

# Deep Dive: An Advanced Training Course



This document contains the notes for all the topics planned for discussion at the Ranch course: *Deep Dive: An Advanced Training Course*. Please note that Ken constantly updates his seminar presentations to reflect current science knowledge and best practices, thus these notes may not be exactly the same as what you will see live. Additionally, the benefit of attending a live seminar is the flexibility it affords Ken to adapt to questions and attendee interests – for those and other reasons, topics may be added or deleted at the last minute.

## Personal Philosophy

### Introduction

- CEU's
- Housekeeping
- KR Background
- Personal Philosophy

### Define Training

- Training = Teaching

### Cornerstones of Animal Care

- Health Care – VETERINARY PROGRAM
- Nutrition – FOOD & VITAMINS
- Environment – INCLUDES SOCIAL STRUCTURE
- Behavior Management – TRAINING & ENRICHMENT

### Primary Reasons for Training

- Physical Exercise
- Mental Stimulation
- Cooperative Behavior
- Animal Welfare – These things all directly benefit the individual animal and assure that animal welfare is the top priority

### Secondary Reasons for Training

- Education
- Research
- Conservation
- Entertainment
- Work Animals
- Sport
- The list goes on . . .

### Philosophical Foundation

- Laws of learning apply to all animals
- I am first and foremost a practitioner – but I also believe in the importance of the science
- Training is not a luxury – it is a key component to good animal care

# Non-Food Reinforcement

## Topic Description

Reinforcement is the key to successful training, as most trainers already know! However, there are many different reinforcement strategies and reinforcement options available to trainers: consistent schedules, intermittent schedules, life rewards, toys, play, food, treats, etc. The mythology around how various schedules of reinforcement work can mislead trainers into using a strategy inappropriately and lead to frustration for the animal and the trainer. Many trainers fail to approach new reinforcement strategies systematically, which can be the reason why certain strategies seem to fail. This class will explore both the science behind these concepts and successful methods for implementing different types of reinforcement into a training program. We will also discuss techniques for evaluating whichever approach you choose.

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## Introduction

- Define smart reinforcement
- Delivery of reinforcement
- Substitute reinforcers
- Reinforcement strategies
- Evaluating reinforcers

## What is Smart Reinforcement?

- Effective reinforcement
- Produces desired results
- Maintains a comfortable animal
- Maintains behavior long-term

## Novel Reinforcement

- Novel, unexpected, or surprise reinforcers can make an event memorable.
- Potential to be very reinforcing
- Also has potential to be very aversive
- Use with caution and knowledge
- Systematic introduction of reinforcers removes the surprise but increases overall effectiveness.

## Systematic Reinforcement

- True success at most training endeavors depends on thoughtful approximations
- Advanced reinforcement is no different
- Important concepts
  - Reinforcement Substitutes
  - Schedules of reinforcement
  - Reinforcement Variety

## Definitions

- Primary reinforcer – Inherently reinforcing, satisfies a biological need
- Secondary reinforcer – acquires its reinforcing value through association with primary reinforcers

### Types of Conditioned Reinforcers

- Secondary Reinforcer = Conditioned Reinforcer
- Event marker – Bridging stimulus (clicker, whistle, “good”, etc.)
- Keep going signal, intermediate bridge (discussed in complex tool class)
- Tertiary reinforcers
- Reinforcement substitutes – a learned reinforcer used in place of primary reinforcement from time to time.

### Reinforcement Substitutes

- Conditioned or learned reinforcers used in place of food
  - Clapping
  - Toys
  - Tactile
  - Play
- Train them like a new behavior
- Success depends on four main factors
  - Reinforcement history
  - Relationship
  - Implementation
  - Experience (knowledge, observational skill, evaluation)
- At times misused – making assumptions about what an animal likes
- Only effective if taught systematically
- An important step in providing variety (more options when reinforcing)

### Training Step-by-Step

- Pick stimuli that will be useful in training
  - Something easily available
  - Can be something the animal already seems to “enjoy”
  - May also be novel or insignificant stimuli
- Train each new stimuli (“future reinforce,” “new reinforcer,” or “reinforcement substitute”) as a behavior
- Present new stimuli; follow with primary reinforcer
  - Continue until it is clear animal accepts new stimuli
- Easy well-established behavior; click; new “reinforcer”; primary reinforcer
- Behavior; click; new “reinforcer” only; cue; next behavior; click; primary reinforcer (max 3x per session)
- Harder well-established behavior; click; new “reinforcer”; primary reinforcer
- Hard behavior, click, new “reinforcer” only (max 3x per session)
- Increase use in session gradually (never allow % of reinforcement substitutes to outweigh primary reinforcers – 20/80 max)
- First steps toward “variable schedule” of reinforcement

### Rules for Beginners

- Never use a reinforcement substitute after two consecutive behaviors
- Avoid using same reinforcement substitute twice in succession (if you have multiple options)
- Always ask for behavior followed by primary more often than a substitute

- Continue to use reinforcement substitutes as a behavior more often than as a reinforcer

#### Notes on Premack

- Premack Principle – high probability behavior can be used to reinforce low probability behavior
- My translation – an easy behavior can reinforce hard behavior
- In essence that's what we are creating when we train reinforcement substitutes

#### Advanced Reinforcement Notes

- Can a reinforcement substitute become a primary reinforcer?
- How do you choose an appropriate reinforcer?
  - Individual
  - Time of day
  - Satiation level
  - Task difficulty
  - Health
  - Many other factors
- Experience needed to evaluate well
- Never take reinforcement for granted

#### Schedules of Reinforcement

- Looking at it simply
  - Continuous (consistent)
  - Variable (intermittent)
- Advantages to the use of variable schedules of reinforcement
  - Potential to strengthen behavior
  - Work long duration without treats
- Disadvantages to using variable schedules
  - Can lead to frustration
  - Not effective unless systematically introduced

#### Implementing a ~~Variable Schedule~~ Reinforcement Variety

- Reinforcement variety not technically a variable schedule
- Examples of successes and failures
  - Search & Rescue Dogs
  - Agility Dogs

#### Why does it all Matter?

- Systematic introduction of variety = teaching an animal to accept variety
- An established relationship is critical
- Experience at reading your animal = evaluation of reinforcers

#### Notes about "Natural Drives"

- How do natural reinforcers fit into this?
  - Play
  - Prey
  - Social interaction
- Aren't they primary reinforcers

- The “drives” are primary
- But the object of the drive must be learned (or tested)
- Can be either trained or evaluated quickly

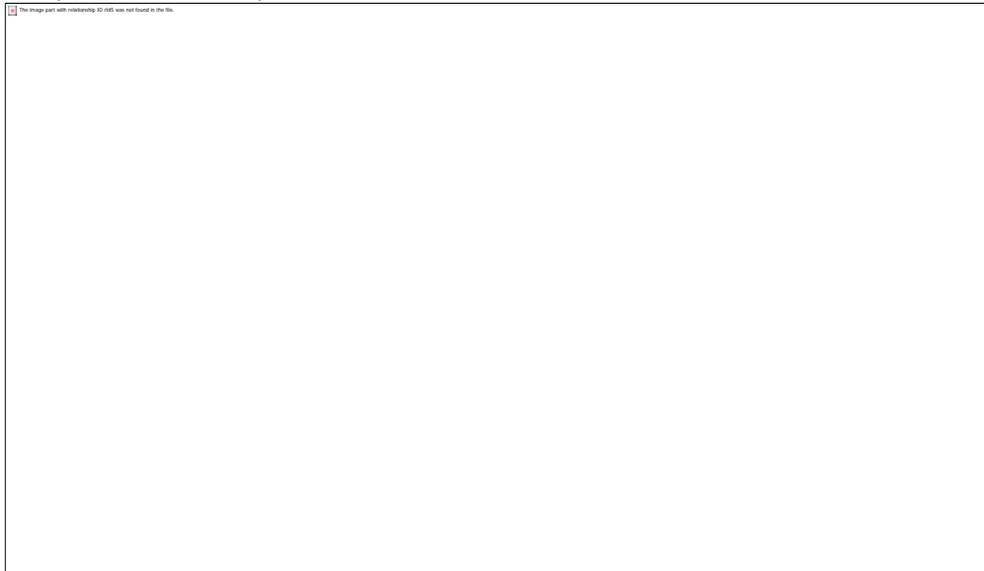
#### How to Read Your Animal (Evaluate Reinforcers)

- Testing for interest in other reinforcers (refrigerator test)
- Immediacy of response
- Animal focus
- Maintenance of behavior
  - Animal should respond well 3<sup>rd</sup> – 6<sup>th</sup> – 10<sup>th</sup> request
  - Eagerness should remain high
  - Behavioral reliability should increase

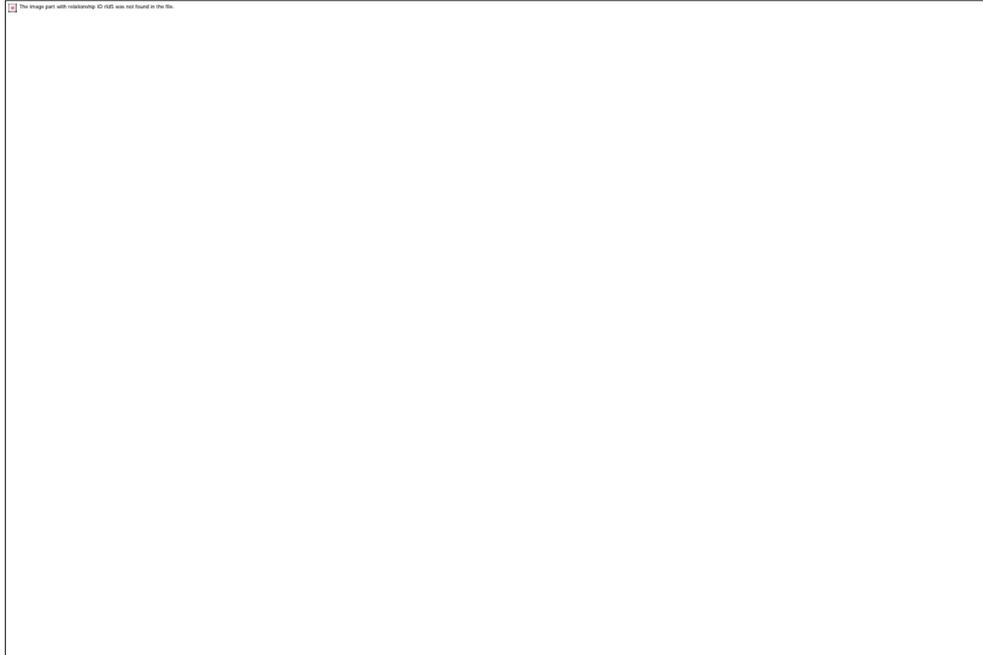
#### Objective Evaluations

- Data driven not subjective
- External evaluator (or video tape)
- Evaluation form helpful tool
- Different types of assessments
  - Effectiveness of single reinforcer
  - Effectiveness of reinforcement strategy
  - Comparison over time
  - Impact of new variables

#### Sample Form (used by instructor)



## Modified Form (for focusing on reinforcement effectiveness only)



### Expectations

- Animals will develop expectations about reinforcement
- Learned based on how and when trained
- Often based on value to animal vs. difficulty of behavior
- Expectations can be changed
  - Must be systematic in reshaping
  - Easiest if planned from start
  - Variable use of reinforcement reduces specific expectations

### Avoiding Reinforcement Pitfalls

- Don't take any reinforcer for granted
- Never forget basic key strategies (form basis for all advanced concepts)
- Constantly maintain strength of reinforcement substitutes (condition/recharge)
- Evaluate reinforcer effectiveness constantly
- Variety in reinforcement helps as long as expectations are met
- Control access to reinforcers
- Always look at behavior – key to everything

### Summary – Conclusion

- Systematic introduction of new reinforcement is important
- Basic concepts, maintenance & evaluation are keys to success
- Relationships are a big part of effectiveness
- Once you understand reinforcers, application becomes easier and more effective.
- That's Smart Reinforcement!

## References

Chance, Paul. (1999) *Learning and Behavior, 4<sup>th</sup> Edition*. Brookes/Cole Publishing Company, Pacific Grove, CA.

Friedman, Susan G. (2008). What's Wrong with this Picture? Effectiveness is not Enough in *Good Bird Magazine*, Vol 4-4; Winter 2008.

Ramirez, Ken (1999). *Animal Training: Successful Animal Management through Positive Reinforcement*. Shedd Aquarium Press, Chicago, IL.

## Additional Information

- Blank **Reinforcement Evaluation Score** form for your use (next page)
- Excerpt from *Evaluating Reinforcement* instructions (following next page)



## Excerpt from *Supervisor's Guide to Training Trainers* by Ken Ramirez

### EVALUATIONS

One of the most important aspects of our job as supervisors is to provide constructive, timely, feedback to each trainer. You are tasked with observing everything from body language, planning, animal focus, cueing, telegraphing, bridging, criteria, reinforcement, behavior selection, variety, use of space, communication with other trainers, and guest perception, to name just a few. Additionally, you are trying to look at big picture issues, training progress, use of tools, problem solving, and other larger issues. You will meet with managers to have training sessions to prepare you for how best to provide feedback. We want feedback sessions to be positive, constructive, and honest. You will be asked to practice giving feedback to a manager, director, or VP several times before being cleared to start giving the feedback yourself.

Our basic evaluation form has not changed in many years. It is designed to give a clear and complete picture of everything that took place in the session. There are objective parameters as well as subjective parameters which allow you to document what the trainer did and how well you feel they handled each activity. The main sections of the evaluation form are below. You should have had plenty of previous experience within our program seeing and understanding the content of this particular form.



The challenge with this form is that it takes experience to complete. One must know our program, our animals, our criteria, our staff, and goals to complete this form. It requires a great deal of experience and knowledge to fill out well – which is why we only allow supervisors or higher to utilize this form. However, in an effort to give younger staff, interns, and volunteers to learn about the value of evaluations, we have created a streamlined form. The new form only focuses on fairly objective variables and is primarily designed to evaluate reinforcer effectiveness. We believe this will be a good learning tool for all trainers and help younger staff begin to get an understanding of the evaluation format.

### REINFORCER EVALUATION

It should be no secret to any trainer in our program that reinforcement is the key to successful training. We believe that if trainers learn to watch each other and learn to evaluate each other – each trainer will become more effective at providing reinforcement and at evaluating their own sessions. As supervisors we must help young trainers or those learning about reinforcement understand how to use these forms and how to interpret them. Generally, we believe they are self-explanatory to the experienced staff who know our program, but there are several aspects that will require explanation to the newcomer. Here is what the headings on the form look like. Below, we will discuss the meaning of each section and what the rankings mean. We have tried to simplify the intent of each section for new users.



### BEHAVIOR ATTEMPTED

In this column the observer should write the name of the behavior requested or describe the activity of the trainer. This will require that the observer at least know our S<sup>D</sup>s to be able to write down what was requested. Without that basic familiarity with our cues and our behaviors, this evaluation will be difficult. However, all staff, most interns and most volunteers should know this information. As soon as a cue is given, the observer can write down the behavior requested and move immediately to the next column.

## **CUE RESPONSE**

This section is designed to look at fluency and latency of response to the cue. Our animals should respond instantaneously to a cue, without any hesitation. Once the cue has been given, the observer can immediately score the response as either:

- 3 – Immediate, the response was quick, no hesitation
- 2 – Slight delay, indicates a brief pause, a second of inactivity before responding. Once cue is complete, the observer can count “one – one thousand” – if the animal takes off within that time, it can be scored a 2.
- 1 – If the animal’s response to the cue takes longer than “one-one thousand” we consider that a long delay.
- 0 – Any response taking longer than 5 seconds is considered a no response.

