

## **MARINE MAMMAL TRAINING**

Since its opening in 1971, millions of people have come to Sea World to see marine mammals perform in shows. Our visitors have the unique opportunity to observe and learn directly from our animals which in turn increases public awareness about Australian marine wildlife. The care of Sea World's marine mammals is closely intertwined with training. Training assists Veterinarian and Curatorial staff to form a more complete picture of an animal's health. The training of marine mammals is a process which has developed in Australia over the last 30 years and continues to grow in sophistication. With a beginning that relied heavily on trial and error, marine mammal training has progressed rapidly due to the theories of operant psychology. This science has provided the means for trainers to condition marine mammals on the basis of positive reinforcement for success rather than punishment for mistakes. The following is an overview of the training philosophies that are employed with the marine mammal collection at Sea World.

### **EARLY CONDITIONING**

The reason that most children commence their schooling at 4 -5 years and not at 60 years of age is because this is the time that they are the most receptive for the introduction of new ideas and concepts. As we grow older we become more "set in our ways" and reluctant to change. For this reason, the most important element in the training of a marine mammal is ensuring an appropriate form of early conditioning. The early stages of an animal's training experience will be of paramount importance for all of its life here at Sea World. Because the early conditioning that an animal receives will be the foundation from which all other forms of behaviour are conditioned, any negativity during its early conditioning period, may lead to an animal that is nervous, un-cooperative-operative, inattentive, and possibly dangerous with limited behavioural potential. Equally, an animal with a positive early experience is one that is confident, eager to respond, safe to work with, and has enormous behavioural potential. The early conditioning of a marine mammal should concentrate on exercises in gaining the animal's confidence and trust in the trainer. Exercises should include substantial amounts of physically handling the animal both in and out of the water. The training of complex behavioural routines will be made all the more easier if an animal has confidence that the trainer is not likely to ask it to do something that it should be apprehensive about or beyond its behavioural capabilities.

### **BRIDGING STIMULUS**

Often called a conditioned reinforcer or secondary reinforcer, a bridging stimulus is any stimulus that bridges the time interval between the point of reinforcement and actual presentation of reinforcement. The bridging stimulus acquires its effectiveness through a history of being paired with primary reinforcement. At Sea World, 4 bridging stimuli are utilised including: the "Dog Training" whistle, the word "Okay" for pinnipeds, the action of "Jumping Off" water behaviours for cetaceans, and a "Double Tap" tactile stimulus. The bridging stimulus was introduced to marine mammal training to pin-point the precise moment of reinforcement during behaviours that due to their specific nature, could not be instantly reinforced. The bridging stimulus is presented as desirable behaviour is elicited by an animal. For example, this may be at the highest point of a jump, or the loudest point of a vocalisation. In simple terms, the bridging stimulus means "yes" to an animal, return to the trainer and receive some form of reinforcement.

### **DISCRIMINATION**

The ability of an animal to distinguish, perceive or recognise various stimuli presented to it is known as its discrimination ability. All performance animals at Sea World are trained a variety of signals or cues which elicit many different responses. A discriminative stimulus is a specific cue or signal that causes an animal to understand that a specific response is required. A comprehension of the stimulus is required by an animal before it can be considered a

discriminative stimulus. At Sea World, discriminative stimuli are presented to the animals in several forms including, visual, audio, positional, contextual, or any combination of these.

Discriminative Difference is a term that is used at Sea World to describe the dissimilarity between alike stimuli. As an example, one stimulus may be the action of a trainer clapping his hands without making a sound. This may signal the animal to elicit a specific response (e.g. a backward somersault). Another stimulus may be the action of the trainer clapping his hands but this time making a clapping sound. This may signal the animal to elicit a completely different response to the backward somersault. Although visually both stimuli are exactly the same, one of the cues has another component attached to it; this being sound. This slight variation between the two very similar stimuli is known as the discriminative difference. Another example of discriminative difference is the variation displayed to the animals by the trainers between shows and training sessions. Although it would appear that during shows the exact same stimuli are given to the animals as are given during training sessions, there are certain associated stimuli within the show circumstance that are not present within training sessions. These include music, costumes, announcing staff, shows always occurring at a specific time, and the trainers lack of ability to terminate the show should poor behavioural standards occur. The result of this discriminative difference between shows and training sessions, is that a trainer generally finds that his animals tend to work better during training sessions than in shows. This discriminative difference is a "fact of life" with all performance animals and all a trainer can do is try to reduce the difference between shows and training sessions as much as possible, without compromising show quality.

### **SUCCESSIVE APPROXIMATIONS**

Traditionally, the conditioning of marine mammals at Sea World is achieved through the use of successive approximations. Successive approximations are any series of stages or levels that are calculated for an animal to achieve a desired behaviour. The process of conditioning a marine mammal to perform a specific behaviour is similar to a child learning to run. Firstly the child must learn to crawl, and then progress to being able to stand, then to walk, and finally the child completes the behaviour of being able to run. As we all know, some children may progress from standing to running in a very short time and others may be a bit slower in their development. This principle also applies to the conditioning of marine mammals as the development of conditioned behaviour will vary from animal to animal. As such, successive approximations must be presented in increments that are appropriate for the specific animals current cognitive and behavioural capability. There may also be several different series of successive approximations for achieving the same behavioural goal. One particular series may be suitable for one specific animal and not for another. If a trainer is experiencing difficulty with a specific behaviour and a particular animal, he must remain flexible in his conditioning approach and be able to "change course" midstream if the situation calls for it.

### **ATTENTION SPAN**

The period of time that an animal concentrates on any given thought, object or training session is known as its attention span. Attention span differs between animals, tasks and circumstances. Generally, attention span is initially of short duration and must be conditioned through successive approximations if a longer duration is required. For example, a young animal undergoing early conditioning will generally have a shorter attention span than older and more experienced animals performing shows. As such, it is important to include attention span conditioning as part of a training programme for young animals. A trainer can assist an animal in increasing its attention span by ensuring that training sessions are positive, varied, challenging and stimulating.

