Recent Research and Behavioral Strategies for Teaching Perspective-Taking Skills to Individuals with Autism

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Clinical Importance

- Autism includes delayed development in socialization

- Successful socialization requires perspective taking, traditionally referred to as:
  - Social cognition
  - Theory of Mind (ToM)

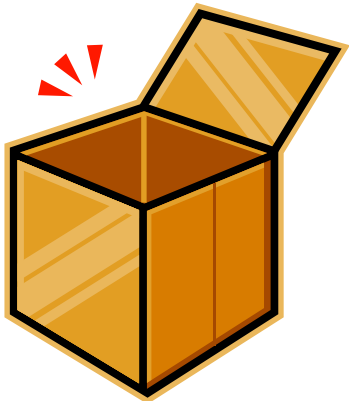
- Individuals with ASD show deficits

Baron-Cohen et al. (1985) – Classic Test of ToM

"Sally-Anne"

or

False-Belief Task



Where will Sally look for her ball?

Behavioral Interpretation of Perspective Taking

- Verbal behavior (Skinner, 1957)
  - Discussed the difficulty that the verbal community has in teaching speakers to respond to their own private events
    - Associated overt stimuli (e.g., scraped knee → feels pain)
    - Associated overt behaviors (e.g., eating fast → feels hungry)
  - Perspective taking is the same thing, except overt stimuli and behaviors are with respect to someone else

Behavioral Interpretation of Perspective Taking (Cont.)

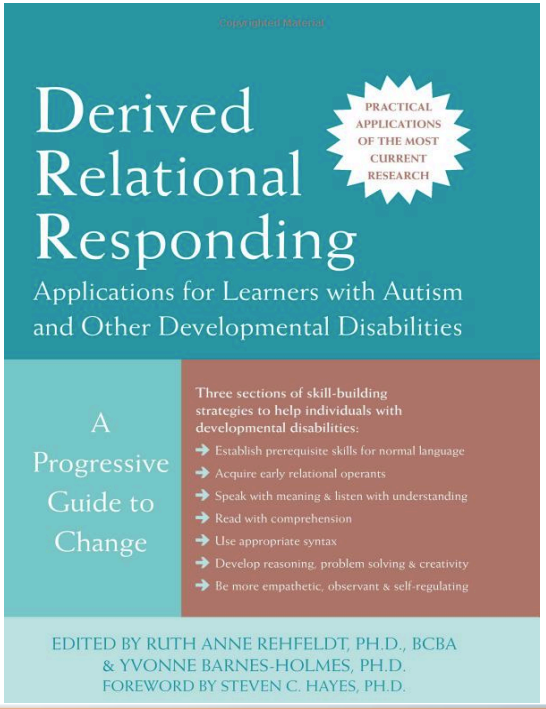
- Spradlin and Brady (2008)
  - Ability to discriminate stimuli currently available to oneself versus stimuli available to others
  - Example: I may be able to see where the block is and so can Anne, but Sally cannot see that the block was moved

- Schlinger (2009)
  - ToM is better understood by analysis of verbal behavior in addition to early learning experiences

Relational Frame Theory (RFT)

- Relational Frame Theory (RFT) posits that relating two or more stimuli is generalized operant behavior
  - Relating = Responding to one thing in terms of another
  - Resulting from a history of reinforcement with multiple exemplars
  - Relating is under antecedent control of contextual cues

- Relations involved in perspective taking
  - Perspective taking involves relating oneself (I) to someone else (you) in accordance with a second relation (e.g., emotions, beliefs)
  - Antecedent contextual cues that control deictic responding: I/you, us/them, etc.



Developmental Research

Skill Area	Age	Behavior
Desires	1-2 yrs.	Gives object in response to pleased facial expression
	3-4 yrs.	Identifies basic preferences of familiar people
	4-7 yrs.	Understands indirect requests
	6-8 yrs.	Identifies the likes and dislikes of others
Sensory Perspective Taking	3+ yrs.	Infers what another person can see
	4+ yrs.	Infers how an object appears to another person
Knowing	4+ yrs.	Can explain how s/he and others know things using all the senses
	5+ yrs.	Considers what the listener already knows about a topic when speaking to them
Emotions	3+ yrs.	Understands that a person's emotions are caused by external situations
		Understands there is a connection between desires and emotions
	4+ yrs.	Understands that beliefs can affect emotions
Thinking	3+ yrs.	Uses the word "think" to describe mental states of others
		Understands cannot see or touch thoughts
		Knows can see own mental images but others cannot
		Knows can think one thing and someone else can think something else
Beliefs	4-5 yrs.	Can pass false-belief task
		Can pass appearance-reality task
		Understands there is a connection between beliefs and perception
		Understands that beliefs cause actions
	6+ yrs.	Understands there's beliefs about beliefs
Deception	4+ yrs.	Engages in deception
		Understands false beliefs held by a person will determine their behavior
	5+ yrs.	Plays bluffing games

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Terminological Review

Sensory Perspective: ID what others sense

Knowing: ID what people know and how they know it

Beliefs: ID what others think to be true without absolute knowledge or justification

Deception: Creation of false belief

Teaching Order

1. Sensory Perspective Taking
2. Knowing
3. Beliefs
4. Deception

General Teaching Approach

- Baseline: Test the perspective-taking skill you want to teach
  - No prompting or feedback
- Training Procedures
  - Multiple Exemplar Training: No rote learning! Train MANY exemplars
  - Behavioral Skills Training: Rules, modeling, rehearsal, and feedback
  - Teach in the natural environment
- Mastery criterion = Generalization

Teaching Order

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Visual Perspective Taking

- Gould, Tarbox, O'Hora, Noon, & Bergstrom (2011)
- Taught children with autism to identify what others see, based on orientation of eye gaze

