
- A police officer gives a speeding motorist a ticket.
- A parent tells a child that if keeps acting up, he will get a “time out”.
- A dog gets a Milkbone if he rolls over and plays dead.
- If you take an aspirin, your headache pain will go away.
- If you get caught drunk driving, you will lose your license.
Other Terms

- Chaining
  - Reinforce behaviour after completing a sequence of responses
- Extinction
  - Decline in behaviour due to lack of reinforcement
- Partial Reinforcement
  - Behavioural response is not rewarded every time

Partial Reinforcement

- Fixed Ratio
  - Reinforced after a fixed number of responses
- Variable Ratio
  - Reinforced after a variable number of responses
- Fixed Interval
  - Reinforced after a given amount of time has elapsed
- Variable Interval
  - Reinforced after a variable interval of time has elapsed
Name that Schedule

- You get 1 air mile for every $20 you spend at Shell
- You may win a large amount playing video poker
- You study for the tests that your professor gives you; the tests occur once per month
- You study for the periodically “pop” quizzes that your professor gives you without warning

- You get one Coca-Cola for every Loony you put in the vending machine
- You check your snail mail, which comes once per day
- Your boss pays you $10/hour
- Your boss pays you 5 cents for every letter you engrave
- Your boss pays you a commission for each sale you make

Beyond Freedom & Dignity

- Skinner
  - Man has no personality, will, intention, self-determinism, or personal responsibility
  - We hide behind these terms and use them to explain things we don’t understand
  - It all comes down to stimulus \rightarrow response
    - We repeat the actions we’re rewarded for
    - We stop the actions we’re punished for
Other Applications

- Inspiration from Operant Conditioning
  - Behaviour Modification Therapy
    - Using positive reinforcement to change behaviour
    - Ignore the behaviours you don’t want and positively reinforce the behaviours you do want
  - Token Economies
    - Desired behaviours are positively reinforced with tokens
    - Tokens are later exchanged for a tangible reward

Overlooked Issues

- Role of Cognition
  - Learned helplessness
  - Beliefs about reinforcement
  - Contrast effects
  - Self-evaluations
- Biological Constraints
  - Can’t learn some behaviours
  - Can’t unlearn others

Observational Learning

- Learning by observing and imitating others
  - Monkey see, monkey do…
- Cognitive process
  - Attention
  - Retention
  - Reproduction
  - Motivation
Social Learning Theory

- Children watched a film of an adult playing with a Bobo doll
  - Adult was either aggressive (used a mallet) or not
- The kids were later brought into a room with toys
  - Including a Bobo doll & mallet
- Kids who saw the aggressive adult modelled their aggressive behaviour
  - But less so if they saw the adult punished for aggression

Vicarious Reinforcement

- We learn based on other people’s experiences
  - If they were rewarded, we do it too
    - Vicarious Reinforcement
  - If they were punished, we don’t
    - Vicarious Punishment
- If you see someone reacting to a German Shepherd with fear, how does that make you feel?

Media Violence
Experimental Evidence

Exposure to a violent TV show increased aggression – especially among boys.

Field Study

<table>
<thead>
<tr>
<th>Grade</th>
<th>TV Violence</th>
<th>Aggression</th>
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<tbody>
<tr>
<td>3rd</td>
<td>.21</td>
<td>.38</td>
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<td>12th</td>
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TV Violence  TV Violence

Aggression  Aggression