### **AVERSIVE STIMULUS**

There will be times at Sea World when a trainer will be required to present an Aversive Stimulus to an animal. An Aversive Stimulus is a repellent stimulus that is terminated, as a desired response is elicited. The classic example of this at Sea World is the use of a net to

coerce a sick animal to swim into a holding pen for husbandry purposes. Often a sick animal will be uncooperative in swimming into a holding pen, and due to medical reasons it may have to be coerced into the pool by the deployment of a net. In this case, the net is the repellent stimulus that is removed (terminated) as the animal swims into the holding pool (desired response). If this procedure is repeated over several days an animal may start to swim into the pen of its own volition in order to avoid the aversive stimulus being presented. This is known as avoidance behaviour. Avoidance behaviour is always associated with an aversive stimulus. An aversive stimulus is a negative experience for an animal and should only be utilised when all other training methods have failed and it is absolutely imperative that the particular response be obtained.

### **BEHAVIOURAL DRIFT**

From time to time a trainer will notice that a particular behaviour presented by an animal has "something different about it" or "looks slightly different". This change may be very subtle, but if this change is inadvertently reinforced it is very likely that the slight change will continue to be elicited. If, over a period of time an animal is continued to be reinforced for "changes" to the behaviour, the behaviour may deviate to the point that it is unrecognisable from what it originally was. Behavioural drift may be intentional or unintentional on the animal's part, and advantageous or dis-advantageous from the trainer's point of view. It is also possible that an animal may behaviourally drift both advantageously and dis-advantageously at the same time. For example, whilst learning a backward somersault, an animal may leap with more revolutions (advantageous) but also leap in a shallow part of the pool (disadvantageous). The trainer must learn to recognise which category the behavioural drift falls under and respond to it appropriately.

### **BEHAVIOURAL ENRICHMENT**

An important aspect of a trainer's day is to provide stimulation to the marine mammals additional to training sessions and performances. This stimulation can be applied in many forms including: favourite activities, objects or toys. Behavioural enrichment is utilised to further enhance an animal's time at Sea World, develop the animal/trainer relationship, and provide the opportunity to inter-act with the trainers in a context which does not involve feeding or work. Whilst employing behavioural enrichment techniques it is important to vary the sessions in such a way as to limit the amount of time an animal spends on any one activity. By doing this the animal will not become bored with the games or toys and the trainer will not lose the reinforcing value gained by such sessions.

### **CHAINING**

Chaining behaviour is the process of teaching an animal a sequence of behaviours (2 or more) that proceeds semi-automatically in a determined order. One behaviour produces the conditions that make the next possible. On the successful completion of one behaviour an animal is reinforced by being able to continue onto a second behaviour. The stimuli linking the behaviours together serves as both conditioned reinforcers, maintaining the determined order of the behaviours to be produced; and as stimuli setting the occasion for the following behaviours. In this way the first behaviour becomes the stimulus for the second behaviour, the second behaviour becomes the reinforcement for the first behaviour and the stimulus for the third behaviour, the third behaviour becomes the reinforcement for the second behaviour and the stimulus for the fourth behaviour and so on. Chains are generally trained by 2 methods; forwards or backwards in a fixed routine so that the animal learns through experience to predict the topography of the chain.

### **CONDITIONED REINFORCERS**

Also known as Secondary Reinforcers, Conditioned Reinforcers are originally ineffective stimuli that derive their reinforcing value from a conditioned association with Primary Reinforcers. The most obvious example of a Conditioned Reinforcer at Sea World is the Dog Training Whistle or Bridging Stimulus used with the Cetaceans. Originally the whistle meant nothing to the animals, but by pairing the sound of the whistle with food, the animals were conditioned to associate the sound with a form of primary reinforcement. Other examples of Conditioned Reinforcers utilised at Sea World include: Ice, the word "Okay", a double tap tactile stimulus, and the recall sound stimulus.

Similarly a Conditioned Stimulus (also known as a cue or signal) is an originally ineffective stimulus for a given response that, by the procedure of conditioning, has become capable of eliciting that response. At Sea World each behavioural response that an animal has been conditioned to elicit has a corresponding Conditioned Stimulus attached to it. Conditioned Stimuli may be presented as visual, audio, positional, or contextual cues.

## **CONFUSION**

Confusion in a marine mammals mind is a lack of understanding of what is required. Confusion may be manifested in 2 ways:

1. A failure to understand what is required and as a consequence, no response is elicited.
2. A discrimination problem in what is required and as a consequence, the wrong response is elicited.

When dealing with confusion with a marine mammal it may at times be difficult to determine whether the animal is refusing to respond or failing to respond. The trainer can assist themselves in this by remembering that refusal is generally attitude orientated, whereby confusion is generally a communication problem.

## **INNOVATIVE TRAINING TECHNIQUES (SCANNING)**

Innovative training can be defined as learning that occurs with an animal through a self-experimental process. In simple terms, this means that a trainer can "capture" appropriate behaviour as an animal naturally exhibits it. Innovative Training Techniques can considerably shorten training time compared to Successive Approximations in the training of complex behavioural routines. During scanning, the trainer offers no approximations to the animal but waits for appropriate behaviour to occur. For example, many husbandry behaviours require an animal to relax its body for extended periods of time. How does a trainer condition an animal to relax through successive approximations? The trainer cannot achieve this; all the trainer can do is wait for the animal to relax and then reinforce this response. This is the nature of scanning. You can offer nothing to the animal except the opportunity to receive reinforcement if appropriate behaviour is elicited. The most difficult part about Innovative Training Techniques is conditioning the concept of being experimental to the animal. This is the fundamental difference between Innovative Training and Successive Approximations. Successive Approximations relies on learning from an incremental behavioural stand-point and Innovative Training relies on learning from a conceptual stand-point. By a trainer appearing to an animal to be available for reinforcement an animal may be prompted to be experimental. This may simply involve standing back from the animal with a bucket of fish in view and reinforcing the animal for soliciting reinforcement by appropriate behavioural responses, or placing an unusual object into the pool, or it may involve a trainer placing themselves in an unexpected position (e.g. suspended over the surface of the pool, up a ladder etc..) whereby the animal responds out of curiosity. Whatever it takes to initially elicit a response in some fashion is the key to teaching an animal to be experimental.

