Supporting Individuals with ASD in Home, School, and Community Settings

Dorothea C. Lerman, Ph.D., BCBA-D
lerman@uhcl.edu

CADD
Center for Autism and Developmental Disabilities

Our Schedule

- Efficient Approaches for Training Teachers and Paraprofessionals in ABA Methodologies (8:30 – 10:00)
- Preparing Individuals with Autism for Life After High School – Part 1 (10:15 – noon)
- Preparing Individuals with Autism for Life After High School – Part 2 (1 – 2:30)
- Training Caregivers Via Telehealth Technologies (2:45 – 3:45)
- Final Q & A (3:45 – 4)

University of Houston Clear Lake

Efficient Approaches for Training Teachers and Paraprofessionals in ABA Methodologies

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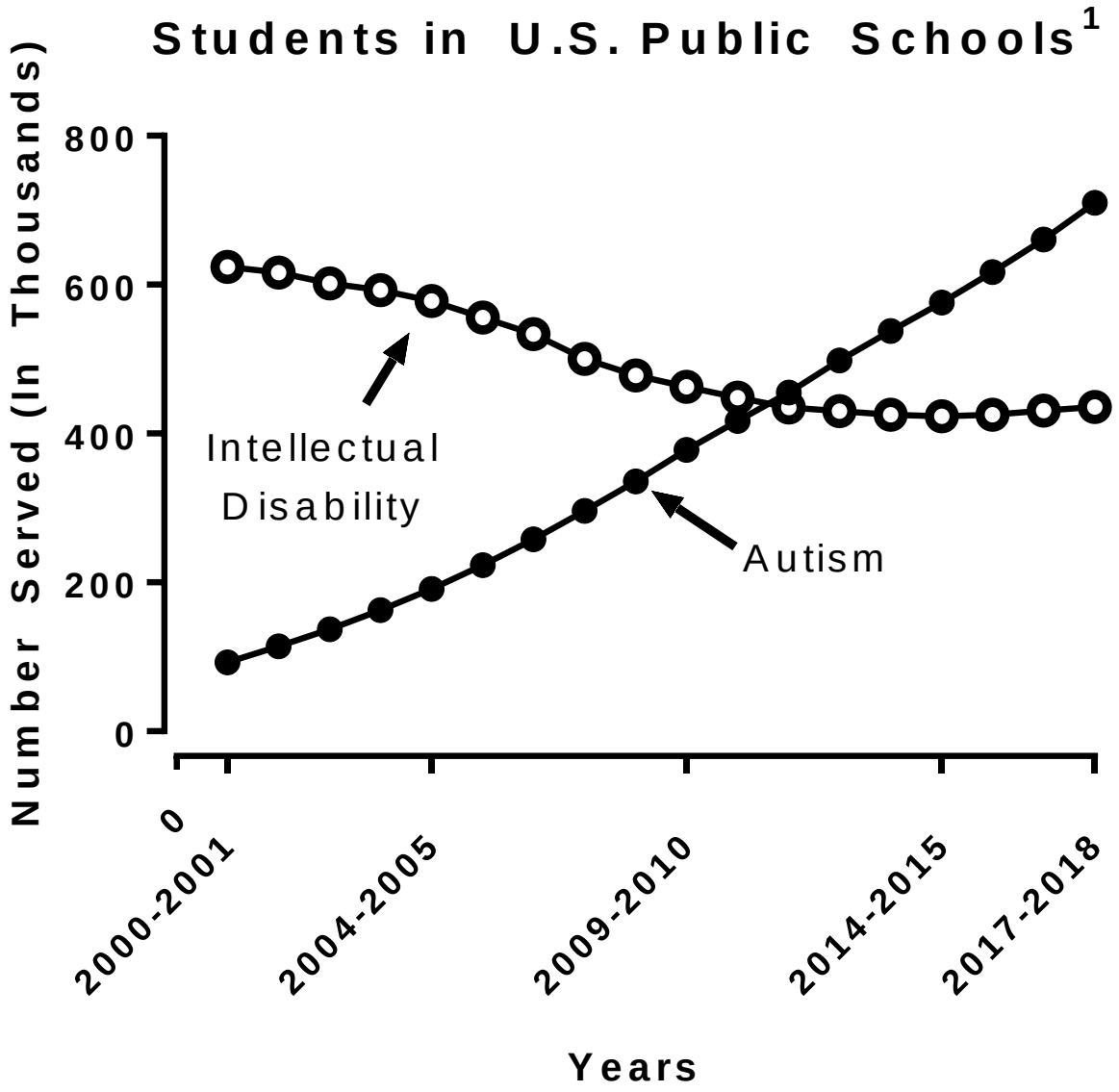
CENTER FOR AUTISM AND DEVELOPMENTAL DISABILITIES



