WELCOME To Week Three!

Welcome to The DogSmith Franchise Training
Week Three Goals

- Nature v Nurture – Evolution and Natural Selection
- Fixed Action Patterns & Reflexes
- Learning – What it is
- Conditioning – What is it
- Operant Conditioning – The Main Focus of this presentation
- How Conditioning Applies To Dog Training

This Bassett indicates additional learning is required
WHERE ONE ENDS THE OTHER BEGINS
GENES AND LEARNING FORM EQUAL PARTS OF THE SAME CONTINUUM.
(NATURE AND NURTURE)
NOT
NATURE VERSUS NURTURE
Evolution, the change in traits of a population over a period of time is influenced by natural selection and adaptive behaviors.

Features that contribute to survival are selected by the environment under a process called “Natural Selection”

- Individuals within a species that have favorable variations are more likely to survive and reproduce.
- Think about how humans have put selective pressure on the genes of dogs and their evolution over the last 100 years.
What is Natural Selection?

- Natural selection helps a species adapt to change across generations but does not help living beings cope with fast environmental change.

- **Natural selection** is the gradual, non-random, process by which biological traits become either more or less common in a population as a function of differential reproduction of their bearers.

- It is a key mechanism of evolution.

Read this short blog
Example of Natural Selection

**Darwin's** illustrations of beak variation in the **finches** of the **Galápagos Islands**, which hold 13 closely related **species** that differ most markedly in the shape of their beaks.

The beak of each species is suited to its preferred food, suggesting that beak shapes evolved by natural selection.
Clutton-Brock (1995) presents that the ecological niche and selective pressure applied when pups were adopted by villagers would have lead to the speciation of the “dog.”

David Paxton proposes that while humans were nomadic, wolves would have taken advantage of waste products left by nomadic groups and in return their close proximity would have provided protection against predators.

Coppinger and Schneider (1995) also believe dogs came into closer contact with humans post the nomadic period. Wolves with a lower flight distance, a variable trait, would have taken advantage of settlement dumps.

There is a common consensus amongst researchers that Coppinger’s dump dog theory is more plausible. However it is possible that components of all three hypotheses have contributed to the speciation of dogs.
In Ethology, a fixed action pattern (FAP), or modal action pattern, is an instinctive behavioral sequence that is indivisible and runs to completion.

Fixed action patterns are stereotyped behaviors that are exhibited by all members of a particular species.

A fixed action pattern is one of the few types of behaviors which can be said to be hard-wired and instinctive.
FAP Examples

- Dogs circling before they lay down
- These behaviors are triggered by some external or internal stimulus, and once triggered, the pattern usually continues to completion.
- Mating dances
- Migration of certain animals

Fixed action patterns are different than reflexes because even though animals are born with both, fixed-action patterns are more complex.
Reflexes – Involuntary Behaviors

Much more on this when we learn about Respondent Conditioning
Reflexes – Involuntary Responses

• A reflex is a relationship between certain kinds of specific events in the immediate surroundings.
• Many reflexes are designed to protect the individual from injury.
• Withdrawing a limb from a painful object
• The observable behavior is not the reflex, example the blinking of an eye

➢ the Eye Blink is the relationship between the speck of dirt hitting the eye
Examples of Reflex Behaviors

- A baby sucking a nipple
- A blink response to a light or an object
- Allergic responses
- Removal of a body part with the onset of pain

Reflexes are highly stereotypic – They are very consistent in form, frequency, strength and time of appearance in terms of an animal’s development.
Eliciting a reflex response can increase the intensity of probability of the response to a stimuli – This is called Sensitization.

Repeatedly evoking a given reflex response can result in a reduction in the intensity or probability of the response – This is referred to as Habituation.
Experiments have shown that during sensitization there is an increase in neurotransmitters (a chemical that aids neural firing) and during habituation there is a decrease in the neurotransmitters.

This proves that the presentation of a stimulus directly affects the production of chemicals in the brain, which in turn affects behavior.
Learning

LEARNING INDICATES A CHANGE IN BEHAVIOR AND TAKES PLACE THROUGH EXPERIENCE TO EVENTS I.E. STIMULUS
Nurture - Learning

- When individuals need to modify their behavior to adapt to new and changing environments they must learn.