Scanning can be very successfully used in the conditioning of aerial behaviours. For example, using traditional approximations the teaching of a dolphin to jump over a surfboard may

involve the trainer conditioning the animal to: 1. Swim over a rope, 2. Jump over a rope, 3. Jump over a stick, 4. Jump over a ball, 5. Jump over a person in the water, 6. Jump over a surfboard. This process may take quite a period of time (perhaps a couple of months) depending on the confidence of the animal, the experience of the trainer and so on. Using Innovative Training Techniques for the same behaviour, the trainer would place the surfboard in the pool and then wait for the dolphin to respond to it. A dolphin can do only so much with a surfboard. The animal may touch the board, push the board, avoid the board, or jump near the board. Any response that the dolphin elicits in an appropriate direction toward the final goal should be reinforced. Even if the dolphin surfaces 5 metres away from the surfboard it should be reinforced. By saying "yes" to any appropriate response that occurs with the surfboard in the pool conveys to the animal that there is some association between that response and the surfboard. It is only the animal's lack of confidence with the surfboard that prevents it from jumping over the board. By selective reinforcement and as the dolphin gains familiarity with the board, the animal will naturally gravitate towards the board. As soon as the animal starts responding appropriately with the board the response should be placed under stimulus control and then shaped towards the final behavioural goal. It has been the experience of some trainers here at Sea World that if the dolphin is already familiar with the surfboard, then the animal may jump over the board on the very first training session. Scanning behaviours has been used successfully on many behaviours over the years including: somersault, spin jumps, breach jumps, hurdle jumps, and is intrinsically linked with successive approximations during the training of husbandry behaviours.

## **MIMICRY**

Another tool available to the marine mammal trainer is the use of Mimicry. Mimicry is often used in association with Innovative Training Techniques and offers the trainer substantial reduction in training time for complex behavioural routines. At Sea World, mimicry is generally utilised with the training of cetaceans. This is due to the nature of working these animals as a group of animals rather than singularly as with pinnipeds. There will be times that a trainer will notice that an animal makes a response that is similar to another animal. This can occur even if the animal has received no conditioning for that response. It is also possible to prompt mimicry within a group of animals. For example, if a floating pole is thrown on to the surface of the pool and a particular dolphin that has been conditioned to jump objects, starts jumping the pole; that animal should be reinforced. Other animals within the group will observe that this animal is receiving reinforcement and may also start responding in a similar fashion. Mimicry has been successfully used at Sea World in the training of many behaviours including: vocals, tail-lobs, bows, tail-waves, spin jumps, hurdle jumps, slide-outs, dorsal tows and dolphin rides.

## **DESENSITISATION**

There will be times at Sea World when a trainer will be required to train desensitisation with an animal. This process is usually associated with husbandry related behaviour such as blood sampling, stomach tubing, and collection of morphometrics or ultra-sound training. Through positive reinforcement, a trainer can condition an animal to become more at ease during an uneasy situation. The animal is reinforced for not reacting to certain stimuli. In many cases this may be simply displaying relaxation during handling procedures. Most desensitisation conditioning involves successive approximations and innovative training techniques being employed simultaneously. For example, a cetacean tail present will involve the trainer using successive approximations to teach the animal to present its tail, and innovative training techniques to teach the animal to keep the tail in a stationary or relaxed position. The successful conditioning of desensitisation with an animal will have many benefits including: maintaining a good animal/trainer working relationship, allowing Curatorial Staff the ability to collect medical data from, or give medical attention to an animal in the least stressful manner, and reducing the physical risks involved in forcibly handling an animal to collect such information or deliver such treatment.

## **FIXED RATIO AND VARIABLE RATIO SCHEDULES**

At Sea World, animal behaviour is conditioned to be performed in one of two formats; Fixed or Varied. A fixed format or Fixed Ratio (FR) Schedule is one that is performed identically each time without variation. This means that if a sea lion is conditioned to do a somersault on a FR schedule of 1, the animal will perform the behaviour once and then expect reinforcement. To get a second response the trainer would have to cue the animal a second time to get a second single response. A dolphin that is conditioned to perform a bow on FR schedule of 3 means that the animal will perform a bow three times and then expect reinforcement. The animal will not stop responding on the first or second bow but always on the third.

In contrast, a Variable Ratio (VR) Schedule is one where behaviour is performed with variation. This means that a dolphin that has been conditioned to perform a somersault on a VR schedule of 3 will perform the behaviour up to five times before expecting reinforcement. In order for a VR 3 schedule to be maintained successfully, the animal must however, be reinforced regularly for performing the somersault once, twice, three times, four times, and five times, with the average being three. Likewise, an animal with a VR schedule of 10 would need to be able to be regularly reinforced for performing a behaviour 19 times. At Sea World most VR schedules are at the level of 3.

## **LATENCY**

This is the term used to describe the duration of time between a stimulus being presented and a response being elicited. If a sea lion is presented with a cue to perform a front flipper stand, and the animal takes 5 seconds to respond to the cue, there is a latency of 5 seconds. Latencies may also be delayed by an animal. For example, a dolphin may respond immediately to a backward somersault cue but take 30 seconds to actually leave the water somersaulting. An animal should when presented with a stimulus, respond fairly immediately. Through un-timely reinforcement an animal's latency on a particular behaviour can drift into unacceptable time frames. This latency problem can then flow onto other behaviours and a general decline in the speed of response to all stimuli may be observed. All trained marine mammals at Sea World should respond in a fashion that is as quick and appropriate for each individual animal's behavioural capability. The latency of a behaviour is an extremely important ingredient in the overall behavioural standard of that behaviour and may on occasion require maintenance.

