PERSPECTIVE TAKING AND NONLITERAL LANGUAGE

Jonathan Tarbox, PhD, BCBA-D
Halifax, May 3rd, 2017

USC University of Southern California

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OUTLINE

- Evolution from simple to complex behavior
- Philosophical background for addressing complex behavior
- Derived relational responding
- Bidirectional naming
- Perspective taking
- Rule-governed behavior
- PEAK studies
- Mindulness

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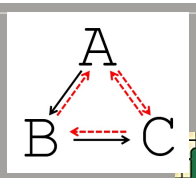
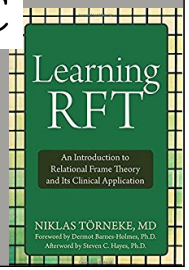
DERIVED RELATIONAL RESPONDING

- **Stimulus equivalence**
- **Bidirectional naming**
- **Relational frame theory (RFT)**
- **Big Picture:** Stimulus generalization does not account for the generativity of language





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BIDIRECTIONAL NAMING

- Thorough program of research by Doug Greer's group in the last 10-15 years
- Training rapid rotation of listener, tacting, and matching produces generalized naming (aka, generalized mutual entailment)
- Most of us might not be training VB the most efficient way!
- Functional **INTER**dependence of verbal operants

"CAR"

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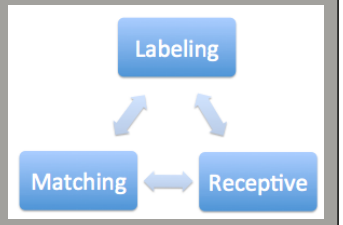
BIDIRECTIONAL NAMING

- Training Bidirectional Naming:
  - Trial 1: "Touch the car"
  - Trial 2: "What's this?"
  - Trial 3: Match car to car
  - Trial 4 and beyond: Random repetitions of these three trial types



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PERSPECTIVE TAKING

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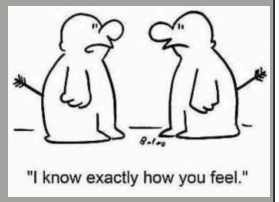
PERSPECTIVE TAKING

- Putting yourself in someone else's shoes
- "Theory of Mind"
- Many individuals with autism, despite sufficient language and IQ, have difficulty with perspective taking



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SIMPLE VISUAL PERSPECTIVE TAKING

- Detecting that what others see is different from one oneself sees is among first perspective taking skills to develop
- Delayed or absent in many children with ASD
- Used table-top multiple exemplar training to teach it

Behavioral Interventions
Behav. Intervent. **26**: 50–66 (2011)
Published online 27 September 2010 in Wiley Online Library
(wileyonlinelibrary.com) **DOI**: 10.1002/bin.320

TEACHING CHILDREN WITH AUTISM A BASIC COMPONENT SKILL OF PERSPECTIVE-TAKING

Evelyn Gould[1], Jonathan Tarbox[2]*, Denis O'Hora[3], Steve Noone[1] and Ryan Bergstrom[2]

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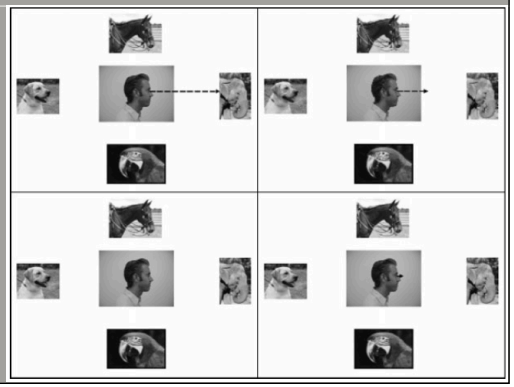
SIMPLE VISUAL PERSPECTIVE TAKING

- 2D stimulus cards
- Instruction: "What does he see?"
- Arrow prompts from eyes to object faded out
- Tested generalization to untrained cards and 3D environment



