

**Dr. Bob Bailey in Copenhagen**

**The Principles Of Operant Conditioning,  
or Animal Training,**

as taught by Dr. Bailey



All of Dr. Bailey's training programs were based on these principles

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**My generalization:**

**Any** trainer, using  
**any** method, can train  
**any** animal, to do  
**any** behavior,  
given enough time!

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**Operant conditioning is a field of psychology dealing in behavior and its consequences**



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**Operant Conditioning is not a "theory"**

It is a description of the *natural phenomenon* of learning – how humans and other animals learn to cope with the environment

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**Much has changed in my life and how I view the world, and how I train.**

**I was fortunate, I learned first from the Brelands to train by principle and not by rote**

**The principles I learned almost 60 years ago I use today**

**I use those principles much better today than 60 years ago**

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**My 60+ years of training experience tells me my view of training is:**

**a minority view – few trainers are data driven and avoid ego  
difficult to teach unless student actively embraces and practices the philosophy, procedures and practices taught**

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### **My objective:**

To study, explain, simplify, change, and manipulate and use behavior in the world around me

Like my father, I'm a machinist at heart – satisfaction is doing it faster, more consistently and accurately, and money

Natural behavior, shaped by Nature over a billion years, is my raw stock; my tools are experience skill and knowledge

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### **What do I teach:**

anyone willing to invest the time and effort to master the basic principles and skills I teach can do what I did

a science-based technology, with principles, processes, and procedures

Seldom teach rote training – do this to get that!

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## **What is science?**

**Science is a systematic way of asking questions and making it difficult to lie about the answers.**

>>> Ken Norris UCLA

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### **My view:**

Science is way of studying the complex world around us

Scientists usually break apart, or simplify, complex phenomena into its component parts

Scientists and technologists study and manipulate those component parts

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## **What is science?**

**There is NO magic in the word “science” or the phrase “scientific” or “science-based training.**

**Anyone can say this!**

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Ogden Lindsley, an early Skinner student, said  
**“Behavior is lawful”**



Behavior may be counter productive and appear irrational, but in all normal animals,  
**There is a reason for a behavior!**

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The TWO Forms of Conditioning (learning) that are of great and immediate importance to trainers:

## Respondent Conditioning

Commonly called Pavlovian or Classical

## Operant Conditioning

Commonly called Skinnerian or instrumental

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## Classical Conditioning...also called

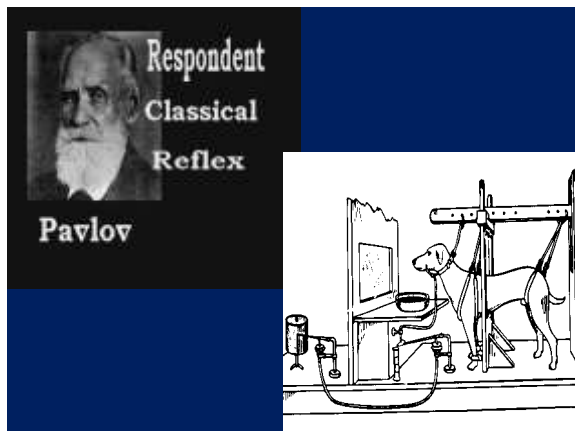
- Respondent Conditioning

- Pavlovian Conditioning

Organisms may associate stimuli that occur close together in time

By association, one or more stimuli may be “substituted” by one or more other stimuli

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RESPONDENT LEARNING has TWO elements

## A and B

It is the A (antecedents) that most influence the B (behavior)

The As “drive” the Bs

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In practical terms in training:  
Do something TO the animal (accidentally or on purpose)

The animal responds automatically because of biology or experience

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## Operant Conditioning...also called

- Instrumental Conditioning

- Skinnerian Conditioning

Behavior is changed or maintained by consequences

Behavior is most influenced by the consequences it produces

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Operant Condition has **THREE** elements

## **A and B and C**

It is the **C** (consequence) that most influences the **B** (behavior)

It is the **C** that “drives” the behavior

**A** (which may become a cue) sets the conditions for the consequence if the behavior occurs.

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**In practical terms in training:**

The animal **DOES** something (accidentally or on purpose, cue or no cue)

The animal gets something good or something bad as a result of the animal's behavior.