## **LIMITED HOLD**

Limited Hold is a tool available to the marine mammal trainer for resolving latency problems. Limited hold is the process of limiting the amount of time that an animal can respond to a given stimulus, by the removal of the stimulus. By implementing this tool, the trainer is saying to the animal, "I am going to give you a specific amount of time to respond to my cue; if you don't respond by the end of that time; your opportunity to respond will be taken away from you. Any response elicited after that time will be ignored". This can very quickly have the effect of prompting the animal to respond quicker. Initially, limited hold should be employed close to the point where an animal's latency has regularly been, and then over a period of time reduced. For example, if a dolphin has been taking 30 seconds to respond to a particular cue, the trainer should count out the seconds to the point of response and remove the cue at approximately 29 seconds. As soon as the animal responds at 29 seconds it should be positively reinforced. This should then become the standard until the animal regularly starts responding at 29 seconds. The trainer should then again employ limited hold at 28 seconds and keep repeating this process until an acceptable latency has been reached.

## **THRESHOLD**

The threshold of a behaviour is the least amount of stimulus required to elicit that behaviour. For example, if a person places their hand on the hot plate of an oven and turns on the heat, that person will be able to keep their hand there for a period of time as the element gets

hotter. But eventually the point will be reached whereby the person will remove their hand as the heat becomes too intense. At this point (when the hand is removed) is the threshold point. In this case the heat was the stimulus and the removing of the hand was the behaviour. In the marine mammal trainer's circumstance, threshold may be how vigorous they have to shake their hand or how high they have to lift their leg before an animal will respond to them. As with latency, some thresholds can get to an unacceptable level, whereby the amount of stimulus required to elicit a response is far more than is desirable. An example of this may be where the magnitude of vigour required by an animal to respond is aesthetically unsatisfactory for a show performance. By deliberately reducing the amount of stimulus, and reinforcing positive responses to this reduction of stimulus, thresholds can be conditioned to acceptable levels.

## **TIME-OUT**

There will be times that a trainer will experience difficulties achieving certain objectives during training sessions. The problem may be one or a combination of, confusion, discrimination, refusal, attitude, aggression, or motivation. During times like these the trainer has a tool available to them in the form of "Time-Out". Time-Out is a period of time in which the opportunity for an animal to be reinforced is removed for a period of time. If Time-Out is decided to be utilised it should be employed at a specific point of undesirable behaviour. This is to associate this undesirable behaviour with a period of non-reinforcement and thus attempt to reduce the problem. Time-Out can be quite variable in its duration. Sometimes it may be for 10 seconds; sometimes up to 3 or 4 minutes depending on the behavioural problem that the trainer is trying to resolve. The difference between the Termination of a training session and Time-Out is this: during a Termination the trainer completely shuts down the session and removes themselves from the training area and view of the animal; or in the case of pinnipeds, places the animal back in its pen. During Time-Out the trainer does not remove themselves from the training area; they simply signal that Time-Out has commenced by stepping back slightly from the animal. A period of Time-Out generally has two beneficial effects. Firstly it gives the animal's time to think about where they were going wrong during the training session, and more importantly, it gives the trainer time to think about where they were going wrong during the session. Quite often, after a period of Time-Out the animals and trainers have both resolved their problems or have a clearer understanding of what is required and a positive session can be continued. If problems continue to persist it is best to go on to other tasks that will generate positive responses or simply terminate the session.

## **VARIABLE INTERVAL REINFORCEMENT**

All marine mammals at Sea World not in a free-feed situation should BE worked on a Variable Interval Reinforcement schedule. Variable Interval Reinforcement is an irregular schedule in which reinforcement occurs after a variable period of time. This simply means that an animal performing a series of behaviours should not expect reinforcement after each individual behaviour, but should be conditioned to expect reinforcement spread throughout the performance. This will create a situation where an animal will be more behaviourally flexible during performances, trainers will not constantly have to have food on their person during performances, and should there be problems with a performance, an animal will not become instantly agitated should reinforcement not be forthcoming. This is of particular importance during water work exercises.

## **RECALL**

Recall is a sound stimulus used at Sea World to shape behaviour. The Recall tools can take two forms:

1. a stainless steel ring that is worn on a trainers finger and when struck against a hard surface (metal, fibreglass, or concrete) creates a sound stimulus.
2. a stainless steel object that when shaken creates a sound stimulus.

The recall stimulus at Sea World is used in two fashions:

1. as a means of sending or retrieving an animal from one location to another.
2. as means of bringing back to station an animal that has responded incorrectly.

The first form of recall occurs if an animal is required to swim to a particular part of the pool or take a certain run-up or path to successfully complete a behaviour. For example, recall may be used in order to position an animal correctly prior to performing a hurdle jump. Recall of an animal in this circumstance requires the presentation of a specific pair of stimuli; these being a visual "Send" cue followed immediately by the recall sound stimulus. In effect, the trainer asks the animal to "Go" with the send cue and "Where to Go" with the sound stimulus. This form of recall is of particular importance in the conditioning of positional behaviours and penning exercises.