[1] U.S. Department of Education, Office of Special Education Programs, Annual Report to Congress on the Individuals with Disabilities Act (retrieved 12/21/18)

Barriers to Dissemination

- Training time

- Resources
- Availability of qualified trainers

Our Model: Focused Training on Core ABA Teaching Procedures

- Outcomes of a five-day summer training program

Lerman, Vorndran, Addison, & Kuhn (2004)
Lerman, Tetreault, Hovanetz, Strobel, & Garro (2008)

Five-Day Focused Training

Topics

Basic Concepts

*Preference Assessments

*Behavioral Assessment

*Discrete Trial Teaching

Shaping and Chaining

Generalization and Maintenance of Skills

*Incidental Teaching

IEP Goals/Objectives

*Data Collection

*Managing Problem Behavior

Other topics (token economies, toilet training, visual schedules)

*Includes both didactic and hands-on training

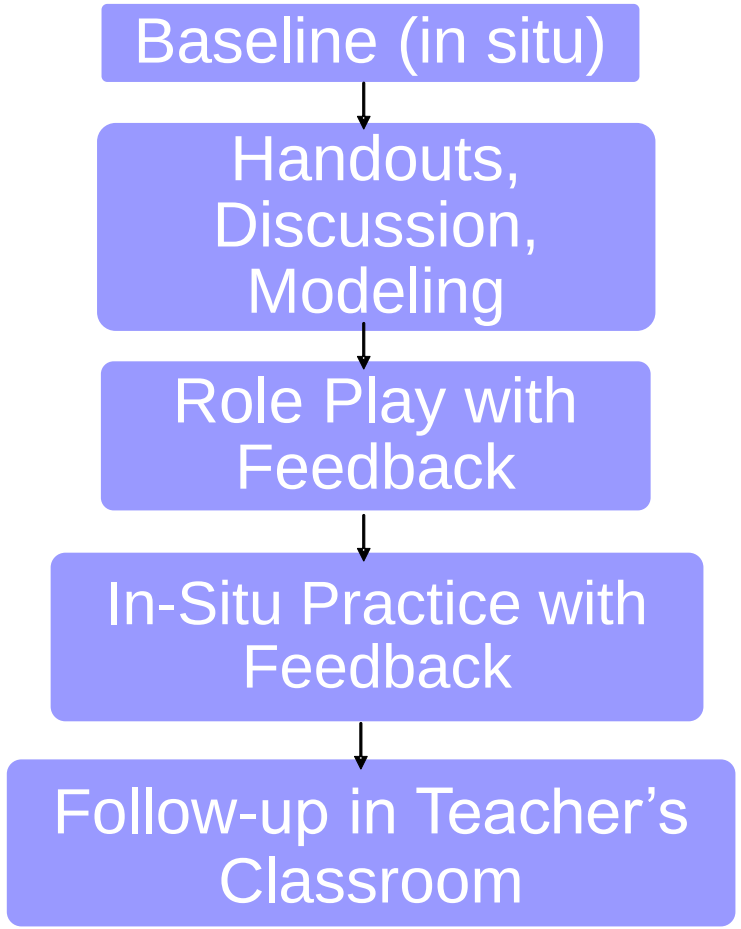
JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2008, 41, 243–248 NUMBER 2 (SUMMER 2008)