The animal does more or less of the behavior as a result of the consequence of doing the behavior

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**The systematic application of operant conditioning or applied behavior analysis is based on simple principles**

**These principles are based on experimental data**

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## **A PRINCIPLE**

**A fundamental body of knowledge usually established by consensus or practice**

**A scientific principle arises only after rigorous testing and validation by many scientists**

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## **Operant Conditioning Principles**

(Few & Simple) – Memorize and understand them:

- 1) Stimulation**  
Animals respond to stimuli
- 2) Reinforcement**  
Increases rate of behavior
- 3) Extinction (non-reinforcement)**  
Decreases rate of behavior
- 4) Punishment**  
Decreases rate of behavior
- 5) Generalization**  
Stimulus generalization  
Response generalization

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## **Stimulation**

**Animals respond to stimuli**

**Responses may be learned, instinctive, or both**

**Responses may change with maturation or circumstances**

**Don't be surprised when an animal responds to environmental stimuli**

**Animals were built by nature to respond to stimuli**

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## When Is a Stimulus NOT a Perceived or a Proven Stimulus

### When the animal demonstrates NO observable response

Animal may NOT see, hear, or feel energy, or change in energy, therefore the energy is NOT a stimulus

Animal may see, hear, or feel stimulus, but exhibit no outwardly observable behavior (trainer MIS-perception)

Animal may have internal respondent conditioned behavior with no outwardly observable behavior (trainer MIS-perception)

Trainer should NOT assume a NON-Stimulus until proven

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## Why may energy, or a change in energy, NOT be a stimulus

Animal has no sensor capable of receiving the energy (may be permanent or temporary)

Animal has appropriate energy receptors, but other energy is competing creating confusion

Animal has appropriate energy receptors, but receptors are disabled (fatigue, habituation, or suppression)

The energy, or change in energy, is not significant (irrelevant) to the organism

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## REINFORCEMENT

The procedure of providing consequences for a behavior that *increase or maintain* that behavior

## A REINFORCER

Any stimulus or event, made contingent on a behavior that strengthens that behavior

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With repetition, the organism learns to associate specific behavior with reinforcement



The greater the association, the more likely the behavior is to be repeated

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## Primary Reinforcer

Any event that **INCREASES** or **MAINTAINS** behavior and is **NOT DEPENDENT** on its association with other reinforcers

When and where the primary reinforcer is delivered is important

## Conditioned Reinforcer:

A stimulus associated with a primary reinforcer becomes a conditioned reinforcer, sometimes called a "bridge"

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## Primary & Conditioned Reinforcers

Both primary reinforcers and conditioned reinforcers strengthen behavior

Conditioned reinforcers can lose strength with improper use

(ie: when not paired with a primary reinforcer)

Bob Bailey with many whistle "Bridges"



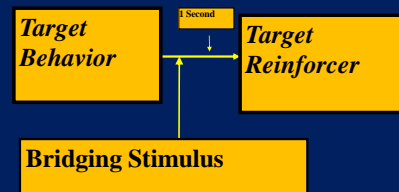
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## Reinforcement is a process, not a single, isolated event

The process begins with the first stimulus indicating reinforcement is on its way, and ends sometime during the acquisition and assimilation of the reinforcer

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## Reinforcement is a process



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## Reinforcement as a concept is simple

Reinforcement as a practice can be complex

In practice, simplify whenever possible

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## PUNISHMENT

The procedure of providing consequences for a behavior that *decrease* that behavior

## PUNISHER

Any event that made contingent on a behavior *decreases* the strength of that behavior

A punisher is defined by the individual animal

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## AVERSIVE

Anything an animal will work to escape or avoid

Something the animal “does not like.”

Often associated with negative emotional issues or physical pain or injury.

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Aversives and punishers can also be PRIMARY BOP! or CONDITIONED

NO!  
ZAP!!  
WRONG!

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# CONDITIONED AVERSIVE or PUNISHER

Created by pairing almost  
any neutral stimulus with  
an aversive stimulus

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# Reinforcers and Punishers can be Positive or Negative

## *Positive:*

Something good or bad can  
ADDED to the environment

## *Negative:*

Something good or bad can  
SUBTRACTED from the environment

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These building blocks make up  
the “four quadrants” that describe  
the basic mechanisms that govern  
learning for all animals

Behavior is a natural phenomenon  
that can be studied as a natural  
science

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# Discrimination Workshop

	ADD (+) GIVE or APPLY	SUBTRACT (-) TAKE AWAY or REMOVE
Increase Rate of Behavior) (Example)	R+ Positive Reinforcement (Give food)	R- Negative Reinforcement (Remove shock)
Decrease Rate of Behavior (Example)	P+ Positive Punishment (Give shock)	P- Negative Punishment (Remove food)

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# EXTINCTION

A kinder, gentler  
way to reduce or  
eliminate behavior...