The second form of recall occurs when an animal responds incorrectly and the trainer wishes to terminate the response and, avoid reinforcing the animal by allowing it to continue responding incorrectly. By allowing an incorrect response to continue occurring, is reinforcing to an animal. For example: if a dolphin is asked to perform a tail-lob and the animal responds by waving its pectoral flipper, the trainer sounds the recall stimulus; the animal terminates the response and returns to the trainer. By recalling the animal as soon as the incorrect response occurs, the trainer is not reinforcing the incorrect response by allowing it to continue. The trainer in this instance has several options available to them after the animal has responded to the recall. The trainer may ask for the tail-lob again, ask for a completely different response that is likely to be correct and then come back to the tail-lob, or the trainer may choose to reinforce the animal for responding correctly to the recall stimulus. If an animal is not regularly reinforced for responding to the recall, the trainer runs the risk of turning the recall stimulus into a Stimulus Delta.

### **PRO-ACTIVE AND RETRO-ACTIVE INHIBITIONS**

There may times during training sessions that an animal seems to be struggling with the learning process. This may be due to Pro-Active Inhibition. Pro-Active Inhibition is the interference of present learning by previous learning or experiences. For example, if a sea lion during its adolescence experiences health problems and has to be forcibly manipulated for medical treatment, it is reasonable to expect that the animal will be initially very nervous and perhaps unco-operative during the conditioning of water work or husbandry exercises at a later date. In order to avoid or limit the effects of Pro-Active Inhibition, the trainer should always investigate or be aware of the previous history of an animal prior to the conditioning of new behaviour. By knowing the history of an animal, the trainer may be able to modify or design a series of approximations specifically to accommodate the animal's requirements.

Retro-Active Inhibition is the partial or complete blocking of old memories or experiences by new learning. If the sea lion in the previous example receives conditioning in a fashion that is appropriate and takes into consideration its negative early handling experiences, it is likely that over a period of time the animal will become comfortable with water work or husbandry exercises. The trainer should be aware that an animal dealing with Pro-Active or Retro-Active Inhibition is likely to take longer to complete a training goal than an animal that is not dealing with these conditions.

### **TEAM BEHAVIOUR (GROUP CONTINGENCIES)**

Most marine mammal performances at Sea World involve groups of animals working together as a team. The reason for presenting groups of animals as opposed to single animals is simply this; the show will be more visually spectacular with seven dolphins leaping through the air or three sea lions sliding across the stage than just one. Like all behaviour, the success of team behaviour is able to be shaped by the trainer through appropriate reinforcement. During team behaviours the trainer should attempt to convey two principles to the particular group of animals. Firstly that an individual's behavioural response can determine the success of the group behavioural response and, secondly that the behaviour of the group as a whole can determine the reinforcing events that each member of the group receives. The varying degrees of success of team behaviour can be very much a subjective analysis by each individual trainer. At times, it may be appropriate for the whole group of animals not to receive any form of reinforcement due to the failure of one particular member of the group. At other times it may be appropriate to reinforce all members who responded correctly, and fail to reinforce any animal who did not respond correctly. During team behaviour problems the trainer should question themselves in this way: Is the current reinforcement schedule that is being applied to this particular behaviour reducing the problem? If not, perhaps a change to the reinforcement schedule will resolve the difficulties. Perhaps the trainer will have to "float" back and forth between schedules to avoid creating an attitude problem with the members of the group. Perhaps the animal that is causing the breakdown in the success of the behaviour should be removed from that particular behaviour for a period of time for re-training.

The greatest tool that a trainer has in presenting team behaviour is understanding the dynamics of the group of animals. Which animal is the least likely to break down during the behaviour, which animal is the most likely, which animal is the dominant one within the group, are there any social changes occurring within the group (sea lion rut season etc..)? Understanding group dynamics will greatly assist the trainer in anticipating team behaviour problems and avoiding the pitfalls of a behavioural breakdown or drift

## **MARINE MAMMAL TRAINING TERMS**

**ABHORRENT BEHAVIOUR:** A response that is detrimental to an animal's physiological and/or psychological well being.

**ABULIA:** A state of mind in which there is a loss of willpower because the number of performances required for reinforcement is too high.

**ABSTRACTION:** When a response is under the control of an exclusive stimulus and cannot occur or exist alone.

**ACCLIMATISATION:** Adjustment to a changed environment, characterised by a decrease in excitability.

**ACTIVATION SYNDROME:** A large group of responses which are elicited by the environment, usually paired with emotions such as fear or anger, and characterised by flight or fight.

**ACTIVITY:** A term used to denote general muscular response.

**ADVERSE:** Tending to discourage, retard, or make more difficult.

**AGGRESSION:** The tendency to engage or challenge the environment; this aggression tendency can be turned into destructive behaviour by a detrimental environment. Normal aggressive responses can be developed and sent in a positive direction, or can be frustrated and sent in a negative direction.

A type of behaviour arising from hostile motives.

Behaviour at changing a frustrating situation. Aggression is not always destructive in character; frustration may lead to an increased constructive effort directed at overcoming the situation.

**ALTERNATE RESPONSE TRAINING:** A technique used in therapy (as desensitisation) and as a self-control strategy in which the individual is trained to engage in a response (e.g. relaxation) that interferes with or replaces another response to be controlled or eliminated.

**ANTICIPATION:** The condition of expecting something.

**ANTI-SOCIAL BEHAVIOUR:** An undesirable response that is beyond the usual parameters of a specific culture.

**APPROXIMATION:** One of a series of stages, measures or units calculated to achieve a desired goal.

**ASSOCIATION:** An aspect of learning in which two or more stimuli, events or ideas become connected through being presented at the same time.

**ATTENTION SPAN:** The period of time an animal concentrates on any given thought, object or training session.

**ATTITUDE SHAPING:** The process of conditioning an animal's frame of mind in eliciting behavioural responses.

**AVERSE:** Not inclined or willing to do or undertake.

**AVERSION:** A dislike or negative attraction brought on by a stimulus.

**AVERSIVE STIMULUS:** A repellent stimulus that has a punishing effect and will alter behaviour through emotion and anxiety. It suppresses a behaviour it follows or increases a behaviour that results in its termination.