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VISUAL PERSPECTIVE TAKING

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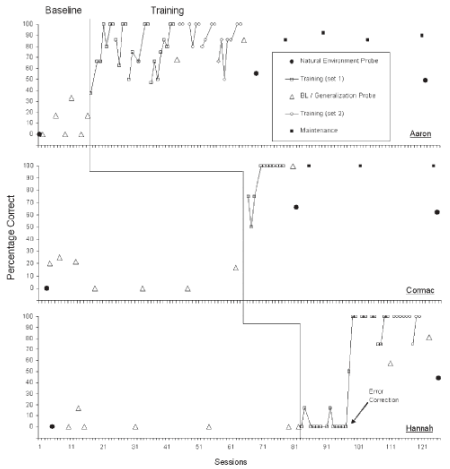

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PERSPECTIVE TAKING: OTHERS' DESIRES

- Identifying what others' want and adjusting one's own behavior is socially critical
  - When others get what they want, they will be happy
  - Can't just always play / talk / do what YOU want
- Many individuals with ASD have difficulty

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PERSPECTIVE TAKING: OTHERS' DESIRES

- Taught children to predict peers' emotions, given 4 circumstances:
  1. Peer gets what peer wants (positive)
  2. Peer doesn't get what peer wants (negative)
  3. Peer gets what she doesn't want (negative)
  4. Peer avoids what she doesn't want (positive)

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PERSPECTIVE TAKING: OTHERS' DESIRES

- Based on predictions, would child with ASD choose activities to make peer happy?
- Or choose activities to make themselves happy?

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DESIRES

- Clients learned predictions
- But did not adjust their own behavior
- We trained them directly to adjust their behavior to peer preferences

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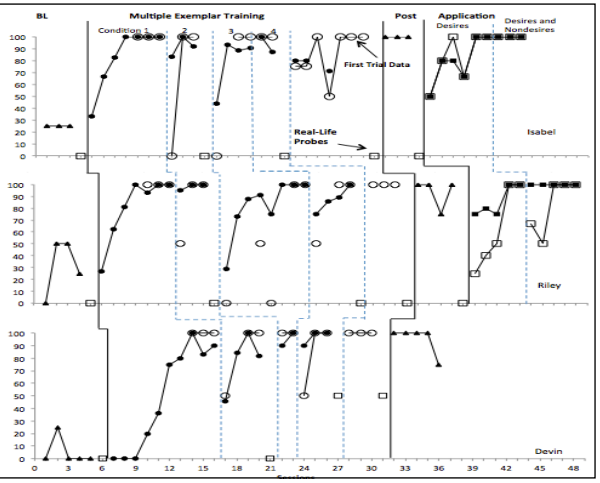

PERSPECTIVE TAKING: LIE DETECTION

- Individuals with ASD have difficulty with lying and detecting lies
- Leaves them susceptible to bullying
- Client's mom asked us to teach him how to tell when bullies were lying to him
- Peers were lying to him to take his items and to exclude him

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Research in Autism Spectrum Disorders 7 (2013) 503–508
Contents lists available at SciVerse ScienceDirect
Research in Autism Spectrum Disorders
Journal homepage: http://ees.elsevier.com/RASD/default.asp

Teaching children with autism to detect and respond to deceptive statements

Jennifer Ranick [a,b], Angela Persicke [a,b], Jonathan Tarbox [a,b,*], Jake A. Kornack [a,b]
[a] Autism Research Group, United States
[b] Center for Autism and Related Disorders, United States

PERSPECTIVE TAKING: LIE DETECTION

- We used multiple exemplar training to teach children with ASD to identify when someone was lying to them
- And to resist the lie (e.g., "No! That's not true!")
- Trained until generalization to untrained lies
- 2 kinds of lies embedded into natural play interactions with adults and peers:
  1. Taking possessions
  2. Excluding child from play

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LIE DETECTION

- All three children learned to detect lies from adult teachers
- Generalization across lies and liars was observed
- And from peer confederates
- Skills maintained for at least a month with no contrived reinforcement or prompting

