

Strategies to Promote Complex Social Communication Skills in Children with Autism and Significant Language Delays

Alice Shillingsburg, PhD, BCBA-D

May Institute

Social Communication and Development

- Human beings have been described as hard-wired to engage in social interaction (Frith & Frith, 2010)
- Within 1 hour of birth babies track moving face-like stimuli (Johnson, Dziurawiec, Ellis, & Morton, 1991)
- Gaze longer at pictures of faces with eyes open compared to those with eyes closed (Batki, Baron-Cohen, Wheelwright, Connellan, & Ahluwalia, 2000)



Social Communication and Development

- By adulthood, humans use upwards of 60,000 words (Turnbull & Justice, 2017)
- Adults spend anywhere from 4.5-5.5 hours each day engaged in social interactions (Reis & Wheeler, 1991)
- Preschoolers spent over half of their time engaged in conversation and $\frac{3}{4}$ of that related to themselves or others rather than just objects or events (O'Neil, Main, & Ziemski, 2009)
- Development of language and social communication are intertwined and develop concurrently

Social Interaction - What's typical?

- 2 year old:
 - Copies others
 - Points to objects when they are named
 - Play with peers is mainly parallel may begin to include peers (chase)
- 3-4 years old:
 - Negotiates solutions to conflicts
 - Takes turns in games
 - Spontaneously affectionate towards peers



<http://www.healthychildren.org/English/ages-stages/toddler/Pages/Developmental-Milestones-3-to-4-Years-Old.aspx>
<http://www.cdc.gov/ncbddd/childdevelopment/positiveparenting/index.html>

Social Interaction - What's typical?

- 4-5 years old:
 - Would prefer to play with friends than by self
 - Wants to be like his/her friends
 - Wants to please friends
- 6-8 years old
 - Wants to be liked and accepted by friends
- 9-11 years old
 - Forms more complex friendships; especially important to have peers of the same sex



Social Communication - What's typical?

- First words
 - Begin to emerge around age 1 year
- Between 18 and 24 months
 - Vocabulary of 200 words
 - Begin putting 2 words together (mommy go)
- Steady, continuous increase in rate of word learning through to preschool years

Social Communication - What's typical?

- Between the ages of 2-6 years
 - Acquire an average of 5 words per day
- By age 6 years, 10,000 word vocabulary
 - Grammatical complexity increases
 - Answering and asking questions, past tense, etc.
- Adulthood – 60,000 word repertoire

Autism (DSM-5, APA)

- Neurodevelopmental Disorder
 - Impairments in Social Communication and Social Interaction
 - Restricted and Repetitive Patterns of Behavior
- Social Deficits are the Hallmark Feature
- Language deficits can range from mild to severe

Autism

- Approximately 65% to 75% of children with ASD exhibit moderate to severe language delays (Anderson et al., 2007; Tager-Flusberg & Coronna, 2007).
- Approximately 25% considered fluent talkers with minimal to no language impairment.

Table 1

Expressive Language Level at Age 9 by Age 2 Diagnosis: Percentage of 172 Participants

Language level	Autistic (n = 84)	PDD-NOS (n = 46)	Nonspectrum (n = 42)
Complex sentences (ADOS Module 3)	23.8	58.7	54.8
Sentences but not fluent (ADOS Module 2)	23.8	26.1	31.0
Words but not sentences (ADOS Module 1; ADI-R = 1)	23.8	10.9	7.1
No or few consistent words (ADI-R = 2)	28.6	4.3	7.1

Note. Four children were not administered ADOSs; level of language was inferred from ADI, Vineland, and best verbal IQ scores. PDD-NOS = pervasive development disorders-not otherwise specified; ADOS = Autism Diagnostic Observation Schedule; ADI-R = Autism Diagnostic Instrument-Revised

(Anderson et al., 2007)

Autism

- Language impairments in children with ASD typically do not improve without intervention (Law & Conti-Ramsden, 2000)
- Language impairments are predictive of negative long-term outcomes (Prelock & Nelson, 2012).
- Language skills deficits and communication impairments are among the most common complaints of parents (Coonrod & Stone, 2004; Guinchat et al., 2012).

Communication Difficulties

- Survey of Parental Intervention Priorities (Pituch, et al., 2011)
- Social Communication Skills
 - Asks others for information
 - Responds appropriately to questions
 - Seeks out interactions with others

Today's Presentation

- Clinical studies addressing social communication skills
 - Manding for information
 - Answering questions about past events
 - Initiating to show and share with adults and peers
- Strategies to teach
 - Manipulating motivating operations
 - Rehearsal
 - Visual and textual prompts

Parental Intervention Priority

Mands for Information
(Asking for Information)



- Souhyla: I want red ketchup. I hate yellow ketchup.
- Peter: That's not ketchup.
- Souhyla: What is it?
- Peter: All ketchup is red. Moustache is yellow.
- Mom: Mustard is yellow.
- Souhyla: Yeah, I hate that kind of ketchup.
- Peter: It's not ketchup. Mustard is yellow.
- Souhyla: Right. I hate Mister Yellow.
- (Pause)
- Souhyla: Mama, you like it?

Asking Questions – What's Typical

- A parent's perspective
- Online Survey
- Systematic research study (Jones & Schwartz, 2009)
 - Observations of families at dinnertime
 - TD children asked avg. 1 question/minute
 - Children with ASD asked a little more than half that

parenting

Littlewoods retailer survey finds mothers asked 228 questions a day

CAN you imagine being asked 228 questions a day? That's what mothers cope with when their children are young, a study reveals.

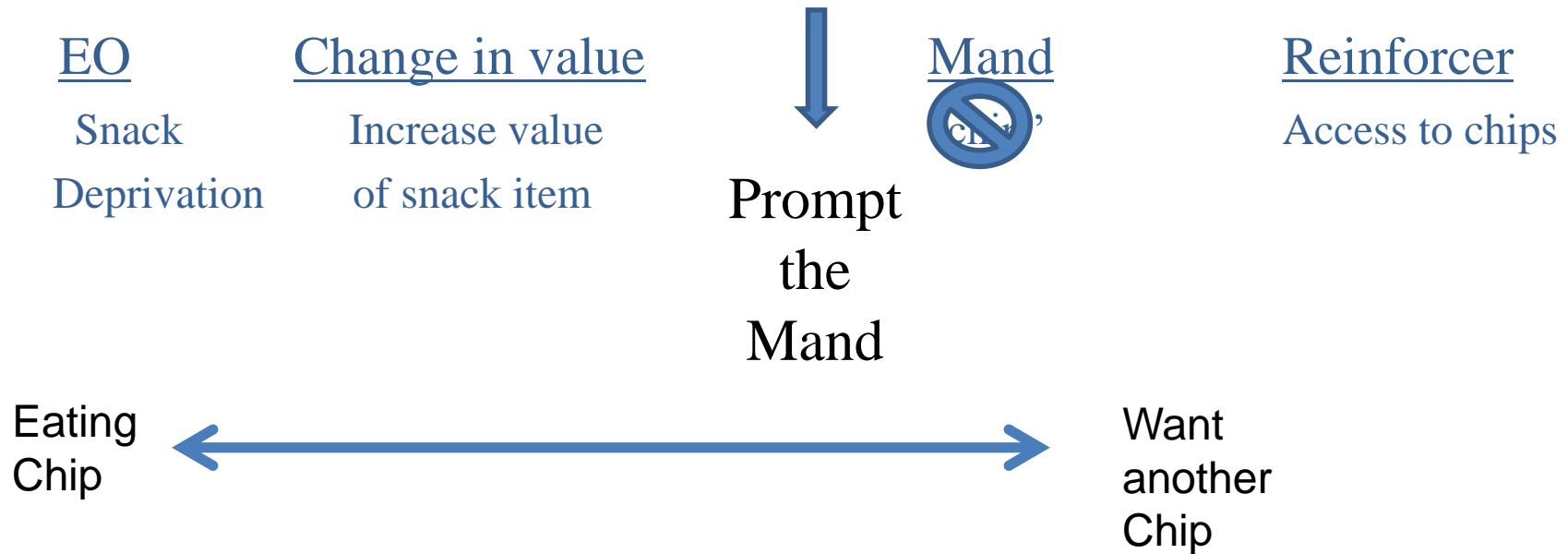
Motivating Operations (Michael, 1993)

1. Change the reinforcing effectiveness of other stimuli (reinforcer establishing/abolishing effect)
2. Change frequency of the occurrence of behaviors associated with those reinforcers (evocative/abative effect)

Establishing operations/abolishing operations

<u>EO</u>	<u>Change in value</u>	<u>Change in Behavior</u>
Food	Increase value	Increase behaviors
Deprivation	of food	that lead to food
<u>AO</u>	<u>Change in value</u>	<u>Change in Behavior</u>
Satiation	Decrease value	Decreases behaviors
	of food	that lead to food

MOs and Communication



- How do we know when the value of food has increased?
- How do we know when to present the prompt?
- Too soon, and we are not teaching when there is an EO.
- Too late, and we risk an error, problem behavior, reduced number of trials.
- Use indicating responses to signal mand trial

Indicating Responses



Indicating Responses



Indicating Responses (Bowen, et al., 2013)



- All the ways motivation can be conveyed
- Response evoked by a strong motivating operation
- Response already in repertoire
 - Vocal response
 - Reaching
 - Pointing
 - Orienting body position toward something
 - Glancing at item
 - Eye contact with you
- Use these indicators when teaching mands

Mand or Ask for Information

- Asking for preferred items is an important skill
- Sometimes we need more specific information
- Basic mands for information can lead to greater independence and social interactions
 - Where missing things are located
 - Who has things we want
 - How to solve a problem independently
- Basic mands for information may reduce problematic behaviors
 - When things aren't readily available
- Sets the stage for mands for social information

Requesting Information

- Basic Wh? Questions
 - Where
 - Who
 - How
- Advanced Mands for Information
 - Asking about others

*MANDS FOR INFORMATION USING “WHO?” AND “WHICH?” IN THE
PRESENCE OF ESTABLISHING AND ABOLISHING OPERATIONS*

M. ALICE SHILLINGSBURG

MARCUS AUTISM CENTER AND EMORY UNIVERSITY SCHOOL OF MEDICINE

AND

CRYSTAL N. BOWEN, AMBER L. VALENTINO, AND LAURA E. PIERCE

MARCUS AUTISM CENTER

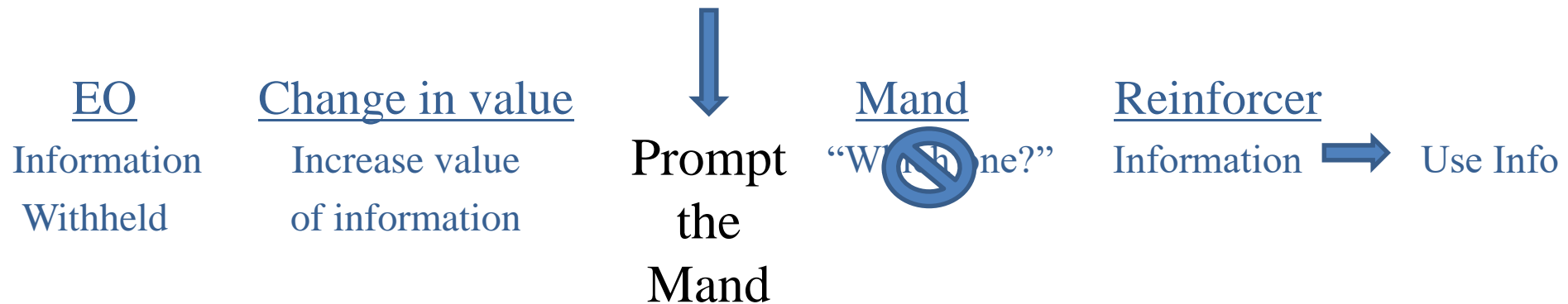
Treatments designed to teach mands for information have included prompting and differential reinforcement, as well as procedures to manipulate the relevant establishing operation (EO). However, previous studies have not included relevant abolishing operation (AO) conditions to ensure that the mand is under relevant antecedent control. Data on listener responses (i.e., use of the information) are also absent in the literature. The current study shows differential responding under EO and AO conditions and reports listener responses that demonstrate use of the provided information. Three participants, diagnosed with an autism spectrum disorder, learned to mand for information using “who?” and “which?” questions exclusively under EO conditions. In addition,

Requesting Information—Who and Which

- Contrive relevant Establishing Operations (motivation) and Abolishing Operations (AO)
- Motivation/EO Present (EOP) – Information regarding location of preferred item NOT given (contriving a motivation for the information)
- Motivation/EO Absent (EOA) – Information regarding location of preferred item given (no motivation for information)
- Dependent Variables
 - Asking “Who has it?” or “Which” when EO is Present
 - Refraining from asking when Motivation is Absent

Requesting Information—Who and Which

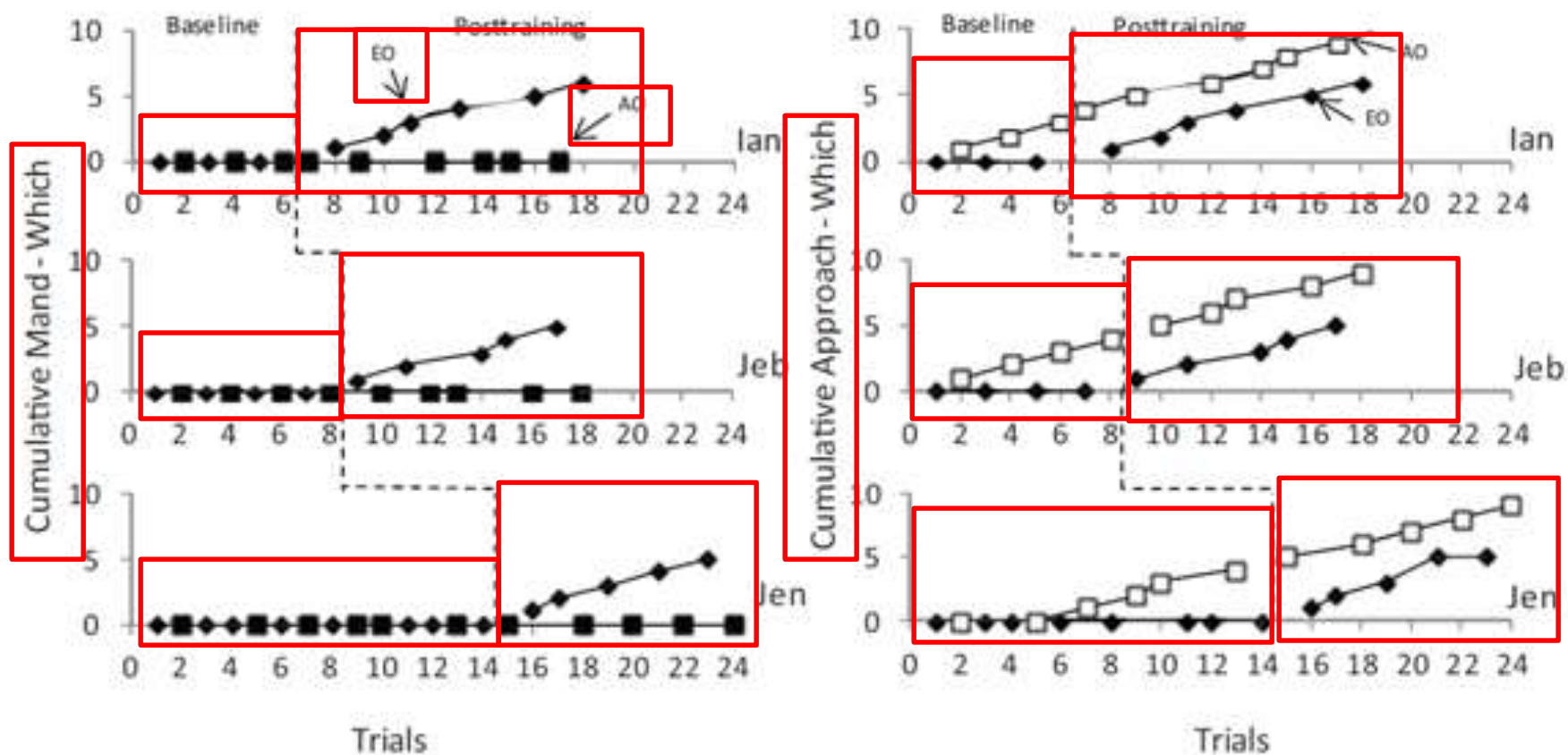
- All trials start with the child asking for something