**AVOIDANCE BEHAVIOUR:** A response that is instrumental in evading or postpones an aversive stimulus.

**AVOIDANCE LEARNING:** Learning that occurs when the subject makes a particular response in order to avoid an unpleasant stimulus.

The process through which an animal learns to avoid unpleasant consequences by engaging in preventative actions. Often external stimuli signal the necessity for such responses.

**BAULK:** An interference to the process of responding to a specific stimulus.

**BEHAVIOUR:** Any observable or measurable response of an animal. Behaviour is occasionally broadly defined to include cognition's, psychological reactions and feelings, which may not be directly observable but are defined in terms that can be measured using various assessment strategies.

**BEHAVIOURAL DRIFT:** A change or stray from the norm in standard of response. The result of behavioural drift over a period of time is deviation.

**BEHAVIOURAL ENRICHMENT:** Stimuli presented for the purpose of enhancement or enrichment of an animals existence.

**BOND:** A relationship that an animal maintains with a con-specific towards which certain behaviour is exclusively or preferentially directed.

**BRIDGING STIMULUS:** A stimulus that pin-points the precise moment of a desired response and bridges the time span between the point of success and actual reinforcement.

**CHAINING:** The process of learning a sequence of behaviours that proceeds semi-automatically in a determined order. When one response is conditioned to produce a Discriminative Stimulus for another response, the two form a chain. One behaviour produces the conditions which make the next behaviour possible.

**COGNITION:** A concept of learning where items of knowledge are acquired to form abstract and concrete thinking ability.

**COMMUNICATION:** The passing of information from one organism to another (and so influencing its behaviour) by means of signals that have developed for that purpose.

**CONCURRENT BEHAVIOUR:** A response occurring simultaneously with another.

**CONDITIONED REINFORCER:** See SECONDARY REINFORCER.

**CONDITIONED RESPONSE:** A response that is elicited by a stimulus after learning has occurred.

**CONDITIONED STIMULUS:** An originally ineffective stimulus for a given response that, by the procedure of conditioning, has become capable of eliciting that response.

**CONDITIONING:** A learning or training process through which a response becomes attached to a previously neutral stimulus.

**CONFLICT:** A state in which an animal is simultaneously motivated in two or more incompatible ways.

**CONFUSION:** A lack of understanding.

**CONTINUOUS REINFORCEMENT:** A schedule of reinforcement in which every selected behaviour is reinforced.

**CUE:** See CONDITIONED STIMULUS

**DELTA:** See STIMULUS DELTA.

**DESENSITISATION:** The process of reinforcing an animal for refusing to respond to a stimulus. Used in changing an animal's attitude against sensitivity to become more at ease in an uneasy situation.

**DETRIMENTAL:** Causing damage.

**DEVIATION:** A distinct departure from what is prescribed or considered the norm.

**DIFFERENTIAL REINFORCEMENT:** The act of reinforcing at selected occasions, to shape the topography of specific behaviours.

**DISCIPLINE:** To train or develop through exercise. Functionally different from punishment.

**DISCRIMINATION:** The ability to distinguish, perceive or recognise small differences between stimuli.

**DISCRIMINATIVE DIFFERENCE:**

1. The dissimilarity between alike stimuli.

2. The deviation in a stimulus that is generally presented in a specific context, with the result being behavioural drift or confusion.

**DISCRIMINATIVE STIMULUS:** A conditioned stimulus which has the property of producing a specific behaviour.

**DISPLACED AGGRESSION:** Aggressive behaviour that is directed to an inappropriate available target because the specific cause or conflict cannot itself be assailed.

**DOMINANT BEHAVIOUR:** A response that exercises controlling power, authority or influence.

**DURATION:** The specific period of time in which behaviour occurs, lasts, or exists.

**EARLY CONDITIONING:** A term to describe the initial and fundamental learning experiences of an animal.

**ELICIT:** To call forth or bring out something latent, hidden or unexpressed by the use of a stimulus

**EMIT:** A display of behaviour that occurs without a stimulus.

**EMOTION:** A state of mind that includes fear, anger, enjoyment, etc., producing conscious feelings. When and if these emotions are altered, behavioural changes in an already existing repertoire may appear.

**ENFORCED DECREASE:** The deliberate process of limiting food to an animal in order to increase food motivation.

**EXHIBIT:**

1. A public display area housing animals.
2. To display or make apparent.

**EXTINCTION:** The process of non-reinforcement of conditioned behaviour, bringing about a reduction in motivation and willingness to respond until behaviour is no longer elicited

**EXTINCTION BURST:** An increase in the frequency and intensity of responding at the beginning of extinction.

**FADING:**

1. The process of diminishing or reducing the amount of stimulus required to elicit a response.
2. The procedure of changing one stimulus controlling a certain behaviour to another stimulus.

**FIXED INTERVAL REINFORCEMENT:** A schedule in which reinforcement occurs after a fixed period of time.

**FIXED RATIO SCHEDULE:** A schedule in which behaviour has been conditioned to be elicited without variation.

**FIXED RATIO REINFORCEMENT:** A schedule in which reinforcement occurs without variation.

**FOOD DEPRIVATION:** The deliberate process of with-holding food from an animal for husbandry purposes.

**FORGETTING:** The loss or the losing, temporary or permanent, of something earlier learned.

**FREE FEED:** The process of an animal being fed without being required to elicit behavioural responses.

FREE SESSION: A training session incorporating Innovative Training techniques.

FREQUENCY: The number of times a response occurs.

FRUSTRATION: An emotional condition that exists when goals that an animal is motivated to attain are blocked by barriers which may reside within itself or in the external environment.

FUSSY: A term to describe an animal that is exhibiting unusual food preferences.

GROUP CONTINGENCIES:

(Team Behaviour) Contingencies in which a group of animals participates. There are two major variations:

1. An individual's behaviour can determine the consequences delivered to the group.
2. The behaviour of the group as a whole determines the consequences that the group (each member) receives.

