

# Behavior Shaping

Jesús Rosales-Ruiz  
UNT

TxABA 2018

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## Shaping

... An operant is not something which appears full grown in the behavior of the organism. It is the result of a continuous shaping process.

By reinforcing a series of successive approximations, we bring a rare response to a very high probability in a short time.

This is an effective procedure because it recognizes and utilizes the continuous nature of a complex act.

Skinner (1953)

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## Shaping is defined as

The differential reinforcement of successive approximations to a response

Or simply:

The differential reinforcement of behavior

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## Differential Reinforcement

**Reinforcement:** If the occurrence of an operant is followed by the presentation of a reinforcing stimulus, the strength is increased.

**Extinction:** If the occurrence of an operant already strengthened through reinforcement is not followed by the reinforcing stimulus, the strength is decreased.

Skinner (1938)

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## For example ...

To teach a pigeon how to peck a spot:

We first give the bird food when it turns slightly in the direction of the spot from any part of the cage.

This increases the frequency of such behavior.

We then withhold reinforcement until a slight movement is made toward the spot.

This again alters the general distribution of behavior without producing a new unit.

Skinner (1953)

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## Successive Approximations

We continue by reinforcing positions successively closer to the spot, then by reinforcing only when the head is moved slightly forward, and finally only when the beak actually makes contact with the spot.

Skinner (1953)

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## From Undifferentiated to Differentiated

The total act of turning toward the spot from any point in the box, walking toward it, raising the head, and striking the spot may seem to be a functionally coherent unit of behavior;

But it is constructed by a continual process of differential reinforcement from undifferentiated behavior, just as the sculptor shapes his figure from a lump of clay.

Operant conditioning shapes behavior as a sculptor shapes a lump of clay...

Skinner (1953)

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## From Old to New

Shaping always begins with the existent repertoire

From an initial behavior to a final one

From old control to new control

Shaping progresses through a program of changing contingencies

You either

Change the response and hold the environment constant, or

Change the environment and hold the response constant

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## From Old to New

the development of complex behavior is most easily accomplished

by carefully designing the environment so that it favors the occurrence of early stages of the behavior,

and so that it can be gradually converted into the environment where the final behavior must occur (Michael, 1963, in reference to Terrace, 1961)

it is often more convenient to remove or to alter strong controlling stimuli than to weaken their control by extinction

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## Example Chase Owens

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## Barking



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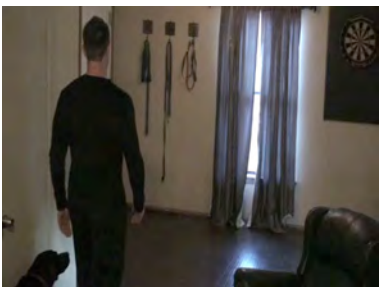
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## CA Program - Step 1



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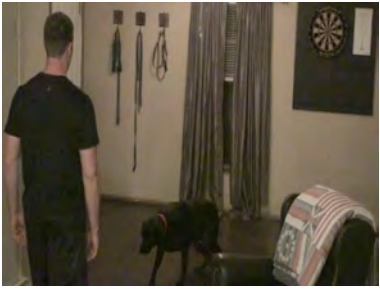
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## CA Program - Step 2



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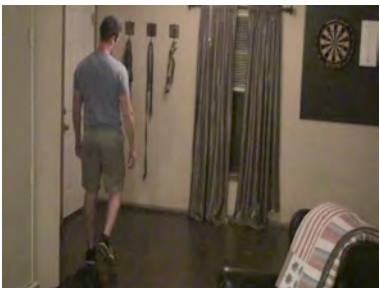
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## CA Program - Step 3



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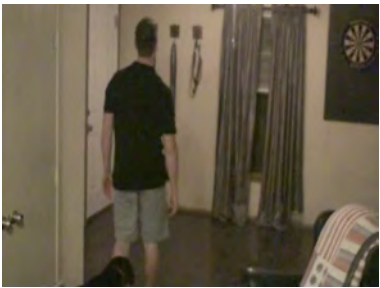
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## CA Program - Step 4



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## The 4 Questions of Shaping

Where do you want to go?

Where are you now?

What steps are going to take you to your destination?

What is going to keep you going?

Goldiamond (1974) and Skinner (1968)

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# The Reinforcement System

Consist of

An Unconditioned Reinforcer (SR)

Something worthwhile for the organism (eg. food, social contact, ...)

A Conditioned Reinforcer (Sr)

Something the organism is able to detect (e.g., sound, visual, ...) that precedes the SR

The Fluent delivery of Sr and SR

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# JRR Mechanics

*Jesus Rosales-Ruiz &  
Kent  
In Training  
Music Maestros*

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# Another Non-example



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# The delivery of the SR

Should be taught first

Teach the organism where to find the reinforcer

Should be efficient

With minimal or no searching for SR on the part of the organism and easy to get

Should enhance shaping

Generates movement in the right direction and leaves the organism in a position to respond again

With no room for undesirable behavior between the Sr and the SR

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Alexandra Kurland



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Kay - PORTL



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PORTL - Reinforcer Delivery



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Bob Bailey



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# Kay Laurence

extract:  
Chapter 1  
from  
Clicker Training  
The Perfect Foundation  
by Kay Laurence

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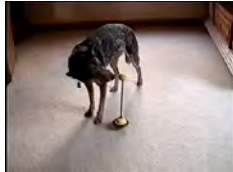
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## Time between Sr & SR

Immediate



5 Sec Delay



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## Time between Sr & SR

Immediate



5 Sec Delay



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## Time between Sr & SR

Immediate



5 Sec Delay



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## Time between Sr & SR

Immediate



5 Sec Delay



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## Optimal Shaping

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## Selection

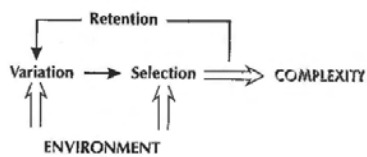


Figure 9-1. The major components of selection processes—variation, selection, and retention.