Behavioral Interventions
Behav. Intervent. **26**: 50–66 (2011)
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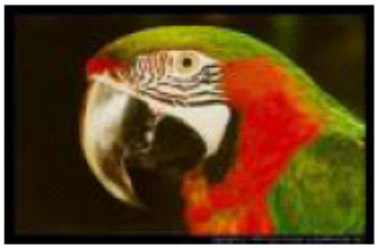
(wileyonlinelibrary.com) **DOI**: 10.1002/bin.320

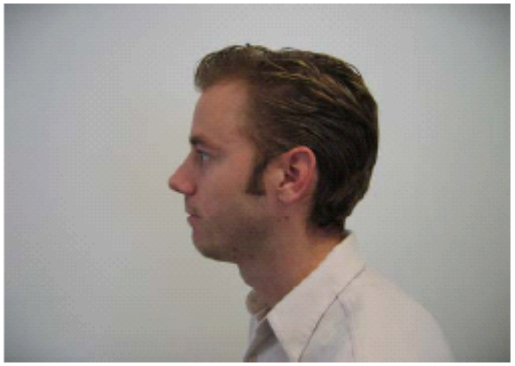
TEACHING CHILDREN WITH AUTISM A BASIC COMPONENT SKILL OF PERSPECTIVE-TAKING

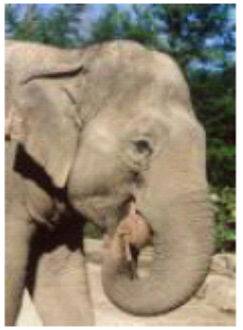
Evelyn Gould[1], Jonathan Tarbox[2*], Denis O'Hora[3], Steve Noone[1] and Ryan Bergstrom[2]

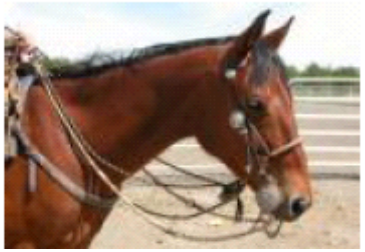
[1]Bangor University, Wales, Gwynedd, UK

“What does he see?”

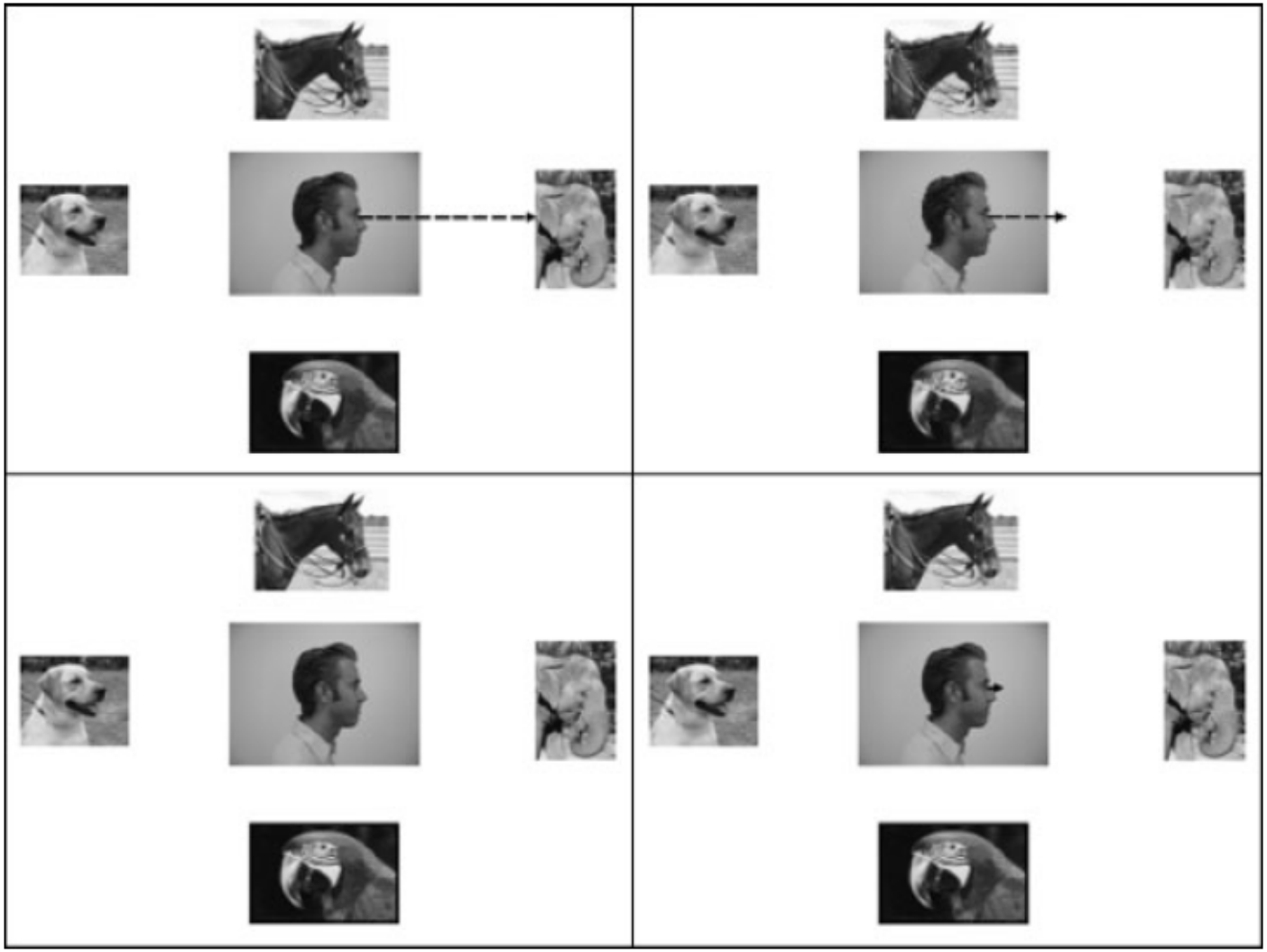








Visual Perspective Taking



General Teaching Approach

- Baseline: Test the perspective-taking skill you want to teach
  - No prompting or feedback
- Training Procedures
  - Multiple Exemplar Training: No rote learning! Train MANY exemplars
  - **Teach in the natural environment**
- Mastery criterion = Generalization