HUSBANDRY: Long term physiological and psychological management ensuring the viability of a species.

INADVERTENT CONDITIONING: Learning that has been unintentionally achieved.

INADVERTENT STIMULUS: A stimulus that is unintentionally and unknowingly presented.

INADVERTENT REINFORCER: A reinforcer that is unintentionally and unknowingly presented.

INCIDENTAL CONDITIONING: See DESENSITISATION.

INCREMENTAL LEARNING: Learning that takes place in a series of steps, in which the amount of learning increases until the learning is complete.

INCOMPATIBLE: Unable to be appropriate or suitable.

INCOMPATIBLE BEHAVIOUR: Behaviour that is impossible to occur with another at the same time.

INHIBITION: A nervous response that holds in abeyance some behavioural activity that might have otherwise occurred.

INNATE: Possessed at birth.

INNOVATIVE TRAINING: Learning by which an animal is reinforced for successfully reaching appropriate approximations through a self-experimental or self-inventive process.

INSTINCT: A natural and unconditioned capability shared by all members of a species.

INTERFERENCE: Failures of memory caused by the effect of old learning on new learning or new learning on old.

INTERMITTENT REINFORCEMENT: Any schedule of reinforcement which occurs on an occasional basis.

LATENCY: The duration of time between a stimulus being presented and a response being elicited.

LATENT LEARNING: Learning that takes place in the absence of reinforcement and that is not apparent until reinforcement is introduced.

**LIMITED HOLD:** The process of limiting the amount of time an animal can respond to a given stimulus, by the removal of the stimulus. Limited Hold is utilised in order to reduce latency.

**LEARNED HELPLESSNESS:** A learned inability to adjust or modify behaviour. A condition created by exposure to inescapable aversive events. This can retard or prevent learning in subsequent situations in which escape or avoidance is possible.

**LEARNING:** A relatively permanent change in behaviour as a result of previous experience and reinforcement.

**LEARNING PLATEAU:** A period in which early progress in learning appears to have stopped and improvement is at a standstill; the plateau is followed by a new period of progress.

**MAGNITUDAL REINFORCEMENT:** Any reinforcement schedule that is of greater significance to an animal than usual.

**MIMICRY:** The act, practise or art of copying the manner or expression of another.

**MOTIVATION:** The physiological and psychological variables that account for or control behaviour.

**MULTIPLE CRITERIA:** More than one measures or standards.

**NATURALLY OCCURRING REINFORCERS:** Those reinforcing events in the environment that are not contrived but usually available as part of the setting. Attention, praise, completion of an activity, and mastery of a task are some events that are naturally occurring reinforcers.

**NEGATIVE REINFORCEMENT:** Reinforcement that occurs through the termination of an aversive stimulus. The term "reinforcement" is used in this case because a behaviour will increase in frequency through the termination of an aversive stimulus.

**OBSERVATIONAL LEARNING:** Learning by observing another individual engaged in a behaviour. The observer need not perform or receive direct reinforcement to learn the behaviour.

**OPERANT BEHAVIOUR:** Emitted behaviour that is produced through a natural willingness.

**OPERANT CONDITIONING:** The experimental process of reinforcing an animal immediately after a naturally occurring response has been emitted without an initial Discriminative Stimulus.

The process by which, through learning, free operant behaviour become attached to a specific stimulus.

**PAIRING:** The uniting of various stimuli with a specific response through the process of association.

**PARTIAL REINFORCEMENT:** A schedule in which a response is reinforced only some of the time.

**PERFORMANCE:** Measures of observed behaviour.

**PHOBIA:** An intense and at least on the surface, irrational fear.

**POSITIVE REINFORCEMENT:** An affirmative event which, when presented, increases the probability of a response it follows.

**PRE-AVERSIVE STIMULUS:** A stimulus which has been conditioned through association as a predecessor to an aversive stimulus.

**PRECURSOR STIMULUS:** An event that comes before another that signals its arrival.

**PRIMARY REINFORCER:** A stimulus that an animal finds inherently rewarding. An element that usually satisfies biological motives and does not depend on learning to achieve its reinforcing properties. (food, water, sex, etc.)

**PROACTIVE INHIBITION:** The interference of earlier learning upon present learning.

**PROGRESSION:** Forward movement or development.

**PROMPT:** An preceding event that helps initiate a response.

**PUNISHMENT:** Any stimulus (positive or negative) that when presented, reduces the probability of a response occurring.

**RECALL:**

1. The process of sending or retrieving an animal from one point of station to another through the use of a conditioned sound stimulus.
2. To bring back to station.

**REFLEX:** Behaviour which is caused by the environment forcing a response. (see Respondent Behaviour)

**REFUSAL:** A lack of response.

**REGRESSION:** A return to an earlier mental or behavioural stage of learning.

**REINFORCEMENT:** Any circumstance or event (positive or negative) that increases the probability of a response occurring.

**REINFORCING STIMULUS:** Any stimulus which, when presented immediately a response has been elicited, increases the probability of the response.

**REPertoire:** The total number of possible responses which an animal may emit under the various conditions present in its environment and as a result of its past history.

**REPRESSION:** The failure of operant behaviour caused by previous aversive consequences. A kind of forgetting; however, functionally different from either extinction or passage of time.

**RESHAPING:** The reinforcement of a series of approximations of a previously conditioned behaviour due to deviation or behavioural drift.

**RESPONDENT BEHAVIOUR:** Behaviour which is produced forcibly by the environment. Respondent behaviour is not produced willingly.

**RESPONSE:** An identifiable demonstration of behaviour.

**RESPONSE RATE:** The number of response instances per unit of time.

**RETROACTIVE INHIBITION:** Partial or complete blocking of old memories by new learning.

**REWARD:** A stimulus that, when presented upon the successful performance of a task, elicits within an animal the feeling of satisfaction.