FURTHER EVALUATION OF A BRIEF, INTENSIVE TEACHER-TRAINING MODEL

DOROTHEA C. LERMAN, ALLISON TETREAULT, ALYSON HOVANETZ, MARGARET STROBEL, AND JOANIE GARRO

UNIVERSITY OF HOUSTON, CLEAR LAKE

Behavioral Skills Training



Check one **Percentage Correct: _____(# Yes / # Yes + # No)**

_____ ___ Materials ready/organized
Yes No N/A

_____ ___ Instructions delivered when child attending.
Yes No N/A

_____ ___ Instructions clear, concise, and consistent.
Yes No N/A

_____ ___ Appropriate and consistent prompting strategy
Yes No N/A

_____ ___ Reinforcement delivered immediately for correct responses
Yes No N/A

_____ ___ Highly preferred tangible reinforcers paired with praise
Yes No N/A

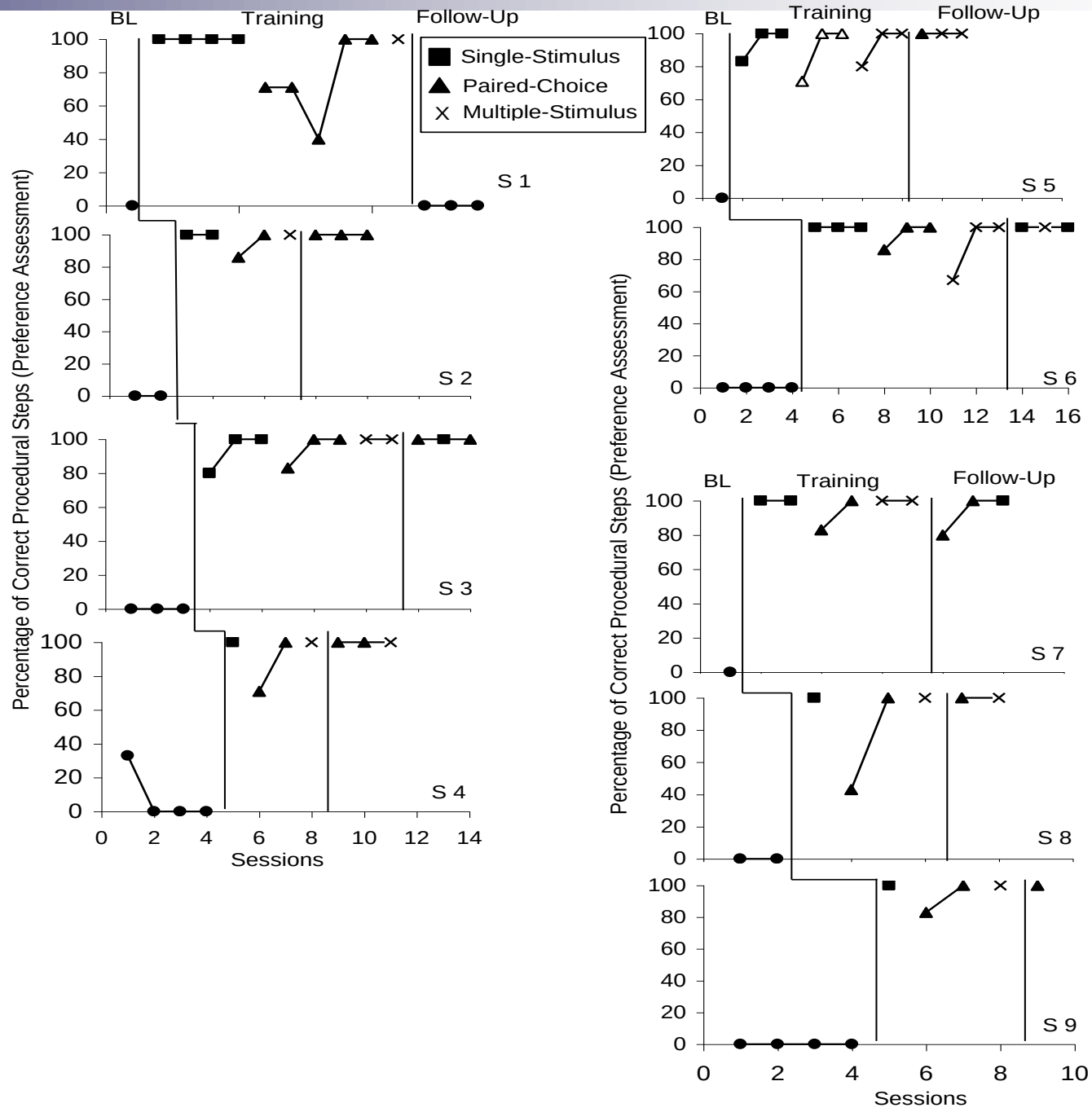
_____ ___ Varied reinforcers used.
Yes No N/A