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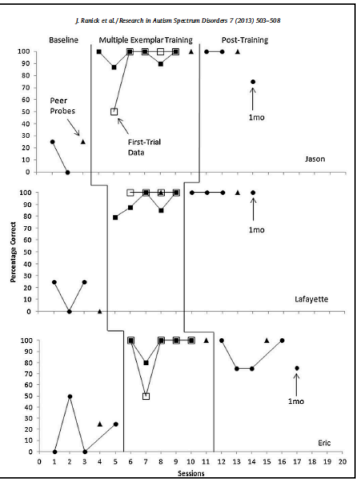
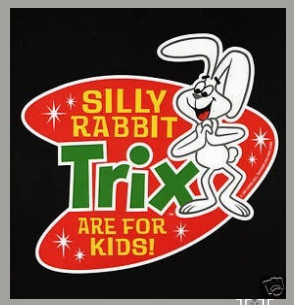


PERSPECTIVE TAKING: PLAYING TRICKS

- Fun way to teach perspective taking skills and creativity / flexibility
- Successful trick playing involves
  - Identifying what others know
  - Identifying behaviors that will prevent others from knowing
  - Doing something new that the other person will think is fun
  - And executing all this in a way that maintains the deception



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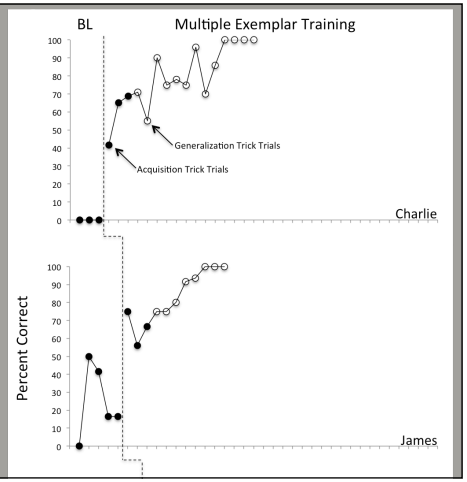
PLAYING TRICKS

- Clients
  - Children with autism who needed to work on perspective taking
  - Highly verbal
  - Couldn't keep secrets or surprises
- Task analysis
  1. Create a new trick
  2. Describe it and why it's a trick
  3. Execute without "giving it away"
  4. End the trick appropriately, e.g., "Gotcha!" or "Tricked ya!"

- Initially taught same tricks
- Then moved to novel tricks every session
- Taught rule "A trick is when you play a joke on someone for fun. If you make someone sad, it's mean, it's not a trick"
- Multiple exemplar training across tricks



NONLITERAL LANGUAGE

NONLITERAL LANGUAGE: METAPHORS

- **Metaphors**: Calling a thing something other than what it really is
- Many individuals with ASD have difficulty
- We used multiple exemplar training to teach ability to decode metaphors


Research in Autism Spectrum Disorders 6 (2012) 913–920

Contents lists available at SciVerse ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Establishing metaphorical reasoning in children with autism

Angela Persicke, Jonathan Tarbox *, Jennifer Ranick, Megan St. Clair

Center for Autism and Related Disorders, Tarzana, CA, United States

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METAPHORS: TEACHING METHODS

- Told short stories and then asked metaphorical questions
- Trained intraverbal - echoic responses across multiple exemplars
- Continued training until generalization to untrained exemplars

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METAPHORS

- "I once knew a boy who was really strong, he always wore yellow and he stayed up really late at night."
  - "What would I mean if I said he was a banana?"
  - "What would I mean if I said he was an owl?"
  - "What would I mean if I said he was a super hero?"