**RITUAL:** A pattern of animal behaviour that has a distinctive stylised quality.

**SATIATION:** The process of using a specific reinforcer excessively to the point where it no longer has reinforcing value.

**SECONDARY REINFORCER:** A stimulus that derives its reinforcing value from an conditioned association with a Primary Reinforcer.

**SELECTION:** The process of discriminatively choosing an individual or any number of animals from within a group to perform a particular task.

**SELF INDUCED DECREASE:** The process of an animal choosing of its own volition to refuse part of its food quota.

**SELF LIMITING:** See SELF INDUCED DECREASE.

**SHAPING:** The reinforcement of a series of approximations of desired behaviour towards a final behavioural goal.

**SOCIALISATION:** The process whereby an animal acquires and participates in the patterns of behavioural characteristic of its society.

**SPONTANEOUS RECOVERY:** The tendency of a conditioned response that has undergone extinction to occur again after a rest period. The magnitude of a response temporarily recovers spontaneously is usually lower than its magnitude prior to extinction.

**STATION:** An assigned position for an animal, designated by a trainer.

**STEREOTYPIC BEHAVIOUR:** A repetitive response that is without variation for extended periods of time. Stereotypic behaviour is usually brought about through lack of stimulation.

**STIMULUS:** An internal or external object or event which causes a physiological or psychological response.

**STIMULUS DELTA:** A stimulus which is consistently present when responses are not reinforced.

**STIMULUS GENERALISATION:** The tendency for an animal that has learned to associate a stimulus with a specific behaviour to display this behaviour toward other stimuli resembling the original stimulus.

**SUBMISSIVE BEHAVIOUR:** A response that is elicited without objection or resistance to a dominant stimulus.

**SUBTLE:** So slight as to be difficult to notice or appreciate.

**SUCCESSIVE APPROXIMATIONS:** A system of conditioning behaviour not currently in an animal's repertoire. It appears through reinforcement of performances which are in the direction of desired behaviour.

**SUPERSTITIOUS BEHAVIOUR:** Behaviour that results from misunderstanding. It is produced when there is no intended relationship between response and reinforcement. Superstitious behaviour can be produced through self stimulation, self reinforcement, inadvertent reinforcement and positive reinforcement.

**TACTILE REINFORCEMENT:** Any reinforcer discernible by touch.

**TARGETING:** The process of stimulating an animal to touch a particular object.

**TERMINAL RESPONSE:** The final pattern of behaviour that an animal is expected to demonstrate at the completion of the shaping process.

**TERMINATION:** The abrupt conclusion of a training session.

**TIME-OUT:** A situation in which the opportunity for an animal to be reinforced is removed for a period of time. Time-Out is randomly used to decrease incorrect or unsatisfactory responses through the association of non-reinforcement.

**THREAT:** A ritualised gesture (including vocalisations) of aggression.

**THRESHOLD:** The least amount of stimulus required to elicit a response. The point at which a stimulus becomes perceptible or is of sufficient intensity to elicit a response.

**UNCONDITIONED REINFORCER:** See PRIMARY REINFORCER.

**UNCONDITIONED RESPONSE:** A response that is elicited by an unconditioned stimulus without prior training. Any display of instinct is an unconditioned response.

**UNCONDITIONED STIMULUS:** Any stimulus which can produce a response without the need of being taught or having been previously conditioned. (hunger, thirst, sex drive, aggression)

**VARIABLE INTERVAL REINFORCEMENT:** An irregular schedule in which reinforcement occurs after a variable period of time.

**VARIABLE RATIO SCHEDULE:** A schedule in which behaviour has been conditioned to be elicited with variation.

**VOLUNTARY BEHAVIOUR:** Behaviour which the animal elicits of its own free will.

**WITHHOLD:** To be unwilling to grant reinforcement.

## **References**

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## **Abbreviations**

C.c. Concurrent

D.F.I. Daily Food Intake

D.I.P. Dorsal Inspection Position

E.D. Enforced Decrease

F.F. Free Feed

S.I.D. Self Induced Decrease

S.t. Stool Sample

T/S Training Session

V.B. Voluntary Blood Sample

V.I.M.I. Voluntary Intramuscular Injection

V.I.P. Ventral Inspection Position

### **Do I have to be a Marine Biologist to work at Sea World?**

No, However marine biologists do hold positions at Sea World like some of our Aquarists, Divers and Marine Mammal Trainers.

### **How do I become a Marine Mammal Trainer?**

Many of our Marine Mammal Trainers have completed a Science Degree at University. This option allows for other job opportunities as well as training. A Science Degree takes at least four years at University. We also recommend completing your Honours Degree for an additional twelve months. This is a year of researching your own project.

There are other ways of becoming a Marine Mammal Trainer at Sea World, including completing a "Certificate in Zookeeping" which is run through your local TAFE. However, you must be working in a zoological establishment, with animals, to be eligible for this course. The "Exotic Animal Training and Management Program" at Moorpark College in the USA is also acceptable training. The address is:

EATM  
Moorpark College  
7075 Campus Road  
Moorpark CA 93021 USA

EATM Moorpark College

Applicants who do not have any of the above requirements must have at least four years experience working in a similar field. There is a very low turnover of personnel within the Marine Mammal Department at Sea World. New openings in the field are both limited and competitive. During your studying we suggest you obtain a SCUBA certificate and practice your public speaking skills. A large part of the position of a Marine Mammal Trainer is dedicated to educating the public, being comfortable presenting information to varying groups and numbers of people. Sea World does not offer work experience opportunities to students; however, experience working with any animals will provide the desired outcome - the realisation that there is hard, sometimes dirty work and long hours involved in caring for animals.

You may be interested in taking part in one of our Animal Adventures programs at Sea World Trainer for a Day.