APPLIED ANIMAL BEHAVIOR ANALYSIS: TERMINOLOGY, CONTRIBUTIONS, AND THE FUTURE

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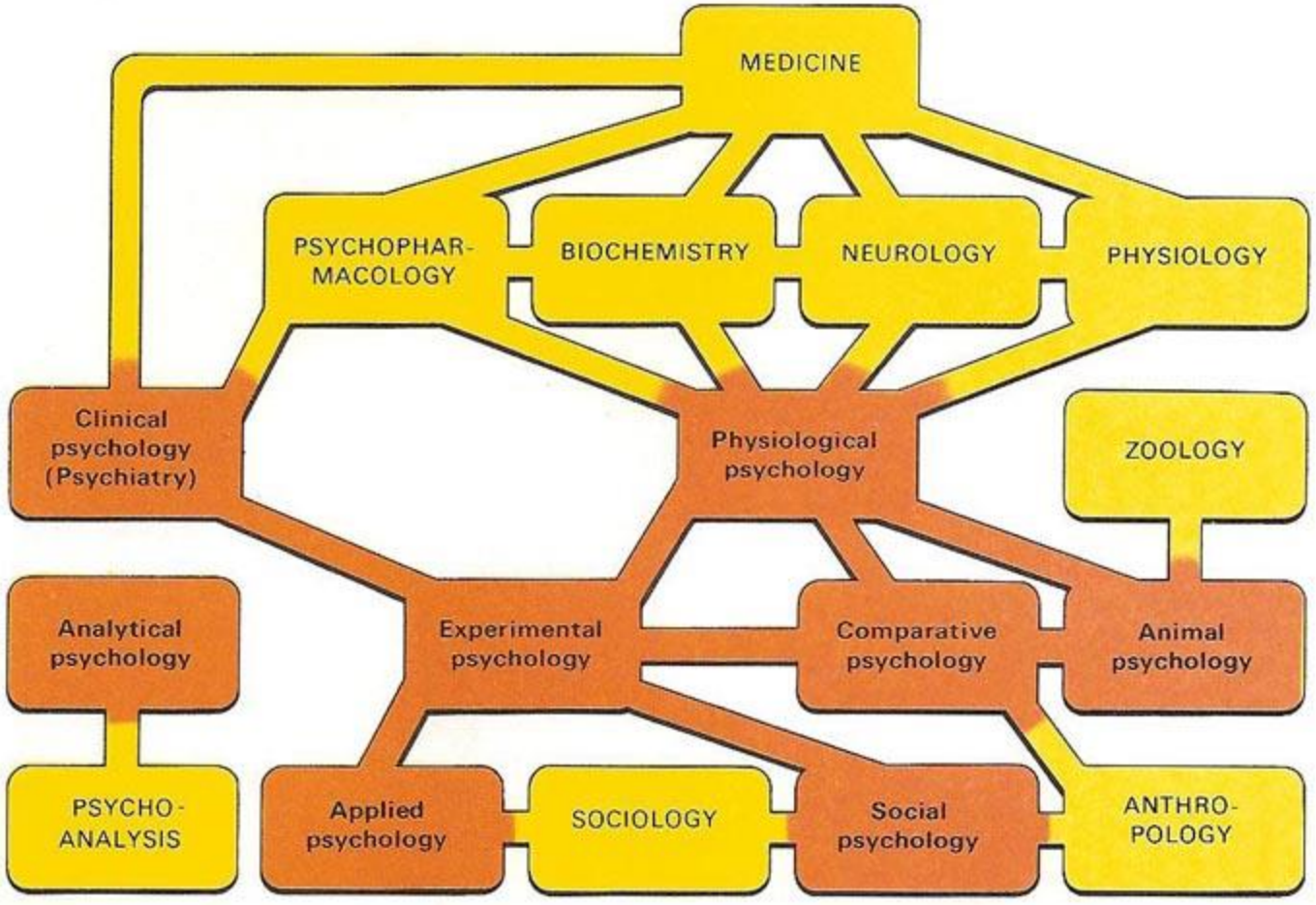
Objectives

- Frame behavior analysis within the behavioral science space
- Describe the two major domains of behavior analysis and describe the 7 characteristics of “applied” behavior analysis (ABA)
- Use BA terminology to describe common behavior goals and methods
- Identify where to find more ABA research