- Learning is essential for survival. Chance (2008 p 24) states that “learning takes up where reflexes, modal action patterns and general behavior leave off”.
Bringing Them All Together

- Learning, if a species cannot learn and adapt within its environment then it would not survive.
- There is an interaction of genetics and the environment to mold behavior and ensure survival and reproduction of the species.
- The ability to learn is in itself the product of both heredity and experience.
Bringing It Back To DogSmith

WE ARE BEHAVIOR TECHNICIANS

- WE CREATE, REINFORCE AND BUILD BEHAVIORS
- WE MODIFY, CHANGE AND REDUCE BEHAVIORS
- WE CHANGE EMOTIONAL RESPONSES
What is Behavior

Some behaviors can be covert and we will discuss these in more detail much later in the training.

- Behavior is OVERT
- Behavior in animals is what we see
- Behavior has an impact on the environment
- Behavior is lawful, that is it is systematically influenced by environmental events
- Behavior can be observed, described and recorded
- Behavior has three dimensions
  - Intensity, frequency or duration
Behaviors have one or more dimensions that can be measured.

**The frequency** of behavior is the number of times the behavior occurs.

**The duration** of a behavior is how long the behavior lasts for, and last but not least

**The intensity** of a behavior is the physical force of the behavior, the amount of effort put into the behavior.

*The Measurement of Behavior is a presentation of its own*
In Behavioral modification the behavior to be corrected is called the target behavior.

A behavioral excess is an undesirable targeted behavior that we aim to decrease in frequency, intensity or duration.

A behavioral deficit is a desirable targeted behavior we want to increase in frequency, intensity or duration.
What Changes Behavior

- Learning is due to experience
- Experience refers to exposure to events that affect or are capable of affecting behavior
- These events are called STIMULI
- STIMULI are physical events

Note – not all changes in behavior are due to experience and not all experiences are learning experiences.
LEARNING IS THE ACQUISITION OF NEW BEHAVIOR THROUGH CONDITIONING.

CONDITIONING IS DEFINED AS
“A PROCESS OF BEHAVIOR CHANGE BY WHICH A SUBJECT COMES TO ASSOCIATE A BEHAVIOR WITH A PREVIOUSLY UNRELATED STIMULUS”

OPERANT CONDITIONING

RESPONDENT CONDITIONING
Operant Conditioning involves the regulation of behavior by its consequences

Skinner called this Operant Conditioning

Any behavior that operates on the environment to produce an effect is called an operant.

Most behaviors that are willful, voluntary or purposive action are analyzed as operant.

See Poster ABC
A = Antecedent

What comes before the behavior is generally referred to as the Antecedents for the behavior.

Proximate antecedents usually referred to as discriminative stimuli (SD), reliably evoke the behavior. Distant antecedents are commonly referred to as setting events and motivating operations.

Setting events are general conditions that set the occasion for the behavior (but are not the immediate SD). They might include medical conditions, nutrition issues, or lack of exercise. Things that may make the behavior in question more likely to occur. They do not directly evoke the behavior but they provide a context in which the behavior is more likely to be evoked by the SD.

Motivating operations are stimuli that make the reinforcer involved more or less valuable, thereby also making the behavior more or less likely. Satiation and deprivation are good examples.

Respondent Conditioning
NS paired with a US creates a CS that evokes a CR. It does not matter what the animal is doing. Respondent conditioning involves involuntary reflexive behaviors. Respondent Conditioning explains reflexive behaviors. CER’s are counter conditioned using respondent conditioning principles and systematic desensitization.
Behavior is anything an individual or organism does that can be observed and measured. Learning is a change in behavior due to experience.

When modifying a behavior you MUST develop a **Behavior Modification Program** based on a 95% confidence contingency statement that is the final product of a **Functional Assessment**.

The behavior analytical approach systematically identifies the functional relationship the behavior has with the environment. When these relationships have been identified then efficient and effective solutions can be developed.

The behavior analytical approach is called a functional assessment, an objective systematic, efficient and effective strategy for explaining, describing and controlling behavior. No guess work. No trial and error tactics.
C = Consequence

Anything that happens after the behavior is a postcedent. Those that have an effect on the behavior are referred to as consequences. Behavior is the function of its Consequences
(Operant conditioning)\[ R - R + P - P \]

Operant Conditioning relies on the three-term contingency, S-R-S, the antecedent stimulus, the response behavior and the consequence stimulus. Behavior is voluntary.

Reinforcement
Criteria - what are we reinforcing?
Reinforcement Schedule, which type?
Differential Reinforcement, which one?
No reinforcement - Extinction.
Type of Reinforcement, primary or secondary?

