

Treatment Integrity, Reliability, and other Evidence-Based Challenges in Implementing Ethical ABA Programs

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Philosophy 101

How Do We Know About Things?

Some Thought Experiments (and
music) Follow

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How Do You Know...

that the person sitting next
to you is real? that you know that YOU are
real. and
sic?

Maybe you're
listening to music
and I'm not here.

Maybe you're
just hallucinating.

Is it possible that YOU
are part of a dream
that somebody is
having and when s/he
wakes up you'll be
gone?

Maybe it's an alien
shape-shifter posing
as a human (you know,
like in Star Trek.)

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Teaching and Knowing

Knowing involves...

Truth v. Belief

Fact v. Fiction

pix: unicorn and
elephant

pix: flat earth v. planet

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Knowing and Teaching

Science is a method of knowing

Behaviorism is the science of
knowing how behavior changes

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Interesting Causes

World view:

- Behavior is a product an organism's capacity and the environment.
- Environmental stimuli change and organism's behavior (within its capacity)
- Selectionism and survival of a species/group
 - Insects v. insecticides and genetically modified seeds (GM)
 - Bacteria v. antibiotics
 - Moriori cultural practices v. Maori cultural

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Interesting Causes



Diamond, Jared (1997), *Guns, Germs, and Steel*

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Applied Behavior Analysis: the methodology of behaviorism

Discriminate “truth” from “belief,” “fact” from “fiction”

- Guidelines for determining important behaviors and determining *who* decides what's important (i.e., *ethics, social validity and generality*)
- Identifying environmental principles that change behavior
- *Using principles* to develop procedures to change behavior
- Guidelines for determining *what* responses to teach and take data on (i.e., *dependent variables, DV*)
- Methods to determine accuracy of data (i.e., *reliability of DV*)
- Methods to determine if a *teaching procedure* was correctly done (i.e., *fidelity/integrity of procedures*)
- Guidelines: graphic displays, interpretation, evaluation of data and teaching decisions (i.e., *continue, modify, or find a different procedures*)

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A brief history of Applied Behavior Analysis (ABA)

Experimental Analysis of Behavior

Applied Analysis of Behavior

1903 1920-50s 1959 1968 1998 2014



John Watson
“Behaviorism”

Animal
research
establishing
Principles of
Behavior

Ayllon &
Michael
Psychiatric
Nurse (JEAB)

- JABA
- No BACBs.
- Fewer than 500 BA most working in University.
- Focus: showing principles of behavior work with people.

BACB
incorporated.
credentialing
behavior
analysts

•~12000 BCBA
& BaCBA in
world.
•Most providing
ASD services.

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Behavior Analysis: 1920s- 1940s

Not Applied:

- Scientists interested in behavior changes
 - rats running mazes
 - what environmental events makes them run faster
 - how teach a pigeon to peck a red light v. a white light
 - what environmental events are useful to teach a selection response (discrimination training)
 - environmental events that make an animal "work" longer (intermittent schedules of reinforcement)

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Pigeons Playing Ping Pong



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Baer, Wolf, & Risley (1968)

Defined the Field of Behavior Analysis

(changing behavior a.k.a., "teaching" and "learning")

7 Dimensions of Applied Behavior Analysis

Applied

Behavioral

Analytical

Conceptual Systems

Technological

Effective

Generality

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Applied: Important behaviors

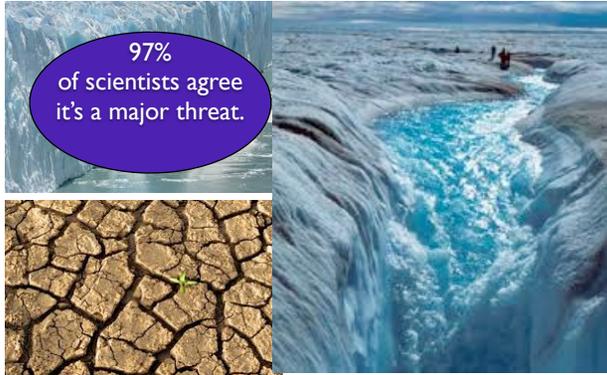


Cultural discussion still going on

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Climate change a major problem?



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Applied

What are important behaviors in education?

How can we identify important behaviors?

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Is "important" defined by a topography?



