Chapter 9 - Escape, Avoidance & Punishment

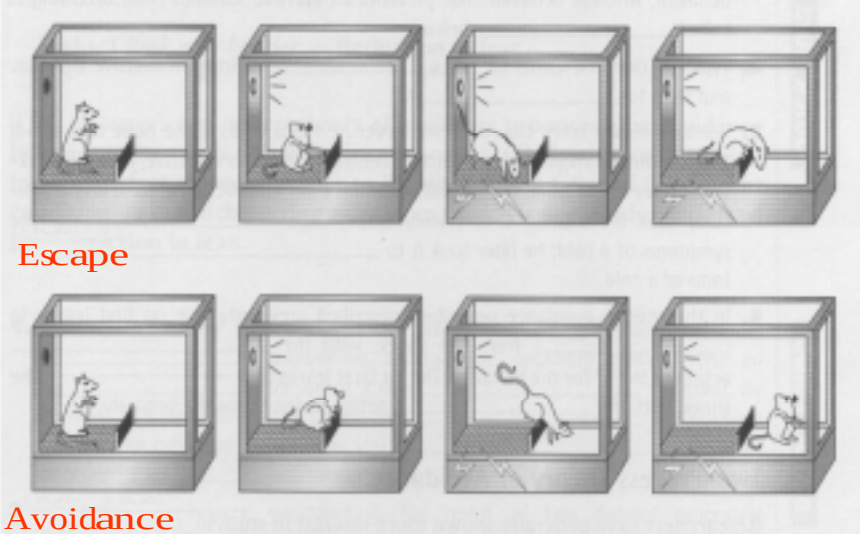
Lecture Outline

- Escape & avoidance
  - Two-factor theory of avoidance
  - Avoidance conditioning & phobias
  - Avoidance conditioning & OCD
- Punishment
  - Types of punishment
  - Problems with punishment
  - Effective use of punishment
  - Theories of punishment
- Effects of non-contingent punishment
  - Learned helplessness
  - Masserman's experimental neurosis

Escape & Avoidance

- Negative reinforcement
  - Removal of an aversive stimulus that leads to increase in behavior
- Escape
  - Performance of a behavior
  - Shock (S^D) : *Cross Barrier* (R) →
- Avoidance
  - Performance of a behavior
  - Light (S^D) : *Cross Barrier* (R) →

Escape & Avoidance



Escape & Avoidance

- Two-factor theory of avoidance (Mowrer, 1947)
  - Two processes involved in learning escape response
    1. Light (CS) : Shock (UCS) → Fear (UCR)
       Light (CS) → Fear (CR)
       (fear response elicited by the CS)
    2. Light (S^D) : *Cross Barrier* (R) → Reduced Fear (S^R)
       (avoiding the CS is negatively reinforced by reduction in fear)
  - Theory predicts that avoidance responding is performed to the extent that

Evidence for two-factor theory

- Kamin (1957)
  - Fours groups of rats in a 2-chamber avoidance apparatus
    - Group 1 – avoids shock & terminates (CS) signal
    - Group 2 – avoids shock & signal (CS) remains on
    - Group 3 – receives shock & terminates (CS) signal
    - Group 4 – receives shock & signal (CS) remains on
  - Two-factor theory – Prediction
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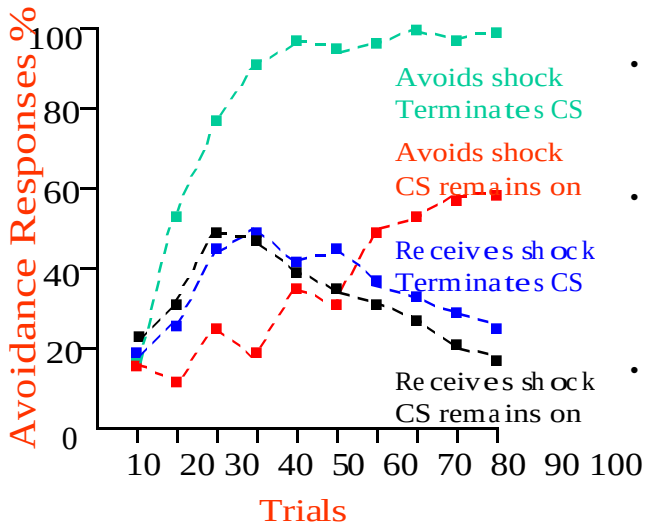


