# Operant Conditioning

## Paradigm

## Relevant Terms

## Consequences

## Confusing Consequences

## Schedules of Reinforcement

## Summary

OC Paradigm

## Edward Thorndike - studied cats in puzzle boxes and came up with the law of effect.

## B. F. Skinner

## *“Behavior is shaped & maintained by its consequences.”*

## *“Skinnerian” Conditioning* is also called: *Operant Conditioning (OC), Instrumental Conditioning, Trial & Error Learning*

## Operant behavior is sometimes called *“goal directed behavior”*.

## Unlike CC, in OC the organism is in control.

## R → S\* Response leads to a Stimulus Consequence

## Examples:

### Pigeon Turning - B.F. Skinner.

### Dog gets cookie for a sit.

### You are getting an education as a result of attending this seminar.

### I am getting paid to give this seminar.

Relevant Terms

## Contingency

## A *“contingency”* refers to a dependence of one event upon another.

## In the case of OC, it refers to the dependency of the stimulus consequence (S\*) on the behavior (R).

## In other words, the S\* is contingent upon the R.

## Note that S\* can also be contingent upon No R.

## We will discuss OC contingency space in more detail later.

## Shaping by Successive Approximations

## Description

#### A procedure where the contingency is gradually made more stringent until the desired behavior is obtained.

#### May involve varying the task along one or more stimulus dimensions, including:

### Latency (speed) - ex. fast sit.

### Duration - ex. longer stay.

### Distance - ex. sit from close or far.

### Frequency - ex. *2fers* & *3fers.*

#### May also involve breaking the task into components which can them be “chained”.

## Service Dog Skill

## Training a dog to retrieve a tissue from another room & then drop it in a garbage after it’s used.

## Has numerous components (go away, get, hold, bring, go to, drop. . ., wait, etc.) & some involve dimensions of distance & time.

## More Examples

## Outing (releasing toys or the decoy)

### Toy (having two & trading is a big help)

### Tug toy

### Sleeve of passive decoy

### Sleeve of passive decoy after stick hits

### Sleeve of active decoy (bite on wrong target or perp gives up but is struggling in pain)

## Jumping

### Low to high jump heights

### Come-overs, run-bys, go-overs (angles help)

### More than one jump (& repeat above)

### Tire/window, double, triple, & broad jumps

## Premack’s Principle

## States that a high probability of occurrence behavior can be used as a reinforcer for a lower probability of occurrence behavior.

## In other words, *“play”* can be used as a reinforcer for *“work”*. Many dog will also work for the opportunity to hunt, fight, bite, sniff, swim, etc.

## Example of reinforcer relativity in people.

## You need to figure out what is important to your dog & then make these activities contingent on good behavior.

## Discriminative Stimulus

## A stimulus that signals that a particular contingency is in effect.

## Words, hand/body signals, people, etc. can all be SD’s.

## Example: SD → R → S\* or ”Sit” → sitting → treat

Consequences or Procedures

## Goal of Reinforcement is to increase behavior.

## Goal of Punishment is to decrease behavior.

|  |  |  |
| --- | --- | --- |
| Stimulus | Given (+) | Taken away (-) |
| Pleasant | +R give a goodie | -P ”time out” or withhold an expected goodie |
| Aversive | +P give pain | -R terminate pain |

# Reinforcement Quantity & Quality - More and better is more effective.

# Reinforcement Delay - Less delay is more effective.

# Punishment

## Delay

## Camp, Raymond, & Church (1967) taught rats to bar-press & then punished the response with a 1- sec, .25 mA shock after varying delays.

## Found punishment to be more effective with less delay.

## Intensity

## Camp, Raymond, & Church (1967) taught rats to bar-press & then punished the response with a 2 sec shock of varying intensity.

## Found intensity to be directly correlated with effectiveness.

## Problems

## Effects may only be temporary - more of a problem when the aversive stimulus used is mild (a nag).

## It is not as clear of a source of info as is reinforcement - reinforcement tells the animal *“what your doing is good”*; punishment tells the animal *“stop that”*.

## It may lead to fear responses, escape, avoidance, & aggression - mechanism is CC.

## Contingency between behavior & punishment may not be recognized - in this case, the animal will learn “*helplessness*”.

## Principles for Effective Use

## Be prompt - it should follow the occurrence of the undesired behavior immediately.

## Be consistent - it should occur each & every time the undesired behavior occurs.

## Provide an alternative behavior that can be reinforced - purpose is to overcome problem of punishment not being a good source of info.

## Choose intensity of aversive stimulation carefully - too little immunizes; too much sensitizes.

## Sometimes a conditioned punisher is useful - a signal that predicts the occurrence of an aversive event.

## Lindsay (2000) provides a list of 20 guidelines.

Confusing Consequences

## Folks confuse +P & -R for several reasons:

## The term negative. The +/- signs are used arithmetically (+ = add/give, - = minus/take away). Thus negative does not = bad.

## The behaviorists had a phrase *“accentuate the positive”*. Unfortunately the word reinforcement was left out because it made the phrase less catchy.

## In order to use -R, one must typically administer the aversive stimulus in order to be able to terminate it.

## Another way to look at consequences:

|  |  |  |
| --- | --- | --- |
|  | Desired effect on behavior: | |
| Stimulus | Increase | Decrease |
| Pleasant | +R give | -P take away |
| Aversive | -R take away | +P give |

## Clearly then:

## Goal of Reinforcement is to increase behavior.

## Goal of Punishment is to decrease behavior.

## Punishment is not the same as *“retribution”*.

Schedules of Reinforcement

## CRF = Continuos ReinForcement

## PRF = Partial ReinForcement

|  |  |  |
| --- | --- | --- |
| Stimulus | Given (+) | Taken away (-) |
| Ratio (# responses) | FR | VR |
| Interval (time) | FI | VI |

## Conclusions

## Ratio schedules better than interval.

## Variable schedules better than fixed.

## Each schedule produces a unique pattern of responding.

## VRVR (Variable Ratio with Variable Reinforcement) is probably the overall best for dog training.

OC Summary

## OC is concerned with *“how do I get what I want (or avoid what I don’t want)”* or, more specifically, it is concerned with how the organism’s responses influence the occurrence of biologically relevant consequences.

## Thus, OC deals with relations between stimuli & responses (R-S relations).