

## Lecture 6: Operant Conditioning

**Operant Conditioning:** Learning where behaviour is strengthened/weakened by consequences of novel behaviours – not innate. Modification of voluntary behaviours, individual actively operates on the environment, must be a contingent relationship between behaviour and reinforcer.

Whereas, Classical Conditioning is the modification of reflex behaviours, passive response to cues, involuntary behaviours

Concept	Definition
Positive	Stimulus added (good or bad)
Negative	Stimulus removed (good or bad)
Punishment	Weakens behaviour (good or bad), a consequence that follows a response and decreases the future likelihood of the response
Reinforcement	Strengthens behaviour (good or bad)
Positive punishment	<i>Decreasing</i> behaviour by <i>adding</i> something aversive
Negative reinforcement	<i>Increasing</i> a behaviour by <i>removing</i> something aversive
Contiguity	Must be clear which behaviour is being punished, delay can confuse which behaviour is being punished, immediate to be most effective, general suppression/learned helplessness (increase anxiety/depression), punishment as a model, ethical (physical/psychological damage)
Contingency	Extent to which the behaviour results in the reinforcer affects the extent to which the behaviour is reinforced
Extinction	Ignoring the behaviour (no reinforcement or punishment), dissociate UCS and CS to eliminate CR
Instrumental conditioning	Behaviour used as instrument to produce/avoid consequences

- Discrete trial procedure: has a start and an end with one response and reinforcement
- Free operant procedure: response can be made at any time and reinforcement can be scheduled according to the response

Reinforcers (proposed by Skinner): any event that follows a response and increases the rate of response (negative/positive)

Concept	Definition	Notes
Reinforcer	Any event that follows a response and increase the probability of occurring in the future	See below: primary and secondary
Primary reinforcer	innately effective, satisfied biological need, not depended on leaning	food, water, comfort, drugs, sleep, social contact, sex
Secondary reinforcer	conditioned reinforcer acquired ability to reinforce through its association with a primary reinforcer	e.g. money → access to primary reinforcers), must be periodically paired with primary reinforcer to be effective
Token economy	Object that symbolises something else, tokens to reinforce behaviours through exchange for desired items	e.g. earning 5 tokens can earn a lolly
Intrinsic reinforcer	Comes from within the person	e.g. blowing on a harmonica naturally produces sounds. If the sounds serve to reinforce blowing on the harmonica, then the sounds provide intrinsic reinforcement
Extrinsic reinforcer	Comes from external environment, can undermine intrinsic (if justification for task is to receive extrinsic reinforcer)	e.g. money
Shaping	Uses successive closer and closer approximators to train desired behaviour	First reinforce distantly related behaviour → increasingly related → terminal response behaviour
Incentive value	The pleasure a stimulus will produce	Behaviour motivated by the value of external rewards
Drive reduction	A stimulus that leads to drive reduction is a primary reinforcer	Behaviour is motivated by biological needs. A drive creates a tension which can be reduced by an appropriate stimulus. E.g. food reduces hunger

## Theories and Principles

- Premack's Principle: increase the performance of a low probability behaviour by making the opportunity to perform a high probability behaviour contingent upon it – contingent
- Response-Deprivation theory: all behaviours have a preferred level of engagement and any behaviour will be reinforced when the individual is prevented from engaging in the behaviour at normal frequency
- Some behaviours can't be influenced by operant conditioning as they're not under conscious control
- Stimulus generalisation: the tendency of learning experience to spread/transfer to other situations, facilitates transfer of behaviour across similar situations
- Stimulus generalisation gradient: rate at which responding drops off as the stimulus is changed indicating how much the stimulus is controlled by a particular stimulus dimension, influenced by learning
- Stimulus discrimination: discriminate between situations in which behaviours are rewarded and those where it is not
- Matching to sample: making a response association with different comparison stimuli

## Edward Thorndike: studied animal intelligence by presenting animals with a problem repeatedly to determine how experience effects animal behaviour

- Law of effect: responses that produce satisfying effect in particular situation become more likely to occur again in that situation, and responses that produce discomforting effect become less likely to occur in that situation again – behaviour is a function of its consequences
- Stamping in: reward influences strength of association between stimulus, situation and response, reward 'stamps in' relationship between stimulus and response

## B.F Skinner: coined 'operant conditioning'

- Emphasis on behaviour: thoughts, emotions and other internal, mental activity should be excluded from analysis and theorising of psychology
- Suggested applications for operant conditioning
- Skinner Box: automated delivery of reinforcer and response
- Radical behaviourism: aim to determine the empirical correlation between behaviour and environment, behaviours controlled by consequences (operant) and others by antecedents (respondent)
- Extinction: gradual weakening and disappearance of a response because the response is no longer a reinforcer, continuous reinforcer = fast extinction, intermittent reinforcer = slow extinction

## Schedules of Reinforcement

Schedule	Definition	Example
Ratio (number of responses)	A certain number of responses are required for reinforcement	See below: fixed and variable
Fixed ratio	fixed number of responses have to occur before reinforcer is delivered	e.g. FR 10 – 10 coffees bought to obtain 1 free coffee (response lowered if ratio becomes too large)
Variable ratio	Reinforcer occurs after a variable number of responses	e.g. VR 6 average of 6 responses but uncertain (high and steady responding)
Interval (amount of time)	Minimum time that must elapse before reinforcer	See below: fixed and variable
Fixed interval	Reinforcer becomes available after fixed time period	e.g. FI1 reinforcer becomes available after 1 minute (scallop pattern)
Variable interval	Reinforcer becomes available after a variable period of time	e.g. VI1 reinforcer becomes available after an average of 1 minute (low and steady)

### **Additional Notes and Reflections:**

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