Requesting Information—Who and Which

- All trials start with the child asking for something



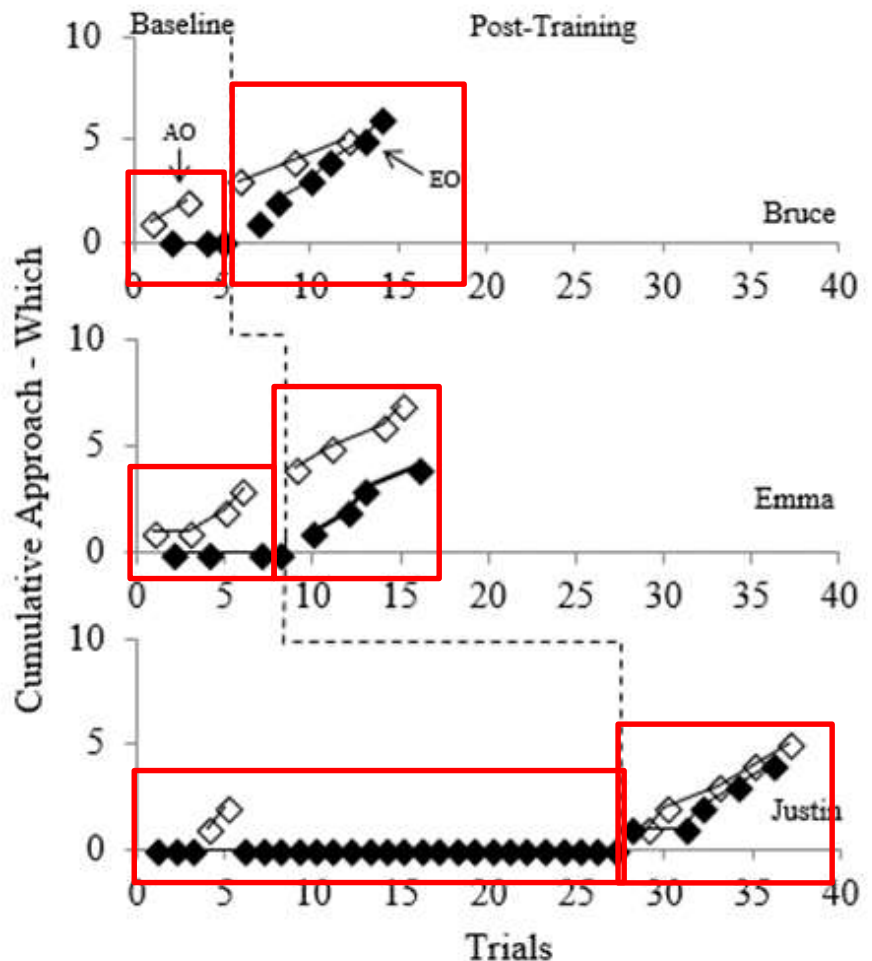
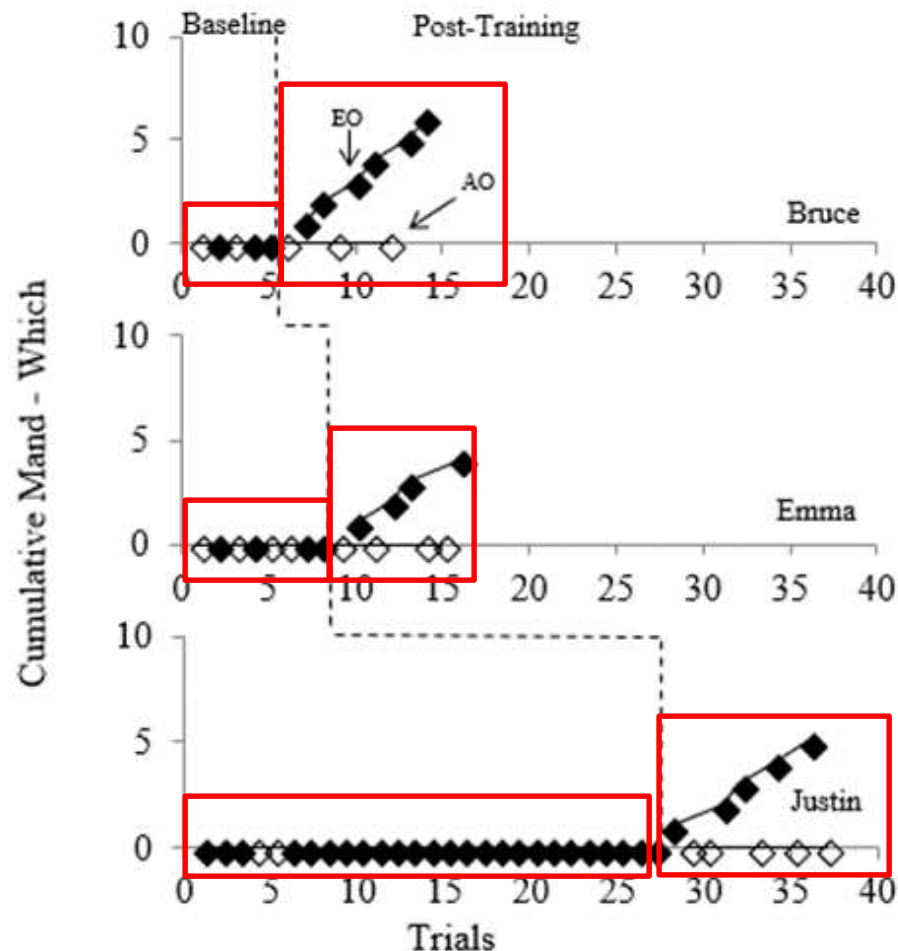


Requesting Information—AAC

- Augmentative & Alternative Communication (AAC) interventions are often considered for children who remain minimally verbal (Van der Meer & Rispoli, 2010)
- High tech devices are more accessible than ever



Shillingsburg, Marya, Bartlett & Thompson (in press) *JABA*



BRIEF REPORT

Mands for Information Using “How” Under EO-Absent and EO-Present Conditions

M. Alice Shillingsburg • Crystal N. Bowen •
Amber L. Valentino

Published online: 8 December 2013

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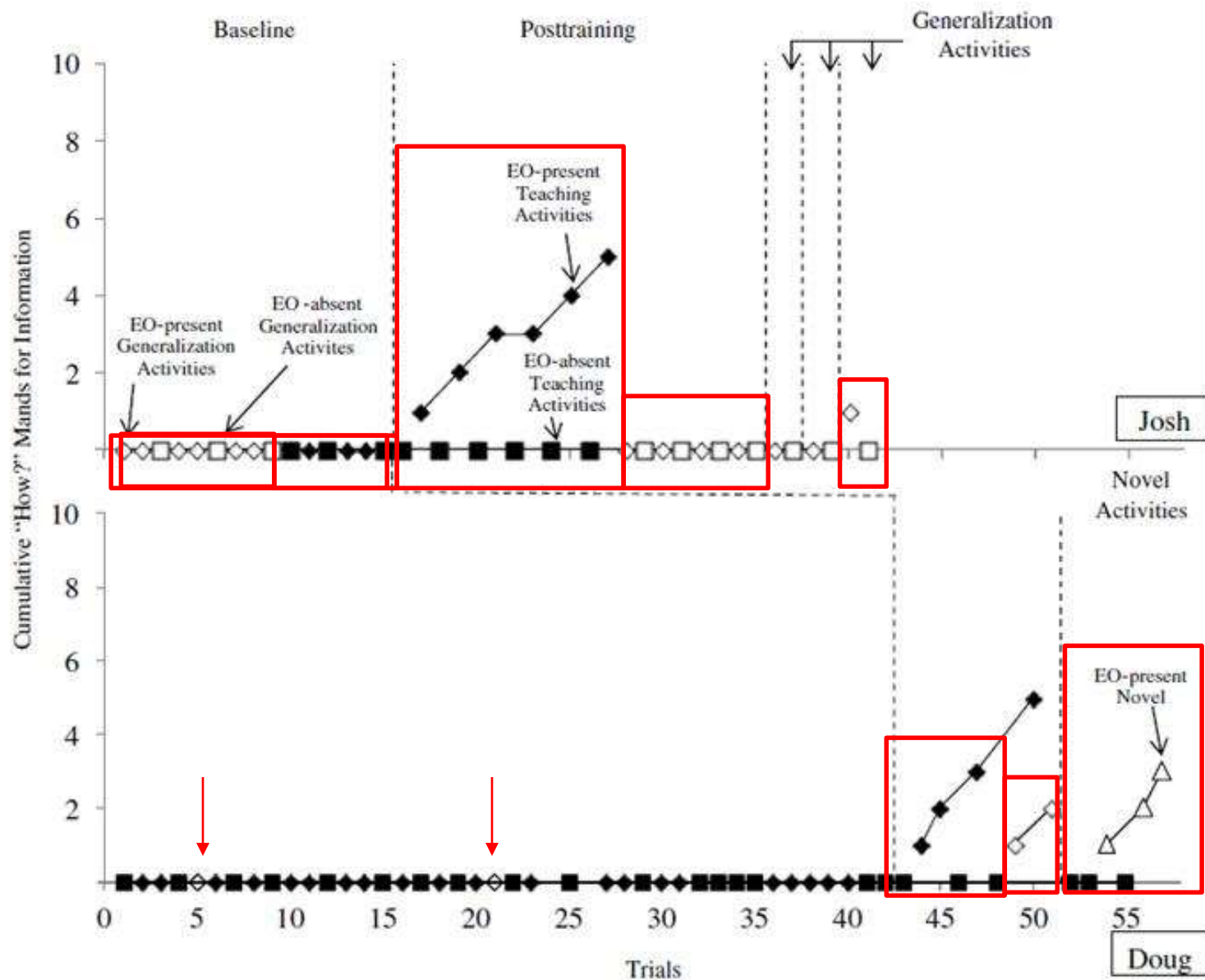
Abstract The present study replicates and extends previous research on teaching “How?” mands for information to children with autism. The experimental preparation involved mand training in the context of completing preferred activities and included training and testing un-

reinforcer for the mand and a discriminative stimulus (S^D) for subsequent behavior that leads to a terminal reinforcer. Less is known about teaching mands using “How?” Asking How? is a pivotal skill that can have a critical impact on learning if targeted in a clinical or

Requesting Information—How

- All trials start with the child asking for something
- EO Present (EOP) – Information regarding how to complete activity unknown (contriving a motivation for the information)
- EO Absent (EOA) – Information regarding how to complete activity is known(no motivation for information)
- Dependent Variables
 - Asking “how?” when EO is Present
 - Refraining from asking when EO is Absent





*TEACHING MANDS FOR INFORMATION USING ‘WHEN’
TO CHILDREN WITH AUTISM*

ROBIN K. LANDA

MARCUS AUTISM CENTER

BETHANY HANSEN

MARCUS AUTISM CENTER AND EMORY UNIVERSITY SCHOOL OF MEDICINE

AND

M. ALICE SHILLINGSBURG

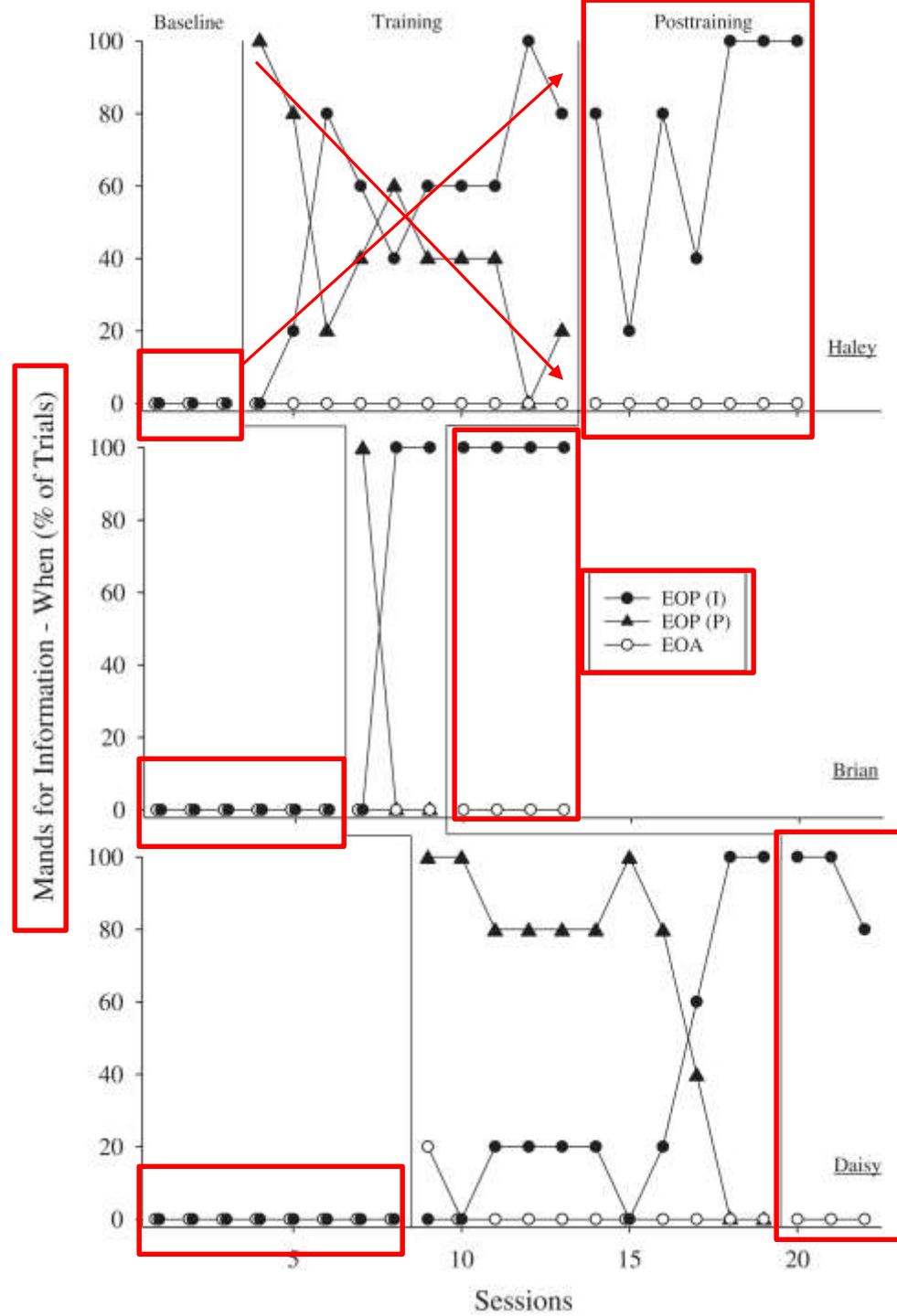
MARCUS AUTISM CENTER AND EMORY UNIVERSITY SCHOOL OF MEDICINE

Previous research has evaluated contrived motivating operations to teach mands for information. However, literature evaluating acquisition of the mand *when?* is comparatively limited. As an extension of Shillingsburg, Bowen, Valentino, & Pierce (2014), we taught three children with autism to engage in mands for information using *when* under alternating conditions in which a contrived establishing operation was present (EOP) or absent (EOA). Following training with a constant prompt delay, all participants acquired the mand for information and demonstrated correct use of the provided information and a decrease in inappropriate attempts to access restricted items.

Requesting Information - When?

- All trials start with the child asking for something
- EO Present (EOP) – Information regarding when a denied item will be available is withheld (contriving a motivation for the information)
- EO Absent (EOA) – Information regarding when a denied item will be available is already provided (no motivation for information)
- Dependent Variables
 - Asking “when?” when EO is Present
 - Refraining from asking when EO is Absent





BRIEF PRACTICE

A Preliminary Procedure for Teaching Children with Autism to Mand for Social Information

M. Alice Shillingsburg^{1,2} • Sarah E. Frampton¹ • Sarah C. Wymer¹ • Brittany Bartlett¹

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Abstract We used procedures established within the mands for information literature to teach two children with autism to mand for social information. Establishing operation trials were alternated with abolishing operation trials to verify the function of the responses as mands. Use of the acquired information was evaluated by examining responding to questions about their social partner. Both participants acquired mands

instructions (e.g., Swerdan & Rosales, 2015). Although successful, these approaches have focused on establishing discriminative stimuli for conversation rather than bringing question-asking under motivational control.

Skinner (1957, p. 39) classified questions as one form of mand, “which specifies verbal action” from the listener. This form of mand would be under control

Requesting Social Information



- EO Present (EOP) – Information about another person is unknown and inaccessible (contriving a motivation for the information)
- EO Absent (EOA) – Information about another person is known or accessible (no motivation for information)
- Dependent Variables
 - Asking for personal/social information when EO is Present
 - Refraining from asking when EO is Absent

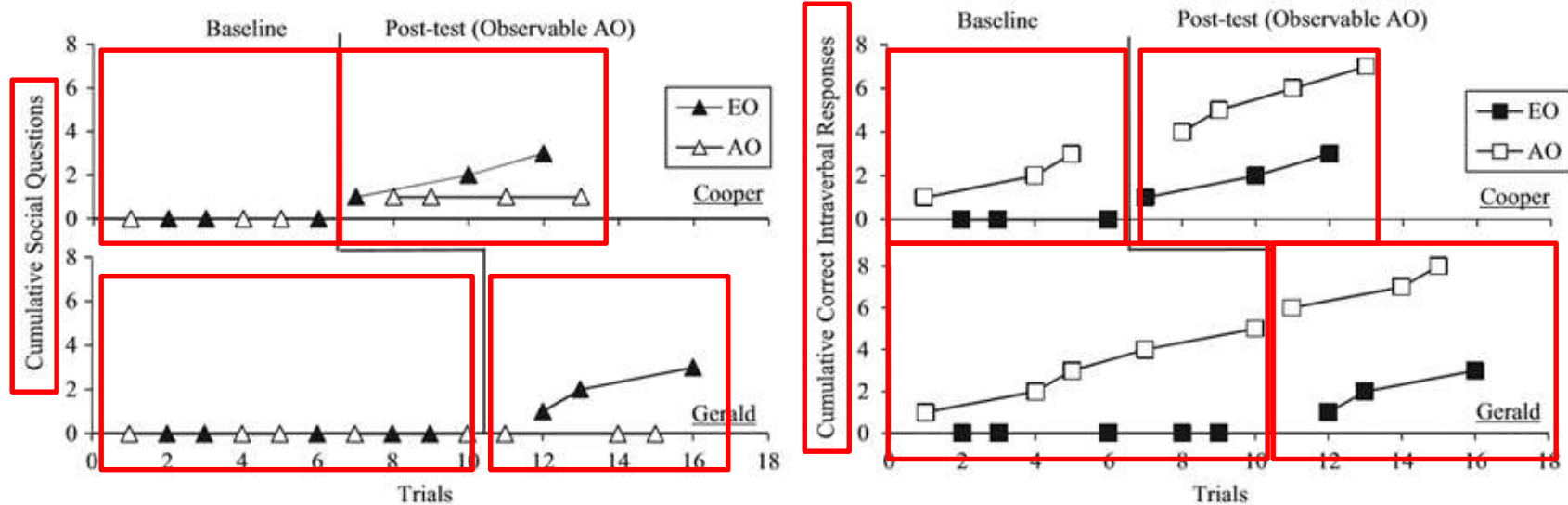


Fig. 1 Cumulative number of social questions with SP1 and correct intraverbals across conditions