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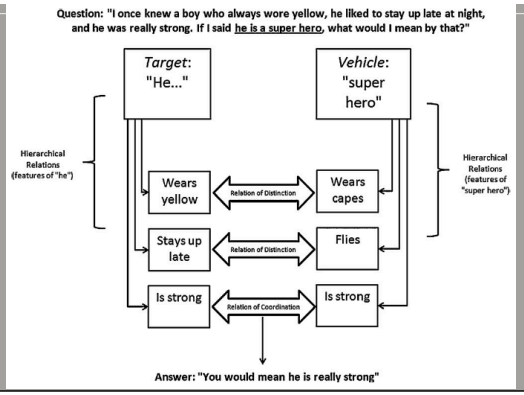
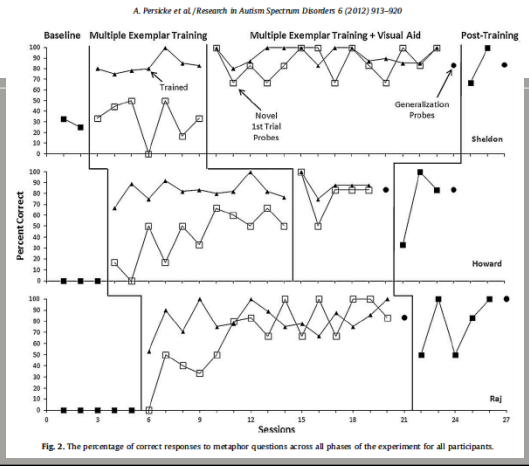
VISUAL PROMPT

BOY	OWL
STRONG	BIRD
STAYS UP LATE	LIVES IN TREES
WEARS YELLOW	AWAKE AT NIGHT

RELATIONAL FRAME THEORY ANALYSIS





METAPHORS: DISCUSSION

- Looks like "understanding metaphors" may be learned verbal behavior
- Participants began responding as speakers - making their own metaphors
- Limitation: Did not test generalization to real-life social interactions
- Ana Ramon-Cortes is now running her dissertation in Spain on teaching kids to create their own novel metaphors

NONLITERAL LANGUAGE: SARCASM

- **Sarcasm**: Saying the opposite of what you literally mean
- Many individuals with ASD have difficulty understanding and using sarcasm

Research in Autism Spectrum Disorders 7 (2013) 193–198

Contents lists available at SciVerse ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Teaching children with autism to detect and respond to sarcasm

Angela Persicke [a,b], Jonathan Tarbox [a,b,*], Jennifer Ranick [a,b], Megan St. Clair [a,b]

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NONLITERAL LANGUAGE: SARCASM

- We used multiple exemplar training to teach children with autism to detect and respond to sarcasm
- Many comments rotating between sarcastic and sincere comments
- Everyday natural language interactions
- Prompting, prompt fading, reinforcement

Table 1
Sample context and corresponding sarcastic and sincere comments.

Context	Sarcastic comment	Sincere comment
warm sunny day	*"It's definitely going to snow today."*	*"It's so warm outside today."*
non-preferred food item	*"You would love to eat broccoli every day."*	*"I know you don't like broccoli."*
messy room	*"You didn't make a mess at all."*	*"This room is so messy."*
preferred activity	*"Playing video games is never fun."*	*"It's so much fun to play video games"*

SARCASM

- Trained until correct responding to untrained comments first time

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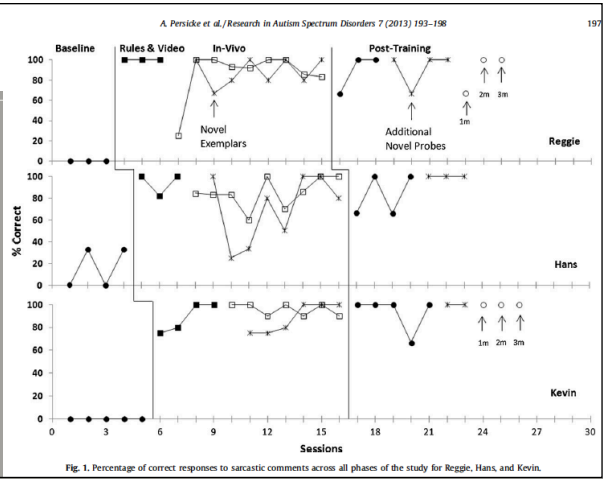

Fig. 1. Percentage of correct responses to sarcastic comments across all phases of the study for Reggie, Hans, and Kevin.