Behavior science lenses

- **Experimental psychology:** All controlled research on psych (clinical psych)
- **Comparative psychology (experimental):** Study of behavior and mental processes of animals in contrast to humans
- **Ethology (biology, natural):** Study of animal behavior for species-specific behavior patterns; assessment of evolution and phylogenies
- **Behavior analysis:** Study of behavior focused on observable, measurable behaviors as a function of environment



https://www.daviddarling.info/encyclopedia/P/psychology.html

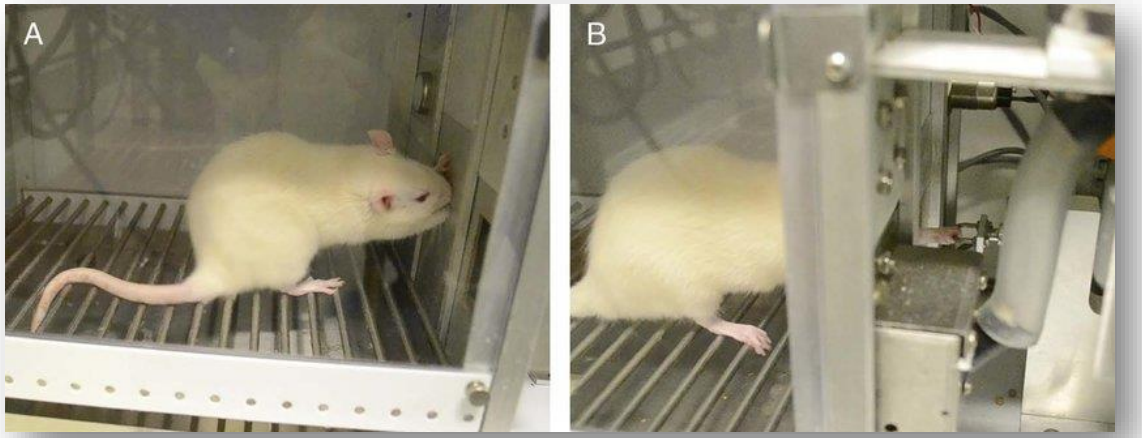
Lyman-Henley, L. P., & Henley, T. B. (2000). Some thoughts on the relationship between behaviorism, comparative psychology, and ethology.

Domains of behavior analysis

- **Experimental (EAB):** studying fundamental behavioral processes and principles

- **Applied (ABA):** using behavioral principles in practice

  Subcategory: applied animal behavior analysis (AABA)



Barbe & Popoff. (2020). Occupational Activities: Factors That Tip the Balance From Bone Accrual to Bone Loss.

Characteristics of ABA

Domain	Definition
Generality	Intervention works across: environments, time
Effective	Produces believable, useful behavior change
Technological	Described enough to be replicable
Applied	Focuses on socially-relevant issues
Conceptually systematic	Intervention based on theory/data
Analytic	Can demonstrate behavior change was function of intervention
Behavioral	Intervention validated through behavior change

Baer et al., 1968

Common ABA terminology

Terms

- Respondent behavior
- Operant behavior
- Antecedents
- Consequences
- Operational definitions

Common ABA terminology

Respondent vs. Operant Behaviors

Respondent

- **Behaviors:**
  - A function of prior stimuli
  - Reliably and automatically elicited (reflexive)
- **Conditioning:**
  Stimulus-stimulus pairings

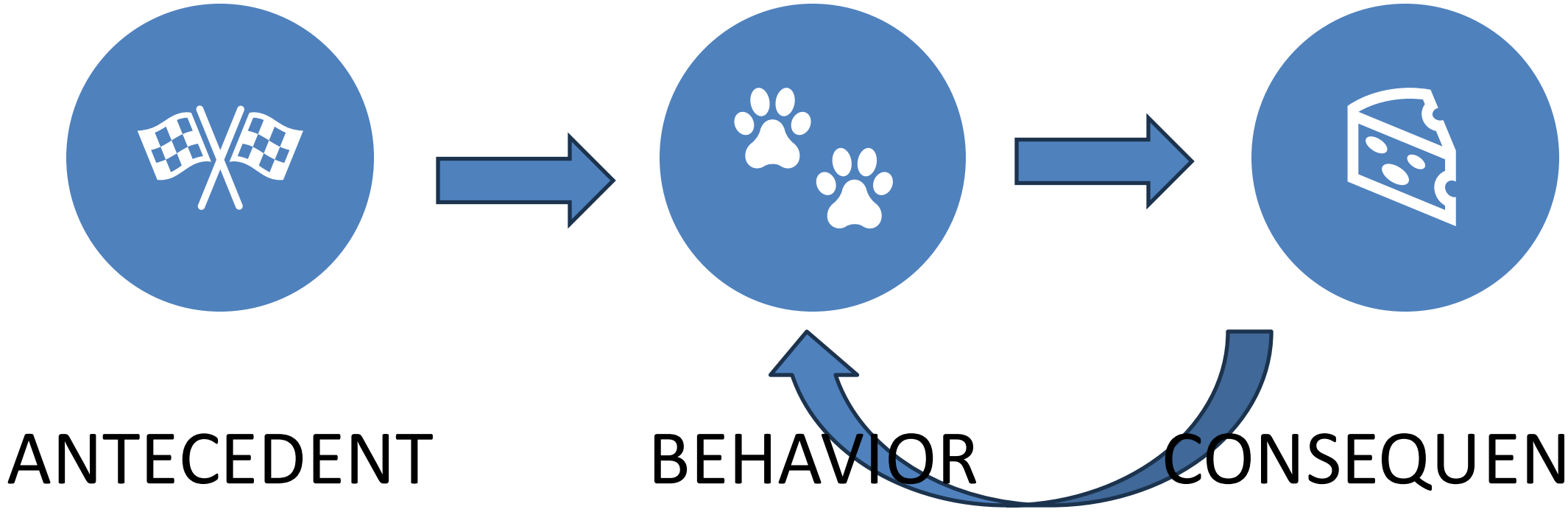
  NS + US (UR) → CS (CR)