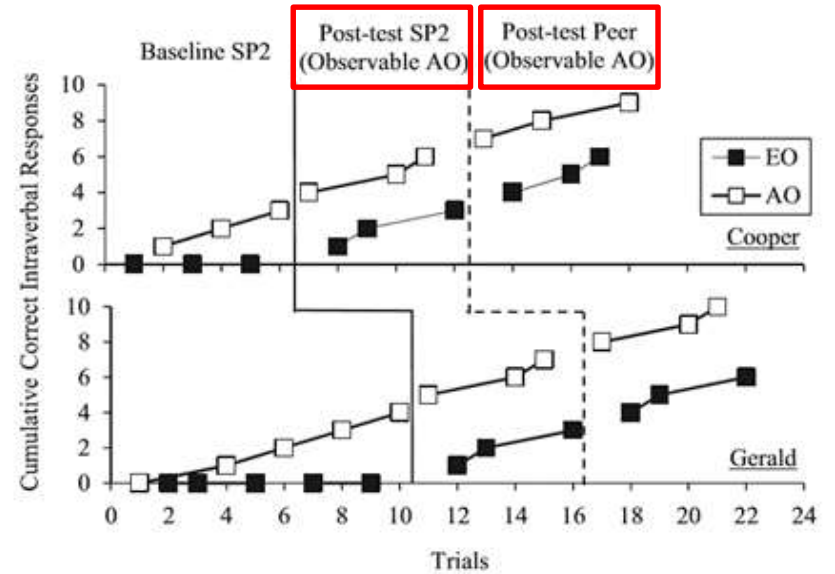
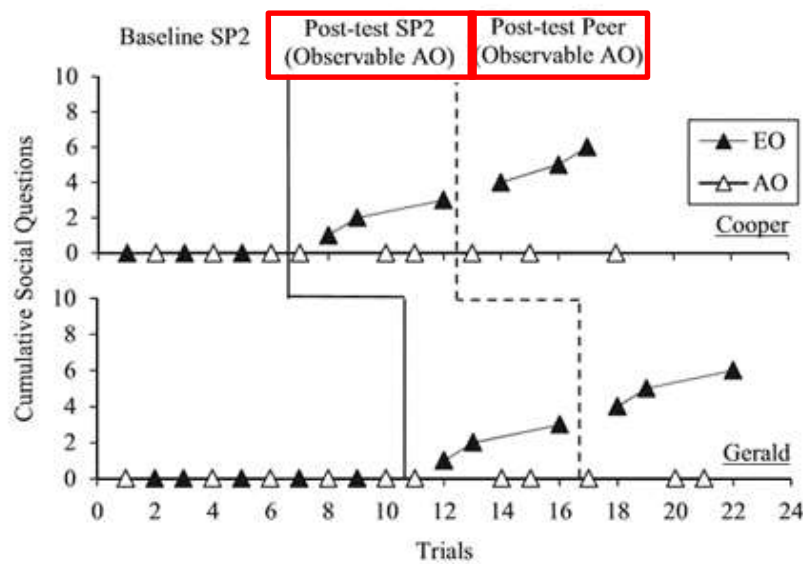


Fig. 2 Cumulative number of social questions with SP2 and a peer and correct intraverbals across conditions

Parental Intervention Priority

Answering Questions
Describing Events



Reporting Past Behavior

- Children are expected to report past behavior
 - Did you finish your homework?
 - Who did you see at school today?
- Common caregiver concern

Development of Reporting Past Behavior

- Self-tacting
 - “...current stimuli, including events within the speaker himself **generated by the question**, in combination with a history of earlier conditioning” (Skinner, 1957, pg. 143)
- Intraverbal control (Palmer, 2016)



Development of Reporting Past Behavior

- Verbal community arranges reinforcement contingencies and provides clarifying information
 - Who did you see at school today?
 - Was Jessica there?
- This is how reporting past behavior is shaped in typical development

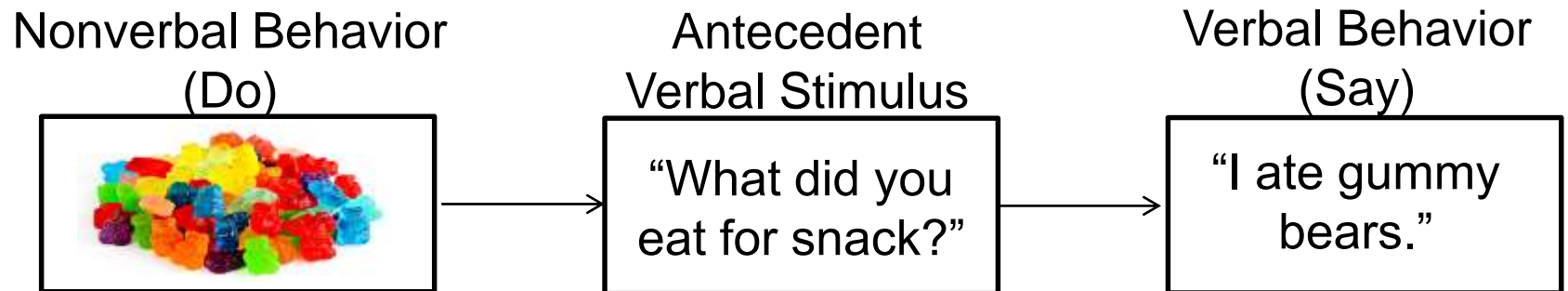
Reporting Past Behavior

- Deficits in accurate reporting
 - Errors in stimulus control (Skinner, 1957; White, 1985)
 - Failure of relevant stimuli to evoke response or insufficient reinforcement history
 - Social interaction may not function as a reinforcer for children with ASD (Call et al., 2013)

Correspondence

- Nonverbal and verbal behavior

Do/say correspondence = accurately reporting past behavior



Reporting Past Behavior

- Vocal Responding-Echoic prompts and prompt fading (Shillingsburg, Cariveau, Talmadge, & Frampton, 2017)
- Speech generating devices (SGD)-Replication under review (Shillingsburg, Marya, Bartlett, Thompson, Walters)

Participants

- Three non-vocal children with ASD
- All used device to mand, tact, and intraverbally respond

Participant	Sex	Age	Device response topography
Erica	Female	7y	Picture and text selection
Josh	Male	6y	Typing or text selection
Ben	Male	3y	Text selection

Response Measurement

- Correct response: providing the name of activity when asked what was done in a specific location via picture selection, text selection, or typing on his or her device

Response Selection

- Navigation
- Array size
- Text when possible



Procedures

- Pre-teaching
 - Taught tacts for activities and locations
- Order of locations and activity completed at each location varied quasi-randomly



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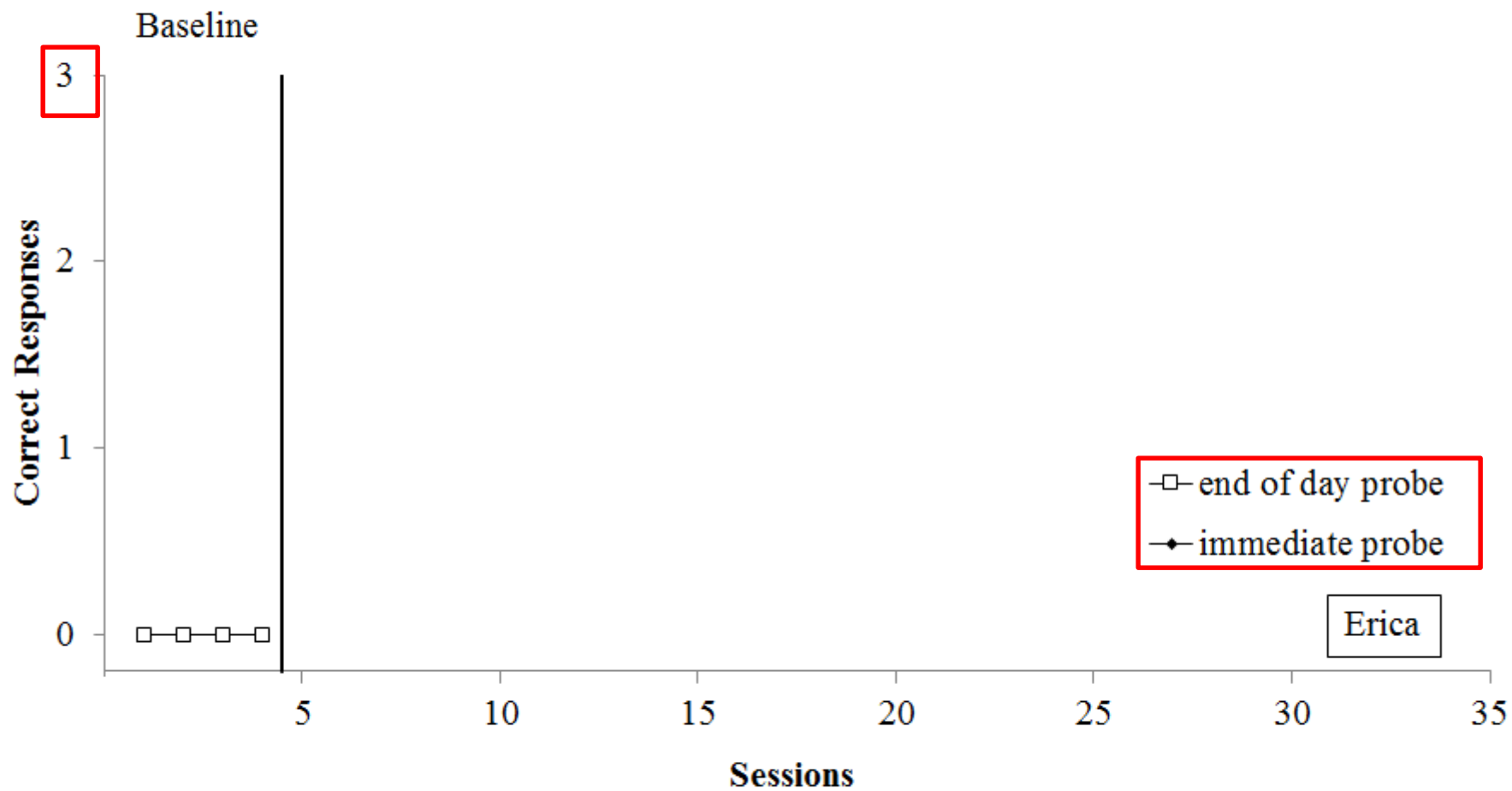
Baseline

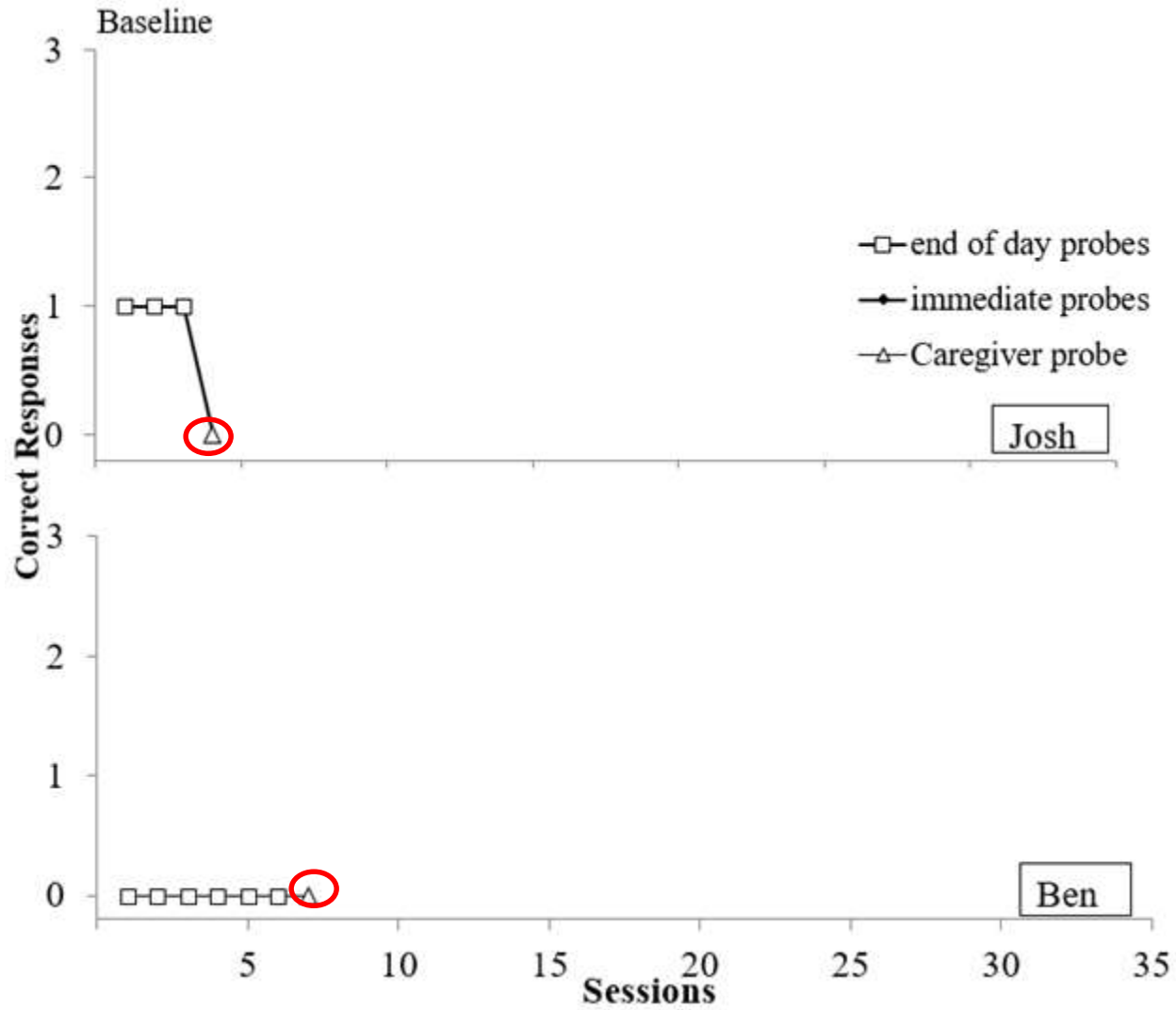


“What did you
do in _____?”

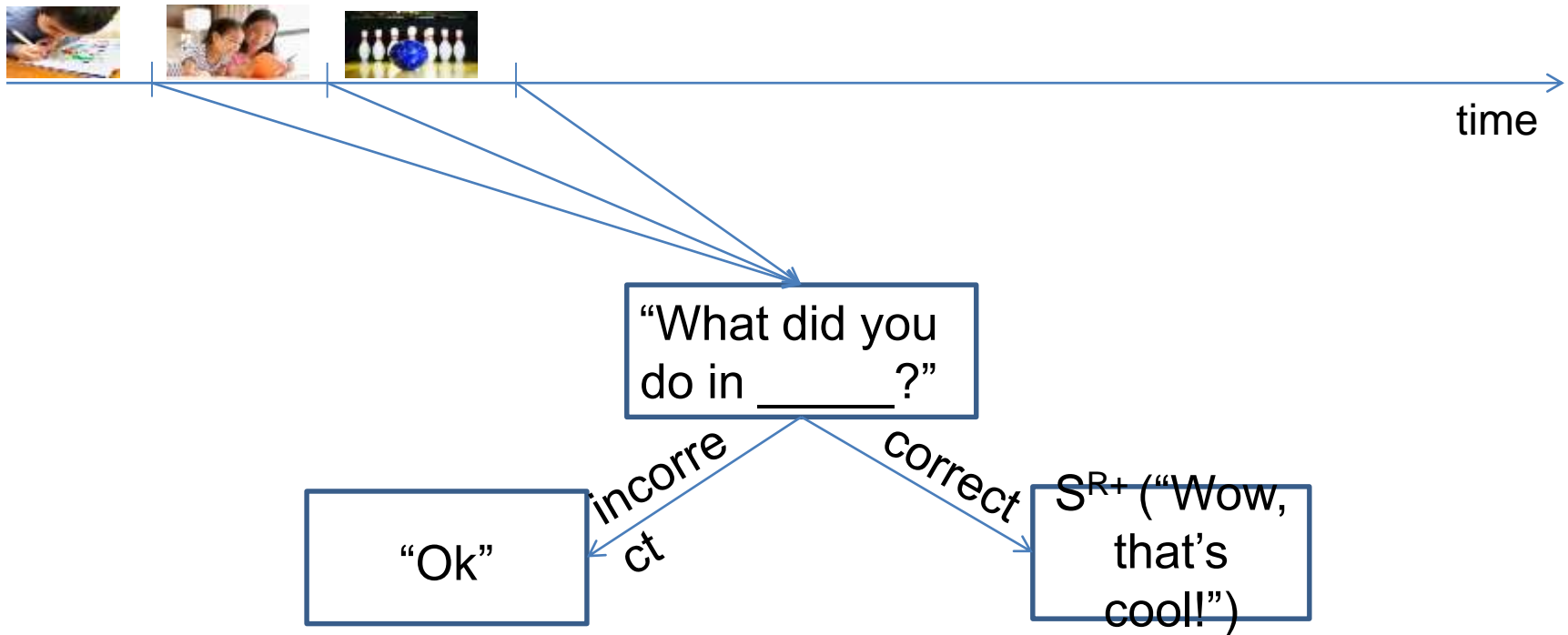
“What did you
do in _____?”

“What did you
do in _____?”