General Research Approach

- **Nonconcurrent multiple baseline across participants**
- Baseline: Test the perspective-taking skill you want to teach
  - No prompting or feedback
  - **Save baseline exemplars for posttraining (don't train)**
- Training Procedures
  - Behavioral Skills Training: Rules, modeling, rehearsal, and feedback
  - Multiple Exemplar Training: No rote learning! Train MANY exemplars
  - Teach in the natural environment
- Mastery criterion = Generalization
- **Posttraining: Same as baseline**
  - **Exemplars that were never trained**

Our Sensory Perspective Taking Study

- Purpose
  - Teach all five senses: see, hear, smell, feel taste
  - Conduct in the natural environment

Journal of Applied Behavior Analysis

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TEACHING A PERSPECTIVE-TAKING COMPONENT SKILL TO CHILDREN WITH AUTISM IN THE NATURAL ENVIRONMENT

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General Procedures

- 10 trials per session
- A dice was rolled to determine order of senses and people engaging in sensing behavior
- Two people and other stimuli were present in the room
- "What does (person) see / hear / smell / feel / taste?”
- Participant had to be engaged in a different behavior than experimenter

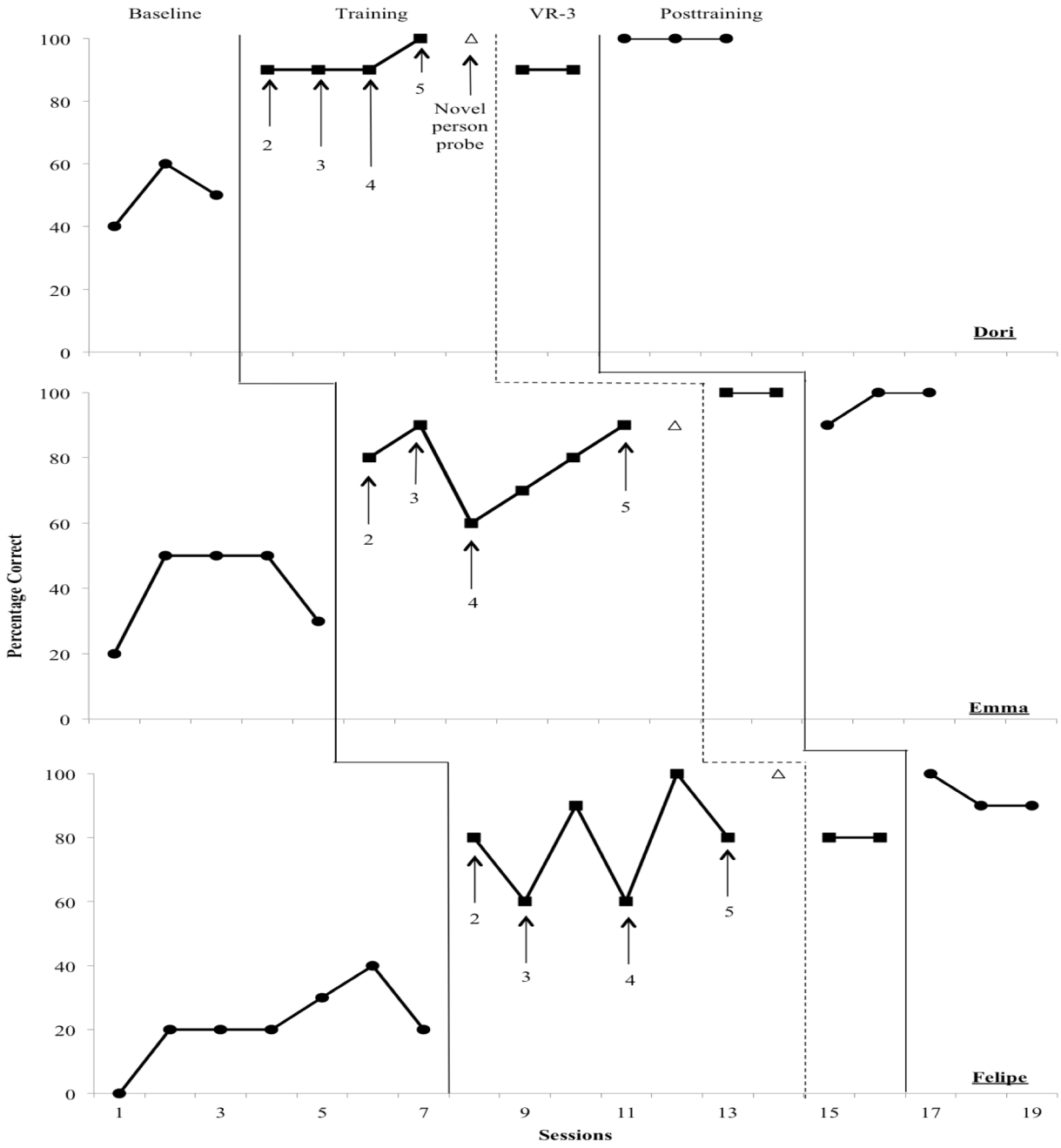
Baseline / Posttraining

- Conducted as in the general procedure
- No feedback
- No reinforcement
- 3-4 people were included in baseline