Operant

- **Behaviors:**
  - A function of consequences
  - Occasioned by antecedent stimuli but selected, altered, and maintained by consequences
- **Conditioning:**
  Behavior-consequence pairing

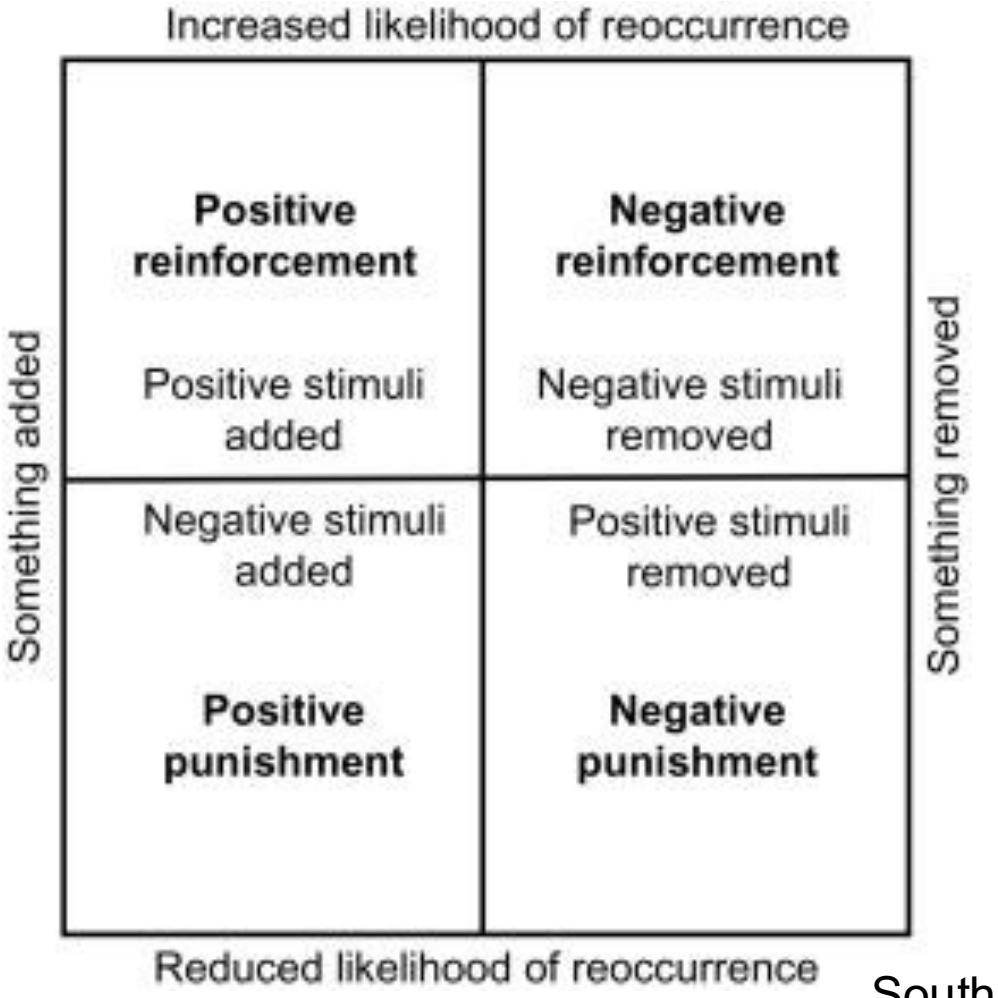
Common ABA terminology

Operant behavior:
Antecedents, Behaviors, Consequences



Common ABA terminology

Consequence types



- Throwing a treat away from a crate or stranger is R-
- Turning away from your dog contingent on response = P-
- Stopping play contingent on response = P-

Southam-Gerow et al., 201)

Common ABA terminology

Operational definitions

Describe objective, identifiable features and non-features of a behavior to allow for reliable and valid measurement of the behavior. Definition should be:

- Objective
- Observable (includes active verbs)
- Unambiguous

- Definition should not include:
  - Internal states (e.g., angry, sad)
  - Inference (information about intent or behavioral function). For example, “purposely” biting or “defensive aggression”

Published operational definitions

Behavior Label	Operational Definition *(direct or modified quote from reference)*	Reference
Down (lying down)	The torso touching the floor in the chest and/or hip area, with the dog either laying on the chest, side, or back	Owens (2017)*
Down (lying down)	Lying down with limbs either tucked under or placed in front of body	Protopopova et al. (2014)
Down-stay	When a dog's elbows, abdomen, and rear pasterns were touching the ground	Waite & Kodak (2021)