Finger sucking
in an infant



Finger sucking
in an older child

Can't define "important behaviors"
a topography

Context is important: age, location, audience

Adverse affect on person or culture: truancy, literacy, computer
and social competence

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Applied: Important behaviors

What behaviors are important?



making a bed



stereotypy

Not all bothersome behaviors are important

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Applied: Important behaviors

• What About: Stereotypy

- Motor:
 - hand flapping
 - rocking
- Vocal:
 - scripting
 - humming
- Visual:
 - waving fingers
 - tracking lines
 - spinning object

Considerations:

- Context: age, location, audience
- Treatment is often time consuming and ineffective
- What other reinforcers?
 - will reducing object spinning eliminate the only Sr?
 - can other stimuli be conditioned as competing reinforcers?
 - can access to stereotypy be used as reinforcer?
- Will treatment interfere with skill acquisition programs?
 - is reducing stereotypy more important than learning to mand?

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Ethical issues:

What behaviors are important and when they are important?

Choosing between deceleration and acceleration targets

What's more important?

- Reduce injurious head hitting or teaching child to write his name?
- Teach attending to teacher or reducing ear playing?
- Reduce hand flapping or teach motor imitation/mands to a non-verbal child?
- Reduce vocal stereotypy or increase the number of reinforcing activities for a person?

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How do I know if my teaching is (ABA) "Applied?"

- Education is dealing with this: Core curriculum v. local control
- Cultural value v. value of local control
- Burden and cost to society
 - skilled workers, scientists, doctors,
- ASD children
 - cost to culture v personal value to child
- Outcomes: immediate v. deferred outcomes (behavioral cusps)
 - behavioral cusps: looking at person, mand training
 - language skills v. skills of daily living
 - academic v. custodial programs

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Ok, I'm teaching a behavior (skill) that's important to the culture and person, but....

How do I know my teaching is

Behavioral

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Behavioral means: A response is

Observable

Some Response Examples

- walking, typing, reading aloud
- opening a peanut bag
- naming things, conversing



- Magnitude: force, loudness, intensity

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Behavioral means: A response is

Observable

Precise o

Countable



How many tricks does the rat do? 3? 6?

How many goals does the black rat make?

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Applied Behavioral is Observable and Countable

Culturally value

Personal value



How many unassisted steps taken?

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Academic operational definitions

What does "know" mean?

"Knowing" as doing

- say names of numbers when asked
- responding to "count to 100?"
- reads numbers to 100 on number line
- selects numbers to 100 when asked
- follows classroom rules in classroom

"Knowing" as saying

- state classroom rules when asked
- says numbers in a song, e.g. "5 little monkeys"

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Operational definitions of problem behavior

Self-injurious behavior: Any forceful hand hit to the body

Property destruction: Any destruction of materials

Aggression: Any forceful and unwanted contact or attempted contact with another person

Operational definitions should include response examples and non-examples

When possible CALL A RESPONSE by its topography, not a presumed class, e.g., head hitting v. SIB.

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Behavioral

Defining what to count

- mand (things, information)
- tact (feature, function, class)
- echoic
- intraverbal
- Vocal, written, signed responses
- Other motor Rs

Operational definitions

Defining how to count it

- cumulative frequency
- duration/latency
- intensity/force
- rate (frequency/time)
- # of different topographies
- percentage correct

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Behavioral: A response is observed and counted

Whose responses are counted?

The Teacher?



The Student?



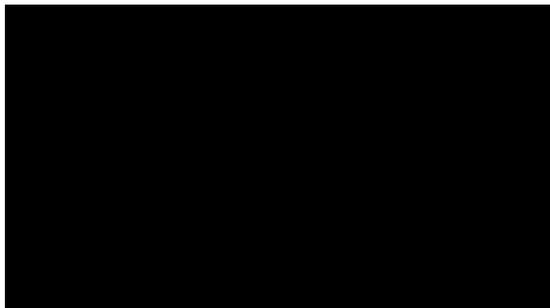
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Lined writing area for slide 40.

Things that affect our observing and counting of our DV

Who's behavior is counted?



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Lined writing area for slide 41.

Who's behavior was counted?

FAR
FAR
FAR

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Lined writing area for slide 42.

Who's behavior was counted?