RULE-GOVERNED BEHAVIOR

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RULE-GOVERNED BEHAVIOR

- Rule-following: Antecedents and behavior (Tarbox et al., 2011)
- Rule-following: Behaviors and consequer (Wymer et al., 2016)
- Rule-deriving, social problems (Szabo, in preparation)
- Derived rule following in games (Dixon, 2

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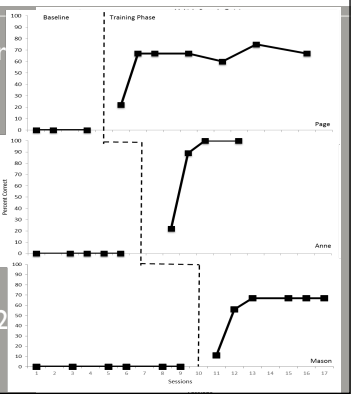
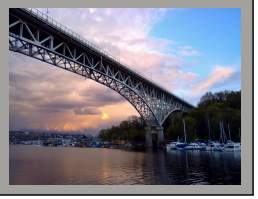


RULE-GOVERNED BEHAVIOR

- **Rule-governed behavior:** Behavior that occurs in response to a rule, AS IF the behavior had contacted the contingencies described in the rule in the past
- **Rule:** An antecedent description of contingencies that controls behavior AS IF the behavior had contacted those contingencies
- Example: "Don't drink bleach or you will die"

RELEVANCE OF RGB

- Absolutely critical to human civilization
- Skinner:
  - Science is essentially rules for effective action with respect to nature
  - Rules are how knowledge (i.e., effective action) is passed on through generations



RGB: TARBOX ET AL., 2011

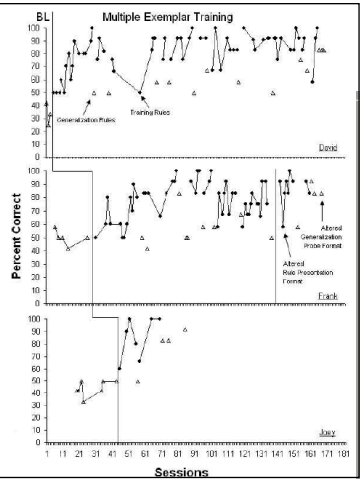
- Tarbox, Zuckerman, Bishop, Olive, & O'Hora (2011)
  - Used multiple exemplar training to establish generalized repertoire of following novel rules describing antecedents and consequences

Table 1
Rules Presented During Baseline, Training, and Generalization Probes in Experiment 1

Baseline and generalization probes	Directly trained
If this is orange then touch your head	If this is a carrot then clap
If this is a pig then arms up	If this is a triangle then turn around
If this is a shoe then touch the floor	If this is a ball then stomp
If this is a chair then knock	If this is a cookie then jump
If this is a spoon then stand up	If this is a hat then stick out your tongue
If this is a car then wave	If this is a bike then touch your nose
	If this is a cup then show me laughing
	If this is an apple then touch your ears
	If this is a square then clap
	If this is a motorcycle then stomp
	If this is a cracker then turn around

RGB: TARBOX ET AL., 2011

- Worked well but took a long time for some learners
- We thought it might have to do with how we presented the rules



RGB: TARBOX ET AL., 2011

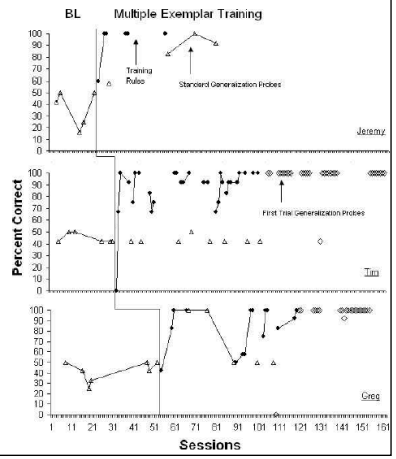
- Experiment 2: "Clap if this is a carrot," etc.