Training

- General procedure
- Training package: multiple exemplar training (all novel), prompting, and reinforcement
- Reinforcement: for correct responses
- LTM prompting hierarchy

	See	Taste	Feel	Hear	Smell
Leading Question	"What are my eyes looking at?" Are my eyes looking at (incorrect object)?	"What is in my mouth" "Do I have (incorrect object) in my mouth?"	"What is my hand touching?" "Is my hand touching (incorrect object)?"	"What sounds is close/loud enough for my ear to hear?" Is (incorrect sound) loud enough for me to hear?	"What am I sniffing with my nose?" Is (incorrect scent/object) near my nose?
Experiential	Bring learner so s/he has same view	Learner looks inside mouth, "Look, what can I taste?"	Learner looks at item and say "look what can I feel?"	Learner stands next to BI, "Listen, what can I hear?"	Learner smells items, "Smell it, what can I smell?"
Full Vocal Model	"Say, 'You see (object)'"	"Say, 'You taste (object)'"	"Say, 'You feel (object)'"	"Say, 'Uou hear (object)'"	"Say, 'You smell (object)'"



Teaching Order

1. Sensory Perspective Taking
2. Knowing
3. Beliefs
4. Deception

Our Knowing Study

- Purpose
  - Teach learners with ASD to identify whether they and others know information and how they do or do not know (pertaining to senses)
  - In the natural environment

General Procedures

- 20 trials per session
- A dice was rolled to determine order of senses and people engaging in sensing behavior
- Two people and other stimuli were present in the room

General Procedures Cont.

- "Do you / Does (person) know _____?" for self/others and known/unknown info
  - "Yes" (Known)
    - "How do you / does (person) know?"
      - "He/she/I can (hear/smell/see/taste/feel)…"
  - "No" (Unknown)
    - "Why don't you / doesn't (person) know?"
      - "He/she/I can't (hear/smell/see/taste/feel)…"
- Correct – Both correct Yes/No and reason (sense)
- Incorrect – Either Yes/No and/or reason inaccurate or no response within 3 seconds

Baseline / Posttraining

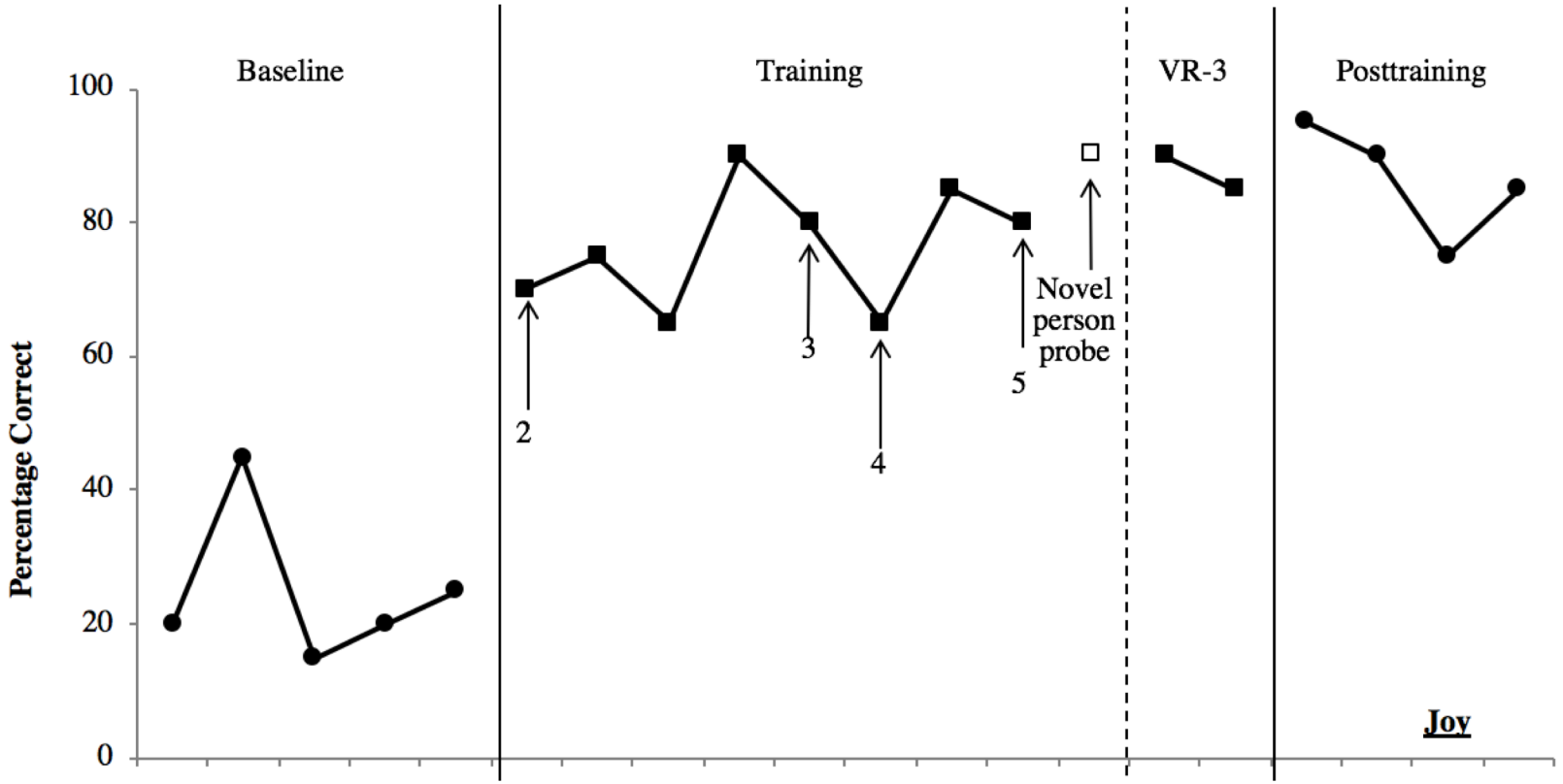
- Conducted as in the general procedure
- No feedback
- No reinforcement
- 4-5 people's perspectives were included in baseline