AABA behavior change goals

- novel skill acquisition/ transfer of existing behaviors into new context
- reduction of problem behaviors

AABA behavior change targets

Focus	Skill Acquisition	Problem behavior reduction
Safety	• crating • cooperative care	• aggression • eloping
Physical health	cooperative care	vet-disrupting behavior
Behavioral health	• social skills • recreational activities	• fear/anxiety • separation anxiety • stereotypies
Caretaker welfare	• polite behaviors	• aggression • behaviors deemed unsafe or obnoxious by caretakers (e.g., jumping, mouthing)

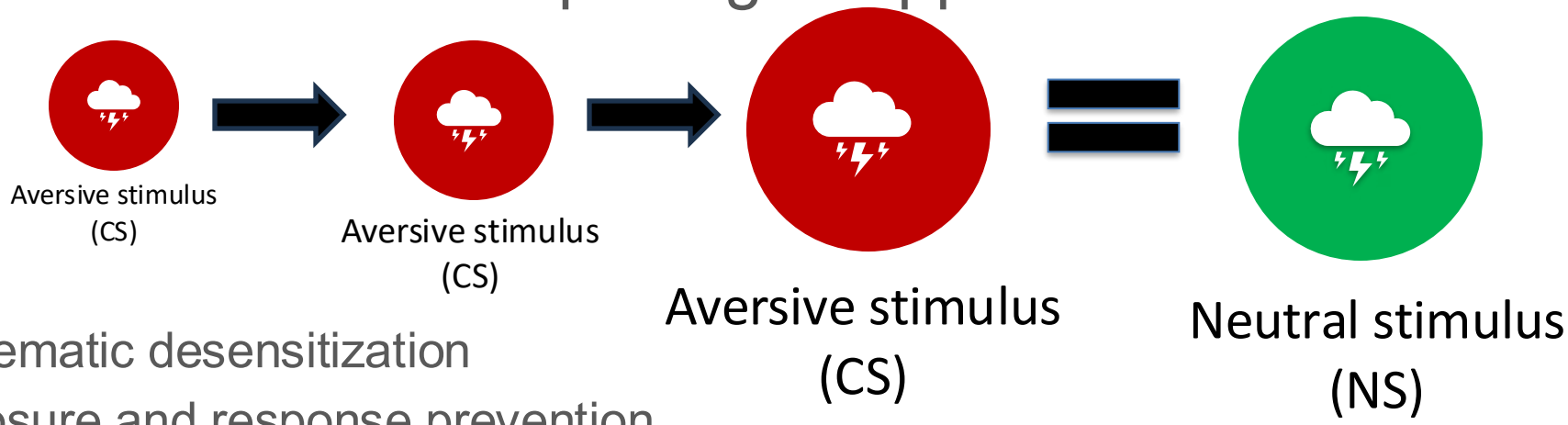
COMMON TREATMENT METHODOLOGIES

Common Tx methodologies

- desensitization
- counterconditioning
- antecedent arrangement
- extinction
- differential reinforcement
- response-independent schedules (NCR)

Desensitization

- Purpose: Change animal's emotional response to stimulus
- Procedure: Presentation of increasingly challenging levels of an aversive stimulus. No pairing of appetitive stimuli.



- AKA:
  - Systematic desensitization
  - Exposure and response prevention
  - Graduated exposure
  - Exposure therapy
- Never used alone in AABA literature

Counterconditioning (CC)

Procedure:

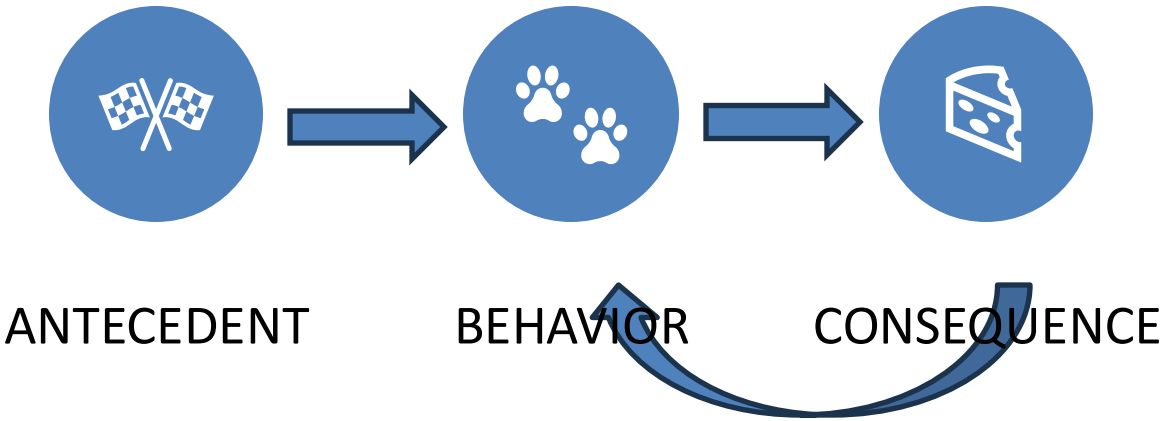
Aversive stimulus (CS)

