

Effective and Informative Functional Behavior Assessment

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The Idea

Behavior occurs as a function of its
consequences

Maintaining Contingencies

- Those environmental factors that predict and control behavior
- Antecedents - Behavior - Consequences
- Repeated exposure to consequences results in a future increase or decrease in the probability of a certain behavior

Some Terminology

- Reinforcement - The process in which the occurrence of a behavior is followed by a consequence that results in an increase in the future probability of a behavior (we will discuss)
- Reinforcer - A stimulus or event that increases the future probability of a behavior when it occurs contingent on the occurrence of a behavior.
- Reinforce - a **behavior** is reinforced, not an individual

(Millenberger, 2012)

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More Terminology

- Environment: "The environment consists of the sum total of objects, circumstances, and stimulus properties that constitute the occasion to which behavior is functionally related." (Moore, 2008)

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Reinforcement as a Process

- A behavior occurs
- A change in the environment is produced
- As a result of that change, the future occurrence of the behavior is maintained or increased ***under similar conditions***
- Reinforcement has not occurred unless the **future** rate of the behavior changes

Positive Reinforcement

- An environmental change involving the **addition** of a stimulus
- That change results in the future maintenance or increase in the rate of the behavior ***under similar conditions***

Positive Reinforcement

- I just woke up and hate the world. I insert money and push a button, I get a cup of coffee from a machine. I drink it and love. In the future, I am likely to use the coffee machine again when I wake up and hate the world.

Positive Reinforcement

- I just woke up and hate the world. I drive to Starbucks and ask for coffee. I drink it and love life. In the future, I am likely to go to Starbucks again when I wake up and hate the world.

Positive Reinforcement

- I just woke up and hate the world. I see a co-worker with coffee. I bite myself and moan loudly. She gives me her coffee. I drink it and love life. In the future, I am likely to bite myself and moan again when I wake up and hate the world.
- Typography (Form) versus Function.

Negative Reinforcement

- An environmental change involving the **removal** of a stimulus
- That change results in the future maintenance or increase in the rate of the behavior ***under similar conditions***

Negative Reinforcement

- A student who hates math is sitting at a desk. The teacher hands her a math worksheet. She bites the the teacher. The teacher places the student in time-out. After the time out, math is over and the class moves to lunch. In the future, the student is more likely to bite the teacher when presented with math work.

Negative Reinforcement

- John had a little to much happy at happy hour. He wakes up with a splitting headache. He takes ibuprofen. The pain goes away. In the future, John is likely to take ibuprofen when his head hurts.

Automatic and Socially Mediated Reinforcement

- Automatic: The reinforcer is produced through the behavior of the individual
- Socially Mediated: Involves the actions or consent of another person to produce the reinforcer

Automatic Positive Reinforcement

- The behavior immediately produces the positive reinforcement
- Examples
 - Running
 - Getting food from the refrigerator and eating it
 - A child takes a toy from the shelf and plays with it

Socially Mediated Positive Reinforcement

- The behavior produces the reinforcer through the actions or efforts of others
 - Asking a question
 - Earning free time after completing work
 - Asking your co-worker to bring lunch

Automatic Negative Reinforcement

- Behavior of the individual directly produces the termination of aversive environmental events
 - Leaving a noisy room
 - Ingesting ibuprofen for a headache
 - Scratching an itch

Socially Mediated Negative Reinforcement

- The behavior results in the removal of an aversive environmental condition through the behavior of another
 - Asking another person to turn down the volume of loud music
 - A student asks for a break from work and is allowed to have that break
 - A child cries when asked to clean their room and is no longer required to do so

All Behavior

	Automatic	Socially Mediated
Positive		
Negative		

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Antecedent Conditions

Motivation and Environmental Stimuli

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Motivating Operations (MO)

- Effect the value of a particular stimulus as a reinforcer
- Effect the rate of behavior associated with the acquisition of that reinforcer
- Establishing and abolishing operations

Establishing Operation (EO)

- "Establish" something as a reinforcer
- Increases the value of a reinforcer
- Increases the probability of behavior associated with the acquisition of that reinforcer

EO Examples

- Feelings of hunger act as an EO
 - Increases the value of food as a reinforcer (I want a protein bowl)
 - Increases the probability of behaviors associated with obtaining food (I go to Green)
- Lack of social interactions acts as an EO
 - Increases the value of social interaction as a reinforcer (Working with kids all day - need "adult" interaction)
 - Increases the probability of behavior resulting in social interaction (Happy hour)