_____ ___ Problem behavior managed appropriately.
Yes No N/A

_____ ___ Data collected appropriately.
Yes No N/A

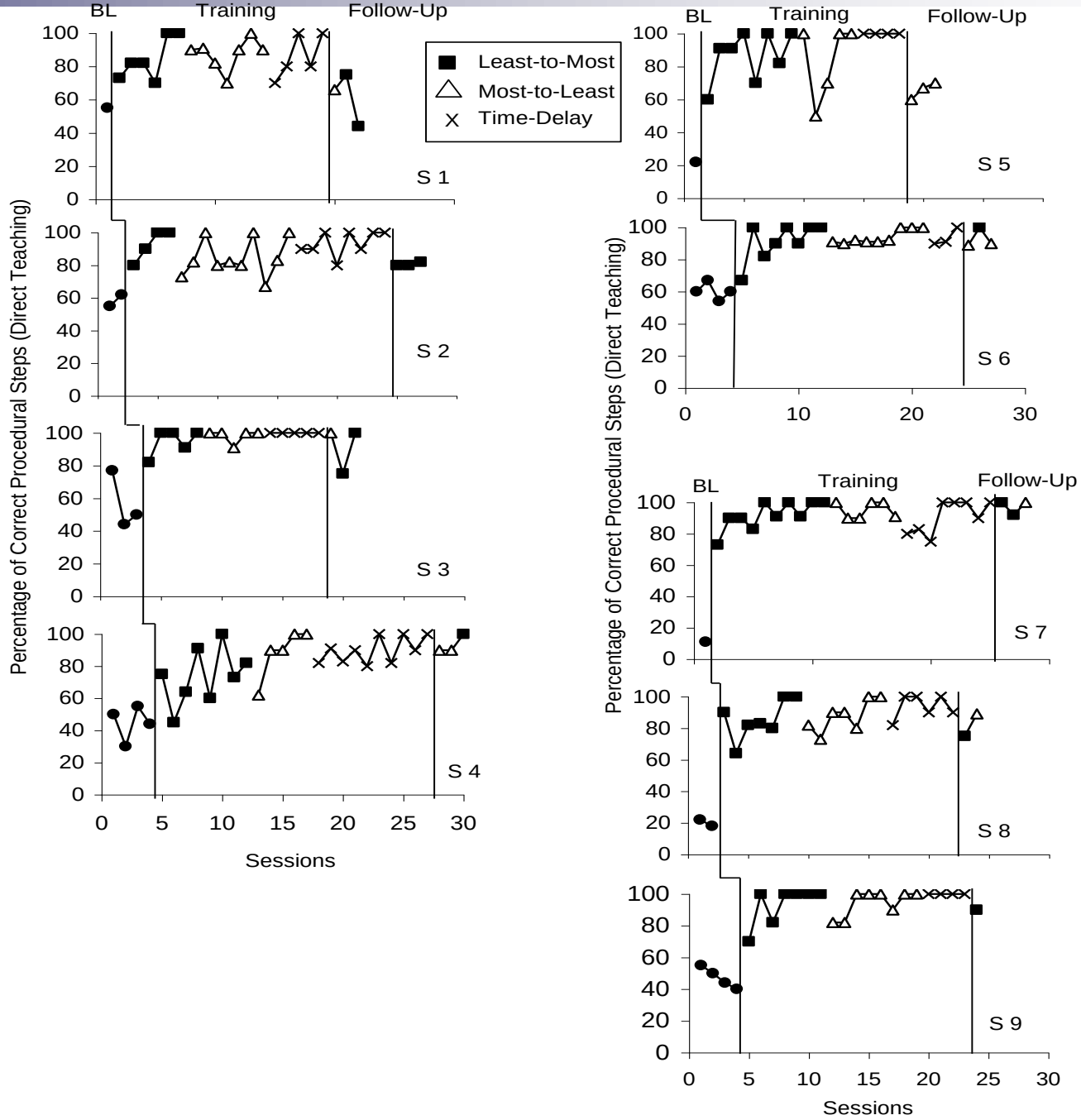
Lerman et al. (2008)

Preference Assessment



Lerman et al. (2008)

Discrete Trial Teaching



Academic-Year Model

Texas Higher Education Coordinating Board Autism Grant 2016-2018

- Two-day group “pull out”
  - Lecture, discussion, model, role play

- Three individual follow-up visits in classroom
  - Observation and feedback
  - Case consultation

Project BCBAs:
Kally Luck and Melissa Waters

- Two BCBAs trained 450 teachers and paraprofessionals serving more than 1,000 students with autism in three school districts
  - Baseline = 36% accuracy
  - Post training = 95% accuracy
  - Satisfaction survey = mean 5.7 on 6-pt scale

Conclusions From Outcome Studies

- Brief, intensive training effective
- Practical for practitioners
- What about paraprofessionals?