Training

- General procedure
- Training package: Rules, multiple exemplar training (all novel), prompting, reinforcement
- Rule at start of session until one session at 80%: “When you or another person know something it is because you or the other person can see, hear, smell, feel, or taste it. When you or another person do not know something it is because you or the other person cannot see, hear, smell, feel, or taste it.”
- Reinforcement: for correct responses
- LTM Prompting hierarchy

	See	Taste	Feel	Hear	Smell
Rule Reminder	Rule Rem.	Rule Rem.	Rule Rem.	Rule Rem.	Rule Rem.
Leading Question	Can/Did I/you see (item)?	Can/Did I/you taste (item)?	Can/Did I/you feel (item)?	Can/Did I/you hear (item)?"	Can/Did I/You smell (item)?
Experiential	Bring learner to where the BI is so has the same view and repeat SD: "Do I know…Why?"	Have the learner look inside the BI's mouth (BI says, "Look" and sticks tongue out or opens mouth), and repeat SD: "Do I know…., Why?"	Have the learner look at what the BI is touching ("Look" and point to what you are touching using the other hand), and repeat SD: "Do I know…., Why?"	Have the learner stand where the BI is standing in relation to the sound and say, "Listen" SD: "Do I know…., Why?"	Have the learner put self in proximity to smelly item that BI is/isn't experiencing and say, "Try to smell it". Then, repeat SD: "Do I know…, Why?"
Full Vocal Model	"Say, 'Yes/No, because I/you can/can't see it.'"	"Say, 'Yes/No, because I/you can/can't taste it.'"	"Say, 'Yes/No, because I/you can/can't feel it.'"	"Say, 'Yes/No, because I/you can/can't hear it.'"	"Say, 'Yes/No, because I/you can/can't hear it.'"

Knowing Results



Applications of Knowing

BI = Behavior Interventionist

- **BI:** The learner is presented with a situation in which a person indicates that they do not know something.

- **R:** The learner provides unknown information, through showing, telling, etc.

Teaching Order

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Identifying False Beliefs Research

- Charlop-Christy and Daneshvar (2003)
- LeBlanc and colleagues (2003)
- Taught children with autism to pass false-belief tasks

Using Video M
Taking t

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Claremont McKenna College

Sabrina Daneshvar
Claremont Graduate University

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2003, 36, 253–257 NUMBER 2 (SUMMER 2003)

USING VIDEO MODELING AND REINFORCEMENT TO TEACH PERSPECTIVE-TAKING SKILLS TO CHILDREN WITH AUTISM

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We evaluated video modeling and reinforcement for teaching perspective-taking skills to 3 children with autism using a multiple baseline design. Video modeling and reinforcement were effective; however, only 2 children were able to pass an untrained task, indicating limited generalization. The findings suggest that video modeling may be an effec-

Identifying Beliefs Research

- Video modeling
  - Adults modeled correct responses to questions
  - Explained problem-solving strategy
  - Asked children questions immediately after video
  - Correct R = praise and tangibles (LeBlanc et al.)
  - Incorrect R = replay the video until correct imitation
- Trained multiple stimulus variations for each task
- Charlop-Christy: 2/ 3 showed generalization to untrained tasks
- LeBlanc: all showed generalization to variant tasks and 2/3 passed Sally-Anne task

Our Beliefs Study

- Purpose
  - To teach identification of false beliefs in the natural environment using prompting, reinforcement and multiple exemplar training in various locations
  - Three tasks:
    - Unexpected Transfer Task (U.T.)
    - Deceptive Container Task (D.C.)
    - Sally-Anne Task (Pre/Post)