## **BEHAVIOR**

This column does require some knowledge of what the behavior should look like. We are really only asking the observer to indicate correct (3), wrong (1), or no behavior offered (0). However there is a subjective option for those who know the animal and behavior well (2).

- 3 – Perfect – Indicates that the behavior was correct, and that it met criteria (this last element may not be possible for all observers to know).
- 2 – Attempt – This is a subjective category that indicates that the animal attempted the correct behavior, but did not meet acceptable criteria.
- 1 – Wrong – This indicates that the animal offered a behavior, although it was incorrect.
- 0 – No attempt – This indicates that no behavior was offered. Either the animal stayed with the trainer or left trainer to wander – either way, no effort was apparently made to offer a behavior.

## **REINFORCER**

This is not a scoring column, but a place to write down what type of reinforcer is being offered as well as quantity of that reinforcer. This may require close observation by the observer. In some cases the observer will know what reinforcers the trainer has prior to the session starting. If there is only one type of reinforcer, the observer may simply write quantity. If observing an experienced trainer, the variety of reinforcers could be large and may include various types of food, a variety of secondary reinforcers, as well as the potential to move on to another behavior. The observer should do their best to track all of these things.

## **FOCUS**

One of the key factors in evaluating the skill and effectiveness of a trainer is in his or her ability to keep an animal’s focus. This is a critical column and one that the observer must be conscious of throughout the session. It is the last column and should reflect focus from the time a cue is given until the next cue is presented. The score at the end of the row should cover that complete period of time. An animal that is motivated and interested in its trainer will maintain eye contact with the trainer, stay at station, and be very responsive. Here are the scores for this column:

- 3 – Excellent – indicates that the animal’s attention never wandered. The animal maintained eye contact and looked at the trainer for that entire time.
- 2 – Distracted – this score would be given if the animal’s attention wandered. They remain at station or with the trainer the entire time but allowed their attention to get pulled away. Perhaps their body’s orientation changed to face another animal or another trainer, but the animal remained “with” their trainer. A momentary eye shift by the animal to look at a sudden appearance of an animal, object, noise, or trainer does not merit a 2 if the animal immediately returned its attention to the trainer – this would be a good thing and still garner a 3. However, any distraction great than that would be a 2.
- 1 – Left briefly – if the animal not only breaks eye contact but leaves station or wanders away from the trainer, even briefly, merits a 1. If the trainer has the animal’s attention even briefly, between cues, the score should be a 1.
- 0 – Gone – this is reserved for those instances when, following an S<sup>D</sup> the animal never comes back, or when it does, the trainer is now setting up for a new cue or a repeat of the last cue. Usually, this would indicate that the animal was gone for more than 10 seconds.

## SCORE

The final column is to add up the score for each behavior at the end of each row. However, the more critical scores are the averages for each column, looking specifically at cue response, behavior, and focus. Interpretation can be rather subjective, however generally the information provided by the average score of a column for a session consisting of at least 10 behaviors can indicate some strong and important trends. Look at the following examples of three different sessions. Let's examine what the scores in each session might mean.

## SAMPLE SESSION #1



Overall, the session above is a very good session. It consists of approximately 12 behaviors, one of which was repeated twice. Other than the one error, the animal had a nearly perfect session. All three categories averaged over 2.5, two were better than 2.75. The quick interpretation is that behaviors are solid and focus is great. This usually indicates very effective reinforcement. The slightly lower score in the cue response column might indicate that this trainer needs to examine their cues to determine if they are being given correctly. But overall this is a great session. Ideally, we would want this trainer to work with this animal several more times, with potentially longer sessions – this would allow us to accumulate a better average and allow us to see trends.

To assist observers in understanding these evaluations better, on the following pages are several more sample sessions with our interpretations.

## SAMPLE SESSION #2



This session is pretty much a disaster. Although 6 out of 10 behaviors receive a 3, for well trained animals in a professional training program, this is unacceptable. However, more telling than the behavioral response (which is barely below an acceptable 2.5) is the terribly low score for cue response at 1.9 and a low score for focus at 2.1. The low focus score and below average behavior score is an indicator of probable problems with reinforcer effectiveness. The other possibility could be that the lower focus score may be as a result of some unusual or unexpected distractions during the session. That is why it would be important to do several evaluations to allow the observer to see trends before making a determination based on a single evaluation. Even the best trainers with the best animals can have a low score from time to time – it is never wise to make any assumptions or decisions based on one evaluation.

On the following page is one more sample session...

## SAMPLE SESSION #3



This is one of the more perplexing examples of session scores. You will note that the cue response score is very low and the behavioral score is low, but the focus score is a perfect 3.0! Why would this be? Here is an example of reinforcement and/or relationship with the trainer being very strong. The fact that the animal maintained perfect focus, even through some problem responses, is an example of an animal that is “eager to please.” Objectively, based on the 3.0 average focus score, we believe that indicates the animal was highly motivated to remain in the session. The two predominant factors affecting that are usually the reinforcers being offered or the relationship with that trainer (which is a form of reinforcement and is usually based on some type of reinforcement history). As supervisors we would start to focus on many other factors of this trainer’s skill set – cueing, criteria, reasons for repetition – but not on reinforcement. Like with the previous examples, we would want to do multiple evaluations over time to see if this one session was an anomaly. Multiple evaluations over time also helps us look at gradual changes in score, which may indicate a problem that is just emerging or an improvement that is gradually coming into place.

### **GENERAL CAUTIONS ABOUT SCORES**

It is important not to read too much into these scores. This process is only a tool. It is not an infallible system and it does not take into account many other variables that could impact the score. This system works within our program because of the controls we put into each session. We find the scores helpful because they give us a relatively objective measure regarding certain factors that we find important. We continue to find that “focus” is a critical factor, particularly when paired with cue response and behavior in evaluating reinforcer effectiveness.

When this system is used by trainers outside of our program, it can still be effective, but certain factors need to be considered and understood.

**CUE RESPONSE** – If animals were not trained to have an immediate response to a cue, the timing of the scores for cue response may need to be changed to match expectations. We expect very fast reaction times, but this may not be true of every program or every species or breed. As an example our dolphins are lightning fast and meet the criteria easily; however our belugas do not move as fast – but we are still looking for them to start their motion toward exhibiting the behavior immediately. A beluga may not get the task done as quickly as a dolphin, but

we do expect a beluga to respond to a cue and begin their movement (however slow) immediately after the cue is presented.

**BEHAVIOR** – For observers who don't know the animal's behavior well (and even for those who do), it is sometimes cleaner to eliminate the score of "2-Attempt" – because it can be reasonably argued that a behavior is either right or wrong, there can be no "attempt". We have chosen to include the "attempt" option because we find that when an animal attempts to do a behavior, but fails to meet criteria, it is worth noting. Although we do not reinforce an attempt, when analyzing the session we have discovered that the fact that the animal tried is significant – its failure to complete the behavior to criteria often indicates other problems that trainer may be having.

**FOCUS** – Within our program, we require our animals to start and end all behaviors at station. Those who do not have this requirement may interpret focus differently – but it is no less important. When setting up observations it is still critical to evaluate the animal's interest in the trainer and focus on the trainer. Any break in focus other than that which is requested is a significant indicator of a decline or decrease in motivation and thus reinforcement.

*Another interesting note about focus:* We refer to focus as being a significant indicator about reinforcement, but it is actually a significant indicator about consequences. We only refer to reinforcement, because that is our consequence of choice within our training program. However, a traditional coercion or punishment based trainer will also have good focus if they apply their "corrections" properly. That focus may include other side effects that point to the negative impacts of coercion-based training – but the animal will be focused. The score will still accurately represent the effectiveness of whatever consequence is being applied.

## **FINAL THOUGHTS ON EVALUATING REINFORCEMENT**

Over the years of teaching trainers and evaluating their performance and progress, we rarely need to use this scoring system. As experienced trainers we are able to give good feedback and assess reinforcer effectiveness through standard evaluations. However, there are those occasions when a trainer desires more objective feedback and this system was designed to allow a non-supervisor to do an assessment. We have tested the objective nature of this scoring system on many occasions by having an average of 10 observers evaluate the same session. The results overwhelmingly indicated a very objective system:

- 81% of control trials produced evaluation scores that were identical (no variation on any score).
- 11% of control trials produced a single point difference in one parameter of only one behavior by only one observer.
- 4% of control trials produced a single point difference in one parameter of only one behavior by three different observers (not necessarily the same parameter or behavior).
- 4% of control trials produced a larger number of point differences – this was from two trials that included 20 or more observers. In both cases the observers were students. Only a handful of students had ever done any training and most were only introduced to the behaviors we were using in the session in passing. However, even under these conditions, more than 50% of the students in each trial matched the instructors evaluation exactly.

We have also found this to be a useful tool for self-evaluation. By videotaping a session, a trainer can watch the session and use the evaluation form when they watch the session at a later time. The most straight-forward way to use these evaluations is to use a single type of reinforcer during each scoring session. The system works with variable schedules and reinforcement variety, but the interpretation of the scores is more complex and beyond the scope of this brief summary. For more information and assistance in interpreting scores, please seek help from a supervisor.

# Classical Conditioning

## Goals

- Review basic understanding of classical conditioning
- Discuss reasons for focusing on operant conditioning
- Delve more deeply into the science
- Explore the practical uses of classical conditioning
- Understanding emotions and CERs
- Look at how it is intertwined with operant conditioning

## Operant Conditioning

- A type of learning in which the frequency of occurrence of behavior is modified by its consequences.
- B.F. Skinner – also called Skinnerian conditioning.
- Instrumental conditioning

## Classical Conditioning

- A type of learning in which a conditioned (or neutral) stimulus is paired with an unconditioned stimulus to elicit a reflexive response.
- Pavlov – also called Pavlovian conditioning.
- Respondent conditioning

## Operant vs. Classical Conditioning

- Why focus on operant conditioning?
  - More easily observed and understood by the beginner
  - Animals make choices
- What is importance of classical conditioning?
  - Explains reflexive behavior
  - Will assist experienced trainer understand complex and problem behavior
  - Changes animal's emotional response
- Animals are always learning and behaving operantly and classically at the same time

## Science of Classical Conditioning

- An association is formed between 2 stimuli
- Stimulus 1 has no intrinsic meaning – Conditioned
- Stimulus 2 has intrinsic meaning – Unconditioned
- Animal's behavior is reflexive

## Key Factors in Using CC Properly

- Timing: inter-stimulus intervals
- Contingency
- Repetition of pairings

- Implementation process

#### Inter-stimulus Interval Matters

- The time between the CS and US is the inter-stimulus interval
- For best results CS should precede US by 1-2 seconds
- Longer intervals will work, but there is a limit depending on strength of US
- Just like in operant conditioning – timing is the key

#### Timing is the Key in all Conditioning

- Trace (1.5 seconds) – Very effective
- Delayed (3-5 seconds) – Effective
- Simultaneous (0 seconds) – Rarely effective
- Backward (Reversal) – Never effective

#### Importance of Contingency

- Does the CS reliably predict the US every time?
- Does the US ever occur alone, without the CS?
- Conditioning is strongest when contingency near 100%
- Be careful of learned stimulus neutrality
  - Results when occurrence of US appears to be independent of the CS
  - If US is just as likely to occur in the presence of the CS as in the absence of the CS – conditioning will not work

#### Examples of Contingency

- Kayavak (beluga whale) tongue tickle
  - Wiggling hand nearly always produces a tongue tickle, which creates soothing feeling of comfort
  - Soothing and comfort triggers an excited trembling
  - Wiggling hand (NS), Tickling creates comfort (US), Body trembles (Reflex), wiggling hand transitions from NS to CS
- Coral crazy barking
  - Fear of strangers causes barking
  - Attempted to change fear response through pairing strangers with food
  - Unable to pair food with the appearance of all strangers
  - Contingency was not 100% (not even close) thus pairing did not work
- Rottie tail wag
  - Wags his tail reflexively when given food
  - Chin rest produces food
  - Wags his tail when touched on chin
  - Chin touch (NS), Food (US), Tail wag (reflex), Chin touch becomes CS after regular pairings

#### Repetitions of Pairing Trials

- Science has proven that conditioning follows a decelerating curve
- First pairings of CS & US are important
- This is why we don't want animals to ever rehearse bad habits, they can be learned quickly (Open gate = Aggression; Door bell = Barking)
- Longer inter-trial intervals are better
- Avoid rhythmic trials

#### Examples of Everyday Use

- Marking (clicking or bridging)
  - Teaching it
  - The marker – gaps between click and reinforcement
- Novel reinforcement creation
- Cues – adding  $S^D$ s to behaviors
- Husbandry – habituation and counter-conditioning
- Use of Redirection (DRA – DRI – DRO)
- Modifying emotional responses (a byproduct of the above uses)

#### Classical Conditioning CER Example

- **Problem:** Unwanted behavior – aggression (CR)
- **Solution:** Pair CS that triggers response (animal/person) with an US that gets a contrary response (food, toys, etc.)
- **Why it Works:** If the UR (Yay! There's food!) is strong enough & incompatible with undesirable CR (aggression) the new connection between the CS (other animal) and the US (food, toys) will weaken future unwanted responses and changes the CER (conditioned emotional response)

#### Implementation Errors

- Using a weak US (not using a high value reinforcer)
- Competing conditioned stimuli (marker/hand in bucket)
- Inadvertent avoidance conditioning (animal afraid of US)
- Extinction – CS (trigger) present without US afterwards
- Changing contingency – presenting US w/o before trigger
- Not transitioning quickly enough to the operant part of the equation (which is why I always focus on that most)

#### Science of Emotion

- Early Science
  - Looked at emotion as a primal survival mechanism
- Myths about emotion
  - Lack of hard evidence, over anthropomorphism, Skinner's hard line, religious beliefs – all contributed to myth idea
- Modern science
  - Combined new discoveries with early science

### Emotions are Primitive

- They integrate body and environment
  - allow for proper reaction to situations
- Centered in limbic system in the mammalian brain
  - all mammals have a limbic system (and thus emotions)
- Animals can't make rational decisions without emotions
- Social animals must be able to regulate their emotions

### Current Definitions of Emotion

- Changes in the body (internal)
- Changes of expression (external)
- Thoughts and feelings that accompany the above (internal & subjective, but less so with current advances in neurobiology)
- Can't understand the science of emotion without understanding something about the brain
- Resources:
  - Jaak Panksepp
  - Dr. Patricia McConnell
  - Meg Daley Olmert

### Biology of Emotions

- Internal changes lead to external behavior
- Our body chemistry reacts to external events
- Keeps brain in touch with body
- Emotional systems drive behavior

### Types of Emotions

- Primary (Core)
  - Fear / Panic
  - Anger / Rage
  - Happiness / Joy
  - Nurture
  - Seeking
  - Needed for survival. Fight or Flight. Protection and Pleasure/Comfort.
- Secondary ("Self-conscious" emotions)
  - Jealousy
  - Guilt
  - Shame
  - Current science suggests these are more evolved and not present in most animals.

### Animal Behavior

- Trainers should learn to recognize emotional responses
- Emotions can be identified through behavior and body language
- These should be learned as precursors that are predictive of pending behavior

#### Creating Emotional Responses

- Emotions can be created, shaped, & modified through animal learning processes.
- What is a CER?
  - A classically conditioned emotional response to a specific stimulus, event, or circumstance

#### How CERs are Useful to Us

- Proactively create positive emotional responses
  - Joy, happiness, engaged
- Prevent development of negative emotional responses
  - Fear, stress, frustration
- Modify negative emotional responses
  - Fear, threatened, anxious
- Neutral Stimulus followed by very powerful or potent stimulus
- Emotional, anticipatory response
- Predictive relationship:
  - When it is good: “Yipee! Here it comes. . .”
  - When it is bad: “Oh crap! Here is comes. . .”