Immediate Probe



Immediate Probe



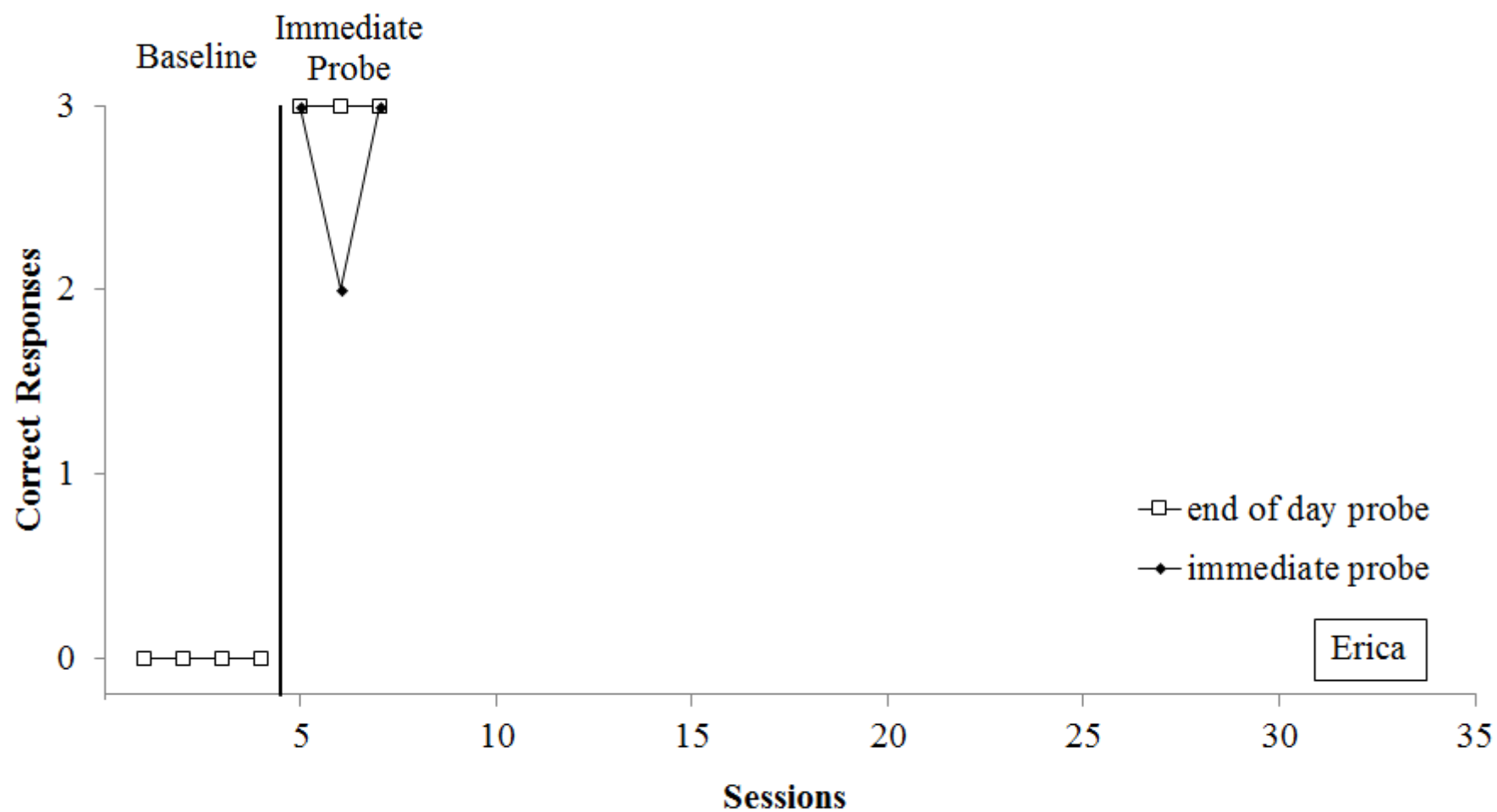
1.5 hour delay

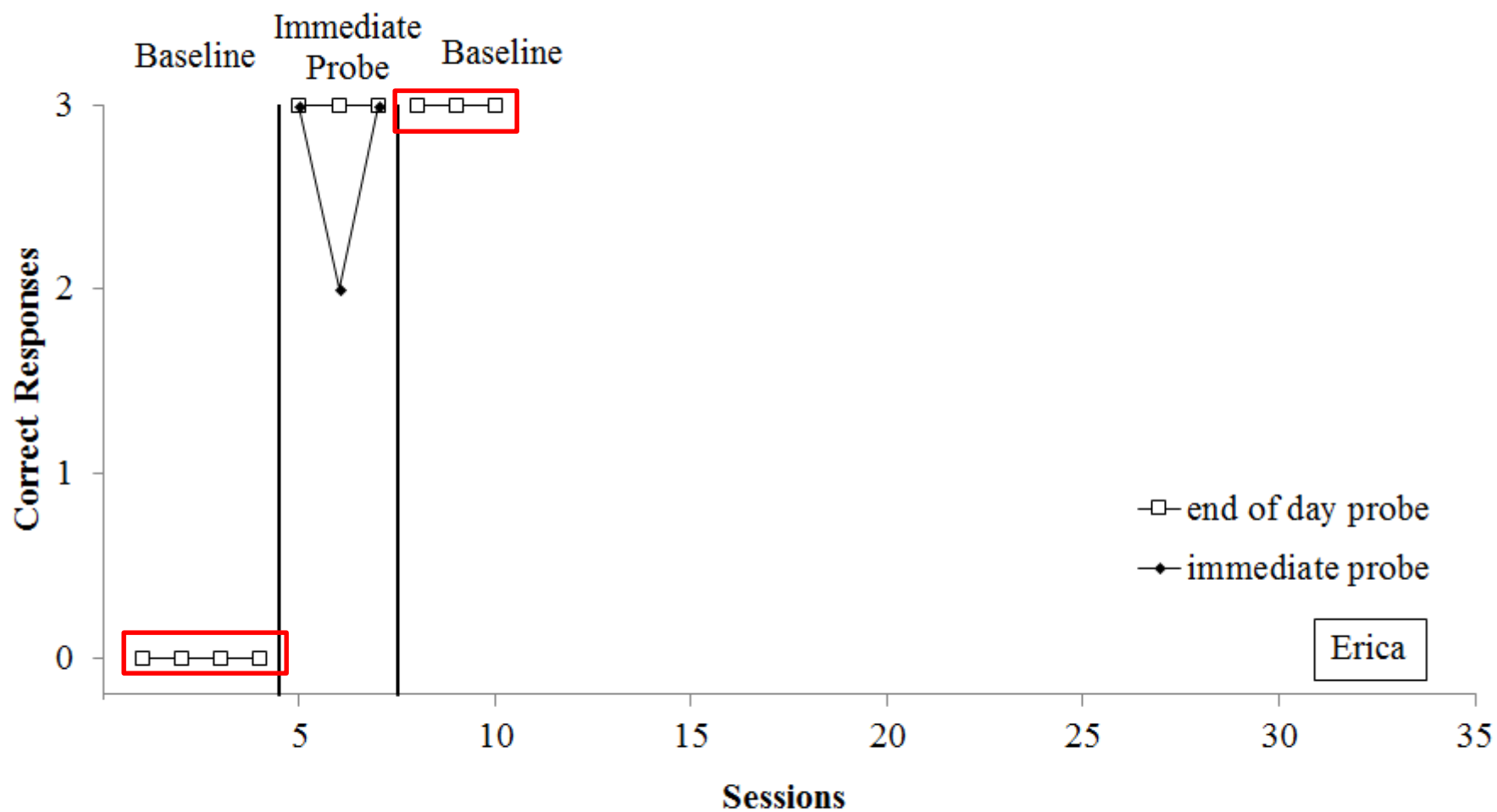
time

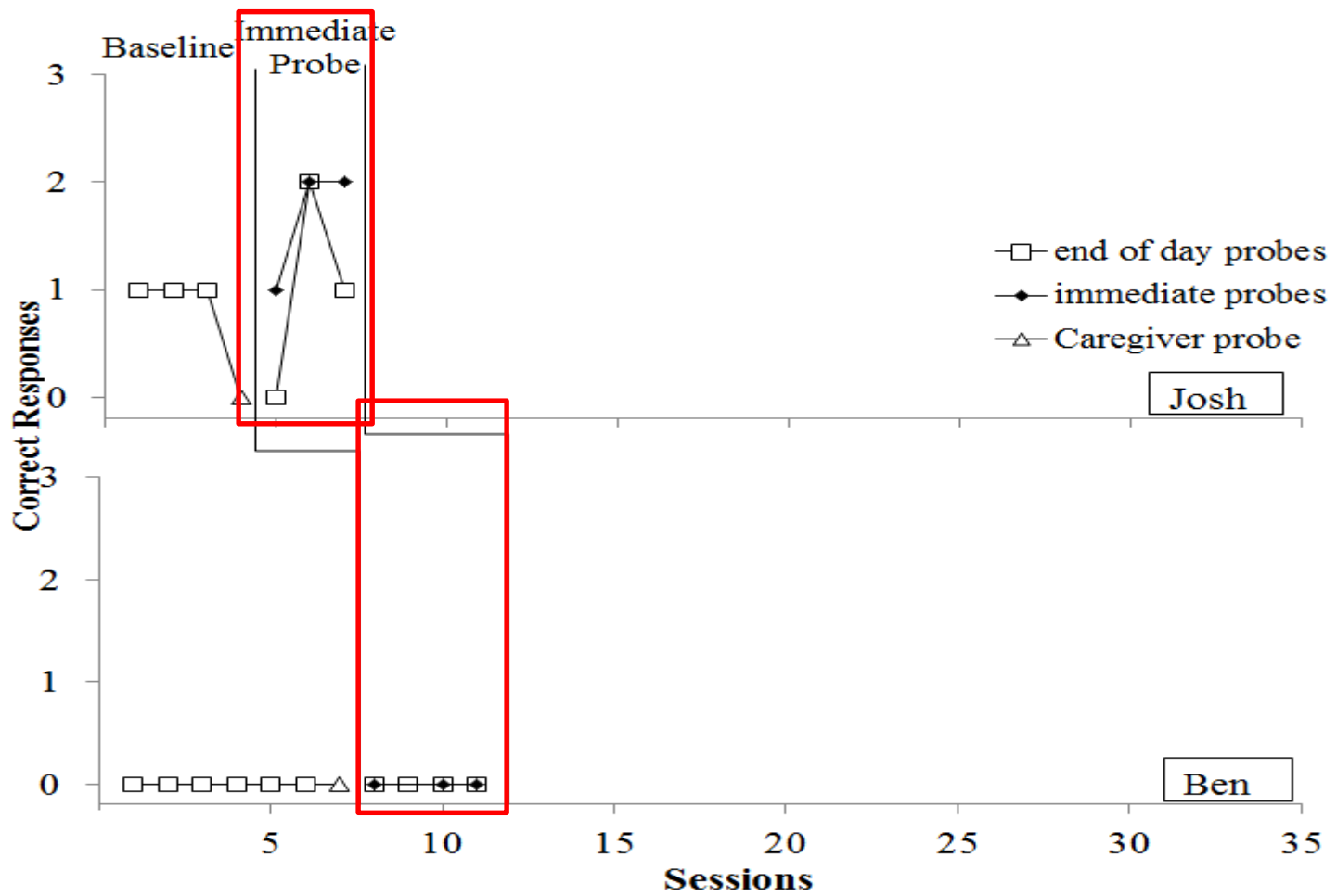
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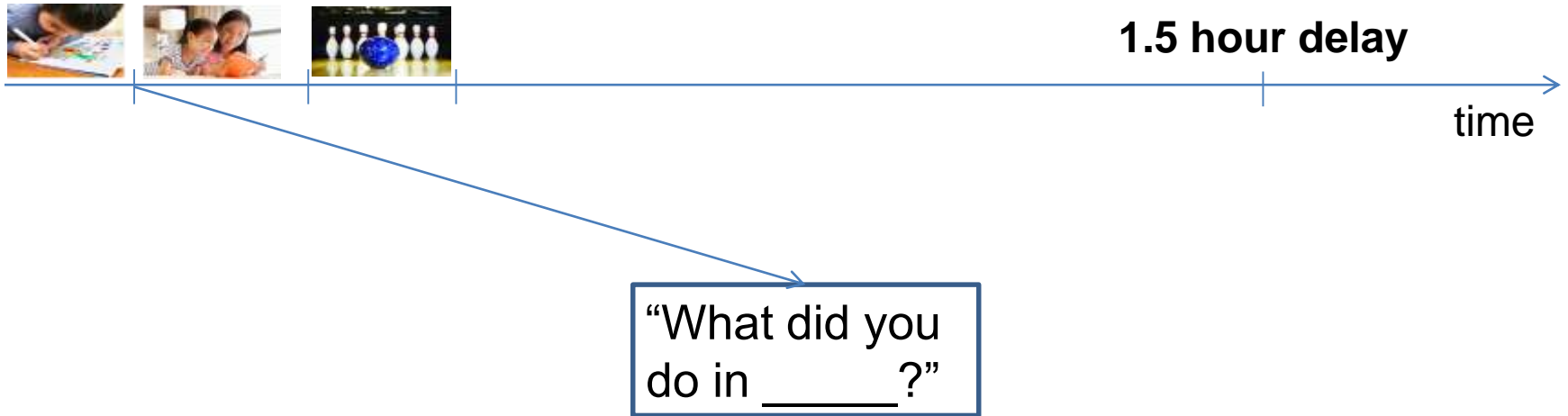
“What did you
do in _____?”