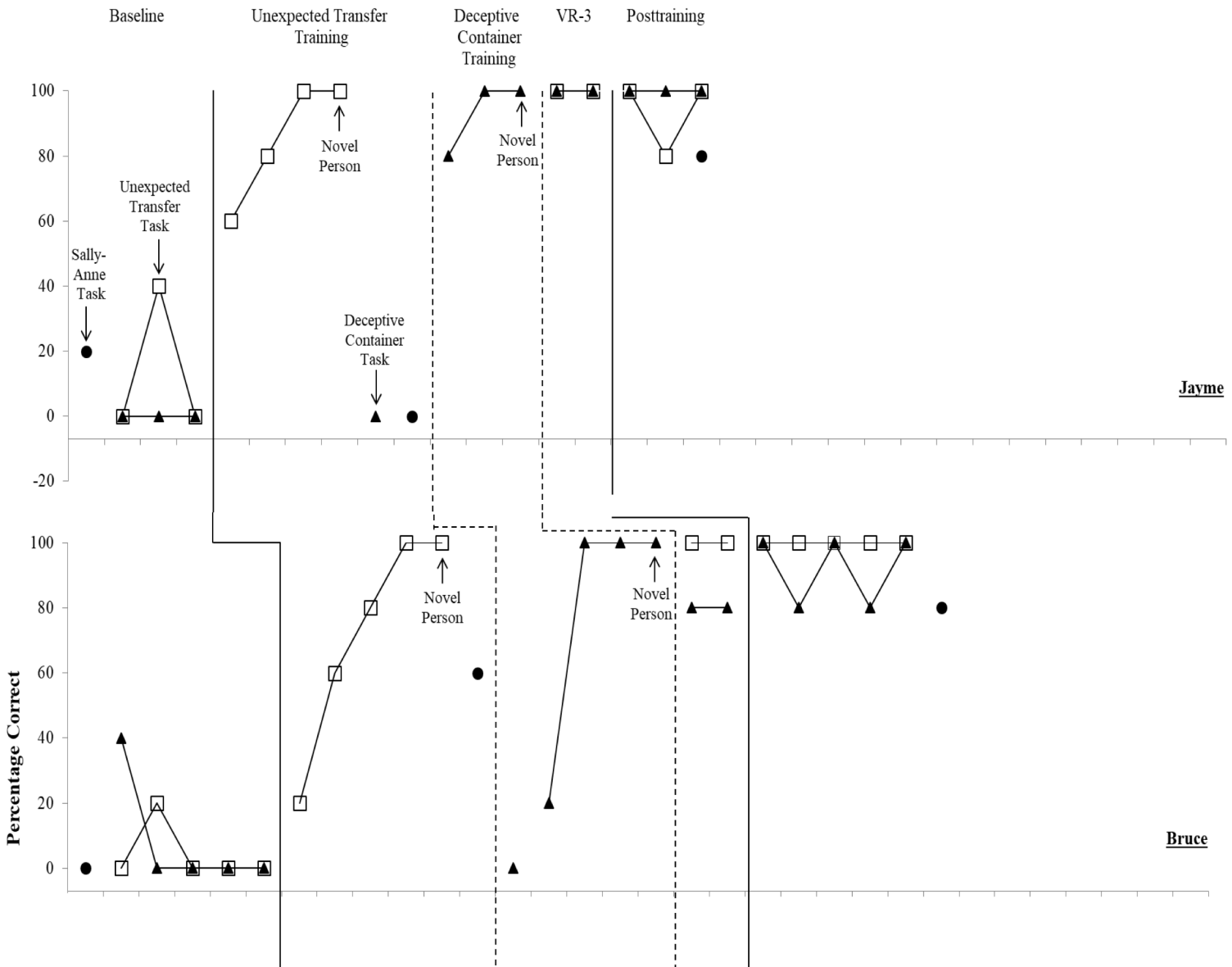
Baseline

- 5 trials each of UT and DC tasks semi-randomly rotated
- In the natural environment
- No prompting, reinforcement, or feedback
- 3 people included in baseline

Training

- 5 trials per session by experimenter
- Training package: multiple exemplar training, least-to-most prompting, and reinforcement
  - Prompts: Leading question, gestural prompt, and full vocal model
  - Reinforcement for correct responses
  - Novel stimuli presented every trial

Results


Baseline
Unexpected Transfer Training
Deceptive Container Training
VR-3
Posttraining
Sally-Anne Task
Unexpected Transfer Task
Deceptive Container Task
Novel Person
Novel Person
Novel Person
Novel Person
Jayme
Bruce
Percentage Correct
100
80
60
40
20
0
-20

Applications: Teaching Belief Identification

BI:

The BI presents stimuli associated with a true or false belief and presents an instruction to identify some element of the object, activity, etc.

R:

The child states his/her belief.

ID Perception Leading to Belief

BI :
"Why did you think (initial belief)?“

R :
“Because I didn’t see / hear / know / wasn’t told (real situation)” (if false belief).
or “Because I saw / heard / knew / was told (evidence / general knowledge)” (if true belief).

Teaching to ID False Belief

BI:

The BI presents new information and asks the child to identify what the object / activity “really” is.

R:

The child changes his / her initial answer based on new information.

Teaching to Predict Beliefs

BI: The BI presents stimuli and asks, “What will (pronoun / person) think?”

R: “(Pronoun / Person) will think (belief).”

BI: “Why will (person) think (belief)?”

R: “Because (pronoun / person) saw / heard / was told (evidence / general knowledge).” (if true belief)

Teaching Order

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Deception

- Deception involves creating a false belief
- Clinical relevance
  - Necessary for social interaction in society
  - Some forms may serve a malicious intent
  - Other forms are harmless, purposeful, practical, and playful
  - Secrets, surprises, bluffing during games, jokes (don't give away the punchline), white lies
- Playing Tricks
  - Serves the purpose of having fun and being humorous
  - Develops around age 4
  - Fun and harmless way to teach the concept of deception

Teaching to Create a False Belief - Tricks

Setup: The BI explains to the child what constitutes a trick using the rule, "A trick is when someone says or does something that makes you think something is going on that really isn't going on. They do it to be funny."

BI: The BI presents a scenario and asks, "Is this a trick?"

R: "Yes." / "No."

Teaching to Play Harmless Tricks

BI: Says, "Let's play a trick on (person),” and asks the child to come up with how they can trick (person) ("What can we do?").

R: The child identifies a trick.

BI (Optional): Indicates a plan for keeping the trick a secret (for a brief period of time if necessary).

R: The child plays the trick and refrains from "giving away" the trick until it is time.

Our Study on Playing Tricks

- Purpose
  - Evaluate methods to teach children with ASD to use adaptive deception skills through teaching them to play friendly tricks

Our Study on Playing Tricks (Cont.)