#### Should We Use CERs?

- Learning by association is a fundamental learning process
- CERs develop continually – even when we are unaware or not actively training
- CERs can be both pleasant or unpleasant
- We can either take our chances or pay attention to them and use them to our advantage.

#### Proactively Creating Positive CERs

- Whether we have thought about CERs or not, there are many situations when we probably have created positive CER’s proactively?
  - During training of most husbandry behaviors
  - Kenneling, crating, trips to veterinarian
  - Early introduction to new animals
  - Performance-related situations

#### Modifying Established CERs

- What situations may have created negative CERs that we might want to try to modify?
  - Veterinary presence (and other medical procedures)
  - Closing a Gate

- Removal of favorite toys
- Presence of incompatible animals

#### How to Train a Positive CER (4 steps)

1. Determine neutral or conditioned stimulus (CS)
  - CS: the event, activity, object, or “trigger”
  - Examples: veterinarian, men, other animals
2. Determine unconditioned stimulus (US)
  - US: biologically potent stimulus which does not require previous learning (“high value reinforcer”)
  - Examples: chicken, smelly treat, certain toys
3. . Order of events is critical
  - CS (trigger) MUST precede US (food)
    - Vet arrives → high value reinforcer delivered
    - Gate opens → high value reinforcer delivered
    - Scary man appears → high value reinforcer delivered
  - Challenge is that animal reaction to trigger can be so severe that they are not interested in reinforcement if over threshold.
  - Sometimes distance or intensity has to be controlled
4. Potency of unconditioned stimulus is a key factor
  - US should be very powerful or strong
  - Novelty or surprise value
  - Animal should respond enthusiastically to reinforcer
  - Or, it must be a relevant or powerful event

#### Incorporating CERs into Program

- Keys to Using CERs Effectively
  - CERs can influence how we choose to train
  - CERs latch on to trainer, equipment, behavior, & context
  - Useful in guiding choice of training methods
- We tend to focus on operant conditioning – and CERs are created tangentially
- We don’t need to use 1<sup>st</sup>, but useful tool for challenges and problem solving. Experienced trainer awareness!

#### Classical and Operant: Hand in Hand

- Operant desensitization – we use it regularly to expose animals to increasing levels of stimuli intensity and reinforce for the behavior that we are looking for.
- When done correctly, we create positive CERs (a classical phenomenon) without even trying.
- When done poorly, we inadvertently create negative CER’s which lead to problem behaviors.
- Example: Mini-Donkey Recall
  - Sound of dinner triangle became a positive CER

- Sound of triangle caused animal to break into a run toward sound of bell (Excited CER)
- With time, animal learned to anticipate sound when trainer arrived in barn, donkeys moved toward gate (operant)
- Recall became very reliable
- Aggression between certain animals begins to happen when coming into barn
- A mild aversive CER is created
- Recall by animal on receiving end of aggression slows down and no longer comes to barn quickly
- Slower return to barn is choice made by donkey (operant)

#### Why I Focus on Operant Behavior

- Animals make choices, this is a desirable thing
  - Refusal to do a behavior is valuable information
  - Reduces injury and mindless behavior
- Easier to see, mark, and reinforce operant behavior
- When done right; no short-cuts; creates clean behavior w/ positive CER as a by product (early examples)
  - No need to worry about CER's because they are good

#### When Should You Worry about CERs?

- Train operantly and have a good plan that includes positive CER triggers (no need to worry about them)
- When young trainers see undesired emotional responses:
  - Consult an experienced trainer (if in structured program)
  - Recognize that experienced trainer may need to be assigned to work through problem (complex challenge)
  - Determine if you can more easily adjust behavior or emotion (they may work at odds w/each other at the start)

#### Understanding Behavior – Dive Deeper

- No matter your experience level there are always new layers to uncover, new ways to understand behavior
- Consider the animal's emotional experience
  - Mental abilities are different than ours
  - Way they experience emotion is likely different (be careful not to become anthropomorphic)
  - Yet use this info to enhance training, care, & quality of life

#### Final Thoughts about CERs

- Punishment & Force
  - Activates the fear system

- Develops negative CERs
- Positive Reinforcement
  - Activates the seeking system
  - Promotes relationship based on cooperation
  - Build's an animal's confidence

# Simplifying Complex Training Tools

## Course Description

The e-lists about clicker training are riddled with long discussions of particular operant methods that may or may not belong in your toolkit. Examples include the keep-going signal, the no reward marker (NRM), differential reinforcement of incompatible or other behavior (DRI/DRO), the least reinforcing stimulus (LRS), jackpots, timeouts, and a myriad of others. Many of these tools are useful only in very specific circumstances such as highly advanced stimulus-control projects. Casual or incorrect use can be confusing to the learner or, worse, punishing. Ken Ramirez, highly experienced in the teaching of clicker trainers, takes away the mystery and confusion.

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## Introduction

- What are complex training tools?
- The science behind the concepts
- Practical applications of the tools
- Should I use them?
- Understanding the “tool box” analogy

## Exploring Advanced Concepts

- Concepts that require experience to apply
- All trainers define differently
- Training that ventures past the premise:
  - Reinforce desirable behavior
  - Ignore unwanted behavior
- Easy as 1-2-3 or A-B-C
- Cautions regarding advanced concepts
  - Trainer as teacher
  - Understanding the theory

## Science vs. Practical Applications

- Getting Past Semantics
- Laboratory Tests & Theory
  - Testing
  - Replication
  - Proof
- Real world trainers adapt concepts
  - Adapt to animal, mix techniques
  - Desired behavior is the goal

## Tools to be Discussed

- KGS – Keep Going Signal

- Jackpots
- NRM – No Reinforcement Markers
- TO – Time Outs
- LRS – Least Reinforcing Scenario
- DRA – Redirection strategies
- Recalls
- Behavior Chains
- ESS – End of Session signals

#### Keep Going Signal (KGS)

- Useful, Non-existent, Controversial (Ramirez, 2009)
- A conditioned reinforcer
- Goes by many names:
  - KGS (Pryor, 1999; Bailey, 2007)
  - Intermediate Bridge (Cover, 1991; 2002)
  - Tertiary Reinforcer (Bostow & Tompkins, 1999; Pryor, 2009)
- Science of 2° and 3° reinforcers well documented
- KGS not in science, but well documented practical application

#### KGS Applied

- Guide Dogs (Landeman, 1971)
- Military Dogs (Bailey, 2007)
- Circus Sea Lion (Kelley, 1946)
- Husbandry practices (Ramirez, 2009)

#### Training a KGS

- Actively condition neutral stimuli to be reinforcing
  - Verbal praise
  - Clapping
  - Rubbing or petting
- Passively condition during other training
  - Use desired KGS just prior to click
  - Gradually increase time between KGS and click
  - KGS always leads to eventual reinforcer
  - Never used to actually mark behavior

#### KGS Challenges & Science

- Cue – if animal needs KGS to continue
- Conditioned Reinforcer – if it strengthens what preceded it & paired with strong performance
- Delta – ongoing signal makes behavior continue, thus KGS is reinforcing, but cessation of KGS serves as a warning, and thus a punisher (delta signal).

- Crutch – used so often by trainer that animal becomes dependant on it, despite its original lack of purpose or meaning
  - Superstitious Behavior – it reinforces the trainer more than the animal
  - My opinion – not needed, does work, often established without trying
- 

### Jackpots

- Definition – Unexpected large or high value reinforce (Ramirez, 2009)
- Timely delivery imperative for effective results
- Immediacy is critical, while behavior is happening
- Varied applications; often used incorrectly – seldom harmful, but not always accomplishing desired result

### Challenges of Jackpot

- Drawn out delivery – reinforces other behaviors
- Sloppy delivery – potentially aversive
- Too novel – can be aversive
- Too frequent – no longer as effective, creates expectation for large reinforcement
- Misuses of these types create belief by some that they are not real or that their effectiveness is overstated.

### Understanding Jackpots

- Attempts to study Jackpots proved challenging (Rosales-Ruiz, Muir, 2009)
  - Project to study jackpot effectiveness at UNT
  - Results were impacted by the way it was used that did not replicate some practical aspects of those who use jackpots
  - The study was redesigned to make delivery of the reinforcers (and thus jackpots) cleaner and more direct, but that resulted in confusing the dog

### Practical Uses of Jackpots

- Jackpots in a casino: we know they work. A few key aspects:
  - They are at times large (or of high value)
  - But the amount/quantity varies
  - The timing is unpredictable
  - And they are delivered sparingly
- Marker signal counters effect – creates variety, thus has beneficial impact, but not what trainer intended (Pryor, 2007) (1971 shaping study)

### Jackpot Final Thoughts

- Jackpots not specifically in literature – practical development
  - High value or novel reinforcement can increase learning
  - Proven useful tool – but only if used with care
-

## No Reinforcement Markers (NRM)

- Varied definitions and uses in practice
- Most common use: it marks the moment animal makes a wrong or incorrect move
- Functions the opposite of a clicker
- Conditioned punisher (Chance, 1999)
- Few skilled trainers can use them well

## NRM Varied Uses & Applications

- NRM
  - “No” or “Wrong”
  - Marks incorrect response
  - What about a very passive “oops”?
    - “It is just information to the animal”
    - “Hard to be mean or vindictive when you say oops”
    - “My animal responds well to it”
  - If it decreases future occurrences of the preceding behavior, it is a punisher
- Warning Signa;
  - “Last Chance”
  - Warning prior to application of an aversive stimulus (a more severe one)
  - Effective, but can become the new cue to the behavior (car lights)
  - This can function as a punisher: however, in many cases, since it does not decrease the frequency of future behavior is it just a cue? Or is it a cue that is also a weak punisher?
- Interrupter – What if it just stops behavior in the moment but it doesn’t change future behavior?
  - Certainly, kinder and probably not inhumane
  - Still aversive for most animals in most contexts
  - If interruption then moves animal away from something it desires, it’s an aversive (perhaps a mild one).
  - Thus, it is a weak or ineffective punisher in many cases (it is redirection)
- What about a “Stop” cue?
  - Growing question among R+ trainers
  - If a trained cue means “stop” or “freeze,” and that action is reinforced, you are then using a form of redirection – not an NRM
  - Redirection will be discussed later
  - It’s not the word “NO” that matters, what matters is the effect it has on behavior.

## NRM Final Thoughts

- Never used one, don’t plan to
- Serves as a punisher
- Many will inadvertently condition one
- Can assist in shaping behavior if timing perfect, but can also create frustration

- Only skilled and disciplined trainers can use well
- 

#### Time Outs

- Definition – Removal of opportunity for reinforcement (Kazdin, 1994)
- Standard application:
  - When animal exhibits inappropriate behavior, trainer leaves training area or turns back on animal making reinforcers unavailable. Length of time out not defined and varies greatly from trainer to trainer.
  - Or, animal removed from training area
- Scientifically speaking it is a negative punisher

#### TO Challenges with Use

- It is a punisher and has the same baggage associated with most punishers
- Often not timed properly, which punishes wrong behavior
- Does not assist animal in knowing what behavior is desired
- Only effective if animal is reinforced by your presence or your reinforcers
- Overused by many trainers

#### TO Science & Opinion

- Properly used, it will punish behavior
  - Scientific literature plentiful regarding time outs (Kazdin, 1994)
  - I would avoid them in all but the most specific situations – such as animal giving you a timeout.
  - Ending a session to take a break or manage frustration is not a technical time out; you are making a management decision not applying a training technique.
- 

#### LRS

- Least Reinforcing Scenario/Stimulus (Scarpuzzi, 1991)
  - Challenging concept for dog trainers because they often have not heard of it
  - Developed in the zoological training community as a way to operationalize “ignoring unwanted behavior”.
  - Some people are not fans of the use of the term “least reinforcing scenario”
  - It is a practical tool that most people already use to some degree
- Designed as most positive approach to incorrect responses
- 3-5 second neutral response
- Goals:
  - Step towards extinction
  - Effort to provide the least reinforcing consequences without causing frustration
  - Giving animal immediate opportunity to earn reinforcement afterwards
- I have used tool for most of my career

## LRS Practical Applications

- Proper Use
  - Brief and immediate
  - Looking for calm response (acceptance)
  - Immediate, easy opportunity for new reinforcement follows
  - Not truly neutral, but an effort to provide least reinforcing option and redirect to a more desirable response
- Challenges
  - Not a fixed posture
  - Not related to eye contact
  - Don't be tempted to extend length
  - Don't turn it into a timeout
  - Refrain from emotional response
- Why it works
  - Due to positive history
  - Rhythm of reinforcement is interrupted
  - Opportunity to continue and earn more reinforcement is available – keeps animal in the game (redirection)
  - Behavioral momentum used to encourage correct response

## Assumptions as we Examine the LRS (Friedman & Ramirez)

- If an animal something wrong repeatedly, the error needs to be analyzed
- We take responsibility for animal's error
- We want to use procedures that are least intrusive – or that give the animal the most control
- We want to see a reduction or elimination of frustration behavior (caused by too low a rate of reinforcement)
- We want to keep the animal engaged
- You work in an R+ environment and want a trusting relationship with an animal
- All training should give the animal three things:
  - Clear information
  - Control over reinforcers
  - Control over escape from aversives
- Animals are in a dialogue with trainer to choose to participate or not – they have the choice
- Training (including the use of specific procedures like the LRS) is a dynamic process that requires dialogue between trainer and learner. Recipes are only useful for the beginner and not the long-term effective management of behavior.

## Analysis of the LRS (Friedman & Ramirez)

- A<sub>1</sub> – Cue
- B<sub>1</sub> – Incorrect response
- C<sub>1</sub> – Micro-pause to keep from reinforcing
- A<sub>2</sub> – Pause cues pre-trained CAB

- B<sub>2</sub> – Animal gives Calm Attentive Behavior
- C<sub>2</sub> – Reinforce, New Cue, or Repeat Cue
- C<sub>1</sub> and A<sub>2</sub> are happening together or in quick succession and this is the LRS, what makes it unique from any other procedure

#### Unique Aspects of the LRS (Friedman & Ramirez)

- Having animal return to a default behavior, (stationing → CAB), is critical for success.
- Includes a reinforcement opportunity as part of protocol (unlike TO's, NRM's, and EXT).
- Animal must be looking to you for feedback, otherwise must use other tool.
- Not useful in maintenance of behavior
- Useful tool for new or inexperienced trainers

#### LRS Final Thoughts

- Proven practically in many settings
- Most positive reinforcement trainers use it naturally
- Designed as structured way to ignore un-wanted behavior (to teach young trainers)
- Sets the animal up for success with the use of behavioral momentum to “keep animal in the game”

#### LRS Discoveries (Friedman & Ramirez)

- My use has evolved over the years, it gets shorter and shorter.
- Discovered many similar approaches used by good trainers
  - Most have never heard of LRS
  - Their protocol has similarities and ABCs are the same
    - Sarah Silverman – Take a step to the side
    - Susan Garrett – “Screw up Cookie”
    - Kay Laurence – Just move on

#### DRA - Redirection Techniques

- Alternate response training
- Differential Reinforcement of \_\_\_\_\_ (Alternative responses)
- DRI (Incompatible behavior)
- DRO (Other behavior)
- DRL (Lower intensity/rate behavior)

#### Alternate Response Training

- Differential reinforcement is at heart of most training (Kazdin, 1994; Chance, 1999)
- Realistically part of every shaping decision
- DRA strategies developed to assist in focusing problem solving
- Gives animal alternative to undesired behavior
- Gives trainer something to reinforce (while combined with extinction)

#### DRI

- Train incompatible behavior in place of undesired behavior
- Active form of alternative response training (Ramirez, 1999)
- Excellent technique for dealing with aggression
- Useful for many types of problem behavior

#### DRO

- Reinforce any behavior other than unwanted behavior
- Shape absence of behavior (Pryor, 1999)
- Passive form of alternative response training (Ramirez, 1999)
- Useful for resolving unwanted behavior taking place outside of a session

#### DRL

- Reinforce desired change in intensity of behavior
- First used with self-injurious behavior with children
- Technique employed in *Click to Calm* (Parsons, 2006)
- Shaping away from unwanted behavior
- Requires greater skill than other DRA; still reinforcing unwanted behavior

#### DRA Final Thoughts

- Scientifically valid technique (Kazdin, 1994; Chance, 1999)
  - Don't let acronyms and initials scare you away
  - Every trainer uses differential reinforcement regularly
  - Focused types of DRA assist in problem solving
  - One of three most useful and essential tools in our discussion today
- 

#### Recall Signals

- A signal or cue that brings the animal back to the trainer
- Trained to manage an animal more effectively; used to increase either animal or trainer safety
- A behavior not a scientific training tool
- Included in lecture because of frequency of misuse

#### Effective Recalls

- When cue sounds, animal should stop everything and come immediately back to trainer (or pre-determined location).
- Most common uses:
  - Dog safety when off leash or lost
  - Trainer safety with dangerous animals in free contact
  - Falconry; Open ocean work with dolphins

- High value or high rate of reinforcement a key

#### Recall Problems & Challenges

- Not reinforced often or well, thus not reliable
- Used when animal doing something incorrectly, thus aversive
- Followed by end of session or change in activity; can be perceived as aversive
- When used in tough situations, inexperienced trainer can have difficulty in determining proper response.