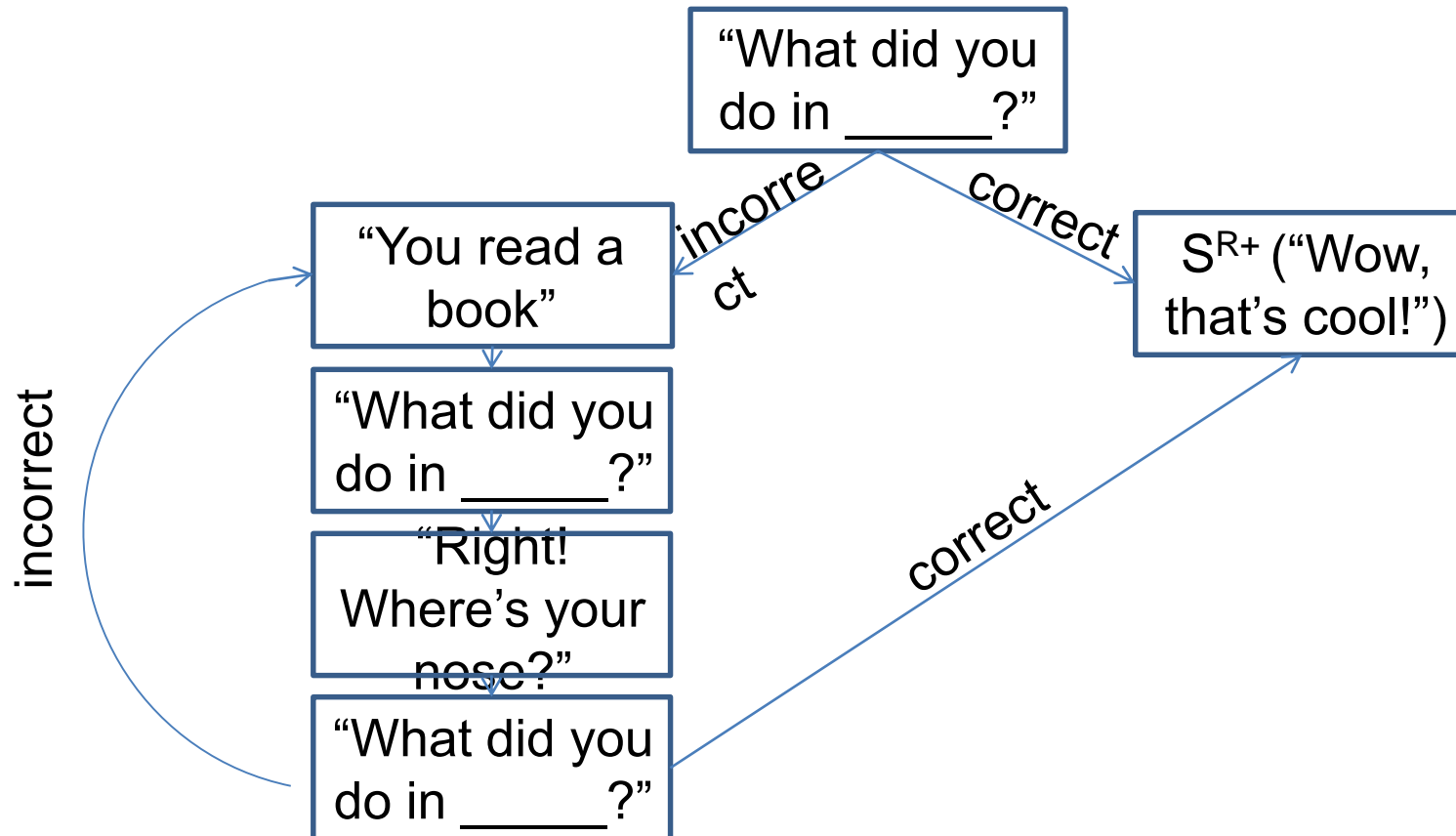


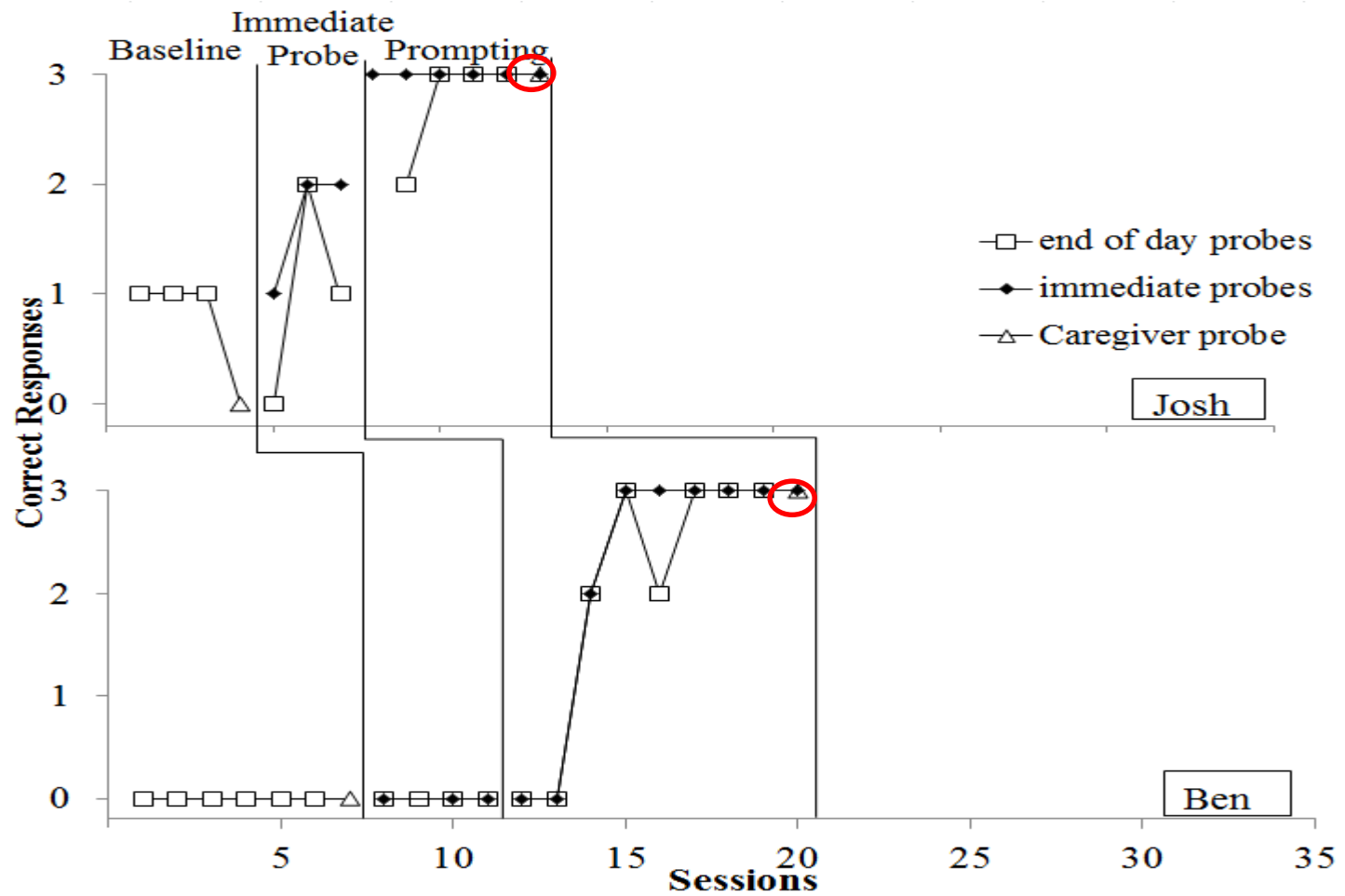


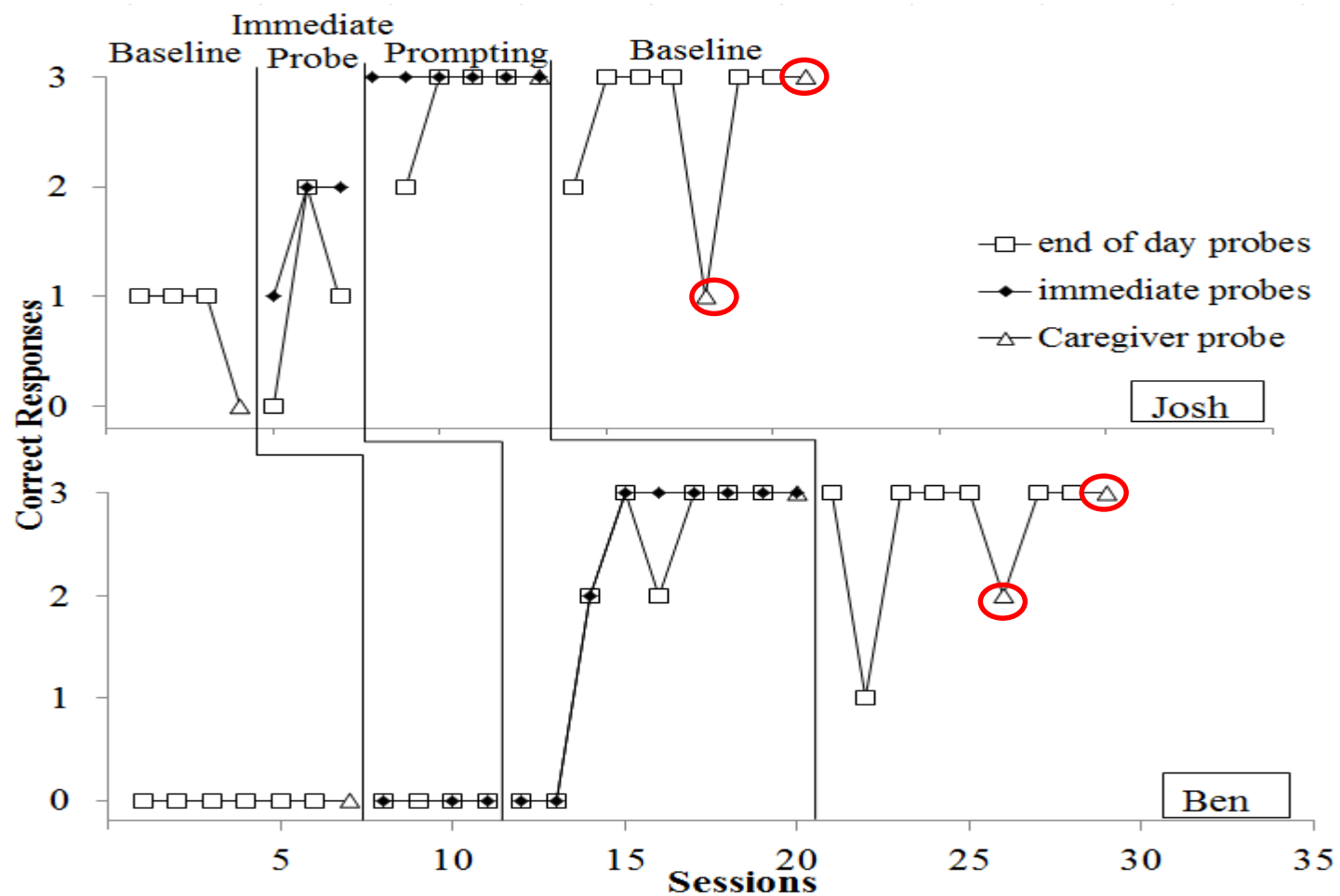
Prompting



Prompting







Results

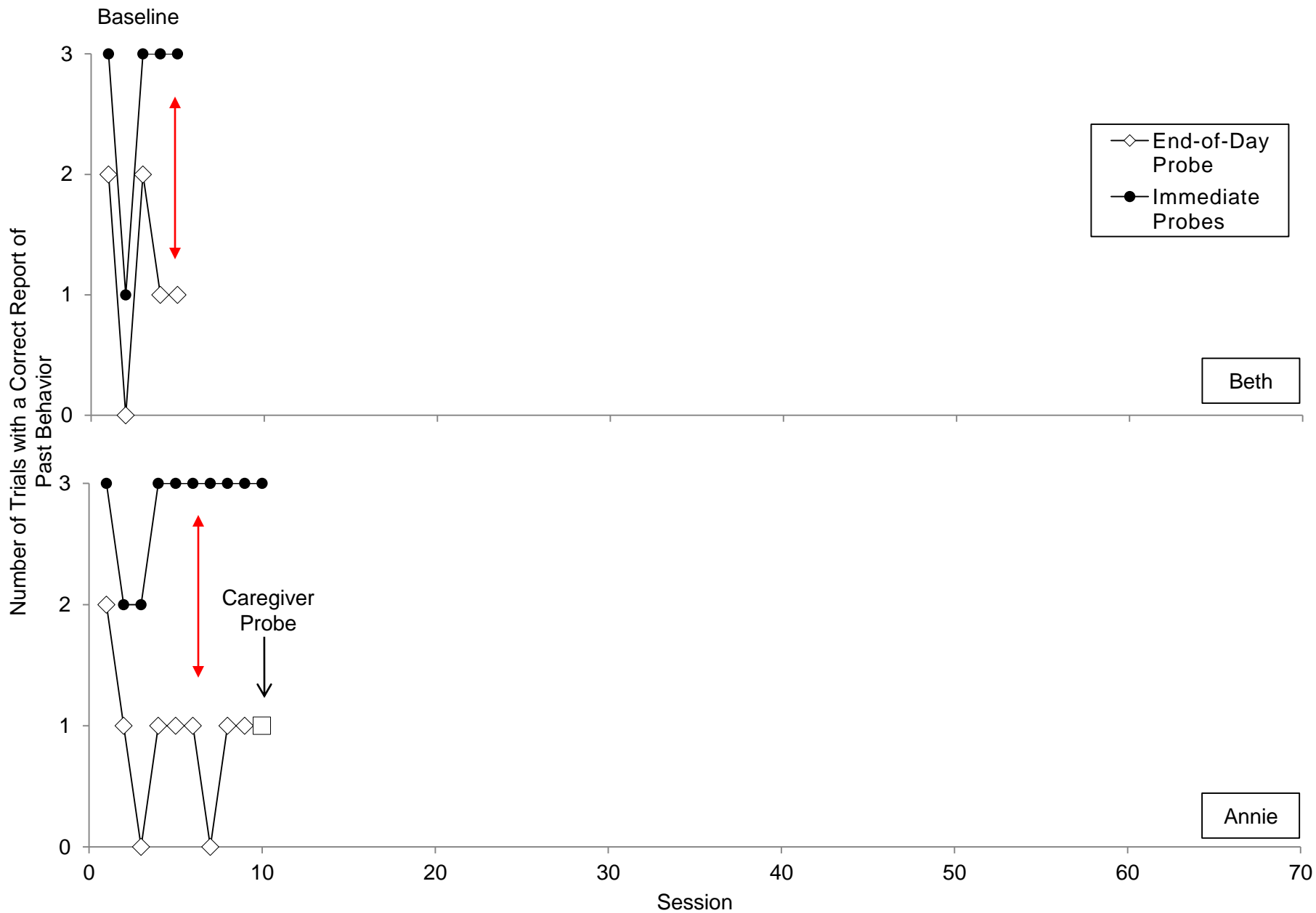
- All participants improved the accuracy of reported past behavior at the end-of-day
 - One participant (Erica) reported accurately following only introduction of immediate probe
 - Two participants, needed prompts to report immediately
 - Once reporting immediately, 100% at end-of-day
- Correct reporting generalized to caregivers

Discussion

- Intervention easy to incorporate in daily activities
- Begin by asking immediately after activities
- Add in prompts and reinforce correct response immediately after completion; don't wait until the end of the day

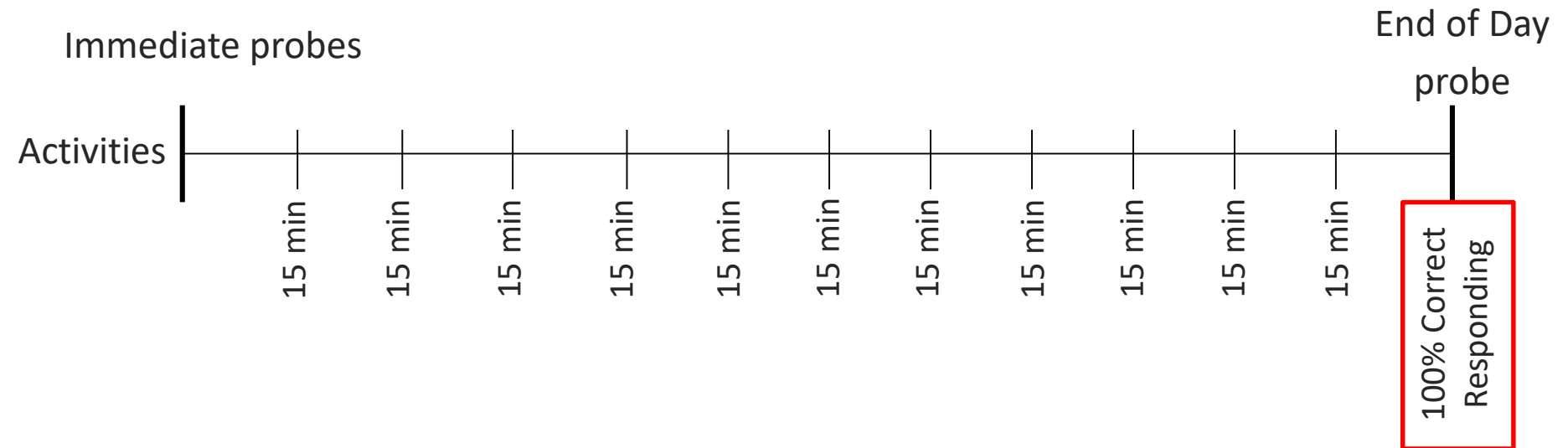
Reporting Past Behavior – Vocal Responses

- Participants
 - Beth, 5 year old female, ASD, emerging level 3 learner
 - Annie, 5 year old female, ASD, level 2 learner