- Taught trick-playing behaviors
  - Stating the Trick
  - Executing the Trick
  - Inhibiting
  - Ending the Trick
  - Explaining the trick

Acquisition Trick Trials

- For the First Three Training Sessions Only:
  - 1) Rule (with Example and Nonexample)
  - 2) Modeling
  - 3) Contrived Practice
  - 4) Feedback

Generalization Trick Trials

- For All <u>Remaining</u> Training Sessions:
  - 1) In Vivo Practice
  - 2) Feedback

"Let's play a trick on someone that we have never played on them before, who should it be on and what should we do?"

Overall Results

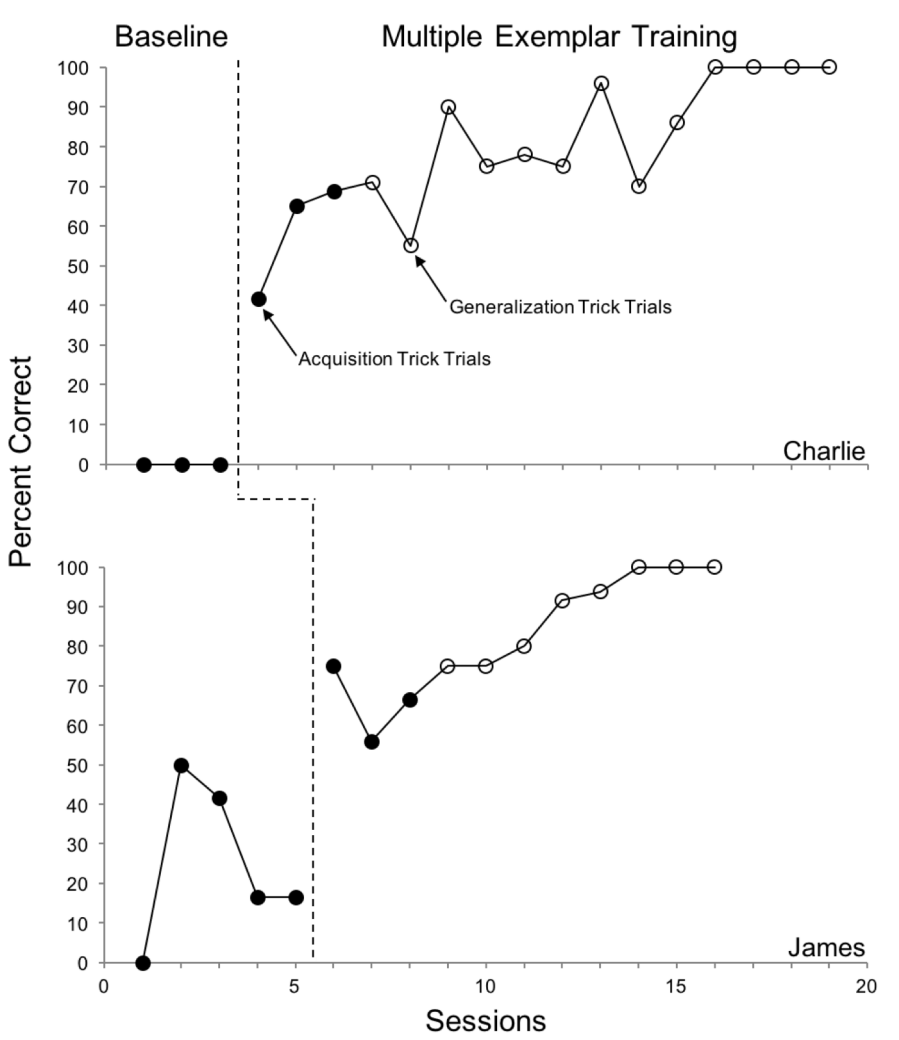

Figure 1. Overall percentage of trick-playing behaviors performed correctly across baseline and multiple exemplar training. Closed circles denote acquisition trick trials and open circles denote generalization trick trials.

Bluffing

Setup:
The BI sets up a game that requires some deception in order to be successful.

BI:
A game requiring bluffing is in progress.

R:
The child bluffs during the game without giving himself / herself away.

Secrets

BI: The BI tells the child a secret and not to tell (might also explain why).

R: Child agrees not to tell the secret.

BI: Someone tempts the child to tell a secret.

R: The child refrains from telling and/or says, "I'm not telling you, it's a secret."

Socially Appropriate Lies

- People tell 1-2 lies daily (Feldman, Forrest, & Happ, 2002)
- Deception is an adaptive skill
- To avoid hurting feelings
  - When given an unwanted gift
  - When someone's appearance changed in an undesired way

Socially Appropriate Lies

TEACHING CHILDREN WITH AUTISM TO TELL SOCIALLY APPROPRIATE LIES

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FOOTHILL CHILD DEVELOPMENT SERVICES, INC.

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JONATHAN TARBOX

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This study used a nonconcurrent multiple baseline across participants design to evaluate the use of rules, role-play, and feedback for teaching 3 children with autism spectrum disorder to tell socially appropriate lies when (a) presented with an undesired gift and (b) someone's appearance changed in an undesired way. The intervention was effective in teaching use of socially appropriate lies, and generalization to untrained people and gifts or appearances was observed.