#### Recall Final Thoughts

- Excellent behavior, useful in multiple situations
  - Always be aware of reinforcement and animal perception
  - Careful to not misuse
- 

#### Chained Behaviors

- Two types of chains:
  - Technical
  - Common
- Technical: Advanced concept in which completion of one behavior cues the start of the next, and each subsequent behavior reinforces the previous behavior.
- Common Chains
  - Many trainers refer to any sequence of behaviors that does not use primary reinforcement to maintain the sequence as a chain.
  - Not defined in the scientific literature, but commonly referenced in popular literature.
  - Scientists tend to use the term “sequence” for this concept

#### Building a Chain

- Forward-chaining – Can build a sequence
  - Behavior is not serving as a reinforcer
  - Could be a variable schedule
  - Can test animals tolerance
- Back-chaining – Builds a stronger chain:
  - Because animal moving toward strength
  - Subsequent behavior does serve as reinforcer as it is conditioned in the training process

#### Using Conditioned Reinforcers

- Training conditioned reinforcers regularly prepares animals to accept new reinforcers
- Behaviors can become reinforcers
- Makes a chain stronger
- Most behaviors are small chains

- Complex chains are simply building duration or length through approximations

#### Most Behaviors: Simple Chains

- Example: Retrieve
  - Go to object
  - Pick up object
  - Bring it to you
  - Release it to your hand
- Depending on how finely you slice behavior, most behaviors are small chains

#### Fixing a Broken Chain

- Prevent it from the start
  - Maintain individual behaviors
  - Reinforce different behaviors within the chain
- Biggest breakdown – animal eager to get to end, takes a short cut
  - Interrupt the chain when error occurs
  - Redirect animal to correct behavior
  - Reinforce when completed
  - Doing it right the first time becomes the quickest way to reinforcement

#### Final Thoughts on Chains

- When chains are trained properly they use reinforcement variety (conditioned reinforcers) not a true variable schedule
  - Powerful tool that reduces reliance on primary reinforcers and treats
  - Requires advanced skills to maintain solid behavior chains
  - Could be a full course on its own!
- 

#### End of Session Signals

- Signal indicating training session has ended (Ramirez, 1999)
- Great debate about its use (even among very skilled trainers)
  - Some swear it is an essential and helpful tool
  - Others claim it to be unnecessary and ultimately harmful
- Why the disparity?

#### Anti End of Session

- Cues removal of reinforcement; timeout; thus aversive
- For dangerous animals working in free contact, cueing end of session can be dangerous
- For social competitive animals, end of session cues animals they can interact with each other; for low animals in hierarchy can pair aggression from dominant animals with cue from trainer.

#### Pro End of Session

- Let's animal know that they can do their own thing

- Reduces anxiousness from animals eager to please
- Personally seen it used well in several situations
  - Service Dogs – “at ease” no need to keep focus, we’ll return to working later
  - Show Sea Lions – “take a break”
- Many trainers use an end of session signal

#### Science & Opinion

- End of Session Signals are not really part of scientific literature
  - Use or lack of use does not make or break a training program
  - Decision should be based on animal’s response – usually easily observed
  - Animals will eventually know when session is over, but does not need to be specifically cued
  - Not indicative of good or bad training
- 

#### Tool Box Summary

- All tools exist for a reason
- Many tools are very specialized and seldom needed
- Don’t use a tool just because you have it
- Successful use of complex tools depends on understanding them completely

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# Aggression Treatment and Context

## Course Description

Dealing with reactive dogs, handling aggression, and working through problems with highly sensitive animals can be a challenge for even the very best clicker trainers. Over the years, many creative trainers have presented various alternatives to handling aggression and reactivity problems. The explosion in the number of approaches, combined with an array of new nomenclature, is often confusing for trainers seeking to choose an approach for themselves or to recommend to others. Today, some of the most discussed approaches include, but are not limited to, Counter Conditioning, Constructional Aggression Treatment (CAT), Click to Calm, Behavioral Adjustment Training (BAT), the “Look at That” game (LAT), and a host of others. How do these varied treatment approaches compare? What common or distinct scientific principles are being employed? Are certain plans better for certain situations than others?

This Session is designed to help you sort out the choices. It will explore the science underlying the approaches, look at their known efficacy, and help you see what these approaches share, as well as their differences, so that you can make informed choices. Attendees at this Session will also learn to ask the right questions and listen/look for thoughtful answers to be well-prepared when the next approach makes its way forward.

## Overview

- Goals and desired outcomes of class
- Nomenclature, science, and practical application
- My approach to aggression reduction
- A review of popular techniques
- An objective comparison/evaluation

## Goals

- Share my approach to aggression reduction
- Most practical procedures worth keeping in the tool box
- Aid in understanding why each works
- Better enable trainers to determine tool right for them
- Share resources for learning more and improving skill at application
- This course is NOT the answer or explanation for specific problem solving it is meant as a starting point for determining the tools you might choose to use

## Nomenclature

- First stumbling block is often terminology
- Many practical trainers don't have scientific background
- Teachers searching for best way to explain a concept use new terms and words to connect to their audience
- In field, we combine techniques creating hybrid concepts that don't have a scientific name

- When we talk about an idea, we get lost in the nomenclature
- I will share my perspective, my understanding, and direct you to resources

### What is Aggression?

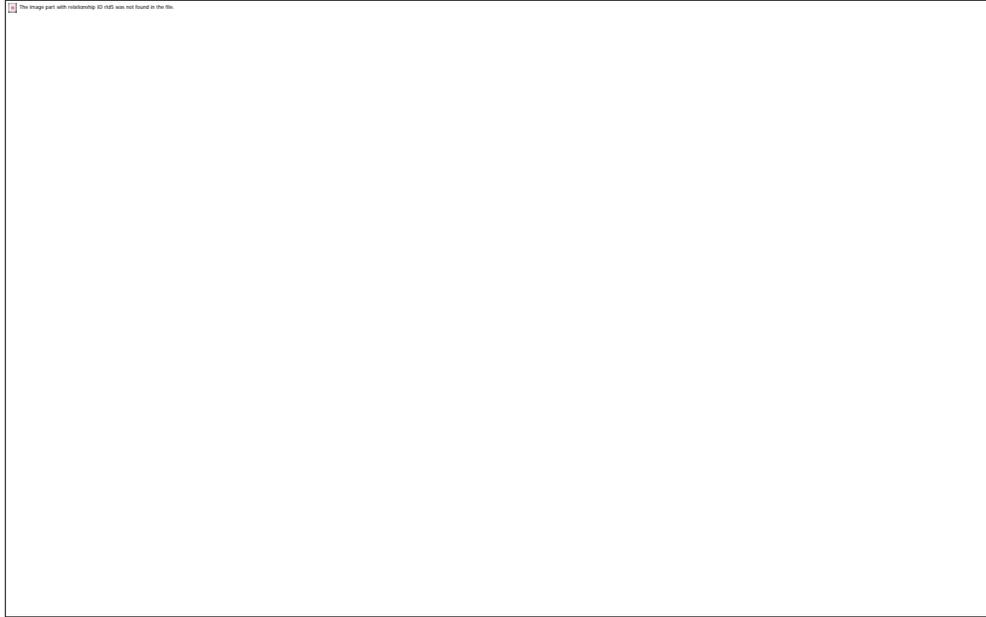
- Even trying to define the topic creates concerns for what we call it
- Today, I am referring to any type of unwanted agonistic behavior
 

Reactivity	Biting
Resource guarding	Barking
Possessive behavior	Growling
Protective behavior	Lunging
- Diagnosis, Causes & Triggers are important in dealing with aggression, however those are dealt with in more detail in the individual procedures we will discuss and beyond the scope of this short seminar.

### Sorting through the Confusion

- At first glance, scientific terms, practical procedures, and hybridized names are all given equal place in the list of options – this is where the confusion begins
 

CAT	DRI	Habituation
Operant Conditioning	BAT	DRO
Click to Calm	Flooding	Counter-conditioning
Classical Conditioning DRL		U-Turn
Abandonment training	Look at That	Negative reinforcement
Train incompatible behavior	Positive punishment	Shape behavior absence
Correction	DRA	Negative punishment
- This partial list, gives the impression that all are equal or similar – but they are not
- Three separate types of terms in that list
  - Broad scientific approaches to learning
  - Scientific principles
  - Practical procedures, strategies, or descriptions
- My attempt to better organize the terms is in the chart below (explained in more detail throughout seminar). The chart is not a comprehensive list of aggression treatments or terms, just the ones that will be discussed in this seminar



### Broad Learning Approaches

- Classical Conditioning
  - Pavlovian Conditioning
  - Respondent Conditioning
- Operant Conditioning
  - Skinnerian Conditioning
  - Instrumental Conditioning
- All animals learn both ways all the time – we may consciously choose to use one, but animals are still learning in both manners. Thus the observer of our training may choose to focus on a different aspect of what they see our animal doing.

### Scientific Principles

- Concepts tested and named in operant and classical labs (Chance 2009; Kazdin, 2001)
- Desensitization techniques
  - Habituation
  - Counter-conditioning
  - Flooding
- Consequences to behavior
  - Punishment (positive, negative, primary, secondary, etc.)
  - Reinforcement (positive, negative, primary, secondary, etc.)
- Redirection techniques – Differential Reinforcement of Alternative behaviors (DRA) which include:
  - DRI – differential reinforcement of incompatible behavior
  - DRO – differential reinforcement of other behavior
  - DRL – differential reinforcement of lower intensity behavior

- There are many others, these are just a few of the examples we will focus on in our discussion today

#### Procedures & Strategies

- Each trainer who must deal with aggression finds a way to apply the science and a way to describe it to others.
- Most use one or more of the previously listed scientific techniques
- A few popular examples:
  - CAT - Constructional Aggression Treatment (Rosales-Ruiz, Snider)
  - Click to Calm (Parsons)
  - U-Turn (McConnell, London)
  - BAT – Behavior Adjustment Training (Stewart)
  - Abandonment Training (King)
  - Look at That (McDevitt)
  - Train an incompatible behavior
  - Watch Me
  - Recall
- Each is a way that a skilled and talented trainer has operationalized the science to deal with aggression

#### Aggression Management (Donaldson)

- In general there are 4 primary ways of dealing with aggression
- Treatment requires that something must be changed:
  - Consequences = operant
  - Associations = classical
  - Access = management
  - Brain chemistry = medication
- We will focus primarily on training options today (consequences & associations)

#### Aggression Management (Ramirez)

- All animals have aggressive repertoire
- Helps animals cope with a variety of life's challenges
- Develops in 3 main ways
  - Reactive
  - Genetic
  - Learned
- Learning principles always at work
  - Success is reinforcing
  - Failure is aversive
  - Keeping these basic facts in mind will aid in aggression reduction or in choosing an appropriate training plan
- Always have an aggression reduction strategy in place

### Rules for Aggression Reduction (Turner & Tompkins, 1999)

- Understand scenarios
- Recognize precursors
- Use Redirection and/or Apply appropriate training strategy
- Stop/Avoid it before it starts
- Keep records

### Punishment

- There are many traditional approaches to dealing with aggression that use punishment
- By definition, and if properly applied, punishers will decrease behavior (Chance, 2009; Kazdin, 2001)
- There are a number of studies that also point out the risks, challenges and fallout of punishment (Sidman, 1989).
- Punishers will not be discussed today, because I avoid their use and prefer not to advocate for their use
- Skilled trainers need to understand punishment and its applications – it is something that exists in every trainer’s toolbox, but I would like to think it is in that spare tool box that is collecting dust on the shelf.

### Classical Conditioning

- Many excellent trainers employ classical conditioning techniques (Sdao, Reid, McConnell, Donaldson).
- Desensitization, Habituation, and Counterconditioning have all been studied, tested, used and written about on numerous occasions.
- Many uses do not have specialized names or unique operationalized procedures that are controversial or debated.
- They are effective, powerful techniques that work.
- As positive reinforcement trainers, we frequently look for operant tools, but we should not ignore nor forget about classical conditioning
  - Operant conditioning (Response-Reinforce) – Animal reinforced for giving correct response.
  - Classical conditioning (Stimulus-Stimulus) – Animal learns a new pleasant stimulus will replace or follow an unwanted or disliked stimulus – no specific task required
- Resources
  - See resource list at end: Donaldson, Jean (1996; 2002; 2004; 2008); McConnell, Patricia (2005); Reid, Pamela (1996); and Sdao, Kathy (2009).

### Look at That Game (McDevitt, 2007; 2009)

- Counter conditioning procedure
- Teaches dog to look at “trigger” or cause of concern
- Changes emotional response to trigger by converting trigger into a positive event

- Doesn't compete with the desire to orient toward offending dog/person/object, allows it and reinforces it
- With time, animal relaxes around trigger and actually does pay more attention to trainer so that it can get its reinforcement.
- Not a complete strategy on its own, must be used in conjunction with other tools

#### Look at That Analyzed (Ramirez)

- Science
  - A classical counter conditioning procedure, but it is operationalized to gain control of and get a desired behavior
- When to use it?
  - In any scenario prior to the animal having an intense reaction to the potential trigger. Obviously the "Look at That" game will have had to be trained first so that it is a behavior in your animal's repertoire.
- Disadvantages
  - Can only function if you take time to train it below threshold (which is true of most techniques) – but otherwise, very few disadvantages
  - Not a standalone strategy in most cases, usually good to be able to follow it up with other tools, part of a bigger plan or program.
- Advantages
  - Changes animal's perception (emotional response) of problem situation. Excellent tool that can be used in so many different situations once trained.
- Resources
  - McDevitt, Leslie (2007) and (2009). See Resource list at end.