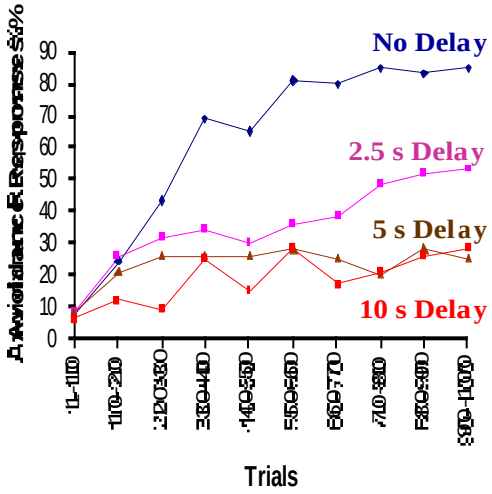
- Support for two-factor theory!!!

Effect of Delay of CS Removal

- Delay of reinforcement
- If termination of feared stimulus is reinforcing then
- Kamin (1957)
  - Fours groups of rats in a 2-chamber avoidance apparatus
    - Group 1 – CS terminated immediately
    - Group 2 – CS termination after 2.5 s delay
    - Group 3 – CS termination after 5 s delay
    - Group 4 – CS termination after 10 s delay

Results

- Effectiveness of CS termination to support avoidance was
- Results suggest that the source of reinforcement in avoidance conditioning was the
- More support for two-factor theory!!!



Evidence against 2 factor-theory

- Solomon, Kamin & Wynne (1953)
  - Conditioned avoidance responding in dogs

    Light (CS) : Shock (UCS) → Fear (UR)

    Light (CS) → Fear (CR)

    (fear response elicited by the CS)

    Light (S^D) : *Cross Barrier* (R) → Reduced Fear (S^R)
  - Shock then disconnected
    -
    -
  - Perhaps exposure to CS too brief for fear to extinguish *(anxiety conservation hypothesis)*

Evidence against 2 factor-theory

- Herrnstein & Hineline (1966)
  - Rats placed in Skinner box
  - Electric shock delivered randomly (probability = .3 for every 2-second period that elapsed)
  - Probability of shock reduced from .3 to .1 if lever pressed
  - Rats could not avoid or escape shock…just reduce number of shocks received
  - Most rats
  - Problem for two-factor theory:
  - Avoidance learning can be explained by one factor – reduction in shock rate

One-factor Theory

- One-factor theory
  - Avoidance is negatively reinforced by the
  - Reduction of aversive stimulation
- Which theory is correct???
  - That depends!!!
  - Several processes seem to be involved in avoidance learning

Avoidance conditioning & phobias

- Phobia
  - Irrational fear of specific object or situation
  - Fear is disproportionate to real threat
  - Acquisition – Pavlovian conditioning

    Elevator(CS) : Feeling Trapped (UCS) $\rightarrow$ Fear (UCR)

    Elevator(CS) $\rightarrow$ Fear (CR)
  - Maintenance – Avoidance (negative reinforcement)

    Elevator (S^D) : *Avoid Elevator* (R) $\rightarrow$ Reduced Fear (S^R)

- Can laboratory analogues of avoidance learning explain phobias in humans???

Avoidance conditioning & phobias

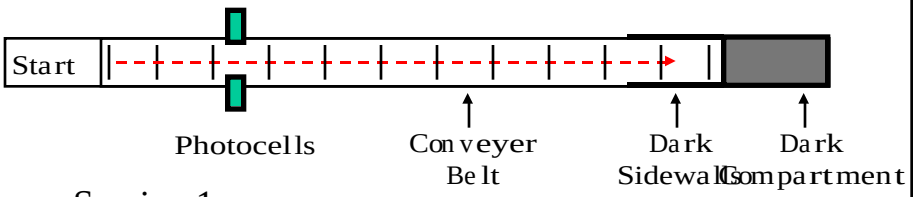
- Mineka (1985)
  - Two limitations to applying analogues of avoidance learning in explaining phobias in humans

    1. In experimental studies the animal avoids the US,

    2. In experimental studies avoidance behavior takes several trials to develop (& often unreliable),

- Stampfl (1987)
  - Argued previous avoidance-conditioning procedures could not address these issues

- Stampfl (1987)
  - Developed procedure to establish:
    1. Fear with single, brief CS-US pairing
    2. Avoidance of the CS & US
    3. Successful avoidance on 100% of trials



- Session 1
  - Rat explores the alleyway
  - Preference for dark compartment but given strong foot-shock after arrival
  - Rat runs to opposite end of compartment