Appetitive stimulus

Neutral/appetitive stimulus (CS)

Process: Changing conditioned stimuli eliciting conditioned responses of fear, anxiety, or avoidance into stimuli which elicit no responses or positive emotional responses

Antecedent arrangement

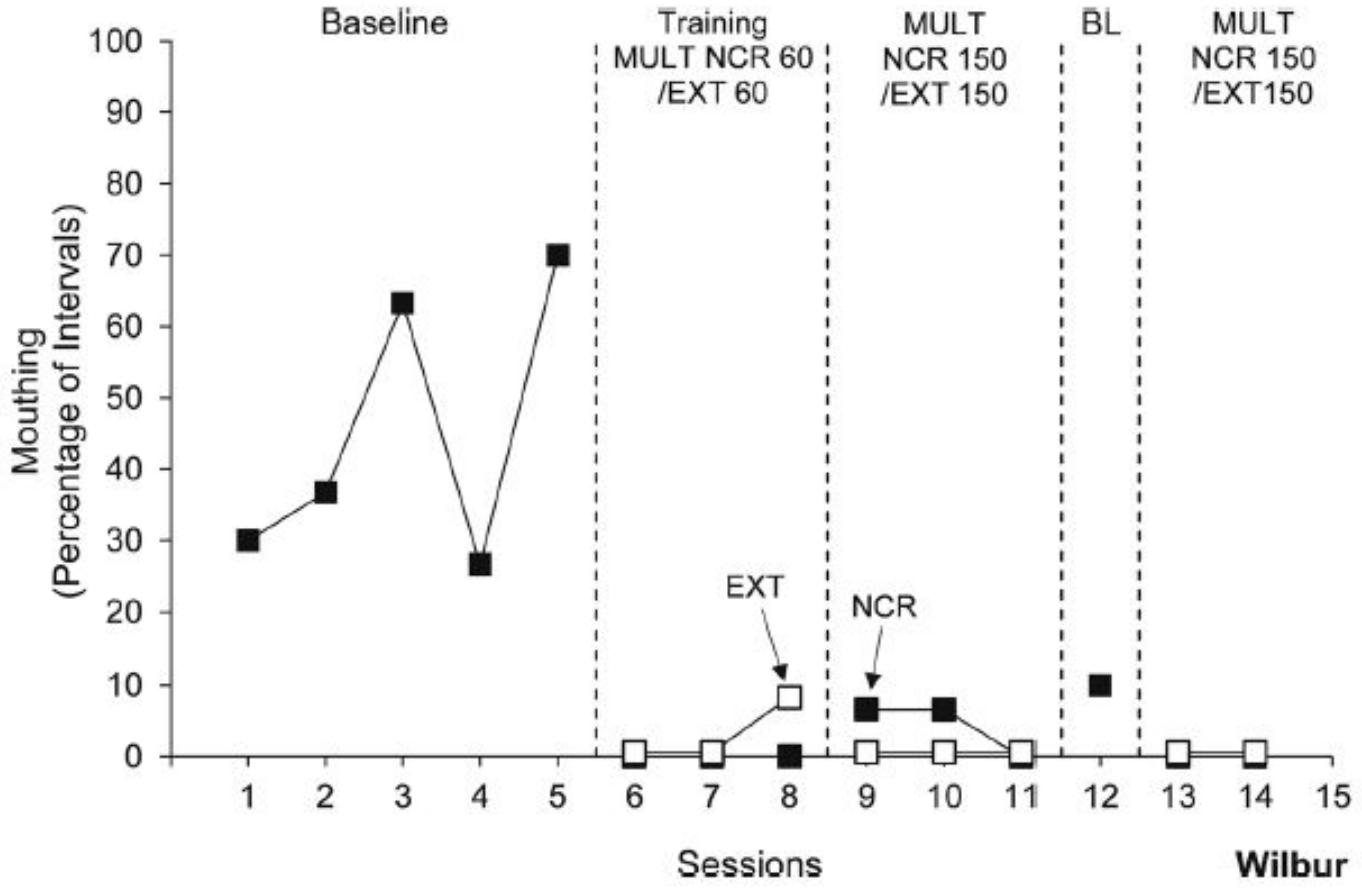


Intervention	Procedure for behavior increase	Procedure for behavior reduction
Antecedent stimulus presentation	present occasioning stimuli	remove occasioning stimuli
Reinforcer value	reduce satiation for R	satiate on R
Response effort	reduce response effort	increase response effort

Noncontingent reinforcement aka "Response-independent schedule"

Reduces value of reinforcer by consistently providing on rich schedule

Waite & Kodak, 2021



Extinction (operant)