#### CAT (Rosales-Ruiz & Snider, 2007)

- Constructional Aggression Treatment
- A negative reinforcement procedure
- Appropriate (relaxed or polite) behavior will cause offending dog/person to leave
- Distance from offender is the reinforcer
- Set-up to allows animal to learn quickly with multiple repetitions
- Trigger and context must be known and understood

#### New 2019 Steps for CAT (Rosales-Ruiz)

- Step 1: Understand your dog (context, trigger, reinforcers)
- Step 2: Imagine the perfect dog (what are desired results?)
- Step 3: Manage the current environment (avoid rehearsal)
- Step 4: Get ready for training (set up and planning)
- Step 5: Determine Starting point
  - NOTE: Steps 1-5 are done before training begins
- Step 6: Shape new behavior (using R- combined with praise)
- Step 7: Interaction
- Step 8: Training for generalization

### CAT Analyzed (Ramirez)

- Science
  - Operant technique focusing on negative reinforcement
  - Well documented as part of Kellie Snider's Masters thesis with Dr. Rosales-Ruiz in 2007.
  - Tested, improved, and shared in 2019
- When to use it?
  - Useful when animal will or must be exposed to situation or trigger unavoidably on a regularly and frequent basis.
  - Best if used in situations where the functional reinforcer is a negative reinforcer.
- Disadvantages
  - Must be able to set up the situation and control trigger during training.
  - Trainer must know how to read precursors well.
  - Treatment is context specific, thus must be retrained in new context (although this is true of most treatments).
- Advantages
  - When timed and set up correctly will work relatively quickly
  - Treats the root source of the problem and gives the animal what it desires - distance.
- Resources
  - Rosales-Ruiz, Jesus and Snider, Kellie (2009). Rosales-Ruiz & Rentfro (2009). Snider (2017). See resource list at end.

### Click to Calm (Parsons, 2005 & 2021)

- Clicking for any minimal reduction, improvement, or absence of aggression; shaping toward a more desired behavior.
- Operant redirection procedure
- Concurrent, gradual counter-conditioning taking place which eventually changes emotional response
- Trainer focuses on any reduction in aggressive behaviors, clicks and treats
- Form of redirection referred to as DRL, DRO, and DRI – Differential Reinforcement of Lower intensity behavior, Other behavior, and Incompatible behavior.

### Click to Calm Analyzed (Ramirez)

- Science
  - Integrated operant redirection strategy. DRL, DRO, and DRI (differential reinforcement strategies) that also capitalizes on classical conditioning effects of counter-conditioning.
- When to use it?
  - When animal's reaction is so intense or so overly rehearsed that trying to work below threshold is difficult or impossible.

- Can also be useful tool when you do not have ability to control trigger (which is not an option with other techniques).
- Still best to work below threshold.
- Disadvantages
  - Concern about what animal is learning if working over threshold. So much going on at that time – it requires good skills.
  - Can be time consuming, not a quick fix (but aggression seldom is).
- Advantages
  - When shaped properly, can be a long-term and permanent fix to problem, completely changing animal's response to a specific trigger or type of trigger.
  - Due it's integrated approach, goes beyond simple redirection.
- Resources
  - Parsons, Emma (2005). See resource list at end.
  - Parsons, Emma (2021). See resource list at end.
  - Parsons & Robitaille (2011). See resource list at end.

#### Train an Incompatible Behavior

- A group of operant procedures have been operationalized by many skilled trainers that focus on training an incompatible behavior.
  - “Watch-Me” – Many trainers teach their animal to look at them on cue when a trigger presents itself. In some cases, on a verbal cue or in other situations to simply react to a distraction or trigger by looking at the trainer. In both cases this earns the animal reinforcement
  - U-Turn – Patricia McConnell and Karen London describe a behavior in which the dog is cued to do an about face and move in the opposite direction away from the trigger, which earns immediate reinforcement.
  - Recall – Many trainers will teach the animal a signal that means immediately return to the trainer, which receives high value reinforcement.
  - There are many other incompatible behaviors that trainers teach; these are just a few examples and ones that are often referenced as techniques for dealing with aggression.
- In each case, the goal is to teach the animal a behavior that they can do instead of being aggressive, a behavior that is incompatible with barking, biting, lunging, or showing other signs of aggression.
- There is an element of classical conditioning taking place, but initially only in how they respond to the cue, not in a change to the emotional response to the trigger. Over time – the response to the trigger may be altered if timing of the incompatible behavior cue is properly used.

#### Watch Me/U-Turn/Recall Analyzed (Ramirez)

- Science
  - Operant redirection procedure referred to as DRI (differential reinforcement of incompatible behavior).

- Classical conditioning is also taking place, but not the primary force at work initially. (O’Heare, 2007)
- When to use it?
  - Anytime a trigger or situation presents itself, that the animal notices, but prior to the animal reacting adversely to the trigger.
- Disadvantages
  - Does not, on its own, relieve the underlying cause of the fear, anxiety, or aggression.
  - Not a standalone strategy in most cases, usually good to be able to follow it up with other tools
- Advantages
  - Useful in the moment to initially interrupt or stop a reaction and move the animal toward a more favorable response.
  - Focuses on what you want rather than what you don’t want.
- Resources
  - See resource list at end Parsons & Robitaille (2011); McConnell, Patricia and London, Karen (2009); O’Heare (2007); Pryor, Karen (1999); and Ramirez, Ken (1999).

#### BAT (Stewart, 2010)

- A procedure that combines LAT with DRI and negative reinforcement
- Although similar to CAT differs in several significant ways
- My personal investigation indicates that it is an effective tool that works.
- Yet another example of a skilled trainer taking a procedure and operationalizing in a way that works in their system or environment.

#### BAT Analyzed (Ramirez)

- Science
  - Operant & Classical technique using counter conditioning, followed by DRI, followed by negative reinforcement, followed at times by positive reinforcement.
- When to use it?
  - In real world scenarios where you can set-up the environment or be reasonably sure of the distractors and options in that environment
- Disadvantages
  - Requires experience and good knowledge of animal to know when to move from one step to the other and which options to choose.
  - Treatment is context specific (this is true of most treatments).
- Advantages
  - When timed and set up correctly will work relatively quickly
  - Treats the source of the problem by giving the animal what it desires – distance
- Resources
  - Stewart, Grisha (2010, 2011, 2016). See resource list at end.

### Abandonment Training (King, 2004)

- Example of one of many very specialized tools for specialized situations
- When trigger appears and your dog exhibits inappropriate behavior, trainer drops leash and immediately leaves dog and training area. An assistant has your dog on a separate long loose line to prevent dog from interacting with trigger or getting in trouble.
- In some versions of this training, the trainer will return and reinforce when dog stops exhibiting inappropriate behavior.
- Works primarily with dogs who's inappropriate behavior is a type of "owner resource guarding"

### Abandonment Training Analyzed (Ramirez)

- Science
  - Operant procedure using negative punishment, commonly called a "time out"
- When to use it?
  - Unique procedure that is only designed for a specific type of dog in a situation where the owner/trainer is the main or predominant reinforcer.
- Disadvantages
  - Only useful for very specific situations and animals
  - Focuses more on unwanted behavior than desired behavior
- Advantages
  - Results should be relatively quick when used with the right type of dog and situation.
  - Note: Just one example of good, but very specific tools. Always look at tools and understand their intended use.
- Resources
  - King, Trish (2004). See resource list at end.

### Summary

- Every technique discussed works and has been proven effective if used correctly and understood by the trainer
- All aggression treatments are advanced – require skill and understanding to use properly – there is no "quick fix"
- It is easy to go wrong and apply a technique poorly – getting an unwanted result, which is why there is so much controversy about many techniques. Too often, criticism is leveled at particular methods due to mistakes in the application of a technique.
  - Poor observation by trainer – not seeing or recognizing the pertinent behavior
  - Poor timing of click and/or reinforcement
  - Sequence of execution is off
  - Working at too high a level of arousal
- Almost every technique requires set-up, a thoughtful training plan, and working below threshold using gradual approximations.
- Selecting the right techniques should be based on multiple factors:

- Individual animals training history
- Type of trigger
- Specific circumstances or situation
- Experience level of the trainer
- Personal ethical hierarchy

### Final Thoughts

- Keep an open mind when looking at aggression reduction strategies
- I don't believe that any one technique is the answer to every aggression problem or situation
- Good trainers keep many tools in their tool box and understand how to use them all, even if some are seldom used.
- Understand the science being used in any tool - it will help you recognize the intended mechanism at work and enable you to compare it to other procedures already out there.
- Learn as much as you can about a tool – look at the resources available to determine which most closely fits your training situation, style, and skill.

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# Concept Training

## Introduction

- Karen Pryor's Clicker Expo seminar
- Concept training – taking a step beyond the standard operant paradigm
- Can an animal think beyond specific cues and generalize?
- Concept training is used with many animals, it is not asking too much of your dog!

## Concept Training Examples

- Space conceptualization - Guide dogs
- Modifiers: Right or Left; Up or down – Search and Rescue training
- Matching to sample – Service dogs
- Addition – Combining establish cues to create new instructions
- Mimicry as a behavior – new research being conducted by the Navy

## A Step Beyond The Normal

- Standard clicker training approach teaches very specific behavior
- Creative games make concept training easier
  - Free shaping
  - 101 things to do with a box
- Clear criteria is still important
- Taking your animal to the next level

## How Do I Begin?

- Important preliminary training before you even consider concept training
- Establish solid basics
  - Clicker
  - Clear criteria
  - Understanding of cues
- Desensitize to new things constantly
- Practice generalization
- Allow creativity within a framework – the animal must learn that you want him to think beyond the cue
- Until you have a well-trained dog, you cannot seriously consider concept training

## MODIFIERS

### Modifier Cues

- Useful in many scenarios
  - Right vs. Left
  - Top vs. Bottom

- Round vs. Square
- Large vs. Small
- Numbers
- Colors (careful!)
- Determine what you will ultimately use or need, plan before you start
- Getting started – right and left (or over and under) are clear concepts that can be taught faster than others
  - Internal modifiers: constant, objective
  - External modifiers: variable, subjective
  - Abstract modifiers: challenging
- Once your animal knows at least three pairs well, new modifiers usually come more easily
- Teach animal more than two modifiers (Large, medium, small)
  - Difficult
  - Seldom needed
  - Not impossible
- Making sure your animal really “understands” – will your animal pass a real world test?
- Step by step – How to teach modifiers

#### Modifiers – Important Points Before You Begin

- Start with solid action behaviors:
  - Target
  - paw/shake
  - retrieve
  - spin
- Don’t dwell on one step for too long or generalization becomes difficult
- Train in pairs, it speeds up the process
- Teach in a pressure-free setting, if it’s fun the animal learns faster
- Determine syntax rules
  - NOUN, MODIFIER, VERB
  - BALL, LARGE, RETRIEVE
  - SHOE, SMALL, RIGHT, RETRIEVE
- If action cue isn’t last, consider teaching a release signal

#### Internal Modifiers – Step by Step

1. Teach right & left with known behavior:
  - Whales/dolphins: target
  - Dogs: paw/shake
2. Fade prompts
3. Increase distance
4. Change targets
5. Change behavior
6. Add obstacles
7. Increase complexity

## External Modifiers – Step by Step

1. Determine objects to be used (large/small)
2. Start with one of the extremes, either the smallest or largest size available.
3. With subjective, variable modifiers it is usually helpful to make sure one extreme is well understood before teaching the opposite modifier.
4. Pick a pair to begin with
5. Vary location of objects
6. Switch the non-target often
7. Once animal reliably understands the large object, change it
8. Add variability as quickly as animal shows you he's ready
9. Use errorless learning if needed
10. Once first extreme is reasonably well learned, move to other extreme
11. Switch regularly between the two – while also changing focus and non-focus objects and position.
12. When your animal is recognizing those two modifiers reliably with one type of object, transfer to a second type of object.
13. Don't use objects that make discrimination more subjective than needed.

## ADDITION

### Types of Addition

- A type of compound cue – can come in many forms.
- Today we will focus on just three
- Additive addition – Cue one behavior, while animal performs that behavior cue next behavior so that animal continues with first behavior and now adds the second behavior, performing both simultaneously.
- Conceptual addition – Animal learns the idea or concept of doing two or more behaviors together and understands the concept so thoroughly that the trainer may cue two (or more) behaviors that have never been put together previously but the animal understands and executes the behaviors asked.
  - “AND” – This version requires the animal to perform all behaviors cued simultaneously.
  - “THEN” – This variation requires the animal to perform all behaviors cued in order, one after the other, in the sequence presented when cued.

### Additive Addition

- Most trainers have done this in some simple or passive form.
  - Passive: To kennel or mat now lay down (while remaining in kennel or on mat)
  - Active Basic: Run with me now jump over hurdle or go through tunnel (while still running with me)
  - Active Complex: Laydown now come to me (while still laying down) – creating a crawl
- More complex combinations require more work on the part of the animal
- Animal often stops doing first behavior to offer second behavior
- Prompting often required to get animal to do both together
- Also requires certain amount of coordination from animal, which can be developed with practice

- The more often additive adduction is used, the more capable (and more quick) the animal becomes at grasping new combinations
- A good first step toward the “AND” version of conceptual adduction

### Conceptual Adduction

- It becomes conceptual based on several criteria
  - Animal can receive multiple cues before carrying out instructions
  - Animal can combine behaviors that have never been previously combined or trained together
  - Without both it has not reached the level of a true “concept”
- Not better than additive adduction, but perhaps useful for certain unique situations
- Often requires a mechanism to let animal know when trainer has completed series of cues
  - Release signal
    - “Go”, “OK”
    - Target removal
    - Location specific to adduction
  - Multiple modal cueing
    - Verbal cue combined with Visual clue – presented simultaneously or back to back
    - Can reduce or eliminate the need for a release signal
- Start by having series of well-established behaviors that keep animal close to you so that you can coach them through the process. Examples:

Bark	Bow	Beg
Roll over	Spin	Back up
Paw lift	Come	Mat

### “AND” with Multiple Modal Cueing

1. Begin by practicing/teaching additive adduction
2. Use a combination that has been successful with additive adduction
3. Make sure two behaviors you plan to combine are reliable when cued individually
4. Try cueing them simultaneously
5. Prompt animal by re-cueing if animal offers only one of the behaviors (similar to what was done during additive phase)
6. Regress to individual behaviors if the animal is not having great success
7. When reliably combining behaviors that were trained the additive way, ask for novel combinations (coach them through it if needed)

### “AND” with Release Cue

1. Begin by practicing/teaching additive adduction
  - a. Animal proficient at more than 5 or more combinations
  - b. Make sure animal still responds to individual cues correctly and does not assume combinations are the new behavior
  - c. Animal will quickly learn new combinations
2. Separately, teach a release cue or mechanism
  - a. Practice with easy behaviors
  - b. Increase time between cue and release until able to wait a full 5 seconds or more
  - c. Gradually use for more active behaviors, increasing time as described above

3. Once steps 1 and 2 solidly learned:
  - a. Ask for a simple combination using release – start with reliable combination that was already trained using additive adduction – prompt animal to add other behavior if they offer only one
  - b. Once this is accomplished try with new, but previously used combination.
  - c. Continue with previous combinations until animal is offering correct response on first try.
  - d. Attempt novel combination
4. If you want to get really creative:
  - a. Try combinations of three behaviors
  - b. Increase time between cues and release
  - c. Try combinations that seem illogical – be prepared to reinforce for honest effort
  - d. These last steps are really pushing it but may be fun for the advanced animal and trainer.

#### Training “THEN”

- Similar approach and challenges to training “AND”
- Normally I would never train “AND” and “THEN” within the same time frame.
  - Start with version you feel will be most useful to you
  - May be only type of adduction you use
  - If you want or need to train both, wait until one version is well learned
  - Find a key to differentiate them to the animal
    - Multiple modal cueing for one and release signal for the other
    - Different release signals for each
    - Contextual difference (location or other differentiator)
- Helpful preliminary work
  - Train small chains regularly
  - Teach animal to work in clusters, multiple behaviors before reinforcement
  - Either builds expectation and understanding that behavior after behavior might be required

#### “THEN” through Additive Adduction

1. Begin with established behaviors
2. Use one behavior that provides destination information (such as “go to mat” or “into kennel” or “go to target”) and another behavior that animal should perform when it gets there (“sit”, “lay down”, “spin”, etc.) – the destination behavior will help clarify concept in their mind.
3. Cue destination behavior; while animal is on its way; cue the next behavior. If they don’t get it, when they arrive at destination cue the second behavior again.
4. Consider adjusting the timing of your second cue. Present second cue, just before arriving at destination.
5. Gradually give the second cue further from the end and closer to the beginning until you can give both cues one after the other.
6. Maintain individual behaviors on single cue.
7. Try as many different behaviors at destination as possible to assure that a chain has not been developed.
8. Follow the whole process with different initial destination behavior.