McGurk Effect

Tritone Illusion

Shepard
Tone Illusion

Weak
operational
definitions

Poorly trained
observers

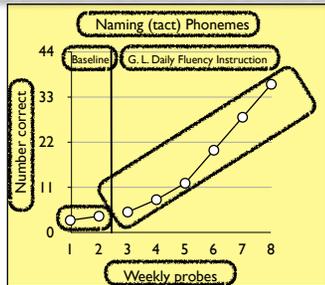
Observer
Motivation

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So What? Data are data?

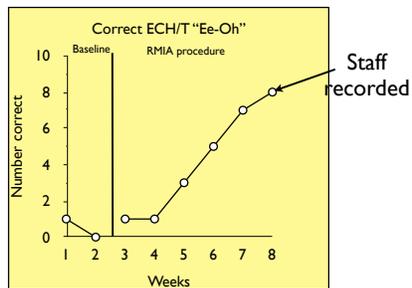
What could go wrong?



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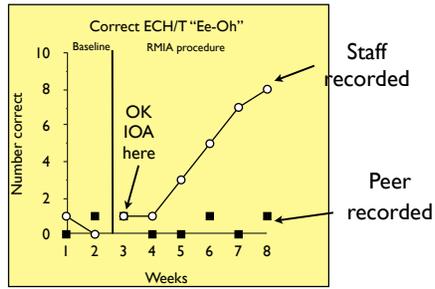
Data Reliability



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Data Reliability



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Reliability of DV (IOA): A Case Study

Teaching Challenge: Non-vocal child

- Sign language: not evoking vocal responding
- Echoic training / not effective
- Stimulus-stimulus pairing / not effective

Rapid Motor Imitation Antecedent (RMIA)

- Procedure:
- "do this": 6 rapid motor imitation responses
- show picture, give an echoic model

"Eeyore"



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RELIABILITY (IOA) PRACTICE

Target: vocal Tact/Echoic "Eeyore"

Instructions:
 Session: Circle "C" correct or "X" if incorrect.
 IOA % (Percent Interobserver Agreement): Circle "Y" if match and "N" if no match. Calculate IOA = #Ys / #Ys + #Ns

Trial	Session 1	IOA 1	Session 2	IOA 2
1	C X	Y N	C X	Y N
2	C X	Y N	C X	Y N
3	C X	Y N	C X	Y N
4	C X	Y N	C X	Y N
5	C X	Y N	C X	Y N
6	C X	Y N	C X	Y N
7	C X	Y N	C X	Y N
8	C X	Y N	C X	Y N
9	C X	Y N	C X	Y N
10	C X	Y N	C X	Y N
# correct		% IOA	# correct	% IOA

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Target: vocal Tact/Echo: **Concurrent Ee-Oh glide**

Instructions:
 Session: Circle "C" correct or "X" if incorrect.
 IOA % (Percent Interobserver Agreement): Circle "Y" if match and "N" if no match. Calculate IOA = #Ys / #Ys + #Ns

Trial	Session 1	IOA 1	Session 2	IOA 2
1	C X	Y N	C X	Y N
2	X	Y N	C X	Y N
3	C X	Y N	C X	Y N
4	C X	Y N	C X	Y N
5	C X	Y N	C X	Y N
6	C X	Y N	C X	Y N
7	C X	Y N	C X	Y N
8	C X	Y N	C X	Y N
9	C X	Y N	C X	Y N
10	C X	Y N	C X	Y N
# correct	8	% IOA	# correct	% IOA

Ys =
Ns =

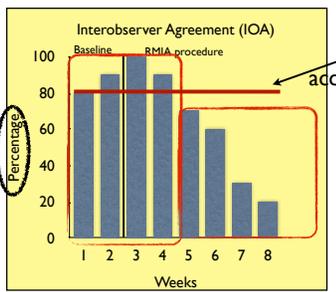
Ys / Ys + Ns =

this number is our session data. Goes on graph.

this percentage tells how reliable that session is.

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Reliability (IOA)



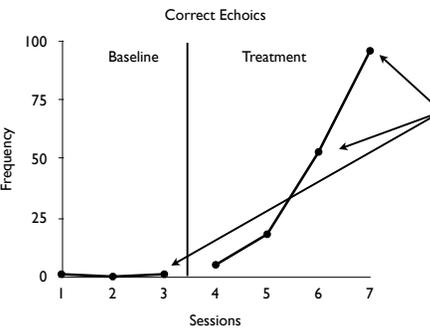
Few correct responses

More correct responses

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Is the child's ECH responding improving?