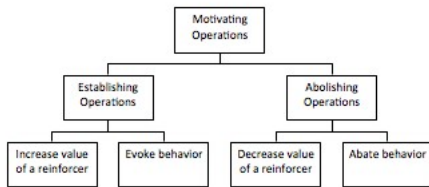
Abolishing Operation (AO)

- "Abolish" something as a reinforcer
- Decreases the value of a reinforcer
- Decreases the probability of behavior associated with the acquisition of that reinforcer

AO Examples

- Eating food is an AO
 - Decreases the value of food as a reinforcer (I am no longer hungry)
 - Abates behavior associated with the acquisition of food (I stop eating and leave green)
- Interacting with people is an AO for social interaction
 - Decreases the value of social interaction as a reinforcer (I'm sick of hearing about your problems)
 - Abates behavior associated with social interaction (I leave happy hour and go home)

Summary



Other Antecedent Stimuli

- Discriminative Stimuli (Sd)
- Delta Stimulus (SDelta)

Discriminative Stimulus

- Signals the availability of reinforcement
- Examples:
 - "Open" sign in front of Starbucks
 - A teacher who regularly takes a student for a walk
 - Dr. Dewlen's office light on

Delta Stimulus

- Signals that reinforcement is not available.
- Examples:
 - No light on at Starbucks
 - Dr. Dewlen's light off
 - Flat tire

Examples

Antecedent Stimulus	Behavior	Consequence
Carol is present	"Hey, baby! How was your day?"	Behavior reinforced "Good, how was yours?"
Bartender is present	"Hey, baby! How was your day?"	Behavior punished, thrown out of the bar

Examples

Antecedent Stimulus	Behavior	Consequence
Instructional Assistant asks student to work	Student Argues	Assistant engages in conversation about why we should do our work. Behavior reinforced.
Teacher asks student to work	Student Argues	Teacher does not respond to argument and repeats request. Behavior on extinction.

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Direct Observation and Data Collection

Why Conduct Direct Observations?

- Objective verification of teacher/parent reports
- Determine variance from "norm"
- Data versus Documentation (Paula)
 - Documentation = it exists
 - Data = Dimensional quantities
- Development of goals
- Baseline (PLAFFP)
- Progress monitoring

Defining Behaviors

- Objective, only observable characteristics
 - No opinions like "angry" or "anxious"
- Readable and unambiguous
- Complete, delineating boundaries
 - May include examples and non-examples
 - May include time component

Examples

- Out-of-seat: The student's bottom is more than 6 inches out of the chair.
- Physical Aggression: Includes hitting, kicking, biting, scratching, pushing, throwing objects at others, or self-injury (head banging, biting self, scratching skin). This also includes lifting objects above the waist with the perceived intent to use as a weapon or to harm another person. Physical aggression is recorded as an event. An event begins at the first instance of behavior, and ends five minutes after the last behavior. Physical aggression does not include cursing, yelling, or screaming.

What and When to Observe

- Define Behaviors
 - Interviews
 - Records review
 - Observable, Objective, and Measurable
- Plan of Attack – when and how to measure
 - Teacher/parent information
 - Estimate frequency to determine which measures to use

Methods of Data Collection

- Frequency/Rate
- Duration
- Controlled Presentations
- Partial Interval
- Whole Interval
- Momentary Sampling

Rate

- Count of occurrences of a behavior
- Pros:
 - Accurate
 - Don't need a form or training
- Cons:
 - Difficult for behaviors that occur frequently (head slapping)
 - Need constant observation during reported interval
 - Does not account for duration
- Report as: rate per time interval (ex: hour, day, etc.)
- Uses:
 - Behavior that is consistent in form and duration (it looks the same every time and it lasts the same amount of time)
 - Elopement
 - Restraints
 - Office referrals
 - Tantrums in some cases

Duration

- Duration of occurrences of a behavior (how long does the behavior last)
- Pros:
 - Accurate
 - Don't need a form or training
- Cons:
 - Only low frequency
 - Need constant observation during reported interval
- Report as: rate per time interval (ex: hour, day, etc.)
- Uses:
 - Repetitive behaviors
 - Time on task
 - Time off task
 - Tantrums
 - Episodes of aggression
 - Report writing time

Controlled Presentations

- Record presence or absence of behavior given the opportunity to demonstrate the behavior
- Pros:
 - Accuracy
 - Flexible application
- Cons:
 - Environmentally cued (must have opportunity to demonstrate the behavior)
- Report as % of opportunities
- Uses:
 - Specific behaviors in response to an environmental cue
 - Following directions
 - Answering a math question
 - Responding to a social cue