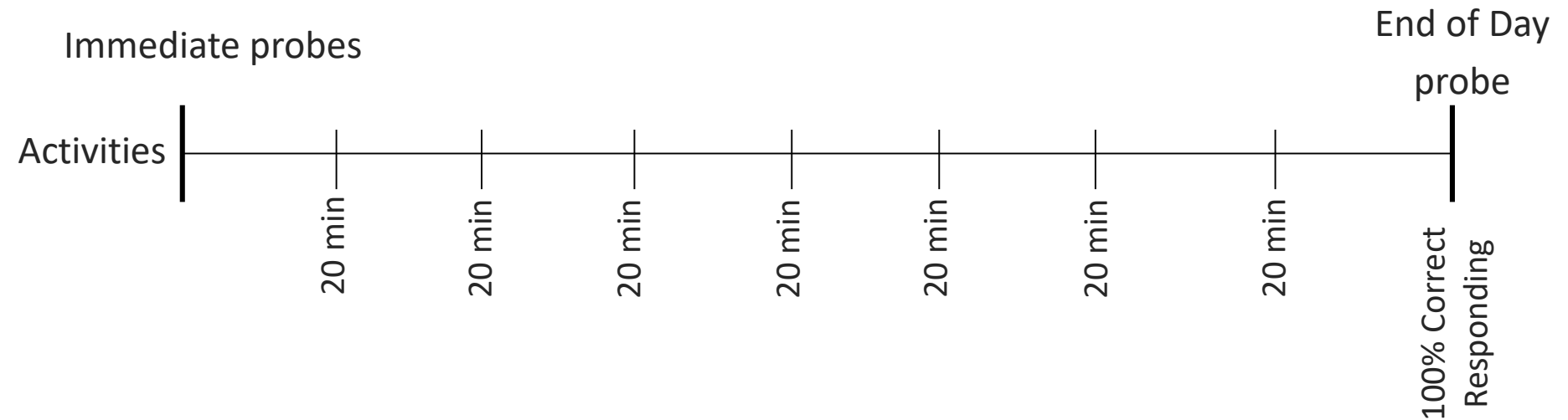
Method

Error Correction and Delay Fading



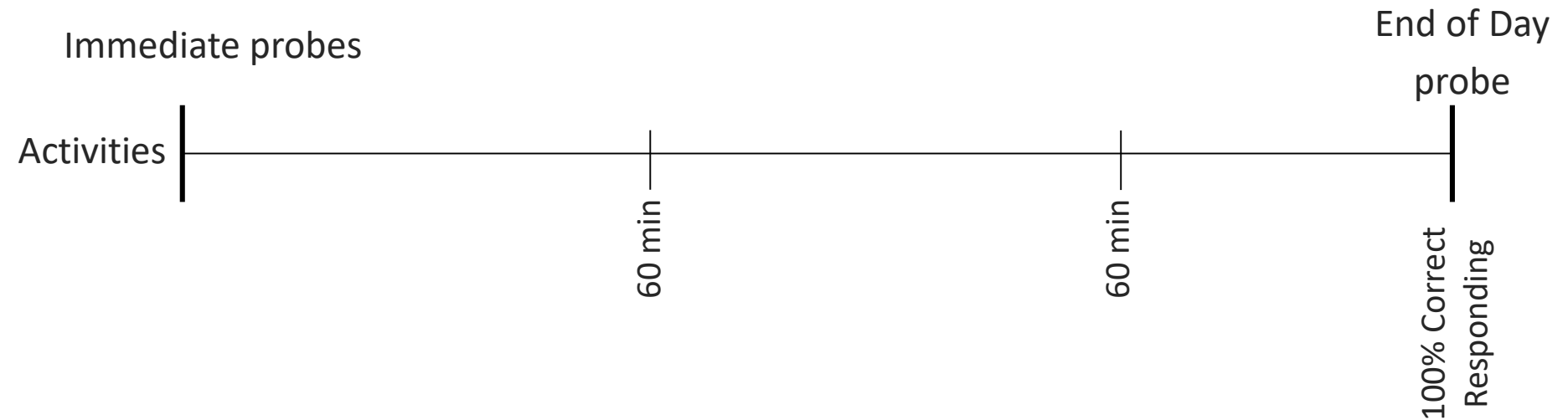
Method

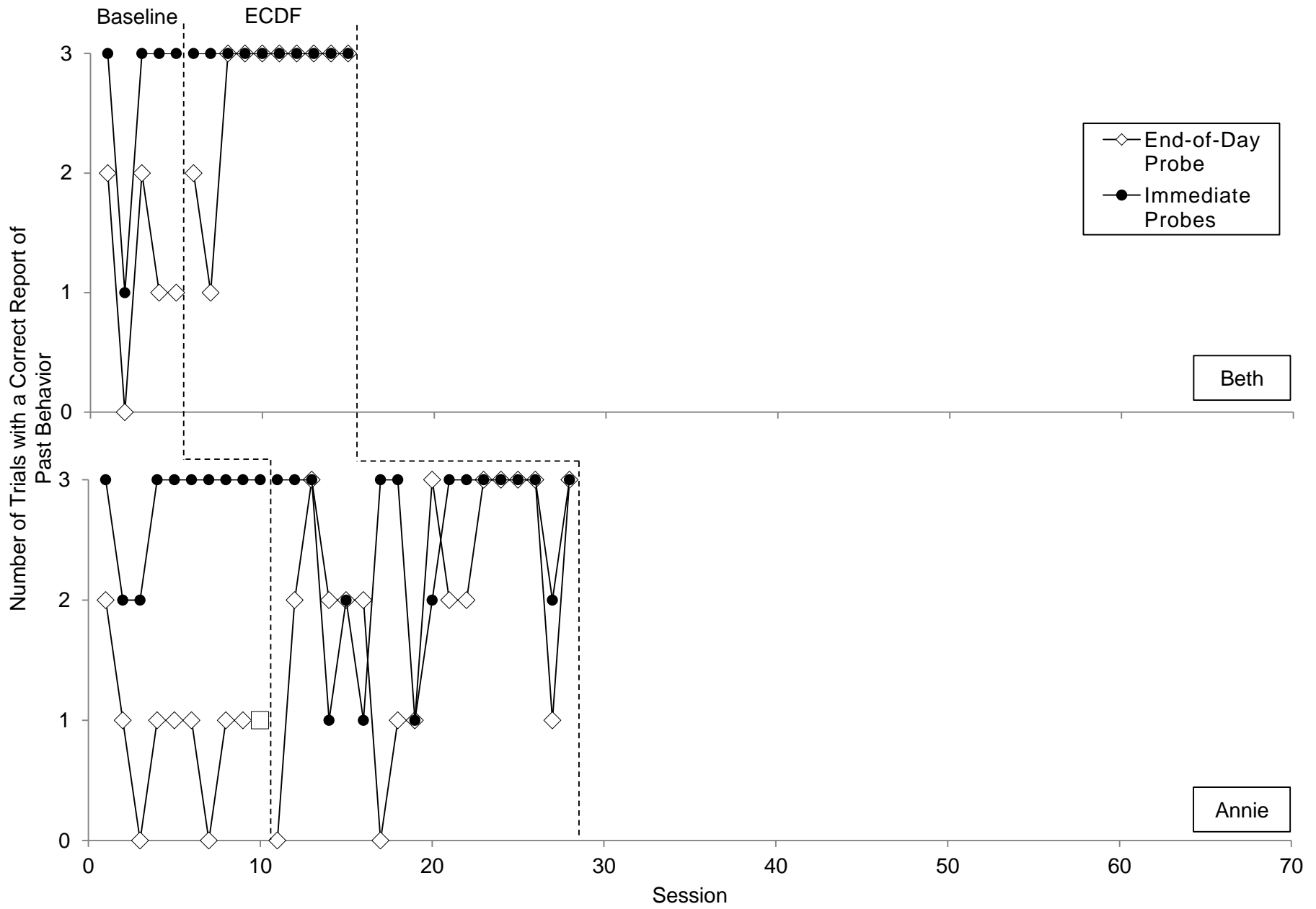
Error Correction and Delay Fading

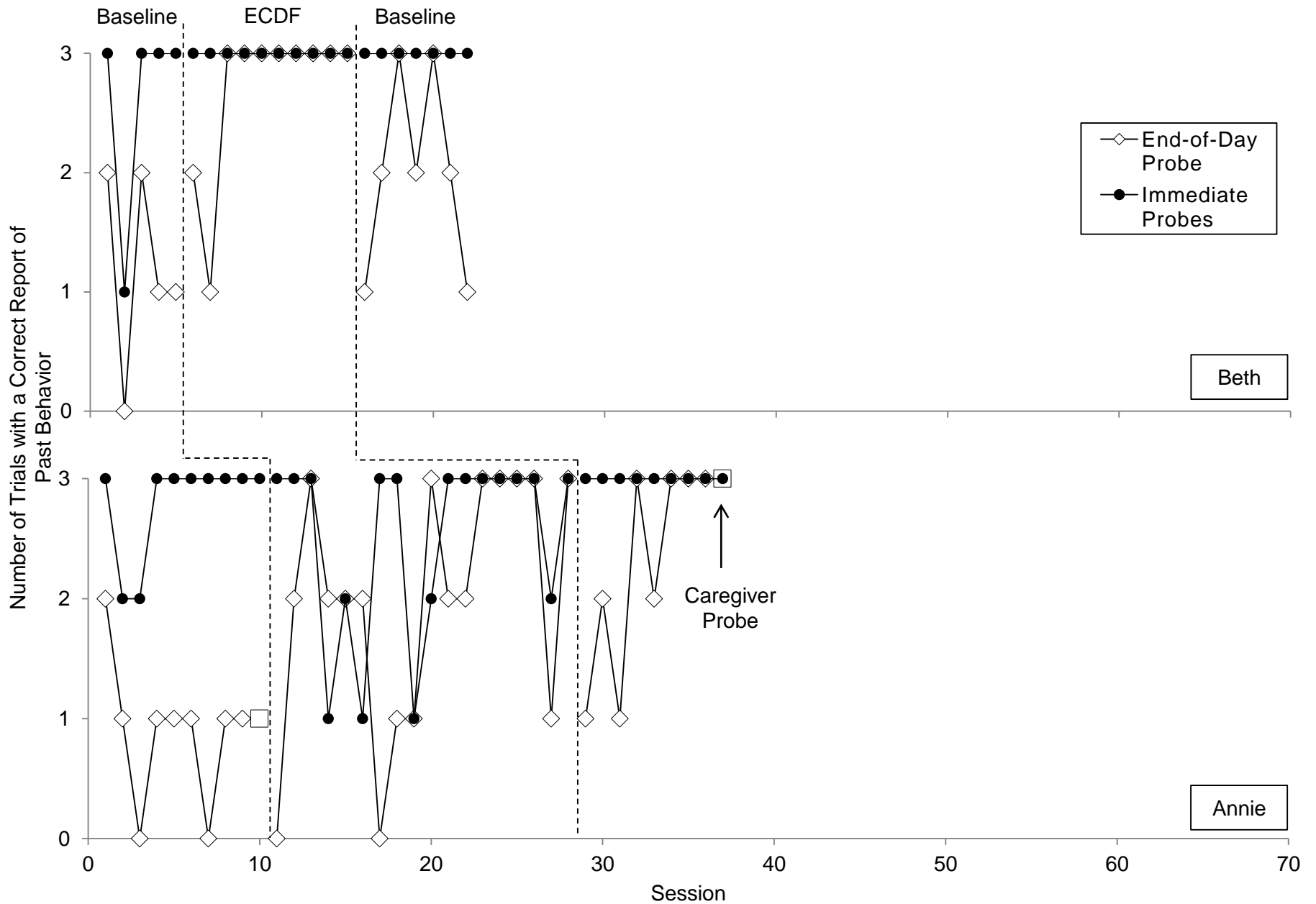


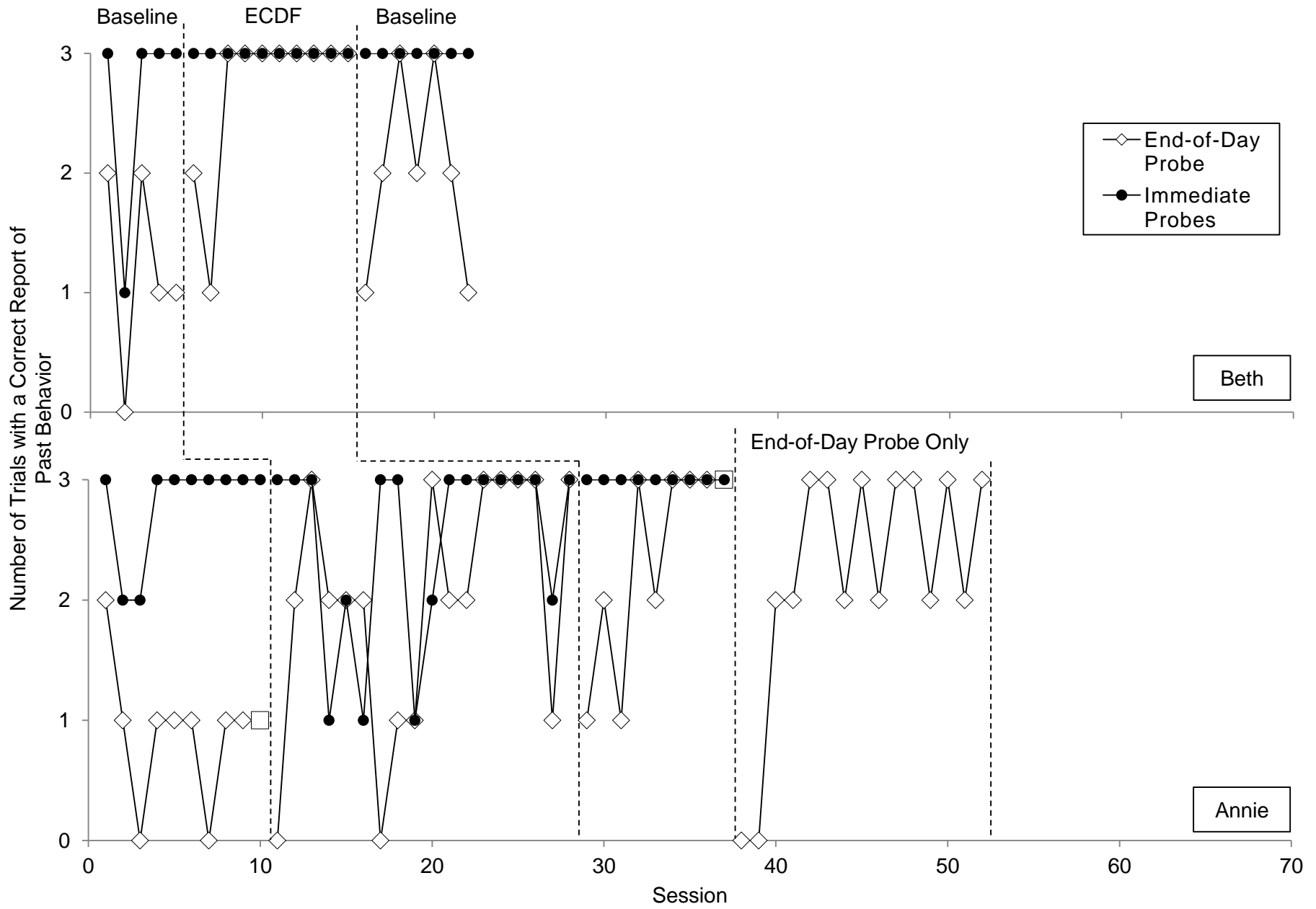
Method

Error Correction and Delay Fading









Method

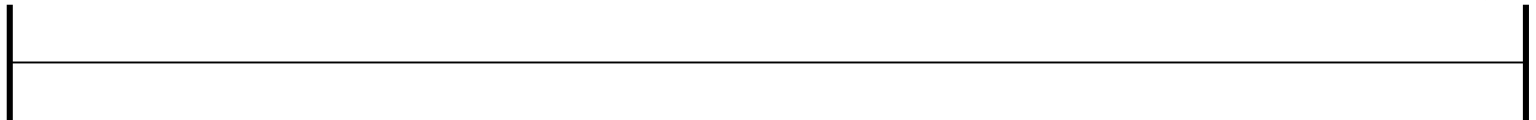
Fading Procedures

Immediate Probe Fading

Immediate probes

End of Day
probe

Activities



Method

Fading Procedures

Immediate Probe Fading

Immediate probes

End of Day
probe

Activities

5 min

100% Correct
Responding

Method

Fading Procedures

Immediate Probe Fading

Immediate probes

End of Day
probe

Activities

10 min

100% Correct
Responding

Method

Fading Procedures

Immediate Probe Fading



Method

Fading Procedures

Immediate Probe Fading

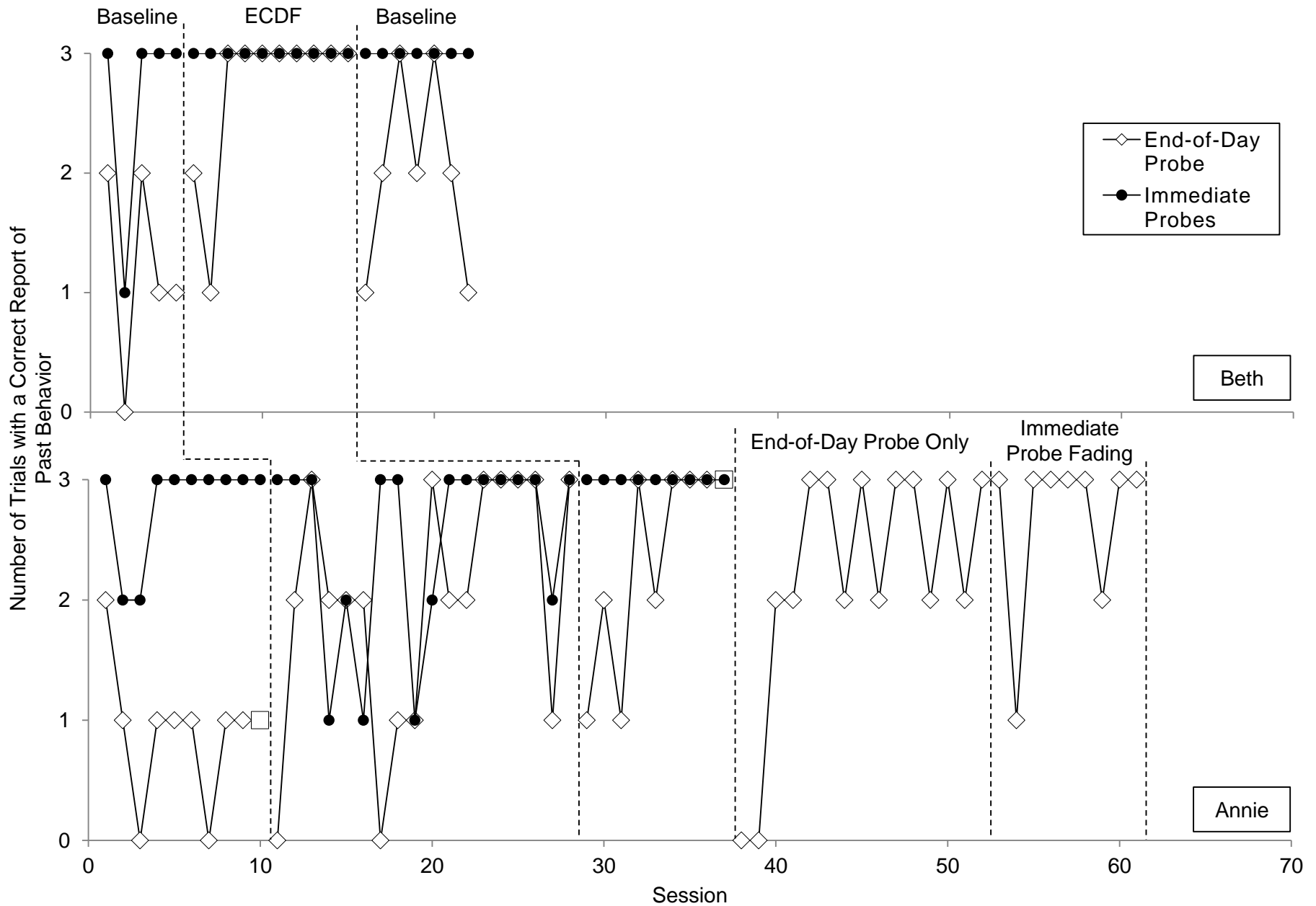
Immediate probes

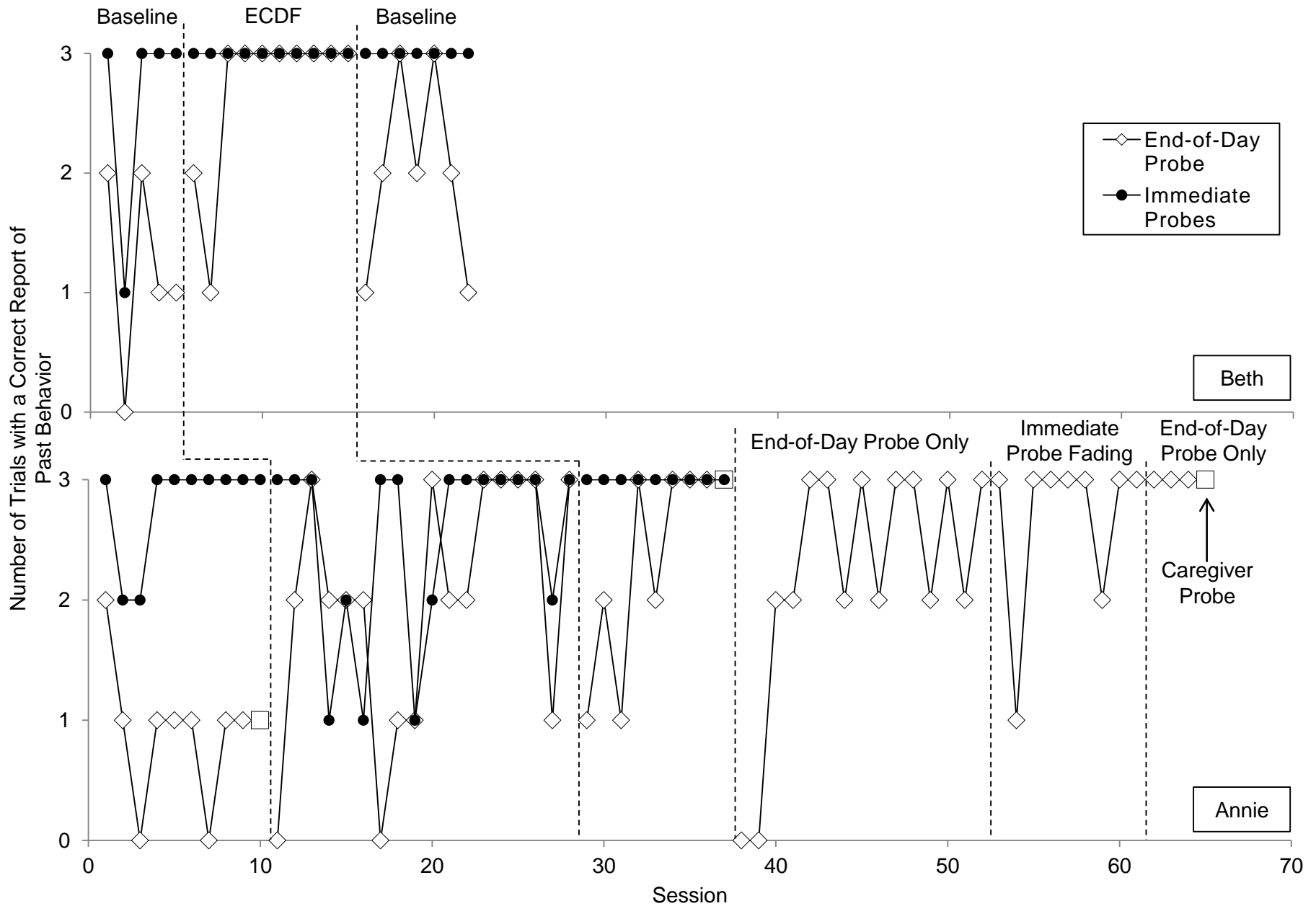
End of Day
probe

Activities

60 min

100% Correct
Responding

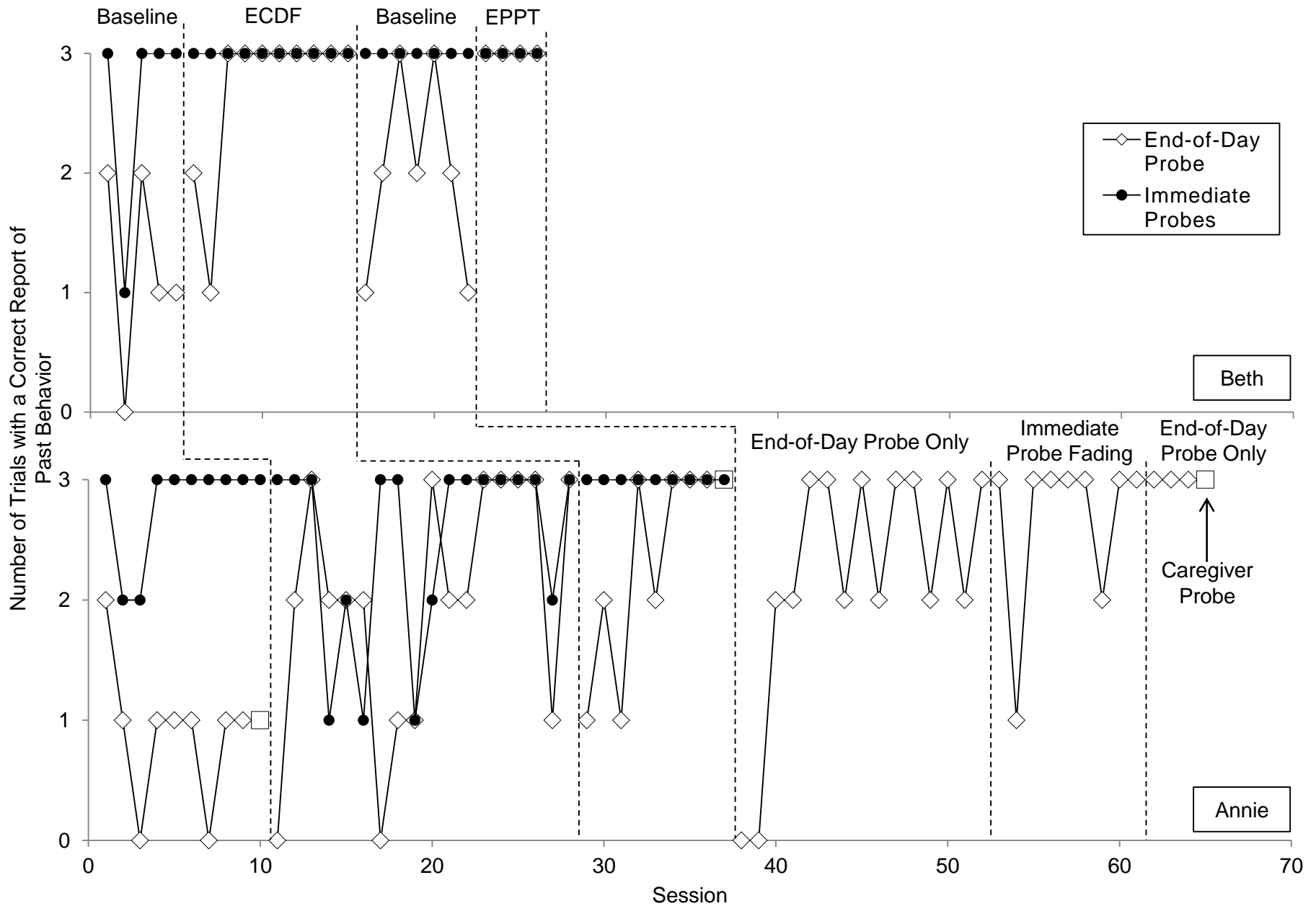


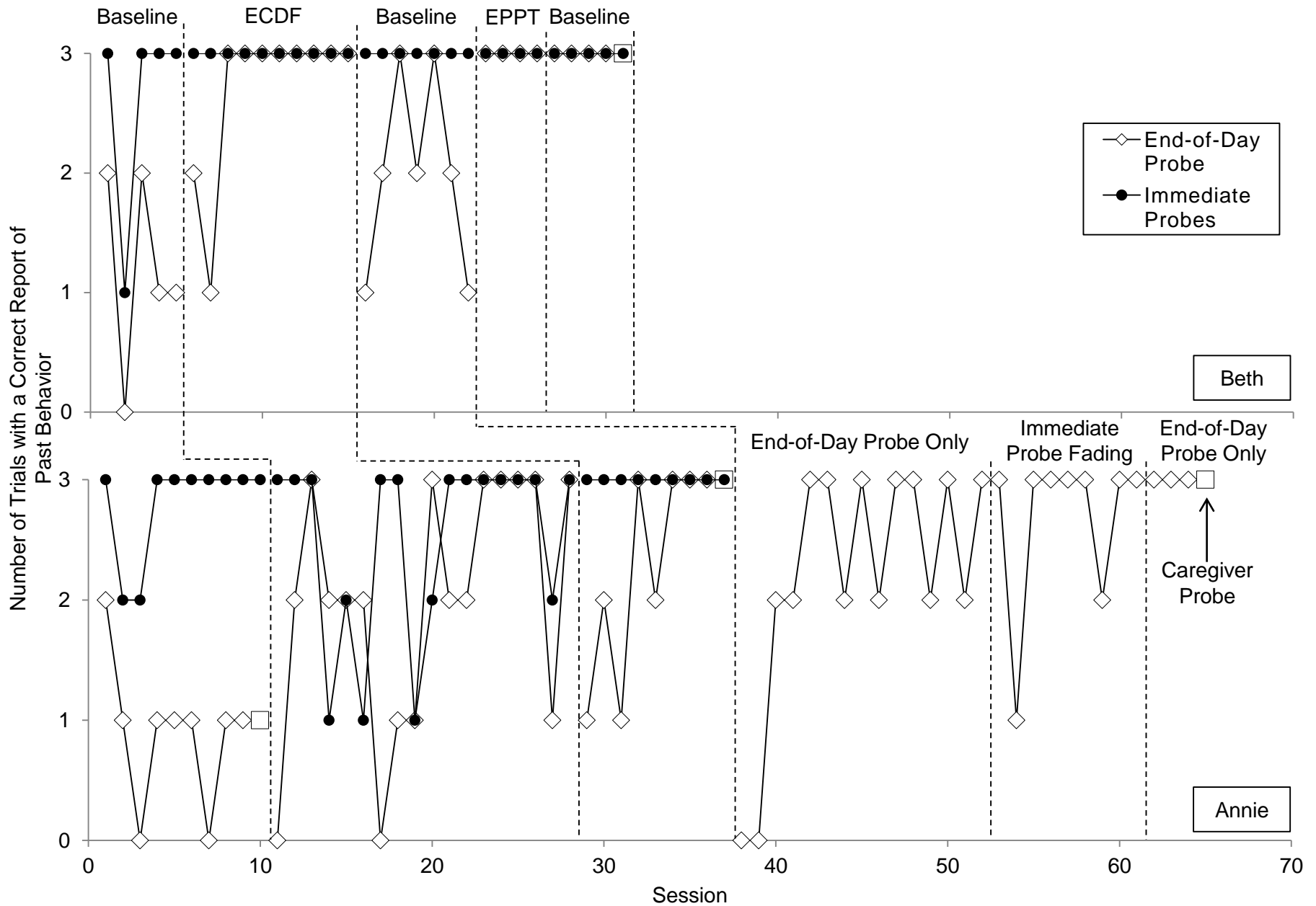


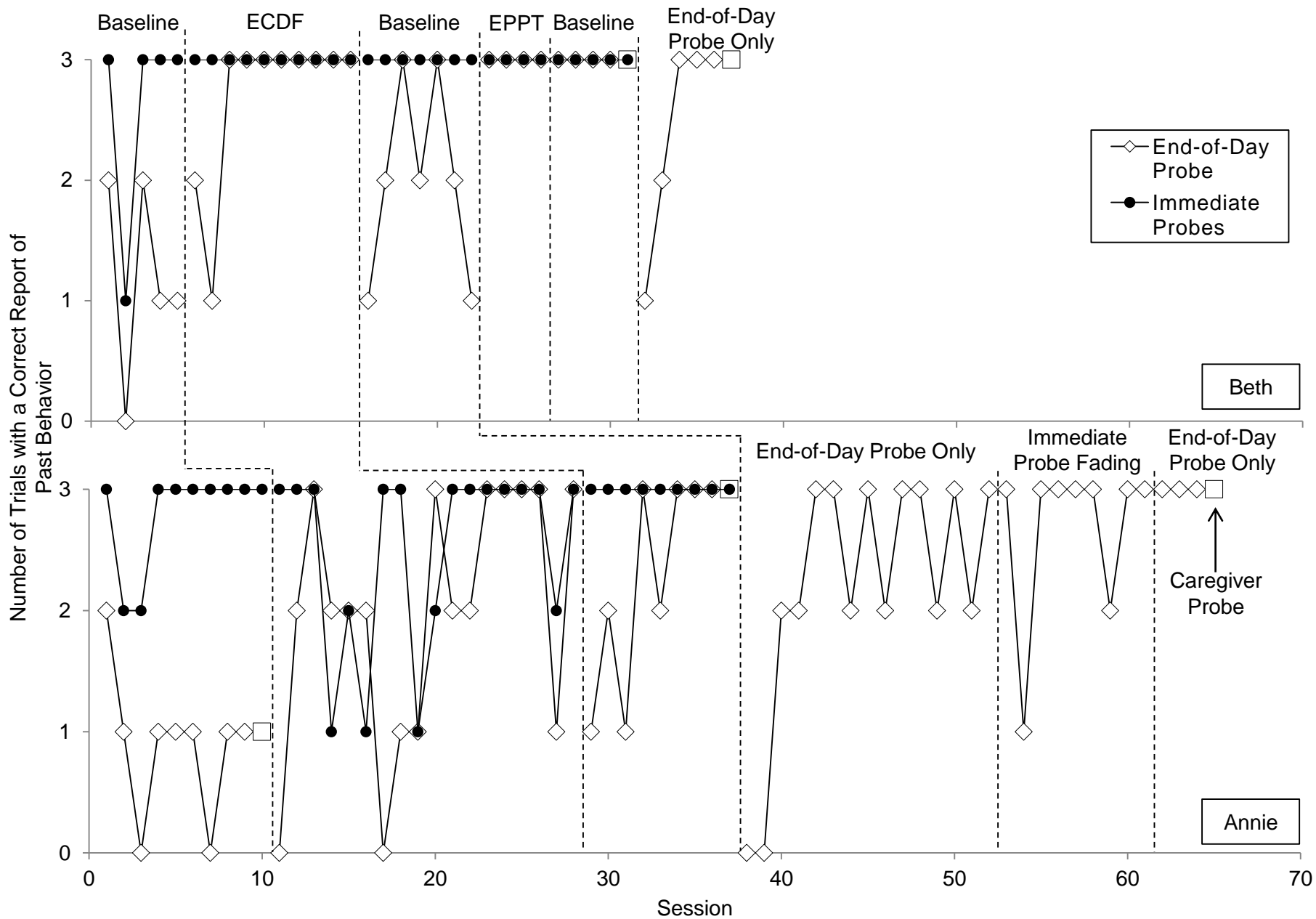
Method

End of Day Probe Practice Trial









Discussion

- Preliminary results
- Additional Replications
- Rehearsal and practice trials were effective strategies

Discussion

- Generalization across novel activities or settings
- Antecedents that may influence responding in children with ASD
 - Complexity of question
- Not clear if accuracy would maintain following greater delays

Parental Intervention Priority

Seeking Out Interactions with Others

Recruiting Attention