Have we asked: Are the data reliable?



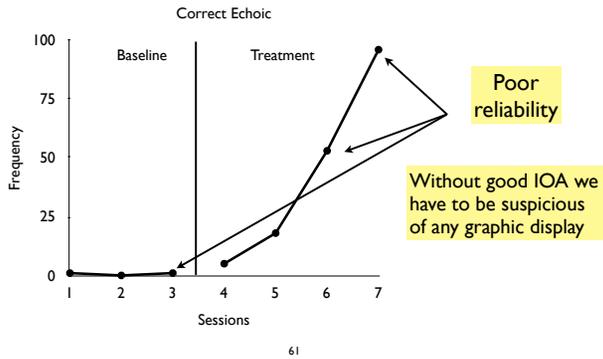
Can 2 people
 • observing the same ECH behavior
 get the same results?

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Is the child's ECH responding improving?

IOA = 50%:

2 observers agree only half the time that an echoic response is correct

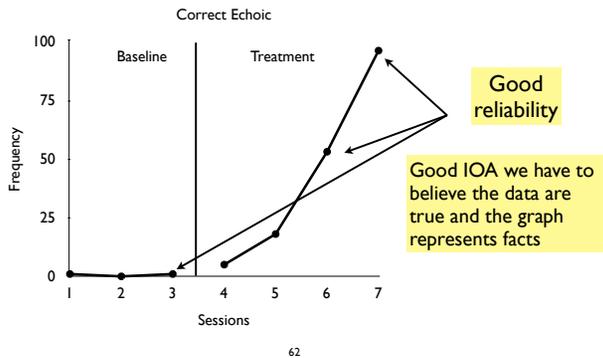


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Is the child's ECH responding improving?

IOA = 90%:

2 observers agree only half the time that an echoic response is correct



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Reliability of Observed Behavior

Why is Reliability Important?

Can't interpret graphic displays without it.

Without IOA

- Believability of data and graph is uncertain
 - Graphic display may be false
- What was observed?
 - Is operational definition clear?
 - Were "expectation" influencing IOA
- Can't make program changes without good IOA

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Threats to dependent variable (DV) reliability

- Ambiguous operational definition
 - staff saying, "looks like SIB," "I think that's a correct ee"
- Poorly designed data sheet
 - too complicated, incomplete (e.g., no instructions)
- Poor staff training
 - can't identify a target response
 - inaccurate take data
- Poor staff oversight
 - don't take data
 - make up data to fill in data sheet at end of day
- Organizational values, unawareness, or indifference
 - it's not important to the organization

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Effects on Teaching....

Rule: Can't evaluate graphic displays without evidence of the believability of the data, i.e., IOA.

Can't can't make informed program decisions without believable data

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Did they say we have to collect IOA on every session!
No Way!



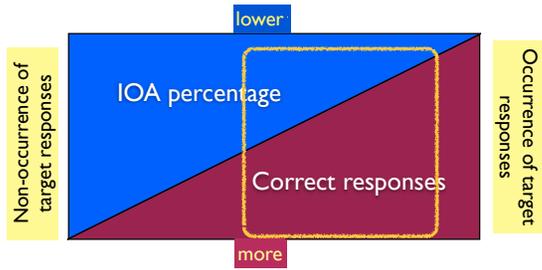
How much IOA?

- research standard: 33%
- no APBA practice standards

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Possible IOA Outcomes



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Collecting IOA suggestions

Acquisition Targets
(# of mands and tacts, play duration)

Deceleration Targets
(SIB, Pica, disruptive behavior, PA, tantrum)

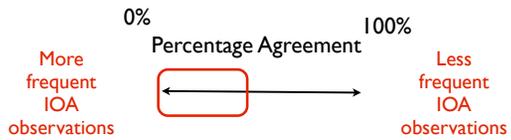
- Difficult without:
- Dedicated trained staff
 - BCBA Supervisor
- possible with
- Instructional data collection
- 10 trial data
 - daily probes
- when
- Target most likely
- later in acquisition training
 - earlier with problem behavior
- and
- Brief samples
- Lead teacher/consult
 - short video tape

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Behavioral: IOA Tip

Look at IOA percentage.



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