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The Three Term Contingency

- Operant conditioning relies on the three-term contingency, $S-R-S$, the antecedent stimulus, the response **behavior** and the consequence stimulus.
- Operant Conditioning - involves the voluntary nervous system and skeletal muscles.
- **With operant conditioning the behavior operates on the environment and behavior is strengthened or weakened by its consequences.**
The ABC in Operant Conditioning

- Antecedent Stimulus
- Behavior
- Postcedent Stimulus Consequence
The Four Quadrants of Operant Learning –

The Consequences of the Behavior

Read the following article on The DogSmith Blog

- Positive Reinforcement
- Negative Reinforcement
- Positive Punishment
- Negative Punishment
- Extinction
Another Way To Look At This

Negative punishment is sometimes called penalty training or response cost.

<table>
<thead>
<tr>
<th>Stimulus is applied</th>
<th>Increases frequency</th>
<th>Decreases frequency</th>
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<tbody>
<tr>
<td>Positive reinforcement</td>
<td></td>
<td>Punishment</td>
</tr>
<tr>
<td>Negative reinforcement</td>
<td></td>
<td>Response cost</td>
</tr>
</tbody>
</table>
The terms positive and negative do not describe the consequence, they indicate whether a stimulus, has been added (positive) or subtracted (negative).

Reinforcement is the process in which a behavior is strengthened by the immediate consequence that reliably follows its occurrence.

When a behavior is strengthened it is more likely to occur in the future.
In learning reinforcement means an increase in the strength of the behavior due to the consequence.

An experience to qualify as a reinforcement must have three characteristics:

1. The Behavior must have a consequence
2. The Behavior must increase in strength
3. The increase in strength must be as a result of the consequence

The concept of reinforcement does not assume awareness of the relationship between a behavior and its consequence.
In Simple Terms Punishment

The terms positive and negative do not describe the consequence, they indicate whether a stimulus, has been added (positive) or subtracted (negative).

Punishment is the process in which a behavior is weakened by the immediate consequence that reliably follows its occurrence.

When a behavior is punished it is less likely to occur in the future.
A Punisher is an aversive stimulus

A consequence that makes the behavior less likely to occur in the future

An experience to qualify as a punishment must have three characteristics

1. The Behavior must have a consequence
2. The Behavior must reduce in strength
3. The reduction in strength must be as a result of the consequence

The concept of reinforcement does not assume awareness of the relationship between a behavior and its consequence
Punishment

POSITIVE OR NEGATIVE
WE WILL STUDY
PUNISHMENT AND ITS
FALLOUT AS A SEPARATE
TOPIC
Positive Reinforcement & Negative Reinforcement

Positive reinforcement is very powerful. It is the addition of something the dog wants.

What reinforces behavior in negative reinforcement is the dog's ability to escape or avoid an aversive stimulus.
Positive Reinforcement

- Neuroscientists have confirmed that positive reinforcement affects the amygdala creating feelings of joy and excitement that help with sustained learning. This is the area of the brain that governs emotion and memory.
- Teaching animals using fear also goes through the amygdala but this shuts down the animals ability to learn and retain information.
- Positive reinforcement also encourages an animals natural SEEKING Circuit.
Examples of Positive Reinforcement

- The dolphin gets a fish for doing a trick.
- The worker gets a paycheck for working.
- The dog gets a piece of liver for returning when called.
- The cat gets comfort for sleeping on the bed.
- The wolf gets a meal for hunting the deer.
- The child gets dessert for eating her vegetables.
- The dog gets attention from his people when he barks.
- The elephant seal gets a chance to mate for fighting off rivals.
- The child gets ice cream for begging incessantly.
- The toddler gets picked up and comforted for screaming.
- The dog gets to play in the park for pulling her owner there.
- The person gets a candy bar for putting money in the machine.

Defined as a consequence that follows an operant response that increases the likelihood of that response occurring in the future.
Examples of Negative Reinforcement

- The **choke collar is loosened** when the **dog moves closer to the trainer**.
- The **ear pinch stops** when the **dog takes the dumbbell**.
- The **car buzzer turns off** when you **put on your seatbelt**.
- The **torture is stopped** when the **victim confesses**.
- The **Shock is stopped** when the **dog performs the behavior**

- In an attempt to increase the likelihood of a behavior occurring in the future, an **operant response** is followed by the **removal of an aversive stimulus**. This is negative reinforcement.
Examples of Positive Punishment

- The **peeing on the rug** (by a puppy) is punished with a **swat of the newspaper**.
- A dog's **barking** is punished with a startling **squirt of citronella**.
- The driver's **speeding** results in a **ticket and a fine**.
- The baby's hand is **burned** when she touches the **hot stove**.
- **Walking straight through low doorways** is punished with a **bonk on the head**.