Key words: autism, deception, lie, perspective taking, theory of mind

Baseline

- Gift
  - Wrapped (wrapping paper or gift bag)
  - "I got you a present." or "I brought a surprise for you."
- Appearance
  - "I love my new shirt! What do you think?"
- 3 points scored
  - 1 point for socially appropriate lie
  - 1 point for using appropriate tone (nonsarcastic)
  - 1 point for appropriate facial expression (smiling)

Training

- BST / MET
- Gift Rule
  - "Sometimes you might get a gift you don't like or already have, and you won't like it. It was nice of the person to give you a gift, and you don't want to hurt their feelings, so even though you are not happy, you should smile and say something nice like, 'Thanks! I like it!' "
- Appearance Rule
  - "If someone is wearing something you don't like or changes how they look, you need to make sure not to hurt their feelings by saying something nice if they ask you what you think. Something like, 'It looks good' or 'that's cool.' "

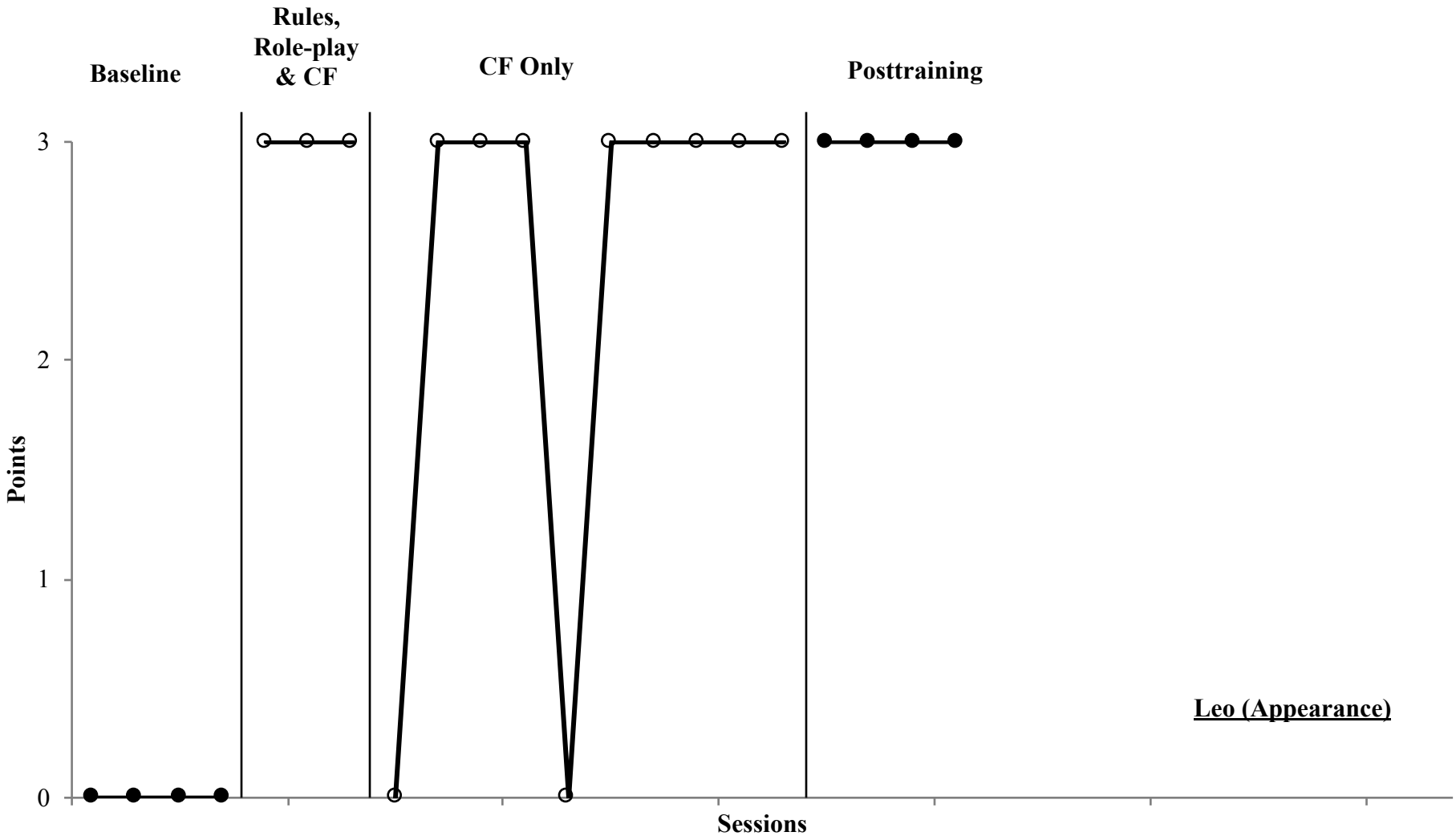
Training (Cont.)

- Role-play with prompting and praise
  - Gift
    - Wrapped (wrapping paper or gift bag)
    - "I got you a present." "I brought a surprise for you."
  - Appearance
    - "I love my new shirt! What do you think?"
- 3 points scored
  - 1 point for socially appropriate lie
  - 1 point for using appropriate tone (nonsarcastic)
  - 1 point for appropriate facial expression (smiling)

Training (Cont.)

- After achieving 3 points with role-play, removed rules and role-play and moved to in situ corrective feedback
  - Conducted in-vivo with confederate
  - "Remember, even if you don't like it, you need to smile and say something nice so you don't hurt my feelings."
- Generalization to untrained people, gifts, and appearances was observed

Socially Appropriate Lies



Additional Perspective-Taking Skills

- Detecting Lies
  - Ranick, J., Persicke, A., Tarbox, J., & Kornack, J. A. (2013). Teaching children with autism to detect and respond to deceptive statements. *Research in Autism Spectrum Disorders*, *7*(4), 503-508.
- Desires
  - Najdowski, A. C., Bergstrom, R., Tarbox, J., & St. Clair, M. (2017). Teaching children with autism to respond to disguised mands. *Journal of Applied Behavior Analysis.*
- Preferences
  - Najdowski, A.C., St. Clair, M., Fullen, J.A., Child, A., Persicke, A., & Tarbox, J. (2018). Teaching children with autism to identify and respond appropriately to the preferences of others during play. *Journal of Applied Behavior Analysis.*

Thank you for your attention!

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