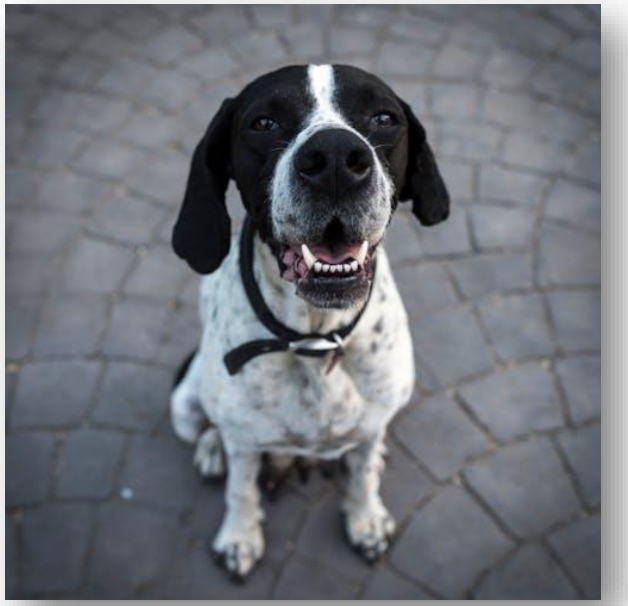
ANTECEDENT BEHAVIOR CONSEQUENCE

Stimulus discrimination training

Purpose: Teach animal to engage in target response to cue

Cue (SD) → response → R

SDT for skill acquisition



"Sit" = Sit → treat

Down, wait, stay

Doorbell = Go to mat → treat

SDT for problem behavior

Problem: Doorbell = bark and rush → distance

DRA + DS/CC:

SDT/DS: Doorbell = Go to mat → treat

DRA:

- Doorbell = Go to mat → R+ (treat) & R-
- Doorbell = Bark and rush → EXT

CC: Doorbell = treat

SDT + DS/CC

Scary thing = Walk away → Treat + distance

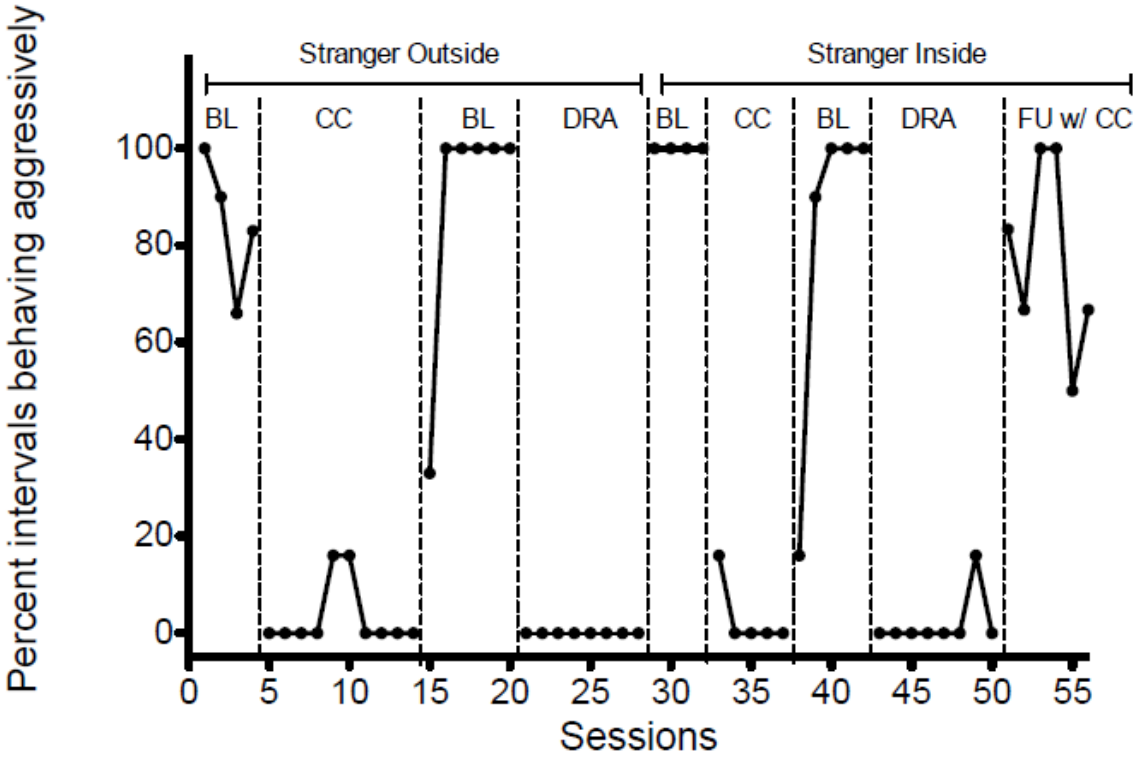
Common Tx methodologies

Differential reinforcement

- At least two different consequential strategies for two different behaviors
- A variety of options:
  - DRA
  - DRO

Differential Reinforcement of Alternative Behavior (DRA)