  - 3 minute delay then conveyer belt begins to return rats to dark compartment
  - Rats runs to opposite end breaks photo-beam → conveyer stops for 3 minutes
  - After 3 minutes conveyer starts again
- Session 2
  - Response requirement changed from FR1 to FR10
  - Rats had to pass photo-beam 10 times to stop belt
- Results
  -
  -
  -

Summary of Stampfl study

- Summary
  - Avoidance response occurs
  - Early responding reduces
  - Minimal effort is required
  - Phobic response is maintained

Avoidance conditioning & OCD

- Obsessive-Compulsive Disorder (OCD)
  - Persistent thoughts, impulses (obsessions)
  - Repetitive behaviors (compulsions)
  - Compulsive behaviors performed the alleviate obsessions
- Cleaning & checking = 2 most common forms of OCD
- Obsessions & compulsions – opposite effects on anxiety
  - Obsessions increase anxiety
  - Compulsions decrease anxiety
- Role of avoidance in OCD similar to phobias
  - OCD –
  - Phobia –

OCD

- Two-factor theory can explain maintenance of OCD
  - Compulsions (e.g., hand washing) maintained by

- Exposure & response prevention (ERP therapy)
  - Prevention of avoidance response should extinguish behavior
  - ERP – prolonged exposure to anxiety provoking stimulus; prevention of compulsive behavior
  - Gradual exposure of systematic desensitization
  - Prolonged flooding

Example (OCD hand washing)

- Example:
  - Person begins by touching objects associated with moderate anxiety (e.g., door handles) and progresses to objects associated with more intense anxiety (e.g., toilet bowl). Client not permitted to engage in compulsive acts (e.g., hand washing). After prolonged session (e.g., 90 mins) anxiety begins to extinguish.

- Problems for two-factor theory in explaining OCD
  -
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Punishment

- Types of punishment
- Problems with punishment
- Effective use of punishment
- Theories of punishment

"Well, Timmy, it looks like you've just earned yourself 10 minutes with Mr. Whiskers."

Types of punishment

1. Positive punishment
    - Presentation of an aversive stimulus following a response → decreases strength of response
    - A stare from the lecturer for talking in class
2. Negative punishment
    - Removal of a desired stimulus following a response → decreases strength of response
    - The lecturer stops smiling when student talks in class
    - The stimulus being removed can typically act as a positive reinforcer (e.g., smile, food, money, sex)

Two types of negative punishment

1. Time-out
   - Loss of access to positive reinforcers following problem behavior (e.g., send child to room)
   - Ineffective if:
     -
     -
2. Response cost
   - Removal of reinforcer for inappropriate behavior (e.g., take toys away for misbehaving)
   - Can adjust severity of punisher to suit severity of behavior

Negative Punishment vs Extinction

- Negative punishment vs. extinction
  - Similarities
    - Both involve removal of reinforcers
    - Both result in decreasing strength of behavior
  - Differences
    - Extinction –
    - Negative punishment –

Intrinsic vs. extrinsic punishment

- Intrinsic punishment
  - The behavior being performed is
- Extrinsic punishment
  -

Primary vs. secondary punishers

- Primary punishers
  - Events that are
  - Electric shock, intense heat, loud noises, pain, hunger
- Secondary (conditioned) punishers
  - Events that are punishing
  - Must be learned
    - Stage 1
      - Tone (CS) : Shock (UCS) → Fear (UCR)
      - Tone (CS) → Fear (CR)
    - Stage 2
      - *Wheel Running* (R): Tone (S^P)

Problems with Punishment

1. Punishment of inappropriate behavior

Example

Removal of privileges for swearing does not strengthen appropriate verbal interactions. The child might withdraw from all verbal interactions.

Problems with Punishment cont.

2. Person delivering punishment

Example

"Wait till your father gets home"!!! Father delivers punishment and child misbehaves in presence of mother

3. Individual being punished might

Example

A child who is punished by her father might begin to avoid interacting with her father

Problems with Punishment cont.

4. Punishment elicits strong emotional response that can

   Example

   Smacking a child for inappropriate play can result in a tearful emotional reaction that is not conducive to teaching the child appropriate play behaviors

5. Punishment can produce

   Example

   Following a disciplinary meeting with the boss at work the person being punished might become aggressive to their boss or to their partner upon arriving home

Problems with Punishment cont.

6. When effective, the use of punishment

   Example

   Individuals who are severely punished or abused as children sometimes grow up to abuse others

Problems with Punishment cont.