Table 2
Rules Presented During Baseline, Training, and Generalization Probes in Experiment 2

Baseline and generalization probes	Directly trained
Touch your head if this is orange	Clap if this is a carrot
Wave if this is a car	Clap if this is a ball
Arms up if this is a pig	Clap if this is a triangle
Knock if this is a chair	Stomp if this is a hat
Stand up if this is a spoon	Stomp if this is a cookie
Touch the floor if this is a shoe	Stomp if this is a bike
	Touch your nose if this is an apple
	Touch your nose if this is a square
	Touch your nose if this is a cup
	Turn around if this is a motorcycle
	Turn around if this is a phone
	Turn around if this is a cracker
	Jump if this is a hat
	Jump if this is a triangle
	Jump if this is a cup
	Stick out your tongue if this is a square
	Stick out your tongue if this is a bike
	Stick out your tongue if this is a phone
	Touch your ears if this is a carrot
	Touch your ears if this is a motorcycle
	Touch your ears if this is a cup
	Show me laughing if this is a cookie
	Show me laughing if this is a ball
	Show me laughing if this is a cracker

TARBOX ET AL., 2011, EXP 2

- Worked better, MAYBE...
- But continuing to probe untrained rules without reinforcement may have taught learners to NOT respond to new rules
- Implemented first-trial generalization probes
- Increased effectiveness



Analysis Verbal Behav
DOI 10.1007/s40616-016-0059-1

BRIEF REPORT

Teaching Children with Autism to Follow Rules Specifying a Behavior and Consequence

Sarah C. Wymer[1,2] · Jonathan Tarbox[3] · Gracie A. Beavers[1] · Christopher A. Tullis[1]

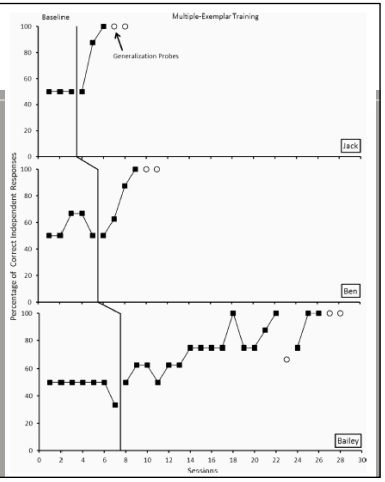
- Used multiple exemplar training to teach repertoire of following rules that described behaviors and consequences

WYMER AND COLLEAGUES (2016)

- "If you clap then you get Elmo"
- "If you stomp then you get broccoli"
- "If you stick out your tongue then you get vegetable juice"
- Rule with preferred consequence → Do the behavior
- Rule with nonpreferred consequence → DON'T do behavior
- Participants demonstrated generalized symmetry before study

WYMER AND COLLEAGUES (2016)

- Multiple exemplar training
- Train a set of rules to mastery, probe a novel set
- Continue until generalization to rules with novel behaviors and consequences



RGB DISCUSSION

- **Just a few baby steps**
- **Still need to research:**
  - **Long delays**
  - **Nonexistent consequences**
  - **Real-life social application**

PEAK STUDIES

- Curricula for autism based on stimulus equivalence and RFT
- Comprehensive assessment and teaching programs
- 12 studies published on validity of the PEAK curriculum
- 15 studies published on effectiveness for teaching skills
  - Equivalence
  - Categorization
  - Comparative relations
  - Rule-deriving
  - Metaphorical emotions
  - Gustatory relations
  - Autoclitics
  - Perspective taking

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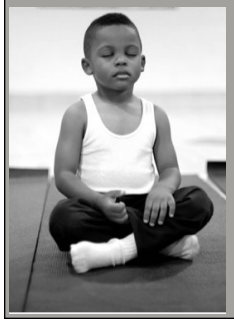
MINDFULNESS FOR PARENTS AND KIDS



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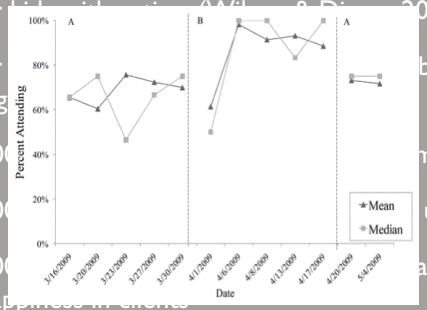