- Problem behavior on EXT or thin schedule of R
- Desired behavior on rich schedule of R

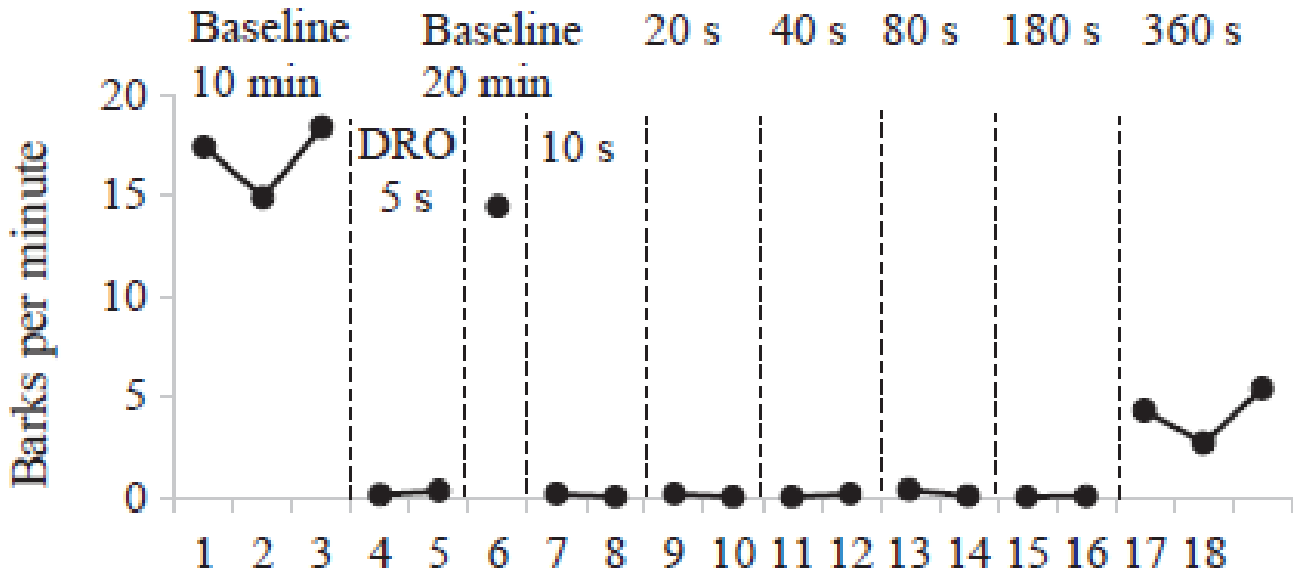


Savage, K. (2010).

Differential Reinforcement of Other Behavior (DRO)

- Reinforcing for “other” behavior or “0” problem behavior during interval
- Interval determined by baseline response rate

Protopopova et al., 2016



Common interventions

Pattern games

- 1-2-3 Game
- Look at That
- Ping Pong
- Superbowls

Common Procedures:

- Stimulus Discrimination Training &/or DRA
- DS/CC

1-2-3 Treat

Look at That

Ping Pong for Crate

Common interventions

Behavioral Adjustment Training (Stewart, 2016)

Procedures involved:

- **DS/CC**
- **Differential reinforcement**
  - **Repertoire of desired behaviors** = Functional R-
    - Optional: Arbitrary R+
  - **Problem behavior** = EXT

Common interventions

Constructional Aggression Treatment (Rentfro, 2012; Snider 2007)

Procedures involved:

- **Differential reinforcement**
  - **Repertoire of desired behavior** = Functional R-
  - **Problem behavior** = EXT
- **DS**

Common interventions

Mat/relaxation protocol (Overall, 2013)

Procedures involved:

- **DRA:**
  - **Mat/relaxed behavior** = R+
  - **Other behavior** = EXT
- **DS/CC**
  - More desired respondent behaviors to CS (mat)
  - Less unwanted respondent behaviors to problematic CS

https://youtu.be/ncaGl5-rHdQ?t=337

Bucket Game/Mat Equivalent

Bucket Game (Patel, 2015)