- In an attempt to decrease the likelihood of a behavior occurring in the future, an **operant response** is followed by the presentation of an **aversive stimulus**. This is positive punishment.
Examples of Negative Punishment

- The child has his crayons taken away for fighting with his sister.
- The window looking into the other monkey's enclosure is shut when the first monkey bites the trainer.
- "This car isn't getting any closer to Disneyland while you kids are fighting!"
- The dog is put on leash and taken from the park for coming to the owner when the owner called.
- The teenager is grounded for shouting at his father.
- The dolphin trainer walks away with the fish bucket when the dolphin acts aggressively.
- "I'm not talking to you after you lied to me"
- The dog does a perfect sit and the dog trainer leaves the training session
- In an attempt to decrease the likelihood of a behavior occurring in the future, an operant response is followed by the removal of an appetitive stimulus. This is negative punishment.
From Shelly's perspective
The behaviors in question are voluntary (whining, temper tantrums, being quiet). Shelly’s behavior is whining (then crying and throwing a temper tantrum), which is followed eventually by a candy bar. This is an example of positive reinforcement because something is given to her (the candy bar), which will increase her behavior (crying, whining) in the future.

From Dad's perspective
Dad's behavior is giving the candy bar, which is followed with peace and quiet.
This is an example of negative reinforcement because something is taken away (the crying and whining) and dad's behavior (giving candy bars) will increase in the future.

The obvious problem in this situation is that undesirable behaviors are being reinforced, which will make matters worse in the future.

There are many ways the dad could handle the situation better, but the bottom line is to avoid providing reinforcement for a behavior that is undesirable.

He could ignore the behavior (extinction) or he could punish the behavior (for example, using a negative punishment like taking away the privilege of going to the grocery store in the future).
Operant extinction is when the consequences that reinforced a behavior are withheld and the strength of the behavior is weakened.

The goal of operant extinction is to reduce the frequency of the behavior.

The immediate effect of withholding the consequence that previously reinforced a behavior may abruptly increase the behavior.

This is referred to as extinction burst.

The previously reinforced behavior may also become more variable in an attempt to elicit reinforcement.

Operant extinction can also increase the frequency of emotional behaviors such as aggression.
Learned Helplessness +P and -R

- Animals will escape aversive stimulation if an escape route is available.
- Animals also learn to completely avoid punishment if the punishment is preceded by a conditioned stimulus to fear.
- When an animal is punished and the punishment is inescapable the animal cannot exhibit operant escape learning, they exhibit a phenomenon called learned helplessness.
- The inescapable punishment teaches the animal to do nothing, thus they are helpless.
- It is not the exposure to the punishment that teaches learned helplessness but the lack of ability to escape the punishment.
The usefulness of all these concepts is directly linked to their abstract quality.

- People have intuitions about what is reinforcing and punishing, and often these intuitions are wrong. – Look at the animal

- By stepping back and analyzing the situation ("Is a stimulus being added or subtracted?"") one can then categorize the situation and identify a reinforcer or a punisher.
The Operant Conditioning Model

- Behavior increase or decrease in probability on subsequent occasions?
  - Increase
    - Reinforcement
      - Postcedent Stimulus Presented or withdrawn?
        - Presented
          - Positive Reinforcement
        - Withdrawn
          - Negative Reinforcement
  - Decrease
    - Punishment
      - Postcedent Stimulus Presented or withdrawn?
        - Presented
          - Positive Punishment
        - Withdrawn
          - Negative Punishment

- Change in postcedent environment?
  - Yes
    - Behavior decrease in probability on subsequent occasions?
      - No
        - No conditioning
      - Yes
        - Extinction
  - No
What Are Reinforcers

Types of Reinforcement
Reinforcement Schedules
Types of Reinforcement

- Primary Reinforcement are unconditioned reinforcers
- Secondary Reinforcers are conditioned reinforcers

Is it Primary or Secondary?
To distinguish between primary and secondary reinforcers, ask yourself this question: “Would a newborn puppy find this stimulus satisfying?” If the answer is yes, the reinforcer is primary. If the answer is no, it’s secondary.