Journal of Behavioral Education
https://doi.org/10.1007/s10864-019-09341-w

ORIGINAL PAPER

Training of Paraprofessionals by Their Classroom Teachers: A Descriptive Evaluation of Pyramidal Training Outcomes

Dorothea C. Lerman[1] · Kally M. Luck[1] · Stephanie Smothermon[1,2] · Brittany A. Zey[1,4] · Taylor Custer[1,3] · Leah D. Smith[1,2]

Goals:

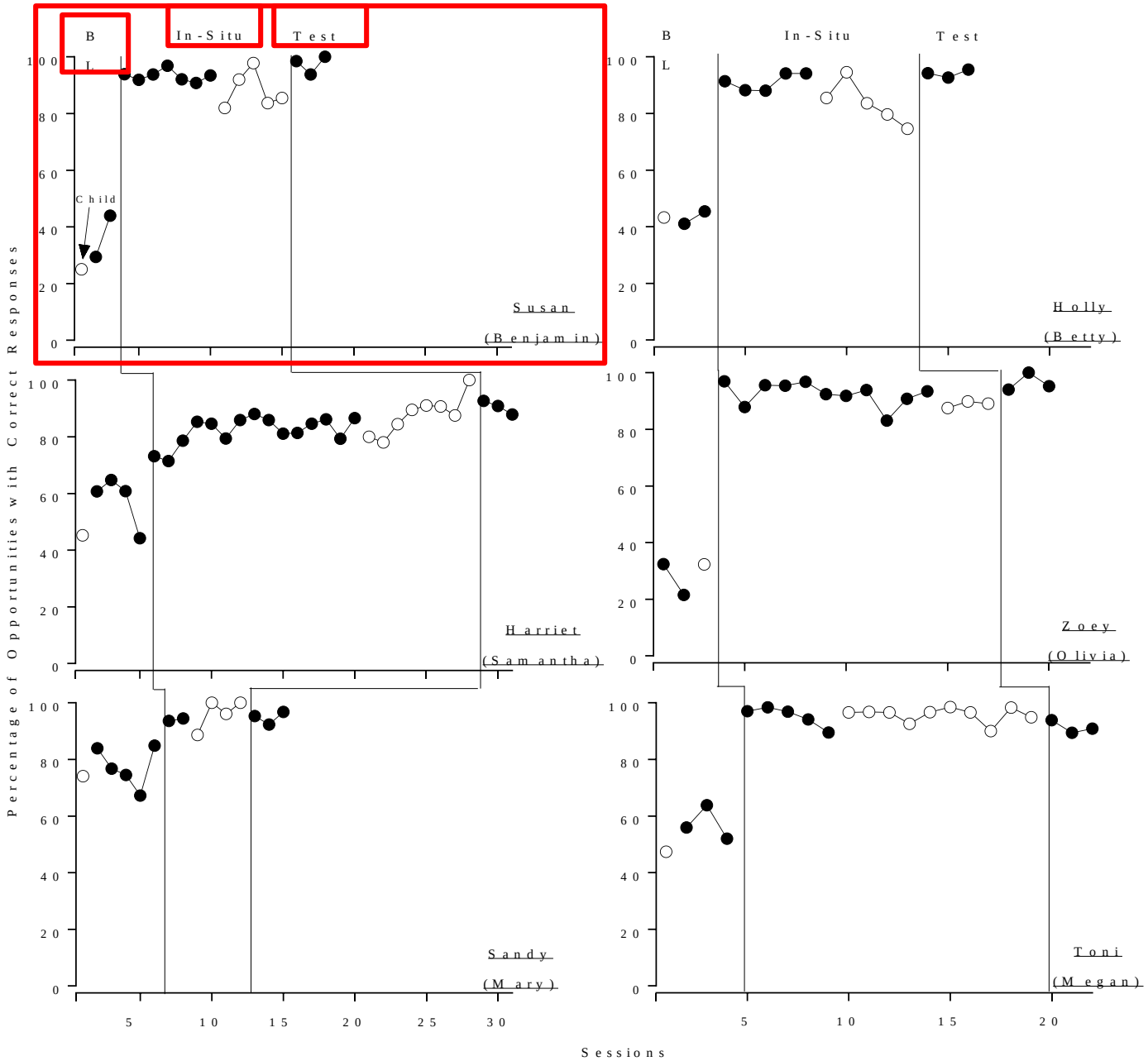
- Large-N extension of pyramidal training for paraprofessionals
- Examine objective measure of social validity
- Evaluate link between training integrity and outcomes