DRA

- **Assent behavior =** Arbitrary R+
- **Dissent behavior =** Functional R-

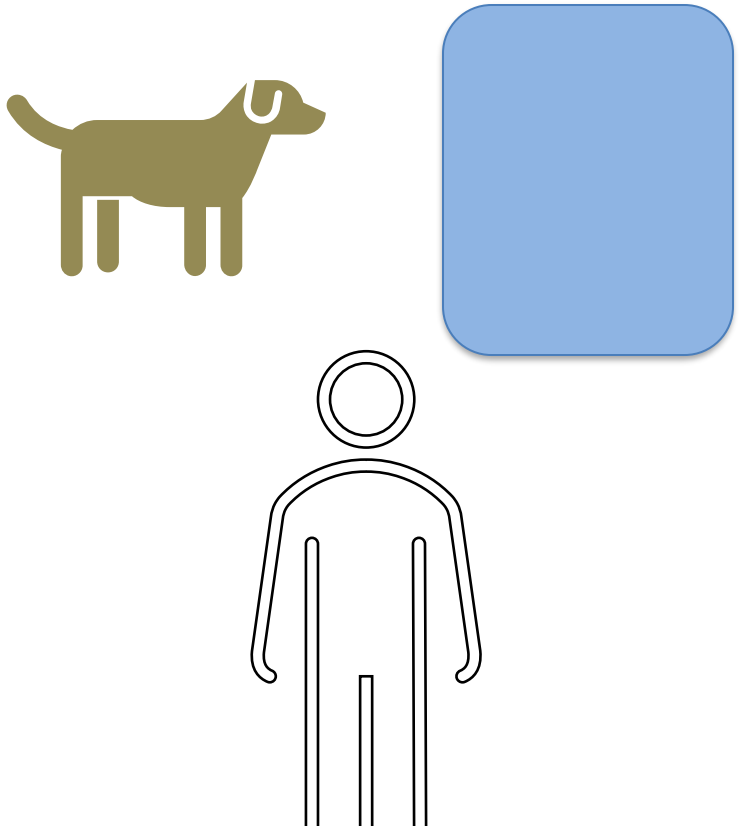
DS/CC

Interesting interventions

Chirag Patel alternative reinforcer mat (Patel, 2019)

Procedures involved:

- **DRA**
  - **Target response** = R+
  - **Alternative response (step on mat)** = R+ and R- (reduced frustration?)
  - **Problem behavior** = EXT
- **CC** for frustrating human stimulus ☺



AABA has added to this space, but so much more work to do!

- Offers a vocabulary to precisely describe intervention components
- Some research performed to test interventions
- Much existing literature, but in different species or behaviors
- The field continues to test new protocols but needs a lot more support for research

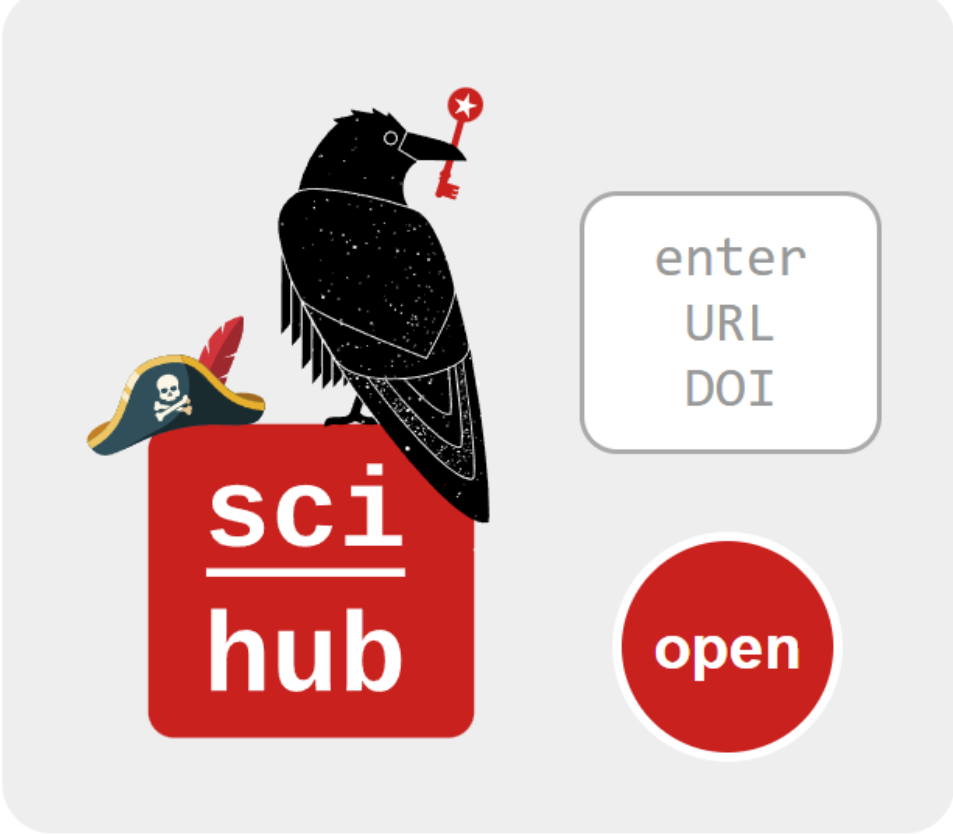
Where to read papers

Journals

- JABAAT (Journal of Applied Behavior Analysis in Animal Training)
- Behavior Analysis in Practice
- Journal of Applied Animal Welfare Science
- Journal of Experimental Psychology: Animal Learning and Cognition
- Journal of the Experimental Analysis of Behavior
- Behavioural Processes
- Animals (sometimes…)
- Journal of Veterinary Behavior (sometimes)

Where to find papers

- SciHub
- Google scholar
- Contacting authors



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Thank you!

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