Showing and Sharing



Showing and Sharing Enjoyment

9 months

- Uses fingers to point

18 months

- Points to show others something interesting
- Points to get the attention of others

2 years and up

- Naming items

<https://www.cdc.gov/ncbddd/actearly/milestones/index.html>

Comments and Responds to Comments

(Jones & Schwartz, 2009)

- TD children initiated w/ comments avg. 2x/min
- Children with ASD initiated w/ comments avg. 1x/min
- TD children acknowledged 62% of others' initiations
- Children with ASD acknowledged 45% of others' initiations
- TD children rejected or ignored 38% of others' initiations
- Children with ASD rejected/ignored 55% of others' initiations
 - Most often comments of others

Recruiting Adult Attention

- Identify preferred items/reinforcers
- Identify activities your child can independently complete and may choose to complete:
 - Puzzles
 - Shape sorter
 - Train tracks
 - Coloring a picture
 - Matching pictures
 - Mazes

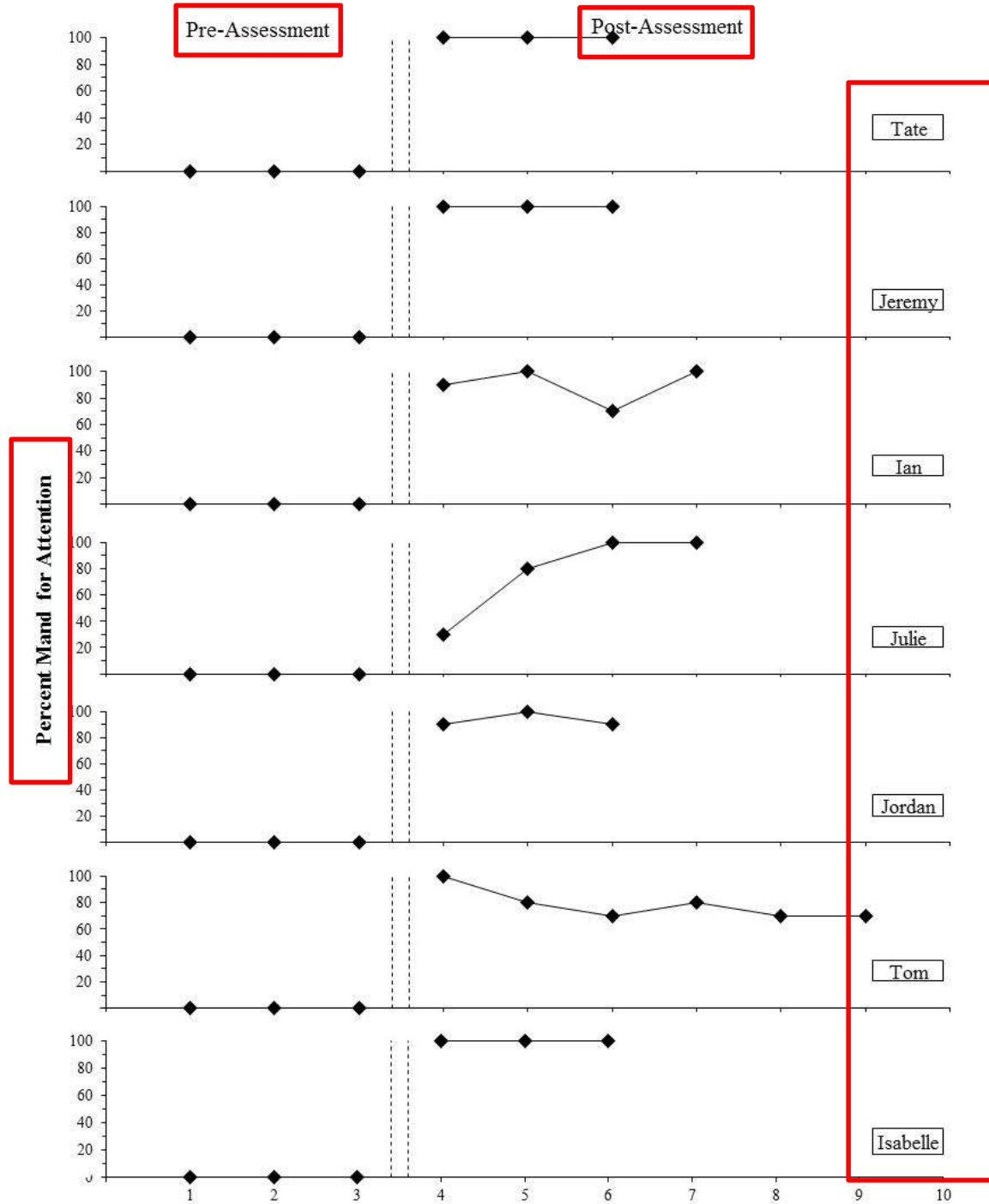
Recruiting Attention

- Direct them to complete the task “finish it”
- Turn attention away from them
- Monitor their progress
- When they’ve completed the task, prompt them to show completed task and say “Look!” (preferably a second adult)
 - IMMEDIATELY turn to them and provide attention
 - Praise, praise, praise, high-fives, celebration, etc.
- Fade prompts

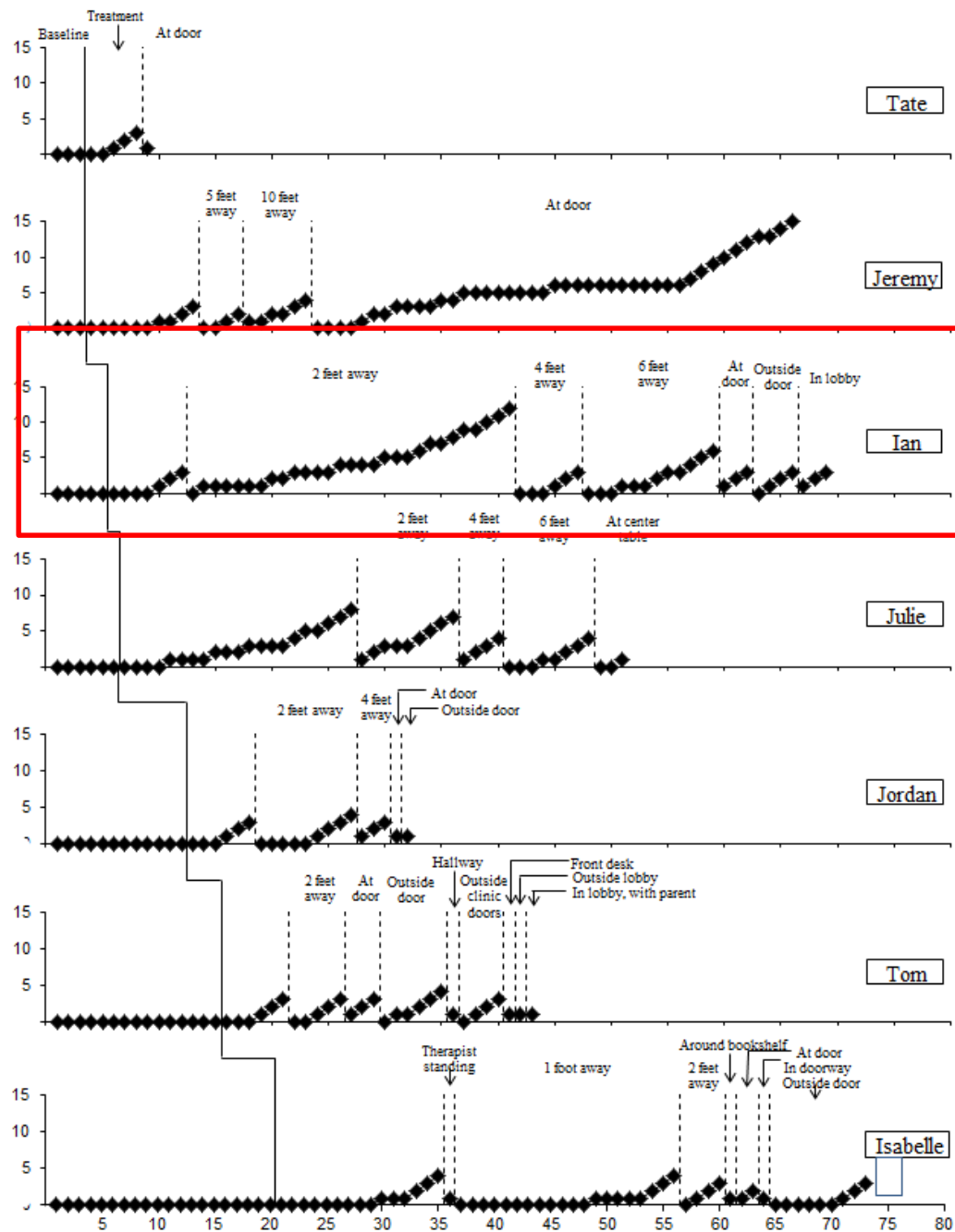
Recruiting Attention

- Increase your distance from your child as they continue to be successful
 - Vary where you are, how you're positioned
 - Vary the people they seek attention from
- Probe in naturalistic situations