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# EXTINCTION:

the process of decreasing  
the strength of a previously  
reinforced behavior by  
eliminating all reinforcement  
for that behavior



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## EXTINCTION

Two common effects of extinction that lead some to believe extinction does not work:

**Extinction burst**

**Spontaneous recovery**

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## EXTINCTION BURST

A sudden increase in the rate and/or intensity of the behavior on extinction during the early stages of the procedure

This chimpanzee was subjected to a combination of punishment and extended extinction trials.

The chimp sent the trainer to the hospital in critical condition. The chimp was destroyed.

Use ratios and extinction trials with care.



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## SPONTANEOUS RECOVERY

The sudden reappearance of a behavior following its extinction

A skilled trainer can sometimes make use of extinction bursts and spontaneous recovery

(not necessary for shaping and not recommended for novice trainers)



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## GENERALIZATION

Generally speaking:

The tendency of the effects of training to spread

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## GENERALIZATION

Two Forms:

Stimulus Generalization

Response Generalization

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**GENERALIZATION:**  
Stimulus Generalization

The stimulus changes but the response stays the same

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## Stimulus Generalization

1.0 kHz tone = response A

1.1 kHz tone = response A

0.9 kHz tone = response A

Similar stimuli may elicit reinforced behavior



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## GENERALIZATION: Response Generalization

The response changes  
but the stimulus stays  
the same

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## Response Generalization: A stimulus elicits more than one response or response class

### Dolphin

Ball + basket = basket with nose

Ball + basket = basket with flippers

Ball + basket = basket with tail

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## GENERALIZATION

An innate capability of all  
animal life

May be an indicator of  
intelligence

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## Operant Conditioning Principles

(Few & Simple) – Memorize and understand them:

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*Animals respond to stimuli*

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*Decreases rate of behavior*

### 4) Punishment

*Decreases rate of behavior*

### 5) Generalization

*Stimulus generalization*

*Response generalization*

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George Collier: behavior economics or  
optimal foraging experiments where  
animals have wide choice

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# MATCHING LAW

Herrnstein - Matching Law

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## Matching Law

The relative frequency of responding closely approximates the relative frequency of reinforcement

Richard Herrnstein, 1963

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**Matching Law: when we apply it to training it means...**

Reinforcing unwanted behavior reduces the power of the reinforcement for wanted behavior

“Bad” reinforcement weakens the power of “good” reinforcement!

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**Practical result of Matching Law:**

**Don't Reinforce Behavior You Don't Want!**

**When shaping, don't strengthen intermediate behavior unnecessarily!**

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**The SIMPLE, practical result of Matching Law:**

**Don't Reinforce Behavior You Don't Want!**

Just clicking and feeding more is not the path to faster, better behavior

It is SIMPLE! You get what you click, not what you want

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Don't reinforce behavior you don't want!  
Think: MATCHING LAW!

Usually better to miss reinforcing a wanted behavior than reinforce an unwanted behavior

“Better never than late!”

Devon Gaston  
student 2013

“When in doubt, leave it out!”

Barbara Bingham Deutscher  
student 2013

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The Matching Law is another reason to know in ADVANCE what you WILL reinforce and what you WON'T reinforce

Don't train,  
"by the seat of your pants"

**Think! Plan! Do!**

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Does the Matching Law say the animal will never learn an incorrectly reinforced behavior?

**NO!**

Ignoring the matching law simply means training is less efficient and less accurate

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**My generalization:**

**Any** trainer, using  
**any** method, can train  
**any** animal, to do  
**any** behavior,  
given enough time!

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**Opinion:**

**Most dog training today is a craft, not a technology!**

**Why isn't dog training today a technology?**

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**Why is changing trainer behavior so difficult?**

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Almost any trainer can train  
Almost any behavior using  
Almost any method

**Given enough time!**

**Remember, animals are designed to learn!**

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# THE END of LECTURE



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