If we want to strengthen behaviors then we have to reinforce them
Primary Reinforcers – Unconditioned Reinforcer

- Strictly speaking, they are things that an animal needs to survive: food & water
- When you give a dog a treat for sitting you are using a primary reinforcer.

Read this article on primary and secondary reinforcers
Secondary Reinforcers — Conditioned reinforcer

- Conditioned reinforcers, referred to as secondary reinforcers, are dependent on an association with primary reinforcers.
- Conditioned reinforcers are not naturally reinforcing to a pet.
Conditioning a Secondary Reinforcer

- A conditioned reinforcer is a secondary reinforcer that has acquired reinforcing properties because it has been paired repeatedly with a primary reinforcer.
- A clicker or the word “yes” becomes a conditioned reinforcer by being paired with food through repeated trials, click-treat, click-treat or yes-treat, yes-treat
Factors Affecting Reinforcement

- **Timing**: It is very important that the reinforcement immediately follows the desired behavior.
- **Magnitude and appeal**: The larger and more appealing the reinforcer, the faster a response will be learned and the more frequently it will be displayed. – This is not a linear process
- **Consistency**: Reinforcement needs to be consistent in relation to the desired action.
When Reinforcements Don’t Work

- The reinforcer is not reinforcing
- The reinforcement is not consistent
- The behavior is not worth it, the dog loses too much or gains too little by changing a behavior
- Too much is expected too soon.
- The dog exhibits “learned helplessness”
Schedules of Reinforcement

There are different schedules of reinforcement and they are applicable at different phases of the learning.
Types of Reinforcement Schedule

- Continuous Reinforcement 1/1
- Intermittent Schedules of Reinforcement – not all correct responses are reinforced.
  - Ratio Schedules – a set number of responses take place before reinforcement
  - Interval Schedules – a set amount of time passes before reinforcement
- Both ratio and interval schedules can be on a fixed or a variable, random schedule of reinforcement

Read the following short article on reinforcement schedules
Continuous reinforcement — Critical when teaching new behaviors

- Continuous reinforcement is when behavior is reinforced each time it occurs, one reinforcer for one response schedule.
- Because each operant is reinforced the increase in the rate of behavior is rapid. However, with continuous reinforcement the animal responds until it is satiated.
- Continuous reinforcement offers little resistance to extinction and produces stereotyped response topography.
- Continuous reinforcement is rare in a natural environment where most behavior is reinforced on an intermittent schedule.
Operant Conditioning Training Protocols

- Lure Reward Training
- Shaping
- Capturing
- Targeting
- Differential Reinforcement – powerful alternative to punishment
The Key Training Strategy

- Training a new behavior involves promoting performance of a target behavior or approximation of it and increasing the rate or frequency of the behavior and also the form of the behavior with reinforcement,
- Followed by Discrimination and Generalization training as appropriate.
- Of course there are many steps and skills within this general strategy.
The General Steps for Operant Behaviors

- **Identify target behaviors and appropriate measure**
- **Identify conditioned and unconditioned reinforcers**
- **Establish quantitative baseline and training objectives**
- **Condition the conditioned reinforcer**
- **Antecedent strategies.** What will your prompts be, hand signals, food lures etc.
- **Postcedent strategies:** Differential reinforcement, which one will you use.
- **Begin thinning schedules of reinforcement**
- **Discrimination training:** Fading prompts where necessary; Transfer stimulus control to
- **Your cue once target behavior form and latency is established.**
- **Work toward maintenance** both of the cue and the reinforcement
  - Antecedent: Generalization and continued discrimination.
  - Postcedent: Fade contrived extrinsic reinforcement to natural sources.

Learn this process by heart
Week Three Homework

- Canine Physiology & Anatomy Manual & Test
- Take the Basic Operant Conditioning Test
- Read the short blogs and articles as identified in this presentation by the
- Make a list of 8 primary reinforcers your dog will work for and 4 secondary reinforcers
- If you do not have any secondary reinforcers then how will you condition a secondary reinforcer?
- You will begin to train a dog starting from next week. Please call me to discuss the dog you will work with so we can discuss the suitability of the dog and the ethics
Additional Reading – it will be included in the week three test

The Goals For Next Week

- Discuss the sequence of teaching a new behavior
- Discuss and learn about the dog training methods that are effective.
- Learn about stimulus control
- Learn about prompts and how to fade them
- Learn about how stimulus discrimination
- Learn about fading and thinning reinforcement
- Learn how to transfer stimulus control