Partial Interval Recording

- Record presence or absence of behavior occurring at any time during each specific interval
- Pros:
 - Efficient
- Cons:
 - Overestimates occurrence of behavior
 - Requires a trained observer
- Report as: % of intervals of occurrence
- Uses:
 - Behaviors that are targeted for decrease
 - Behaviors that occur often
 - Off task behavior
 - Self-injurious behavior
 - Disruptive behavior: talking out in class, out of seat

Whole Interval Recording

- Record presence or absence of behavior occurring during the entire interval
- Pros:
 - Efficient
- Cons:
 - Underestimates occurrence of behavior
 - Requires a trained observer
- Report as: % of intervals of occurrence
- Uses:
 - Behaviors that are targeted for increase
 - Behaviors that occur often
 - On task behavior
 - Social engagement
 - Eye contact

Momentary Time Sampling

- Record presence or absence of behavior occurring at the end of the interval
- Pros:
 - Efficient
 - Easiest of the three interval methods
- Cons:
 - Can over or underestimate occurrence of behavior
 - Requires a trained observer
- Report as: % of intervals of occurrence
- Uses:
 - Can be used for any behavior that occurs often enough to be sampled in a fairly short observation

What Method Would You Use?

- Out of seat
- Academic engagement
- Aggression
- Tantrums
- Math problems correct
- Social engagement
- Hand flapping
- Sleeping in class
- Sleeping in faculty meetings
- Books read
- Reports written in a day
- Talking about preferred topics

Comments

- It takes practices to become proficient
 - Practice on a few cases before you start reporting these data
- These data collection methods are
 - supported in the literature
 - Used extensively in research. These methods are used to evaluate the effectiveness of interventions in the research community

Functional Assessment and Functional Analysis

Developing and testing a functional hypothesis

The Function of Behavior

- Consequences – environmental changes occurring as a result of a behavior
- Determines the future rate and strength of a behavior
- The “why”
 - Every behavior serves a purpose for the person, or it is extinguished from the repertoire.

Functions Identified Through Research

- Positive Reinforcement
 - Attention
 - Tangible items or activities
 - Sensory stimulus
- Negative Reinforcement
 - Escape from attention or individual
 - Escape from demands
 - Escape from sensory stimuli

Positive Reinforcement

- Attention
 - Social interaction from peers or adults
 - May be perceived by others as pleasant or unpleasant
 - Praise or reprimands; pleased or upset
 - Interact with peers
- Tangible items or activities
 - Activity, object, edibles
 - Pizza
 - Use computer, play with a toy

Positive Reinforcement

- Sensory stimulation
 - Visual-auditory-olfactory-kinesthetic, taste
 - Singing, making noises
 - rocking
 - Staring out of the window

Negative Reinforcement

- Escape from attention or interactions
 - Social situations
 - People – peer and adults
- Escape from demands or tasks
 - Academic work
 - Chores
 - Directives (“sit down”, or “wait”)
- Escape from sensory stimulation
 - Pain
 - Uncomfortable temperatures

Functions

Positive	Negative
Attention (Peer, adult; good, bad)	Escape from work demands
Access to preferred Activities	Escape from social situation
Access to preferred Items	Escape from aversive activity
Sensory stimulation	Escape from pain or discomfort

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Behavior in Schools

	Automatic	Socially Mediated
Positive	• Access to sensory	• Attention • Access to tangible • Access to activity
Negative	• Escape from sensory discomfort	• Escape from work demands • Escape from social
Almost all reinforcement in schools is socially mediated!		

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The goal - A Summary Statement

- John hits his head banging in order to escape work demands
- Is this adequate? (You know it's a trick question, right?)

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Back to Antecedents!

- A functional relationship must include a description of antecedent conditions to effectively inform intervention
- When presented with independent work, John will hit his head in order to escape work demands.
- When left alone for 10-20 minutes, John will hit his head to receive attention

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Developing a Behavior Intervention Plan

- Identification of problem behavior
- Functional assessment
- Hypothesis testing (Analysis)

Functional Assessment - What are we looking for?