9. Try two behaviors, if the animal does not understand, regress and continue using more combinations in the previous steps.

#### Use of Behavior Chains

- Back chain several small combinations
- Continue back chaining new combos until animal learns them quickly
- They now have understanding of behavior followed by another behavior
- This is useful whether you plan to train “THEN” type adduction or not.

#### “THEN” with Release Cue

1. Begin by training behavior chains as described previously
2. Separately, teach a release cue or mechanism as described earlier
3. Begin to use the release cue for previously established two-behavior chains
4. Ask for chain several times with chain cue, then try asking for the two behaviors in order using individual behavior cues, then release, animal should offer chain
5. Repeat this with other previous established chains
6. Once animal understands the use of individual cues to trigger sequence, start trying novel combinations – you may have to prompt animal with second cue after completion (or just before completion) of first behavior.

#### Applications

- Most behaviors that we train are already a combination of smaller behaviors
- Additive adduction is commonly used, most trainers use it already
- Conceptual adduction – the ability to combine two novel behaviors the first time asked – is probably not as useful or needed
- However, if learned it will speed up the learning of new behaviors
- The creative trainer and creative animal will find many uses for adduction

#### Closing Thoughts

- Adduction is a useful tool, whether learned as a true concept or not
- Conceptual training stretches skills of trainer and animal
- Don't stretch your animal beyond its comfort level
- Train in small approximations and build to your desired goal
- I have shared various training plans – as always these plans represent ONE way not THE way
- We could only scratch the surface in a short seminar, please feel free to contact me if you have questions.

## **MIMICRY**

#### Mimicry as a Behavior

- Animal taught to copy what another animal does – even if a completely novel behavior
- Can speed up complex training
- First used by Navy dolphins – 5 year training project reduced to 2 years
- Challenges if behavior breaks down

#### Blindly Marching into Controversy

- Always fascinated by concept training
- Taught dolphins to replicate project
- Replicated with injured search and rescue dog for stimulation during recovery
- Trained it several more times with additional dogs
- Later confronted by behaviorists claiming “dogs not capable of mimicry.”
- Never thought to video tape my sessions – didn’t know it wasn’t possible

#### Semantics & Theory

- Mimicry not natural behavior in dogs?
- If true, it may not be natural but it can be taught
- Most mimicry-like behavior in dogs is often referred to as “social facilitation” and not true mimicry
- My goal today is not to create scientific proof – but to show you how to train it

#### Mimicry Training Procedure

- Begin with two dogs that have shared behavioral repertoire of at least 5 or 6 behaviors. Select compatible dogs!
- Begin training with dogs in close proximity where they can easily see each other during training - positioning is critical aspect to success.
- Ask animal #1 for a behavior, followed by the mimic cue, followed immediately by the cue for the same behavior for dog #2 (already trained behaviors for both dogs).
- Repeat this with other known behaviors over & over again – until dog #2 begins to anticipate the behavior.
- Vary behavior frequently and repeatedly so that the mimic cue never comes to be identified with any one behavior.
- Once dog #2 is anticipating the cue and offering the behavior on the mimic cue, start attempting to ask for new behaviors not yet tried with the mimic cue (but already in both dogs repertoire).
- Once you have confidence that dog #2 understands the mimic cue:
  - Mask/hide trainer/dog #1
  - Switch target dog(s): reliability
  - Use novel dog as target
- Try novel behavior only after concept clear (start simple)
- Goal: focus dog makes an “honest” attempt to offer this “new” behavior!

#### Recap for Clarification

- Get in the “groove” with 3 shared behaviors, example:
  - Sit
  - Down
  - Spin
- Add a 4<sup>th</sup> behavior – that both dogs know:
  - Bark; Back-up; Rollover; Anything will work
- Then add 5<sup>th</sup> behavior, include masking
- **Train** concept before **testing** it – this is a critical distinction – wait for novel behavior
- Try novel behavior
- Try new novel behavior

#### Mimicry Challenges

- Finding dogs with shared repertoire

- Making sure animal is not picking up other cues
  - Watching other trainer's cue
  - You knowing the desired behavior and telegraphing it
- Interpreting an "honest" attempt
  - Be liberal at first
  - More strict as concept is grasped

#### Testing Your Animal

- How to know if your animal truly understands a "concept"
- Making sure you don't bias your "transfer test"
  - New items/scenarios
  - Other trainers/handlers
- Making the use of "concepts" fun for your animals

#### Keys to Concept Training

- Solid basics
- Teaching creativity
- Know ultimate use – have a plan
- Set training goals that prevent bias
- Testing for concept understanding

#### Keep it Fun!

- Concept training is not asking too much of your animal!
- The more concepts that you train the more useful they will become.
- Planning, planning, planning!

### **COUNTING (A Review of Process)**

#### Overview

- Reminder (or intro) of past steps to "Counting" Project (Numerosity or Quantity Recognition)
- Discuss most recent 3<sup>rd</sup> phase of project
- Explain training involved (from start to finish)
- Describe some of adjustments and controls
- Share data
- Discuss possible significance of results (including comparison to similar human studies)

#### Background

- I have worked with the idea of counting with many species
  - Research settings with primates and cetaceans
  - Dogs as a cool "parlor trick"
- There are various ways to approach the concept – my journey has been interesting & challenging
- A look at some early trials with California Sea Lions (Kathy Streeter, New England Aquarium). . .

#### Practical Uses

- Has been used in SAR settings to have dog report number of victims found

- Tested with military to have dogs report back number of intruders detected
- Ultimately not that helpful or useful even in those scenarios
- Few other practical purposes.
- Stretches your skills and your dog's skills

#### Phase 1

- Original project designed to demonstrate how to train basic "counting" behavior. (part of series on concept training)
- # of objects taught as cue to for a specific behavior
- I begin most projects of this complexity with exploratory training:
  - Opportunity to work out logistics
  - Chance to see how animal responds to set up
  - Better information to improve the plan
  - "Training without a plan"

#### Indication Behaviors

- In essence – my approach is to teach a different indicator behavior for each #
- I start with a behavior for each #, example:
  - 1 = Sit
  - 2 = Down
  - 3 = Kennel
- The number of objects presented becomes a cue for each of those behaviors
- Dog – Dory: 3 year old rescued shepherd mix

#### Other Approaches

- Indicator behaviors can come in many forms
  - Rope pull
  - # of barks
  - These look good, but are easily biased (too susceptible to Clever Hans syndrome)
- Tried varied targets as indicator with a new dog: Coral – 3 yr. old rescued Airedale mix
- Different target for each number
- This approach looks impressive, but is absolutely no different than the behavior indicator just demonstrated

#### Final Thoughts on Phase 1

- Completed this in January 2014
- Assumed this would be it, mainly trained it to teach others how to train it.
- Excellent use of advanced skills
- But during ClickerExpo 2014 several people made suggestions, inspiring me to go further
- It could be an important research project

#### Phase 2

- Turn it into research
- Change indicator: used equivalency matching
- Expanded numbers gradually over time
- Randomized order of #'s and position of dots

#### Phase 2 Final Thoughts

- Advanced to as many as 8 objects & continued to have a nearly 90% correct response rate
- Added controls for scientific purposes, conducting double blind trials & using a computer to determine randomization
- I completed this project in October of 2014 and reported on it at ClickerExpo 2015
- I felt I had gone as far as I had time and interest in going with this project

#### Showed the Project to Colleagues

- Received great scientific feedback
- Although all applauded the project, they raised interesting and significant questions:
  - How are we defining “counting”?
  - How do we know that Coral is not subitizing? (Defined as “instantly seeing how many”)
  - Is it possible that she is simply using pattern recognition?
  - Have I looked at literature for counting studies with children and other animals?
- They made suggestions on what would make the study more compelling.

#### Decided to do some Research

- I looked at many counting studies:
  - Dogs – nothing beyond 5 (only two studies)
  - Birds – several interesting studies (Crows & Alex)
  - Rats – Lots of work done in lab setting
  - Children – Tons of research (birth to 5 years old)
- Contemplated possibilities considering:
  - My time
  - Coral’s availability
  - Coral’s interest
  - My reduced resource pool (space and staff)

#### Phase 3

- I finally decided to begin a new phase using the new information and suggestions.
  - Use more than one “new number” so that Coral is not simply selecting the one that is different
  - Change the shape and size of the “dots” on the board to interrupt pattern recognition:
  - Use previously trained matching to sample skill to increase number of possible questions per tray and further reduce possibility of subitizing.
- A tray with multiple different types of objects would lend itself to numerous correct responses, depending on the question.
  - How many Kongs? How many balls? How many total items?
  - Possibilities are broader and less prone to bias.

#### Training & Trial Challenges

- New location – Coral had never been in space and it had many foreign dog smells
- Gap in training – Project was restarted after a 9-month break in project
- Coral changes – living in new environment and not exposed to Ken during that break
- Trial set-up – totally different configuration (other than tray and boards)
- Lack of staff for so many positions, had to reduce # and still maintain blind trial conditions

#### Reintroduction to Project

- Excited to see me, great reunion

- First day:
  - 3 sessions to be back where we left off
  - 2 sessions to remind her of matching to sample
  - 7 sessions to introduce her to concept of both

#### Preliminary Data

- Phase 1: 3 Objects 98%
- Phase 2: 5 Objects 95%
- Phase 2: 8 Objects 90%
- Phase 3: New #'s, no training, multiple options
 

	<u>1<sup>st</sup> TRIALS</u>	<u>REPETITIONS</u>
9-10 Objects	84.2%	87%
11-14 Objects	79%	80.4%
15-17 Objects	61%	62%
18-22 Objects	52%	44%

#### Interpreting the Data

- We believe we have eliminated pattern bias
- Counting? Depends on how you define it.
- Quantity recognition/understanding: clearly to #14
- Significant decline at higher #'s (but above chance)
- Frustration set in at higher #'s – overall decline until we returned to easy – then stable up to 14
- No correct answer conditions – some logic could be inferred
- Significant findings when compared to other studies

#### Existing Counting Research

- Definitions of “counting” not clear nor consistent
- Numerical understanding has been seen in most animals to some degree
- Children’s studies show huge change between ages of 3 and 5. Numeric competencies fall into 3 areas:
  - Conceptual
  - Procedural
  - Utilizational
  - Most agree that many animals possess the last two competencies as needed to survive in their world
- Great evidence to suggest that animals while not having natural ability to count, can demonstrate good skills if they are receptive to training and associative learning
- Studies indicate that many children with ADD score above average for children their age on counting studies
  - Hyper awareness seems to make handling concepts such as counting easier
  - Is there a correlation between this and a highly reactive dog (very aware of the environment)?
- Other than counting projects with children, few animal projects have gone very far nor replicated their work.
- Still an area where there is debate and controversy

#### Final Thoughts

- I think I can definitely say that Coral can recognize quantities up to 14 (it may not meet the definition of counting, but it's remarkable)!
- Is it a skill that female dogs need to keep track of their puppies?
- Her highly reactive nature (super awareness of her environment) may have been an advantage.
- She did better than most children 3 and under on this type of study (significant shift as children reach ages 4 and 5)!
- Clearly this work needs to be replicated (I would be happy to help or partner with someone).
- Publication planned in the future.

#### Are You as Smart as Your Dog?

- Measures of intelligence are far from perfect and the question is not actually a fair question.
- Animals are as smart as they need to be to survive in their world.
- But was Coral doing something that was beyond our ability?
  - Beyond the ability of young children
  - Faster than most people can do it
  - Why? And what does that imply?
- Food for thought . . .

## Perspectives on Scent Discrimination

**Seminar Description** – Dogs are uniquely qualified and talented at using their noses. Ken will explore the training of scent discrimination in a variety of disciplines. He will examine the differences and evaluate the many techniques being used for training dogs to use their nose, taking what he calls “an outsiders look at the inner workings of scent discrimination training.” Ken began working as a consultant in a variety of scent discrimination programs more than 15 years ago – precisely because he had little to no experience with scent training. He was asked to take a fresh look at scent discrimination programs with several search and rescue teams (including disaster, avalanche, and cadaver dogs), as well as several law enforcement programs (including explosive and narcotic detection dogs). This seminar will look at all of these types of scent detection work plus some of the newer uses in sport and competition. Ken will evaluate the many techniques advocated by the various scent discrimination disciplines and examine what the science indicates about each – ultimately looking for the most positive and effective of approaches.

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### Goals

- An overview of scent detection applications
- Share my recommendation for basic training steps
- Review biggest challenges
- Discuss common mistakes or errors
- Share with you my unique perspective

### My Perspective

- Not primarily a scent detection trainer
- SAR training since 1997 – brought in to provide R+ perspective
- Led to consulting with many SAR and Law Enforcement agencies
- Discovered many myths & a focus or reliance on less important aspects (in my opinion)
- Not a critique of individual systems (not productive or helpful)
- Just my perspective from the outside looking in (few trainers follow purity of a single system, share my observations)

### Types of Scent Detection

- Search & Rescue
  - General
  - Disaster
  - Avalanche
  - Cadaver
  - Tracking
  - Similar goals, diverse training techniques, most needing to pass 2 levels of FEMA Certification and thus needing to meet specific criteria. Often candidates train for the test and not the job.
- Law Enforcement/Military
  - Explosive Detection
    - German System
    - RCMP Method
    - Lackland Airforce Base

- All have rigid and inflexible protocols
      - Traditionally based
      - Handlers not allowed to vary
      - Full of superstitious behaviors
      - Each mired in its own set of politics
      - Do produce results
    - Narcotic Detection
    - Tracking
    - Arson Detection
    - Agriculture detection
  - Medical Detection
    - Cancer
    - Diabetes
    - Seizure
    - Many others - new and emerging techniques still being studied and not fully understood
  - Wildlife Detection
    - Conservation work
    - Invasive species detection (including home pests)
  - Sport
    - Hunting
    - Obedience Training
    - Nose Work Sport

#### Today's Focus

- "Teaching" scent detection
- Desensitization (Proofing/Distractions/Obstacles)
- Indication or Alert behaviors
- Reinforcement
- Teaching an "All Clear"
- Will cover each in depth later

#### Important Topics – but not our focus today

- Dog Selection
- Search patterns
- Guiding from a distance
- Obstacle/Agility training
- Tracking: match to sample – find source – get reinforced
- Science of scent detection
- Emergency behaviors (quick down, freeze, recall)

#### Basic Training Sequence

- Train/Determine alert or indication behavior
- Present the scent, cue alert behavior
- Short search for scent
- Dilute strength of scent
- Disguise scent
- Long search for scent

- Search for scent with distractions

#### “Teaching” Scent Detection

- We don’t teach scent detection – dogs already experts at this (Susan Bulanda)
- What we teach is:
  - What to find
  - When to find it
  - What to do when they find it
- In my opinion, easiest part of scent detection work; forms only 10-20% of overall task

#### Desensitization

- In my opinion this is the most complex part of scent work, forming 80-90% of task
- Proofing – Distraction Training – Obstacle Work
- Once alert on scent is well established, majority of time is spent preparing dog for real world scenarios
  - Adverse conditions/Distractions/Obstacles
  - Train alert with great reliability before starting major real world desensitization
  - Set dog up for success in early stages so that he succeeds and task remains enjoyable
  - Ultimately, for SAR and Law Enforcement, dog must be exposed to extreme distractions and taught to stay on task throughout