7. Punishment can be

Example

A police officer who issues a speeding fine experiences the immediate satisfaction of knowing that the motorist will stop speeding (at least for a while!). In this case the behavior of issuing a fine has been strongly reinforced. The reinforcing effect of issuing the fine might encourage the officer to issue more fines, possibly in situations that are not warranted.

Effective use of punishment

1. Punishment should be

Example

In animals and children who have not developed language ability punishment should occur immediately so that it is associated with the unwanted behavior

2. Punishment should be

Example

Intermittent punishment has little effect on unwanted behaviors. Once the behavior has been suppressed through punishment, intermittent punishment might be effective.

Effective use of punishment

3. Punishment should be as

Example

Responding to a behavior with a mild punishment often has little effect. To modify future occurrences of the behavior a more intense punishment is needed than would have been necessary at the outset.

4. Negative punishment vs. positive punishment

Example

Negative punishment is preferred to positive punishment because it is less likely to produce many of the side-effects associated with punishment.

Effective use of punishment

5. Punishment is more effective when

Example

Explanations can clarify the exact reasons for punishment and can result in reduced likelihood of future occurrences of the specific behavior. Feedback should included what was done well and what was not done well to facilitate learning appropriate behaviors

Effective use of punishment

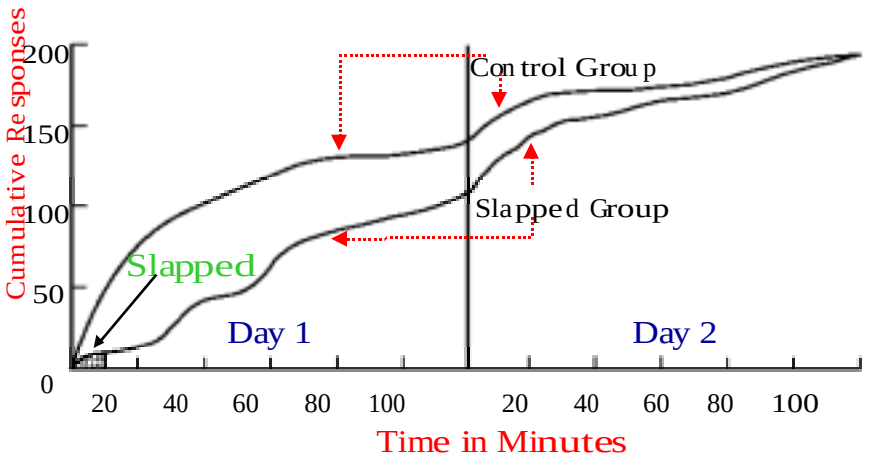
6. Punishment of inappropriate behavior should be combined with

Example

Timeout for being naughty should be supported with praise for good behavior

Theories of Punishment

- *Conditioned suppression*
  - Punishment generates
  - Once punisher is withdrawn
- Skinner (1938)
  - Two groups of rats exposed to 3 X 120-min sessions of VI lever press/food reinforcement schedule
  - Followed by 2 X 120-min extinction sessions
  - Group 1 – during 1st 10 mins of extinction bar-presses resulted in lever jolting up to slap paws (punishment group)
  - Group 2 – normal extinction (no punishment group)



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- By end of extinction on Day 2, both groups
- Effects of mild punishment

Conditioned Suppression cont.

- Azrin (1960)
  - Pigeons trained in operant key pecking procedure
  - Punishment procedure then implemented – key pecks produced electric shocks
  - Unlike Skinner 1930, punishment remained throughout extinction trials
  - Shock intensity also varied across groups
- Results
  - Low intensity shocks –
  - High intensity shocks –
- Interpretation:
  -
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Theories of Punishment cont.

- *Avoidance theory of punishment*
  - Punishment is avoidance conditioning where the avoidance response
  - *Lever Press* (R) → Shock (S^P)
  - *Any Response Other Than Lever Press* (R) → No Shock (S^R)
  - Any behavior other than lever pressing
  - Assumes that punishment does not

Theories of Punishment cont.

- *Premack theory of punishment*
  - Low probability behavior (LPB)
  - Note: Opposite of Premack principle of reinforcement
  - If rat prefers eating food to lever pressing the opportunity to eat can reinforce lever pressing
    - *Lever Press* (LPB) → Eating Food (HPB)
  - Rat will also be less likely to eat food if the consequence of lever pressing was not present
    - *Eating Food* (HPB) → Lever Pressing (LPB)
- Premack approach assumes that punishment is the opposite of reinforcement (i.e., punishment weakens a behavior)