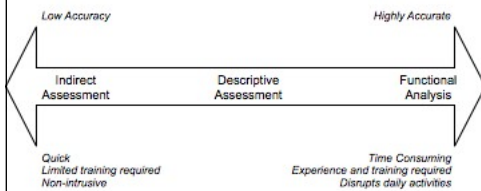
- Antecedents
 - Establishing/Abolishing operations
 - Discriminative/Delta stimuli
- Consequences
 - Positive/Negative reinforcement
 - Punishment
 - Extinction
 - Schedules of reinforcement

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Functional Assessment

- Indirect assessment
- Direct assessment
- Hypothesis testing

Functional Assessment



Indirect assessment

- Interviews
 - Functional Assessment Interview (FAI) (O'Neil, et. al. 2007)
 - Student guided FAI
 - Looking for consistent patterns of antecedents and consequences
 - Listen to the student

Indirect Assessment

- Rating scales
 - Functional Assessment Screening Tool (FAST) (Iwata & DeLeon, 1996)
 - Motivation Assessment Scale (MAS) (Durand & Crimmins, 1992)
 - Questions About Behavior Function (QABF) (Paclawsky, et. al., 2000)
 - What's The Function? (WTF) (Reynolds, in development)

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Direct Assessment

- Descriptive Analysis
- Trigger Analysis
- In-Situ Hypothesis Testing

ABC Descriptive Assessment

- More formal way of looking at patterns
- Establishing operations that may be in place
- Consequences that may be reinforcing
- Examples
 - ABC Data Form (Iwata)
 - Functional Assessment Observation Form (O'Neill, et.al., 1997)

Problems with Indirect and Descriptive Data

- Natural assumption that attention is the reinforcer
- Failure to detect MO when direct or socially mediated access is the function
 - Example: how much deprivation before attention becomes valuable?
 - May correlate settings, academic tasks, and temporal variables that have no impact on the behavior
- Failure to discriminate between escape and attention as the consequence
 - Example: Arguing about work

Trigger Analysis

- Determine antecedent conditions that evoke behavior
- Motivating operations
- Specific events
- Create event and record behavior
- Trigger Analysis form

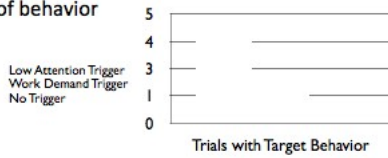
Trigger Analysis for Escape and Attention

Condition	Attention	Work	Behavior Data
Test for No/Low Attention Trigger	Withhold	No Demands (choice activity, not too enjoyable)	Record presence or absence
Test for Work as the Trigger	Provide (No significant help for work)	Demands in place	Record presence or absence
No Trigger	Provide/Available	No Demands	Record presence or absence

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Sample Results

- Staff conducted 15 trials over 5 days
- Each trial 5 minutes, or end with occurrence of behavior



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More Complex Example

Condition	Attention	Work	Behavior Data
Easy Work	Provide	Required	Record presence or absence
Difficult Work	Provide	Required	Record presence or absence
Independent Work	Withhold (no help)	Required	Record presence or absence
No Attention	Withhold	Not Required	Record presence or absence
No Trigger	Provide/Available	No Demands	Record presence or absence

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Functional Analysis

- Experimental manipulation of relevant variables (Antecedents and consequences)
 - Manipulate antecedents in order to evoke target behaviors
 - Follow target behavior with consequences that may reinforce it

Functional Analysis

- Requires Training and Supervision
 - Rigid control of variables necessary for accurate results
 - Not appropriate for all behaviors
 - In some conditions, strengthens inappropriate behaviors
 - Ethical considerations, and **informed consent required**
- Following is for information only

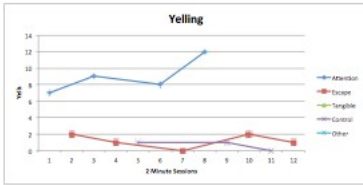
Types of Functional Analysis

- **Exploratory**
 - Evaluate a range of conditions
 - Escape, Attention, Tangible, Control Condition*
- **Hypothesis testing**
 - Evaluate specific conditions identified through indirect or descriptive assessment
 - one or two test conditions, control condition*

* Experimental Control, not "control" as a function

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Sample Results



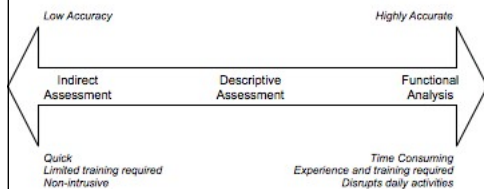
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When you need a Functional Analysis

- **Locate Board Certified Behavior Analyst**
 - With experience in conducting FA
 - Training
 - Supervision
- **FBA, FA, and BCBA Parent/Advocate requests**
 - IDEA and how it applies

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Functional Assessment



Factors Affecting Methodological Choices

- **Resources**
 - Personnel and skill level
 - Time
- **Dimensions of problem behavior**
 - Intensity: mild inconvenience or physically dangerous
 - Frequency: Daily or once per month
- **Risk of being wrong**
- **Cost of assessment**
 - Time for assessment vs. intervention

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