#### Alert or Indicator Behavior

- Aggressive
  - Avalanche – Some Narcotic Detection
  - Paw at/Dig
- Passive
  - Explosive Detection – Some Sport
  - Sit & Stare
- Report
  - Some Search & Rescue
  - Bark
  - Rope Pull
- Train alert behavior first – then pair with scent using basic fading procedure
- Teaching an “All Clear”

#### The “All Clear”

- A behavior that indicates the absence of target scent in search area
- Not common, but something I strongly advocate
- Very successful where used – not part of most law enforcement systems (but a great help for those that use it)
- Allows animal to be reinforced at completion of every requested search
- Virtually eliminates false alerts

#### Training an “All Clear”

- Same process as training the indicator alert
- Once indicator is well established/reliable, teach the “All Clear”
- At end of search of a clean area; pair completion with a new/different alert

- Start with clearly defined area – such as a row of boxes or bags
- Move on to search of an entire room, row of cars, clearly fenced in yard, etc.
- Expand size of search areas as dog learns how you define parameters
- Alternate real hide searches with clean area searches
- Make sure that reinforcement for all clear has same value as an alert

#### Reinforcement

- Choosing appropriate reinforcer
  - Based on type of scent work
  - Rules or regulation of sport
  - Food/Toys equally effective depending on dog
  - Evaluate reinforcers
- From the target/victim – used in SAR to create “victim loyalty”
- From the trainer – more realistic in most real-life situations

#### Challenges

- Laws/Certification
  - Dictates what you can and can’t do
  - Understand what will hold up in court and what won’t – train accordingly
  - Careful of training for the certification test
  - Train for real world – should make you ready for test
- Types of scent
  - Understand science of scent
  - Brownie analogy (Bulanda)
  - Air scenting vs. specific scent tracking
  - Protocols critical since we can’t perceive what dog smells
- Contamination of training materials
  - Container – inadvertently teaching dog to alert on plastic container, baggie, tape, etc.
  - Inadvertently touching objects with hands contaminated with scent
  - Serious scent detection requires careful adherence to careful handling protocols
- Desensitization
  - Already discusses
  - One of the biggest challenges for scent detection trainers
  - Biggest part of training is devoted to real-world scenarios
  - Ongoing process that never ends
- Pressure to succeed
  - Creates anxiety for trainer
  - Increases anxiety on dog
  - Real world scent detection may be serious work, but dog should look at it as fun
  - This will help them to succeed and decrease false alerts or missed finds.
- False alerts
  - Serious issue in many disciplines – wastes resources in searching for something that is not there
  - Missed finds even more serious problem – missing an explosive or not finding a victim has serious consequences
  - Teach an “all clear” signal (the area does not have this scent)
- Understanding “drive”

- Major consideration in many programs and in selection of dogs
- What is drive? A combination of motivation, stamina, and ability
- All dogs can do scent detection
- Not all are motivated to work for long durations
- Picking the right dog for a working environment is critical
- Still revolves around good training
- Ongoing Training
  - Best way to assure a reliable dog is to do regular training sessions throughout detection career
  - Setting up new scenarios and situations (where trainer can ultimately know presence or lack of presence of scent) assists in maintaining confidence for trainer, keeps dog in practice, solidifies reliability in court cases.
  - Too often trainers reduce training time considerably once dog's "training is complete" – Training never ends!

#### Common Errors

- Using food as initial target scent
  - Some people teach dogs to find food because it creates "odor obedience"
  - If food is used, it has to be faded out and actual scent used as soon as possible
  - It can facilitate quick learning
  - But it creates the need to use an extinction procedure which can be frustrating for some dogs
  - Some SAR trainers use it to teach tracking, but it teaches the animals to eat food they may find along the way
- Use of corrections when there is an error
  - Almost all scent detection trainers use positive reinforcement after a correct find
  - But many traditional trainers insist on using corrections:
    - To prevent reactions to distractions
    - To punish mistakes
    - To maintain "obedience"
  - This can cause dogs to shut down and prompts many of the mistakes that are common in scent detection.
- Forward chaining
  - Start by working in the field and training scent – shape alert last
  - Forward chaining works, but it takes longer and makes dog less reliable
  - Back chaining is my preferred approach
- Use of modeling
  - Shape the alert by pushing butt down
  - Dogs learn it, but sitting is less pleasurable behavior
  - Alert behavior should be easy and not forced
- Micro-management:
  - Prompting (because trainers knows location of hide)
  - Inadvertently teaching to alert for what we are doing not what they are smelling
  - Talking to the dog ("oh you're getting close") creates a keep going signal that dog becomes dependent on
- Not trusting the dog
  - Once trained and reliable, never doubt your dog (if showing you normal alert behavior)

- Causes accurate but unknown finds to not be reinforced
- If your training situations are set up properly, you should know if your dog is reliable or not
- If not reliable, do not put in field
- Showing find before reinforcement
  - When this is possible, such as in SAR, this is fine
  - But in many scenarios (drugs, explosives) trainers wait to confirm find, which delays reinforcement and decreases dog's accuracy
  - Trust your dog

#### Basic Scent Detection

- Behavior is simple; it is a basic chain
- Opportunity to find scent (Cue to play the "find it" game)
- Scent cues Alert or Report behavior
- Reinforcement delivered or . . .
- Report prompts Recue – "show me" or "refind" (in certain SAR situations)
- Source of scent found (Alert)
- Reinforcement delivered

#### Conclusion

- Many of the challenges regarding scent detection work are very real.
- The unusual, changing, real-world environment of scent detection work requires many skills and many complex training tasks.
- However, the actual behavior of "find scent – alert" is basic.
- Not a complex behavior in itself and that should be the starting point for all scent work.
- If the find and alert behavior is reliable and fun, moving into the real world will be easier.

#### Final Thoughts

- I have great respect for the dedicated men and women who train scent detection for law enforcement, military applications, search and rescue, wildlife conservation, and many other disciplines.
- Their work and dedication is invaluable.
- Today's seminar comes from a place of love – and a desire to help those committed to these noble tasks – to improve their work and make their dog's life better.
- Please contact me with questions or clarification

## **Consulting Skills**

### **Wanted: Animal Training Consultant: Those Good with Animals Need not Apply!**

Ken frequently likes to tell people that a successful animal training consultant doesn't need to be good with animals! He says this in jest, because animal skill are certainly required to be a training consultant, but this seminar will look at those other skills that frequently trip up good trainers, including people skills and organizational abilities. Ken will share stories from his consulting practice to give the attendees pointers and suggestions that will assist them in being better trainers.

#### Introduction

- People Skills
- Identifying Problem
- Discussing Priorities
- Speaking Client's Language
- Accepting Responsibility
- Finding Acceptable Behavior
- Problem Solving Flow Chart
- Consistency
- Positive Reinforcement for People

#### Over-riding Principles

- General principles apply in all training situations.
- Consultants need these skills from the start
- Managers and supervisors would be better trainers if they kept these in mind
- Zookeepers could accomplish so much more
- Pet owners would get so much further
- The animals are the easy part!

#### People Skills a Must

- I love animals but hate people
  - Won't work for trainers
  - Doesn't work for veterinarians
  - Can't work for consultants
- Organization skills
- Motivational skills
- Training skills – teaching
- Develop trust

#### Identifying the Problem.

- Does everyone in the household or staff see the same problem?
- Do they agree that it is indeed a problem?
- Get everyone to agree – or you may be fighting a losing battle
- Be the ultimate negotiator

Case Study: Marital Discord

#### Setting Priorities

- Before you implement a plan, determine where achieving it fits into your priority list.
- Does your list = everyone else's list?
- A problem that is too low on the priority list may not be easily solved.
- Are you willing to sacrifice something to fix the problem? Change is necessary.

Case Study: The Seagull Dilemma

#### Speak their Language

- Make it easier for client to relate to
- Use examples closer to home or within their realm of understanding
  - Use examples with similar species
  - Use similar type of dog
  - Similar situations
- Don't demean what they have done

Case Study: Macho Factor

#### Unlearn Long Held Truths

- Beliefs, half truths, myths and excuses get in the way of finding solutions
  - He hates children
  - He's bonded with my spouse
  - It's a common problem with this breed
  - My father in law feeds him when we're not here
  - There's no time in my schedule to work on this
- Help them to accept responsibility (Martin)
- Shift their thinking:
  - Instead of "what's wrong with the animal?"
  - Ask "why can't I train it?"

Case Studies: "It's Always Been that Way"

#### Find Acceptable Behavior

- Everyone focuses on unwanted behavior
- What behavior would they like to see?
- Client may need guidance – they never thought about it like that

#### Case Studies: Finding What they Want

#### Problem Solving Process

- Have a formalized process (flow chart, a set of questions, a matrix, or set of rules)
  - Karen Pryor (Don't Shoot the Dog)
  - Susan Friedman (Hierarchy of Effective Procedures)
  - Steve & Jen White (DIP IT)
  - AZA & Disney (Hypothesis System)
  - Ken Ramirez (Balance of Reinforcement Approach)
- Guides questions
- Assists client in doing it themselves
- Helps in understanding plan

#### Consistency

- Make sure everyone agrees on plan
- Make sure everyone approaches training the same
- It's about the animal not our own ego
- Consultant may not see this so you have to make a preventative strike

#### Case Study: "My Way's Better"

#### Positive Reinforcement for Client

- Understand what motivates them
  - Their spouse
  - Making their boss happy
  - Bottom line \$\$\$
  - Time savings
  - Their neighbors (peer pressure)
  - A clean house
- Help them get something out of it
- Stroke their ego
- Gain their trust and don't betray it

#### Case Study: Boss is my Roadblock

## Final Thoughts

- A behavioral consultant does need to understand training and behavior, without it you will certainly fail
- However, the best trainers in the world often fail as consultants or leaders in their area because they lack the requisite other skills:
  - People (talking, motivational, training)
  - Observational (assessment, big picture, reading between the lines)
  - Organizational (a systematic approach, record keeping, teaching)

# Unique Challenges of Real World Working Dogs

## Introduction

- Consult with many working dog programs
  - Law enforcement
  - Search and Rescue
  - Guide dogs
  - Service dogs
- Most common topics requested by clients:
  - **Use of Aversives (Unwanted behavior)**
  - **Impulse Control**
  - **Duration**
  - Eliminating need for Food
  - Fluency & Stimulus Control
  - Generalization
  - Keep Going Signals
  - Fading the Clicker
- Share my approach to consulting regarding some of these issues (in bold)

## Duration

- Hard to work on duration without looking at the interrelation to all aspects of fluency:
  - Precision
  - Latency
  - Speed
  - Distraction
  - Duration
  - Distance

## Improving Fluency

- Fluency is improved through shaping
- Focus on one aspect of fluency at a time
- Generally it is best to start with Precision, Latency & Speed
- Followed by Distraction, Duration, and Distance
- Clear criteria and stimulus control 1st

## Taking a Step Back to Basics

- To discuss fluency and aspects of fluency (such as duration), it is critical that trainers focus on stimulus control (which include the first elements of fluency).
- Even the most experienced trainers can benefit from a review of the early introduction to Stimulus Control

## Duration Guidelines

- Start with one unit of reliable behavior
- Work in small increments
- Begin in distraction free environment
- Collect data for reliability
  - Timer (in seconds)

- Clear guide posts (steps, tiles, landmarks)
- Use all needed equipment and be sure criteria established and clear

#### Stationary Behaviors

- Approximate time very gradually
- Use of clicker or KGS
  - Click “ends the behavior” and may cause dog to leave position
  - KGS does not end behavior
- Teaching a wait or hold
- Data keeping is the key
  - Ping pong duration as you approximate

#### Moving Behaviors

- Click or reinforce as the behavior is happening
- To extend:
  - Recue just before behavior’s maximum duration AS behavior is still happening
  - Click or reinforce for 1<sup>st</sup> step past normal
  - Increase in small increments
  - Vary duration (avoid patterns)
- Monitor data

#### Pitfalls

- Working on more than one criteria at a time:
  - Unrealistic duration and high distractions
  - New duration and new equipment
- Not knowing the reliability threshold for the behavior
- Recuing the behavior as it starts to fail
- Getting into predictable patterns

#### Thoughts about Duration

- Customize discussion to fit needs of client
- Focus on skills that they are in need of most work
  - My own observation
  - Request from supervisor
  - Discussion with trainers
- When possible set up practice sessions to coach trainers through training process and introduce tools if not familiar

#### What is Impulse Control?

- Asking animal to compete with natural desires or instincts
- Dealing with distractions
- Aversives have been traditional approach and thought to be only effective tool
- Until you define it you cannot train it or deal with it.
- It can’t just be about what you don’t want!
- What do you want the dog to do?
- What does that look like?
- Has that been trained?
- Does it have a high reinforcement history?

### Many Possible Tools

- Until you define it you cannot train it or deal with it.
- It can't just be about what you don't want!
- What do you want the dog to do?
- What does that look like?
- Has that been trained?
- Does it have a high reinforcement history?

### Making Choices

- Not every tool may work for you and your animal
- The key is to make the tools you choose a regular part of the animal's life and learning – from the start
- Impulse control is not about prevention as much as teaching rules for specific situations
- It includes good use of desensitization and generalization techniques

### Stationing / Default Behaviors

- A go to place or behavior for animal to always default to
- Start and end most behaviors from this location
- Animal becomes magnetized to this location or to this behavior
- Gives animal a definitive place to be anytime there is doubt
- Removes uncertainty

### Station/Default Examples

- Mat/Platform
- Heel
- Sit or Down
- Eye contact
- I have always trained this way

### Active Exercises

- "Go-to" behaviors that are very reliable
- Not default, but work well if cued
  - Leave it
  - Targeting
  - Go to Place
  - Recall
- Trained with high energy/quick response
- Classically ingrained: automatic response
- Animal can refuse, but at least gives you a chance to redirect

### Training Off-Switch

- Mechanism to shut down high energy behavior
- Start with stimulus that you can control
- Allow animal to exhibit high energy
- Cue an "OFF" or "STOP" – immediately removing stimulus – then allow access again as reinforcer
- With time, you can increase both:

- Stimulus continuing after “off”
- Time before allowed access again
- It is remarkably powerful game, if you play it daily it will become automatic.

#### Release / End of Session / Go Play

- End of Session Signal
- At Ease – you don’t have to pay close attention for a while
- Release - go play or stop current behavior or previous request is over
- Freeze/Stop – Stop what you are doing
- These are at least 4 distinctly different concepts and they each have different meanings to the animal

#### Premack & Focus

- Most of these options work due to the Premack principle
- High probability behavior reinforces low probability behavior
- My translation: easy behavior reinforces hard behavior
- Train a highly reinforcing, well-practiced, often reinforced, default behavior – it will help maintain focus.

#### Other Thoughts on Impulse Control

- Teaching control requires practicing useful and incompatible behaviors
- Practice in real world settings often
- Prevent access (reinforcement) to distractors throughout training
- Animals will default to other behaviors that have proven reinforcing!

#### Physical Punishment

- It should never be your first choice.
- Use of punishers can have serious fallout
  - Aggression
  - Displacement
  - Poor attitude toward training
  - Impacts relationship
  - Can impact animal health
- Rarely used properly

#### Teaching Handlers How to use Punishment

- Controversial decision, but key to my being accepted in law enforcement circles.
- By teaching rules for punishment use, it gave them tools that made their training better.
- It built and nurtured their trust.
- Opened their minds to other tools and other options
- Took several years to come to this decision, but was turning point for many programs (successive approximations).

#### Rules for Use of Punishment

Not information I generally share, but if you must use punishment, it will only be effective if all 8 of these rules are met...