ACT-BASED PARENT TRAINING

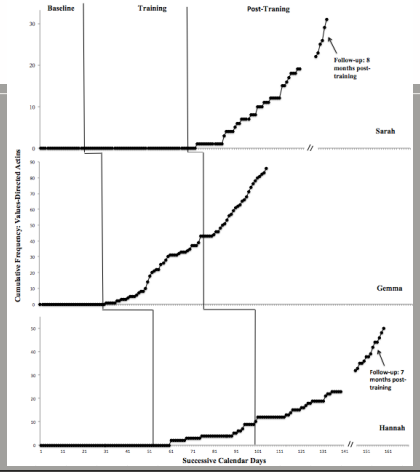
- Evelyn Gould's dissertation
- Used an ACT-based approach to increase values-directed overt behaviors in parents of children with autism
- 1.5 hour sessions, once per week, for six weeks
- All parents had children already in ABA programs
- Started with helping parents identify what they value the most
- Then identified behaviors to measure that were directed toward those values

Value	Values-Directed Behavior	Examples
Quality joyful moments together as a family	Any instance of both parents engaging in a leisure, social event, or family routine together, with both children.	Eating dinner together, playing together at home, going for walks in the neighborhood, having a BBQ, going to a community event.
Having a sense of personal achievement and satisfaction	Any instance of Gemma making a choice about her future or being assertive, or engaging in self-care (in absence of child).	Researching career options, discussing concerns with Program Director or husband, saying "No" to requests from family and friends, accepting respite care, spending time with friends or going to an exercise class, making an appointment with the Doctor or Dentist, taking a bath alone.
My sons being independent, resilient, and happy	Any instance of Gemma following through with recommended behavior management and teaching strategies	Stating clear "first/then" contingencies and following through with demands, using priming or other recommended antecedent strategies, following toilet-training protocol.

Value	Values-Directed Behavior	Examples
Creating a balanced parenting partnership	Any instance of husband taking care of child, without Hannah's supervision	Husband putting child to sleep, playing with child, feeding child breakfast without supervision.
	Any instance of both parents spending "quality time" together outside of home, in absence of child.	Going for dinner, going to see a movie, going for a walk, staying in a hotel for a night, etc.
Taking time for myself	Any instance of Hannah engaging in a leisure, social, or self-care activity, in absence of child.	Taking an exercise class, getting a manicure, getting a massage, spending time with friends (in the absence of child)

FOCUS OF 6 WEEK PROTOCOL

Session	Primary Skill Targeted	Exercise Examples	Homework
1	Valuing	The Three Wishes	Data tracking Connecting to values
2	Mindfulness	Notice 5 things Mindfulness of Breath	Mindfulness
3	Defusion	Having the Thought Leaves on stream	Defusion
4	The Matrix: Tracking	The Matrix	Identifying behavior function Tracking outcomes
5	Committed Action	Eighty-Year Old You Tiniest steps Finding meaning when life hurts	Parenting Commitment
6	Acceptance (with self-compassion)	Wholehearted Parenting Manifesto Creating a Touchstone	Parenting Commitment and Self-care



- Cumulative frequency of values-directed actions per day

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ACT-BASED PARENT TRAINING

- Only the first study on ACT-based parent training producing improvements in overt behavior for parents of children with autism
- Much more replication is needed
- Delayed effect for one parent
- Should be added to traditional behavioral skills training to evaluate additive benefit

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WRAP-UP: FOCUS ON GENERALIZATION

- We are interested in established flexible, generalized operant skills
  - No rote learning!
- Multiple exemplar training and other generalization procedures should be used throughout
  - Not as an afterthought!
- Emergence of derived or untrained performance *is the criterion for mastery*

CONCLUSION

- Sky seems to be the limit
- If you can think of it, you can use ABA procedures to teach it
- Much is still unknown about prerequisite skills
  - If a procedure isn't working, back it up to earlier rereqs
- **Main point:** Don't be afraid to tackle complex skills
  - Start small, fade gradually
  - Lots of practice across many exemplars and focus on generalization!

MORE RESOURCES

- Rehfeldt, R. A., & Barnes-Holmes, Y. (Eds.). (2009). *Derived relational responding: Applications for learners with autism and other developmental disabilities: A progressive guide to change.* New Harbinger Publications.
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