Cumulative Independent Mand for Attention during Daily Probe



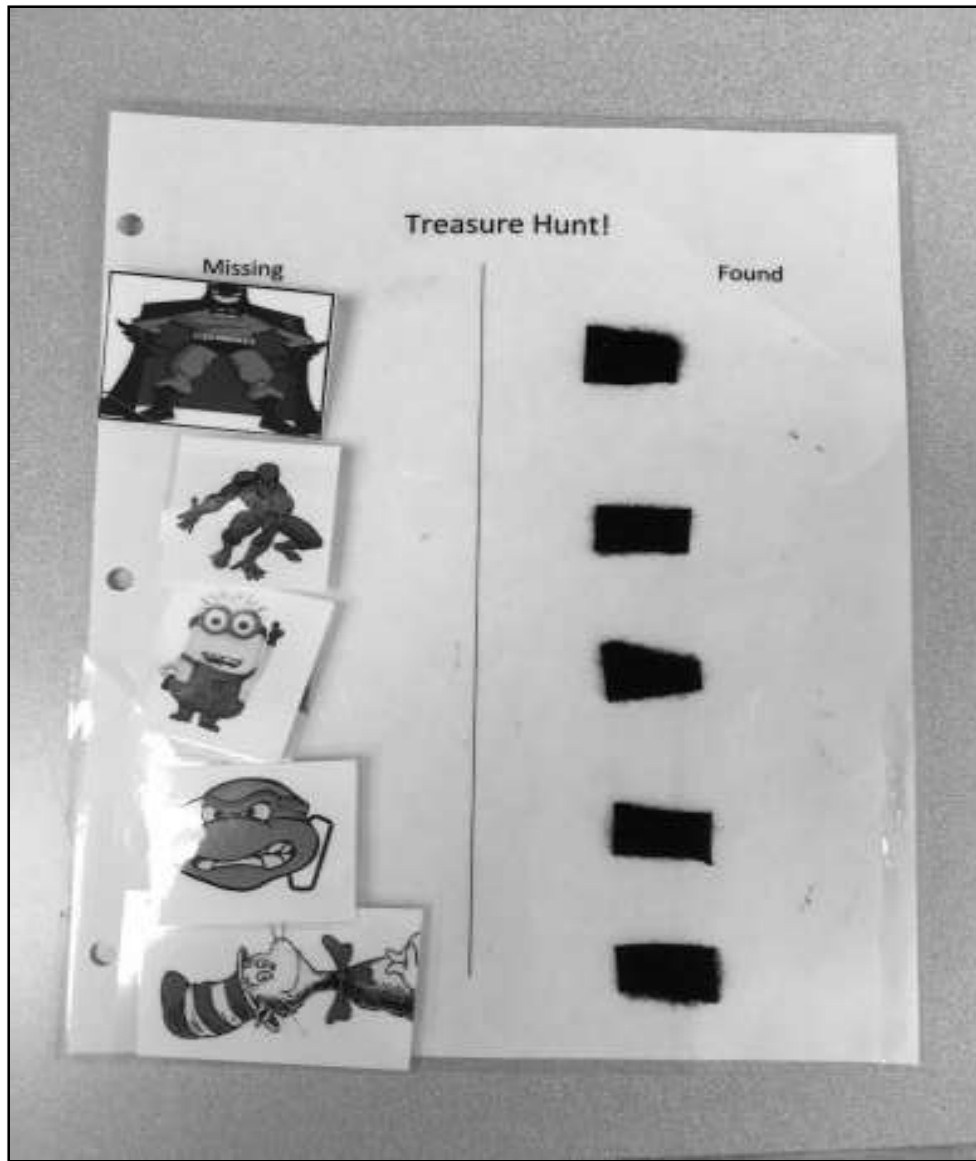
Showing and Responding to Peers



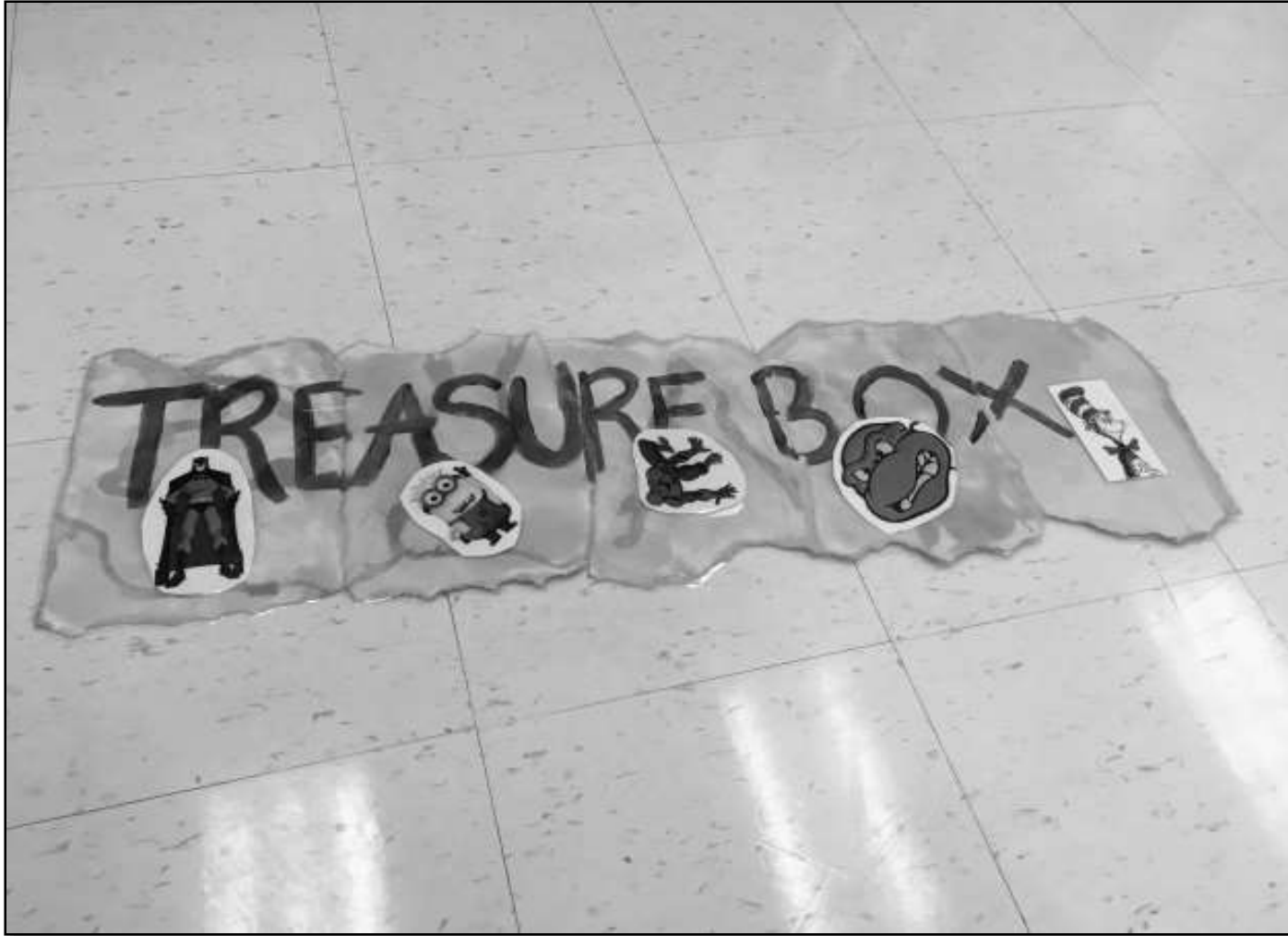
Showing and Responding to Peers

- Scripts and script fading (Krantz & McClannahan, 1998; Scattone, 2007)
- Develop scripts around fun, exciting, novel activities
- Scripts can be simple or complex
- Guide child to follow scripts with point prompts and verbal prompts
- Guide child to orient toward peer while reading script
- After reading script is independent, begin to fade scripts
 - “Look what I found”
 - “Look what I _____”
 - “Look what ____ _”
 - “Look _____”
 - “L_____”
 - Blank

Showing to Peers










Showing to Peers

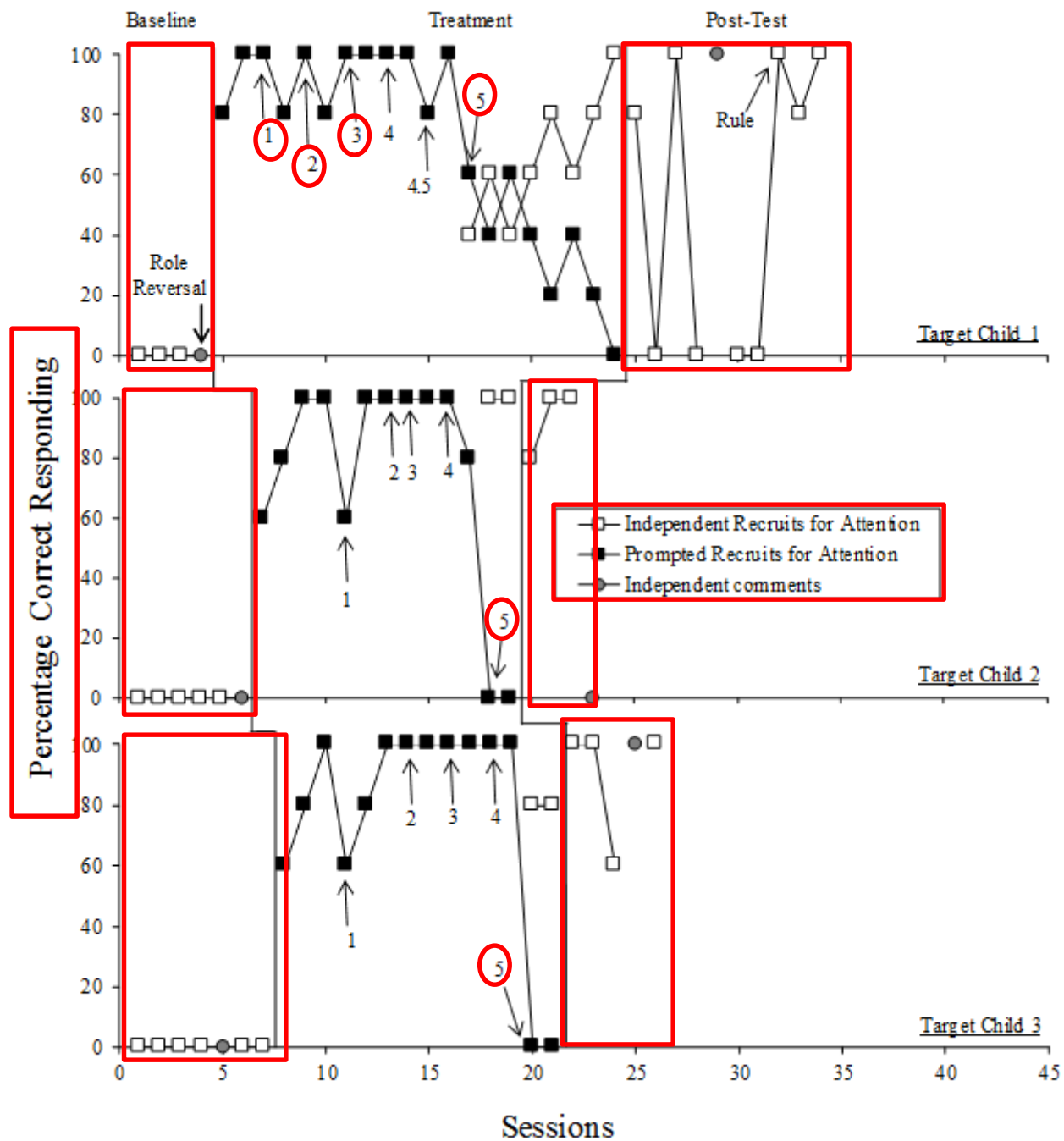


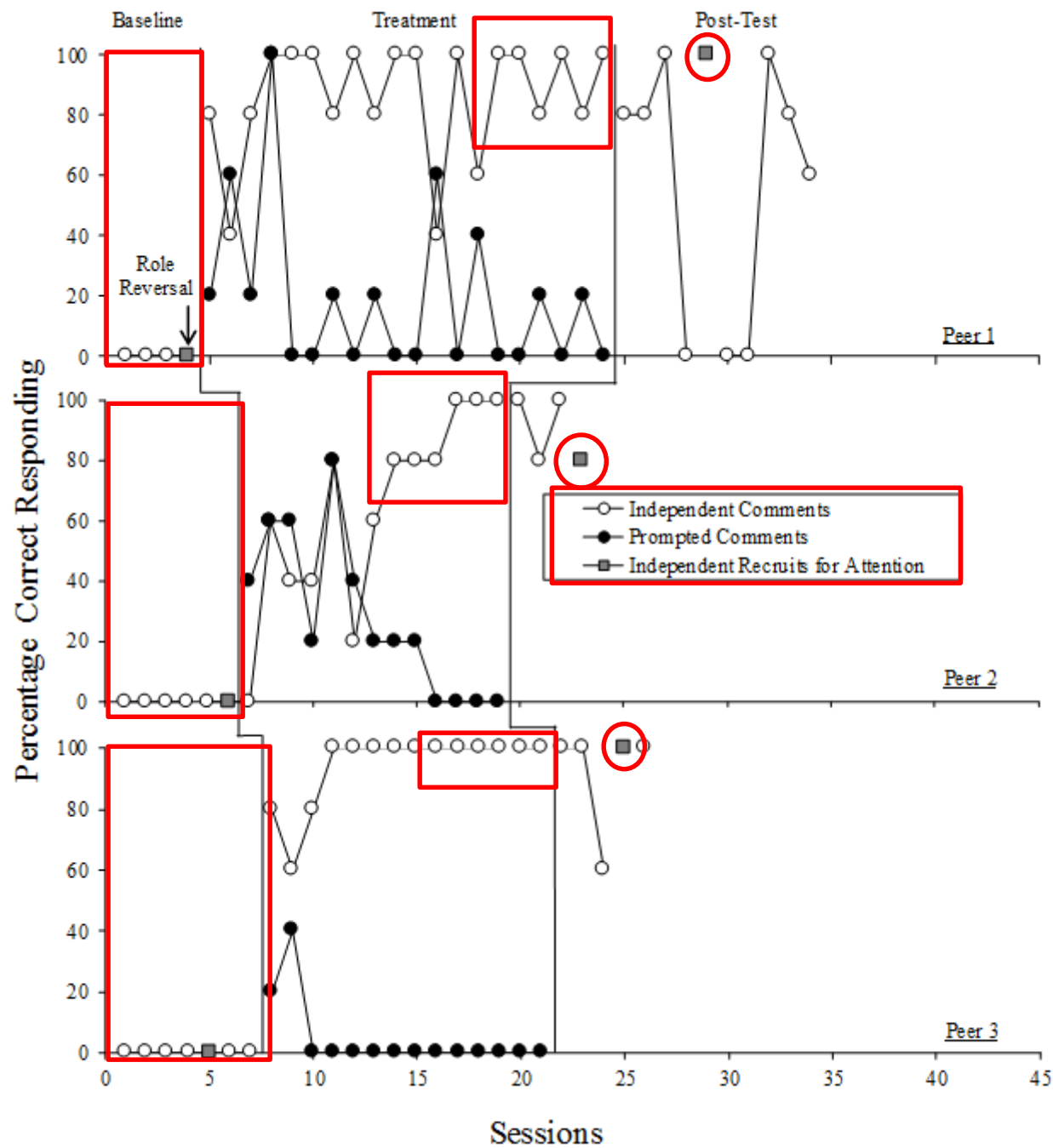
Showing to Peers



Fade Step	Name of Peer	Script	Picture
Full Script	<i>April</i>	<i>Check out my Ninja Turtle</i>	
Step 1	<i>April</i>	<i>Check out my</i>	
Step 2	<i>April</i>	<i>Check out</i>	
Step 3	<i>April</i>	<i>Check</i>	
Step 4	<i>April</i>		
Step 4.5 (Pair 1 only)		_____	
Step 5 (Independent)			







Conclusions

- **Communication and social interaction skills continue to be high priorities for parents of children with autism**
- **Given the range of language and communication challenges that might be experienced, we need to demonstrate effective methods for a range of skills**
- **The field of ABA has well established and emerging methods to promote social communication with children with ASD**
- **Several strategies can be used:**
 - **Manipulating Establishing Operations**
 - **Textual and Visual Prompts**
 - **Rehearsal**
- **More research to understand how which strategy works when**
- **Focus on robust social communication repertoires with vocal and non-vocal children is vital**

Thank You!!!!

Ashellingsburg@mayinstitute.org