- It must be something the animal dislikes.
- It must suppress behavior. *Otherwise it is just abuse.*

- It must be of the perfect intensity. *Too much and the animal will shut down. Too little and the animal develops resistance to punishment.*
- It must happen immediately after the behavior.
- It must be associated with the behavior, not the trainer! *Otherwise, the animal learns that your presence is a signal that punishment may occur, and your absence is one that it will not. The result is a “sneaky” animal – an animal that will only exhibit the undesirable behavior in the absence of the trainer.*
- It must happen every time the behavior occurs. *Otherwise, the undesirable behavior may be on a variable schedule and thus harder to extinguish.*
- There must be an alternative for the animal. *The animal must know how to perform an acceptable behavior and be given the opportunity to do so in order to escape or avoid punishment.*
- Punishment should never outweigh reinforcement. *It must never be used to the extent that the animal perceives more punishment than reinforcement.*

#### Follow-up to Punishment Rules

- These rules apply whether using physical punishment or other tools:
  - NRM
  - Time Out
- Watch handler use and coach them on timing and other options.
- Look for opportunities to introduce positive tools that can be immediately effective.
- No judgement, a critical aspect to success.

# Training for Entertainment & Show

## Topic Applications

- Film
- Television
  - Series, Specials, Commercials
- Media Events
  - News programs, press conferences, etc.
- Theater
- Performance Sports
  - Freestyle, Agility, etc.

## Helpful Building Blocks

- Targeting
- Stationing
- Varied types of Cues
  - Visual, Verbal, Tactile, Situational
- Directed focus (Look at that)
- Behavior chains
- Adduction

## Preparation for New Environments

- Desensitization
- Balance of Reinforcement
- Generalization & Fluency
  - Location
  - Times
  - People
  - Animals
  - Equipment (Cameras, cables, sets, etc)
  - Lighting
  - Movement
  - Noises
  - Smells
  - Cues

## Training for the Specific Event

- Preparation
- Training the specific behaviors
- Having backup plans
  - Flexible behavior
  - Understudies
  - Expect the Unexpected
- Learning to work with directors (producers, the people in charge)

## Working with the Production

- Asking the right questions

- What behaviors are they needing?
- Time frames?
- Rehearsal?
- Opportunity to work w talent/set/props?
- Setting expectations
  - Maximum work length time
  - Time required to make last minute behavior change requests
  - Rest and relief areas and times
  - Rehearsal time
  - Ask for needs, but don't be greedy nor unprofessional

#### Rehearsals & Practice

- Be well prepared
- Don't leave anything to chance
- Performance begins in the dressing room (green room, your car)
  - Have a work warm up routine
  - Set of behaviors that sets animal up for success
  - Begin work in comfortable known way
- Practice unique variations

#### It's Showtime

- Put animal needs first
  - Never allow production to force you to compromise
- Always be professional
- Have contingency plan at all times
- Make sure all involved know plan

# Research Training: A Trainer's Perspective

## Overview

- Excellent use of training skills
- Understanding the peer-review process
- Understanding research paradigms
- Use of concepts in non-research settings

## Stretch Your Training Skills

- Use of advanced training skills
- Change reinforcement policies & strategies
- Lengthen times, teach patience & repetition
- Unusual time lines

## Work Closely with PI

- Make sure you understand the goals of project (milestones, significance, etc.)
- Discuss training challenges with investigator
- Create a true partnership
- Determine research priority with management
- Ask questions – share plans – ask questions – share plans – ask questions...

## Questions Worth Considering

- How strict is time frame?
- Explain your training plan and final behavior in detail, does that raise any concerns?
  - Animal positioning (other animals)
  - Length of sessions
  - Location of training
  - Who is training
  - Reinforcement strategy
  - Non-research activity planned while training
- How many trials, repetitions, etc. are anticipated?
- How flexible is the research protocol?

## Types of Animal Research

- Observational
  - Ethograms a key tool
- Exploratory
  - No definitive hypothesis
  - Animal allowed to show capability
- Opportunistic
  - Taking advantage of already learned skills or previous training
- Trained
  - Tasks trained specifically for research

## Paradigms, Concepts, & Challenges

- Go, No-go paradigm
  - Used to test senses (hearing, smell, taste, etc.)

- Animal indicates when they perceive something, does nothing when they don't
  - The basis of most scent detection tasks (narcotics, explosives, SAR, medical alert)
- Two-choice paradigm
  - Similar to go, no-go
  - However, animal always has a reinforceable choice
  - Growing trend in some scent detection circles (particularly for inexperienced handlers)
- Matching to sample
  - Basis of most scent detection work
  - Used for testing senses
  - Used in cognition projects
- Cognition training
  - Pepperburg: Alex the Parrot
  - Hermann: Dolphins
  - Schusterman: Sea Lions
  - Patterson: Koko the gorilla
- Foreign object use
- Open ocean training
  - At liberty training is a huge challenge, requiring experienced trainers
- Laboratory Training

#### Research Training – Final Thoughts

- A great but challenging way to expand your skills
- Can be a fun way to test and challenge your own animals
- Real research is demanding with multiple obstacles and many frustrating periods
- However, if you maintain your ethics and your integrity, there is the potential for great breakthroughs and significant accomplishments
- My goal today: whet your appetite!

# Conservation Connection

The science and application of learning theory is growing in use and popularity. From training the household pet to caring for the largest exotic animal in the zoo, applied behavior analysis has led to better behaved pets and improved animal care for animals all over the world. Creative trainers are always finding new ways to apply behavioral science; in the last several decades trainers have used advanced training skills to give back to nature and contribute to a wide range of conservation initiatives. Ken will share his training experiences with several unique conservation projects as well as those initiated by other skilled trainers. Conservation training is an exciting and expanding direction for experienced trainers to put their skills to use. Key applications include the expanded use of husbandry behaviors for conservation research, remote training projects, introduction of species to the wild, and other uses of behavior knowledge to aid in managing and studying animals to contribute to conservation. These applications have been used in assisting with conservation efforts with condors, wolves, sea otters, dolphins, sea lions, polar bears, sea turtles, chimpanzees, elephants and many others. The use of remote training in these projects has great possibilities for application in the pet training world.

## Introduction

- I am passionate about animals:
  - Trainer (Observer of behavior)
  - Educator
  - Conservation advocate
- Share some history
- Exciting new projects that I have been involved in
- I hope it will serve as an inspiration; a look at what's possible!

## Overview

- Training an overlooked and underutilized tool
- Putting training into perspective
- Conservation connection
  - Traditional applications
  - Reintroduction to the wild
  - Remote training advances
  - Recent advances & uses

## Training Poorly Understood

- Millions of pets euthanized due to behavioral problems
- Zoos struggle to recognize benefits of behavior management
- Wildlife biologists discount training as a viable method of aiding in conservation efforts
- Share my philosophy of training before discussing conservation applications.

## Never Forget: Animals Come First

- I digress for a moment to remind you of the importance of my philosophical foundation
  - Four Cornerstones of Animal Care
  - Primary Reasons for Training
- Conservation is an important reason for training, but it is still secondary

- Conservation cannot be an excuse for animal sacrifice or mistreatment

#### Cornerstones to Animal Care

- Medical program (veterinary care)
- Nutritional program (food & vitamins)
- Environment (includes social structure)
- Behavior management (training & enrichment)

#### Primary Reasons

- Physical exercise
- Mental stimulation
- Cooperative behavior
- Animal Welfare – These things directly benefit the individual animal and assure that welfare is the top priority

#### Secondary Reasons

##### Animal Care Top Priority

- Training is not the end goal
- Conservation alone does not justify training
- Improved care is the point and purpose
- Conservation is a way to go full circle and pay back to the environment

##### Early Zoo Conservation

- Conservation has long been a goal of zoos and aquariums
- In situ studies and observations have been conducted for hundreds of years
- Training not usually a part of most conservation projects (sea otter video)

##### Training Popularity Increases

- As training becomes more common, animals in zoos and aquariums used in a variety of ways
  - Comparative work with endangered species
  - Studies to better understand health risks of species in wild
  - Training to test ideas before implementation in wild
- These types of uses growing exponentially

##### Introduction of Species

- Repopulation of endangered species has always been a goal of the modern zoo
- Challenges
  - Habitat destruction & human encroachment
  - Understanding reproduction
  - Methods of introduction back to the wild
- In many cases trainer contact is minimized because it runs the risk of habituation or dependency on humans

##### Early Failures

- Many reintroduction efforts have failed for a variety of reasons
- Political challenges within countries

- Cross country differences – animals don't recognize borders
- Cultural impact and involvement
- Animal's lacking survival skill or instincts
- Habituation to humans

#### California Condor

- 1987 – Only 22 condors remain in the world, San Diego and LA Zoos lead reproduction efforts
- 1991 – Attempted a few releases without success (imprinting & power lines)
- 1992 – Training program began
  - Puppet fosters
  - People avoidance
  - Power line avoidance
  - Aversive techniques used
- 1994 – Successful releases begin
- 2017 – Condors now living in 5 locations in the wild
  - Over 1200 condors in wild and zoos
  - Successful reproduction occurring in wild
- Turning point was the use of skilled trainer to develop a plan

#### Remote Training

- Training in which the trainer is not perceived by animal to be part of the process
- Used with condors when puppets were used as fosters
- A technique with great promise for wildlife training and conservation efforts
- Not well understood
  - Modern trainers focus on relationship building
  - This is a key to many of the type of programs I work with
  - Not essential to successful shaping – Skinner used a skinner box, animal was not dependent on person

#### Stellar Sea Lion

- Alaska Sea Life Center (Dennis Christen)
- 80% population decline since 1970
- Focus on juveniles
- Temporary captive to collect samples on up to 50 animals

#### Challenges

- Comply with USDA welfare regulations
- Frequent access for samples & measures
- No habituation to people allowed
- Training forbidden
- Permit for 3 months

#### No Training – It's the Law!

- Misconceptions about training
- Concerns about habituation
- Management strategy – use of remote training
- Convince regulators that this would work

### Remote Training Plan

- Humans not part of reinforcing equation
- Humans only associated with negative activity
- Plan for multiple types of sampling (blood, weights, ultra sound, saliva, feces, tooth measure, etc.)
- Training accomplished in 10 – 14 days after arrival
- Contingent based access to reinforcement separates staff from food.

### Training Specific to Context

- Conditioned gating between pools

### Remote Reinforcer

- Supply plumbing “cannon, pre-loaded
- Manually cast from a distance

### Getting a Weight

- Once gating established, standing on scale required for access to water and fish

### Restraint Cage

- Allows access for research sampling

### Modified Restraint Cage

- Set animals up for success

### Stellar Sea Lion Success

- Provided data not previously available
- No habituation to humans
- 23 animals successfully trained in this manner
- Possibilities are endless with many species

### Bonneville Dam Sea Lion Project

### Weddell Seal Prtoject

### Proven Techniques used in new Ways

- Challenges of remote training with animals in the wild is probably obvious:
  - Animals are free-ranging
  - Controlling the environment is difficult
  - Impacts of behavior beyond your intended focus is always a concern (environmental impacts)
  - Huge team approach with conflicting ideas
- I am working with other agencies on publication of three projects, of which I will just give you a taste today.

Chimps of Sierra Leone

Polar Bear Project

Bilby Project

Zambia Elephant Project

Wildlife Impacts in the Gulf

- 2010 BP Oil Spill - Over 1000 species likely impacted, yet unseen
  - Fish in spawning season
  - Coral
  - Variety of invertebrates
- Faces of an oil spill are usually animals on land
  - Pelicans
  - Sea Gulls
  - Sea turtles

Sea Turtle Efforts

- Hatchlings emerge in August and make their way out to sea
- Summer is nesting season for Sea Turtles
- Once eggs are laid, nest is covered and mom goes out to sea
- All species of sea turtles are threatened or endangered
- Vulnerable areas are protected
- At least 60,000 hatchlings threatened to be impacted that summer
- AZA organizations and U.S. Fish & Wildlife Service worked together to find a solution:
  - Do nothing
  - Head start
  - Relocation
- Relocation plan put into effect. Govt. disappointed that only 14,000 eggs were found
- During discussions regarding the lack of success at finding barely 25% of anticipated eggs, a possible solution was recommended.
- Suggestion not taken seriously at first.
- Provisional approval given to attempt using the dogs
- Allowed to try it over 3 days
- We had two weeks to prepare
- We found 29,000 additional eggs

Conservation Training – a New Frontier

- My focus is still on training animals in our care to improve their life
- But I hope skilled trainers will see conservation as a good use of training technology
- More advanced level trainers needed
  - Who understand the science
  - Know how to apply science in practical ways under less than ideal conditions
  - Broad understanding across species
  - Able to work the politics and people part of the equation
  - Patience to see a project through

- It begins with the work we do every day
- In any endeavor we choose to embark upon, our success is limited only by our knowledge, our willingness to put forth the effort, and our imagination. Each of these are only self-imposed limitations.
- Results and possibilities are endless.

# Positive Reinforcement with People

## Introduction

- Behavior is based in science
- So many management theories, how do you choose?
- Is there any correlation between animal training and managing staff?

Why or how is it possible that trainers are able to work so closely with wild and exotic animals? How do we get such high percentage of cooperation, these animals do what we ask (exactly as we ask more than 98% of the time) – how is that accomplished?

## Conventional Wisdom

- Winning through Intimidation
- Nice Guys Finish Last
- Respect through Aggressive Management
- Show No Fear

Old fashioned mythology creates bad managers and ineffective leadership styles: short-term gains that don't help create a cohesive or happy staff.

## Modern Approach

- Create a Positive Work Environment
- Building respect through trust
- Accentuate the positive
- Redirect if there are mistakes

## Resources

- Whale Done
- Bringing out the Best in People
- The Power of Nice
- The 7 Habits of Highly Effective People

## Workplace Use of Positive Reinforcement

- Not in our nature – we grow up in a negative world
- Easy to ignore correct behavior and focus on mistakes or problems
- Must make a conscious effort to use positive reinforcement

## ABCs of Behavior

- A = Antecedent (activator or trigger)
- B = Behavior (activity)
- C = Consequences
- Human nature: Focus on trigger and antecedent

- Behavioral model: Focus on the consequences (human nature error is a tendency to criticize)

#### **4 Types of Consequences**

- No response
- Negative response
- Redirection
- Positive Response

Immediacy is key to effective results

#### **Focus on Productive Techniques**

- “No response” and “Negative Response” common
- Create resentment and low morale
- Why waste time on ineffective responses?
- “Redirection” and “Positive Responses” best

#### **Redirection Techniques**

- Describe problem or error immediately, clearly and without blame
- Show negative impact
- If appropriate, take blame for not making task clear
- Clearly explain task in detail
- Express continuing confidence and trust in person

#### **Positive Reinforcement is Powerful**

- Praise progress, it is a moving target
- Praise people immediately
- Be specific about accomplishment
- Share your feelings about what they did
- Encourage continued good work

#### **Obstacles**

- Lack of sincerity
- Human nature to be habitually negative
- Not “cool” in some circles
- Staff don’t know how to receive praise (no practice)
- Punishment works and its easy

#### **Must Personalize Reinforcement**

- Public attention for some, private for others
- Thank you – well done – new task
- Watch their responses to your praise
  - Improvement? Good choice
  - Decline? Change reinforcement

- Ask about what motivates them

### **Techniques & Examples**

- Checklists – structure for reinforcement
- Set obtainable goals & be poised to reinforce
- New task, responsibility, or team
- Acknowledge in meetings (be natural)
- Show off accomplishments to supervisors
- Letters of commendation
- Simple but well-timed “thank you” or “well done”
- Good communication is essential

### **Beyond the Supervisor Role**

- Makes a better manager and leader
- The employee can impact his/her boss
- Creates a better life partner
- Develops better parents
- Positive Reinforcement is life changing
- Land of Abundance

### **Summary**

- Reinforcement & redirection take practice
- Effective use takes extra effort at first
- YES opens doors, NO closes them
- Discipline creates structure for positive reinforcement (not contradictory)
- You must make staff development a priority
- Clear communication helps deliver message