Donahoe & Vegas 2011

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## Emitted vs Permitted

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## Emitted

Skinner (1938), p 20.

I do not mean that there are no originating forces in spontaneous behavior but simply that they are not located in the environment.

We are not in a position to see them, and we have no need to. This kind of behavior might be said to be *emitted* by the organism.

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## Permitted

Donahoe (2012, personal communication)

Behavior is permitted by the environment

The current stimulus situation determines what behavior is possible

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## Implications for Shaping

The passive shaper

thinks behavior is emitted

waits for approximations

The active shaper

thinks behavior is permitted by the environment

arranges the environment that favors the occurrence of the approximation

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### PHYSICAL RESTRAINT PRODUCES RAPID ACQUISITION OF THE PIGEON'S KEY PECK

C. M. LOCURTO, TANIA TRAVERS, H. S. TERRACE, AND JOHN GIBBON

COLLEGE OF THE HOLY CROSS, COLUMBIA UNIVERSITY, AND NEW YORK STATE PSYCHIATRIC INSTITUTE

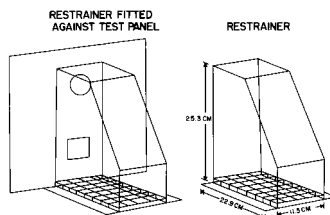


Fig. 1. Diagram of the restrainer (see caption right) and fixed against the test panel of a standardized test chamber containing a response key (circle) and food aperture (square).

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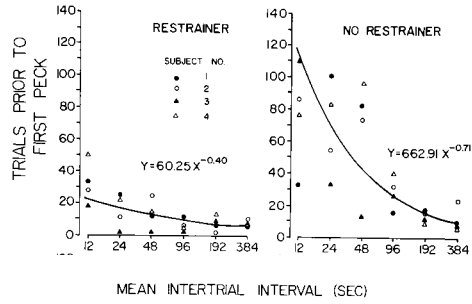
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# Locurto et al. (1980)



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# Heel position



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# Isolating Movement



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# Tail wag



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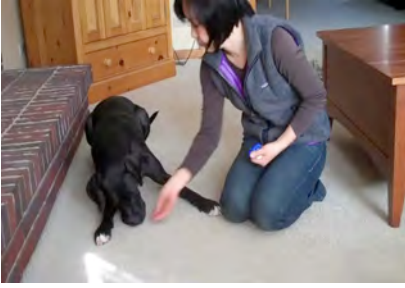
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## Right Paw Movement



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## Luring



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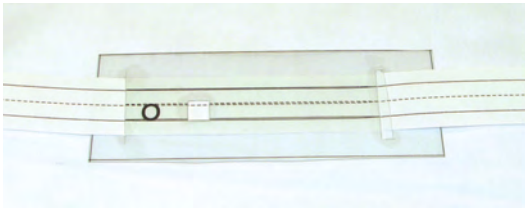
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## Overlay Training



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## Results



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# Movement Cycle

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# Ogden Lindsley (1969)

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## Behavior Cycles

Each response has a beginning and an end  
The behavior is not done until the organism is in a position to do another one

e.g. Sitting Cycle

0 0.5 1.0 1.5 2.0 2.5 sec

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## Movement Cycles

1/4  
1/2  
3/4

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## Outcome



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## Movement



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## What are we reinforcing?



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## What are we reinforcing?



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What are we reinforcing?



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Microshaping



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Ginger Loops

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Clicking at 1/2 Cycle - S9



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Clicking at 3/4 Cycle - S1



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Raising Criteria

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Extinction & Criteria



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Extinction & Criteria



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Errorless Learning

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A Conditional Chain

Mary Hunter

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Other ways to shape behavior

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Adduction

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Adduction

Virginia Broitman  
&  
Gem

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Merging Behaviors

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Merging Behaviors  
Kate & Oscar

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Use resurgence to create complex behavior

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Insight in the Pigeon



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With the help of resurgence



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Staying on Pods



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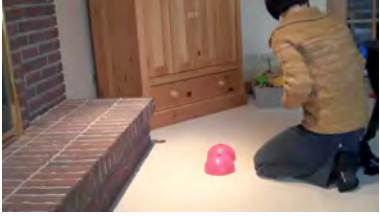
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Exemplars 2 & 3...



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Generalization...



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The "Pose"



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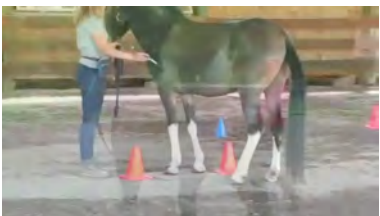
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Passage Training



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