Lerman et al. (2019)

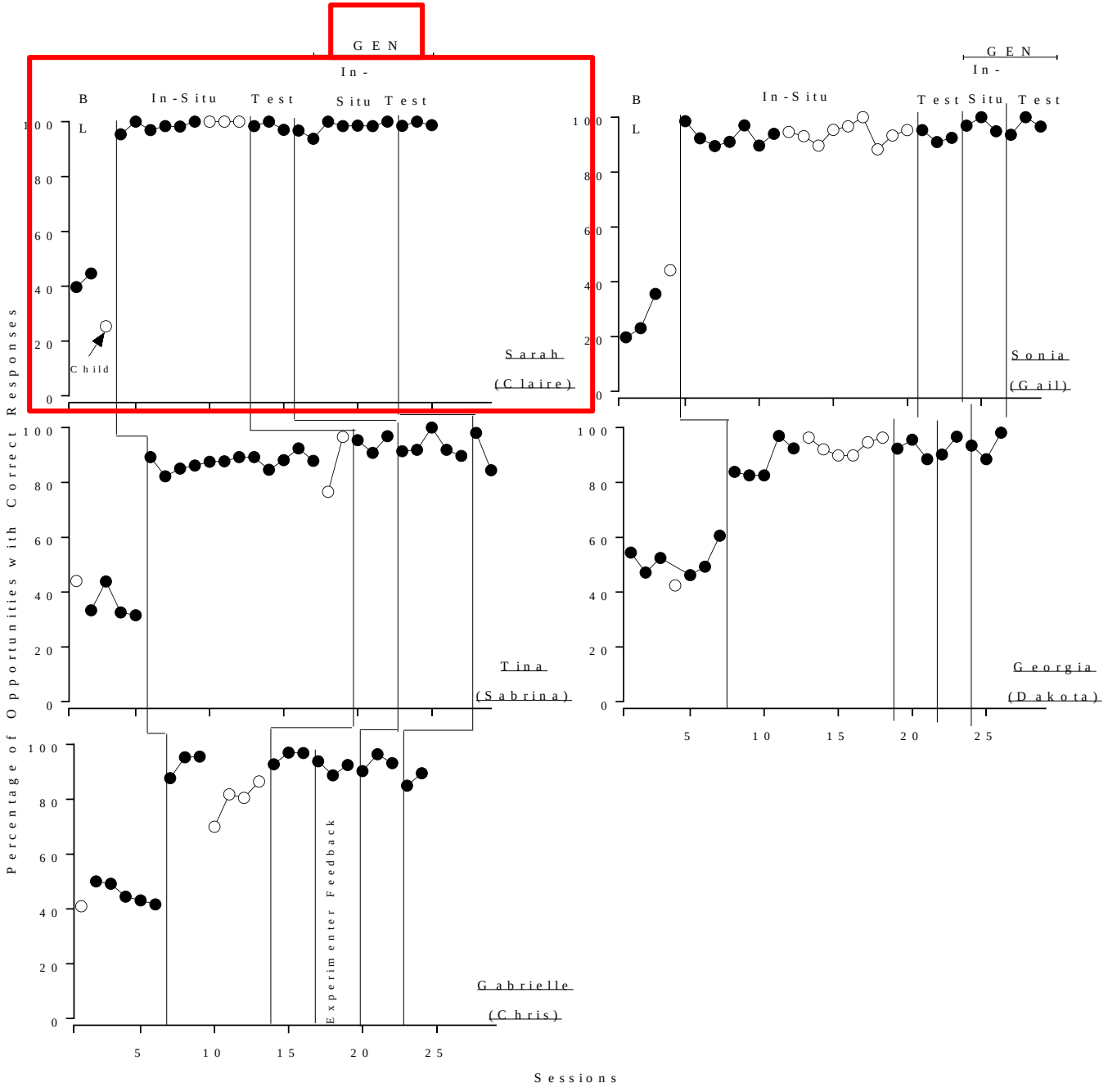
Procedures

- 16 teacher-paraprofessional pairs
- Targeted skill: DTT using LTM + Error Correction
- Trained teachers to implement DTT via BST
- Simulated workshop / classroom (“Train paraprofessionals as you think practical in classroom.”)
- Descriptive analysis of outcomes

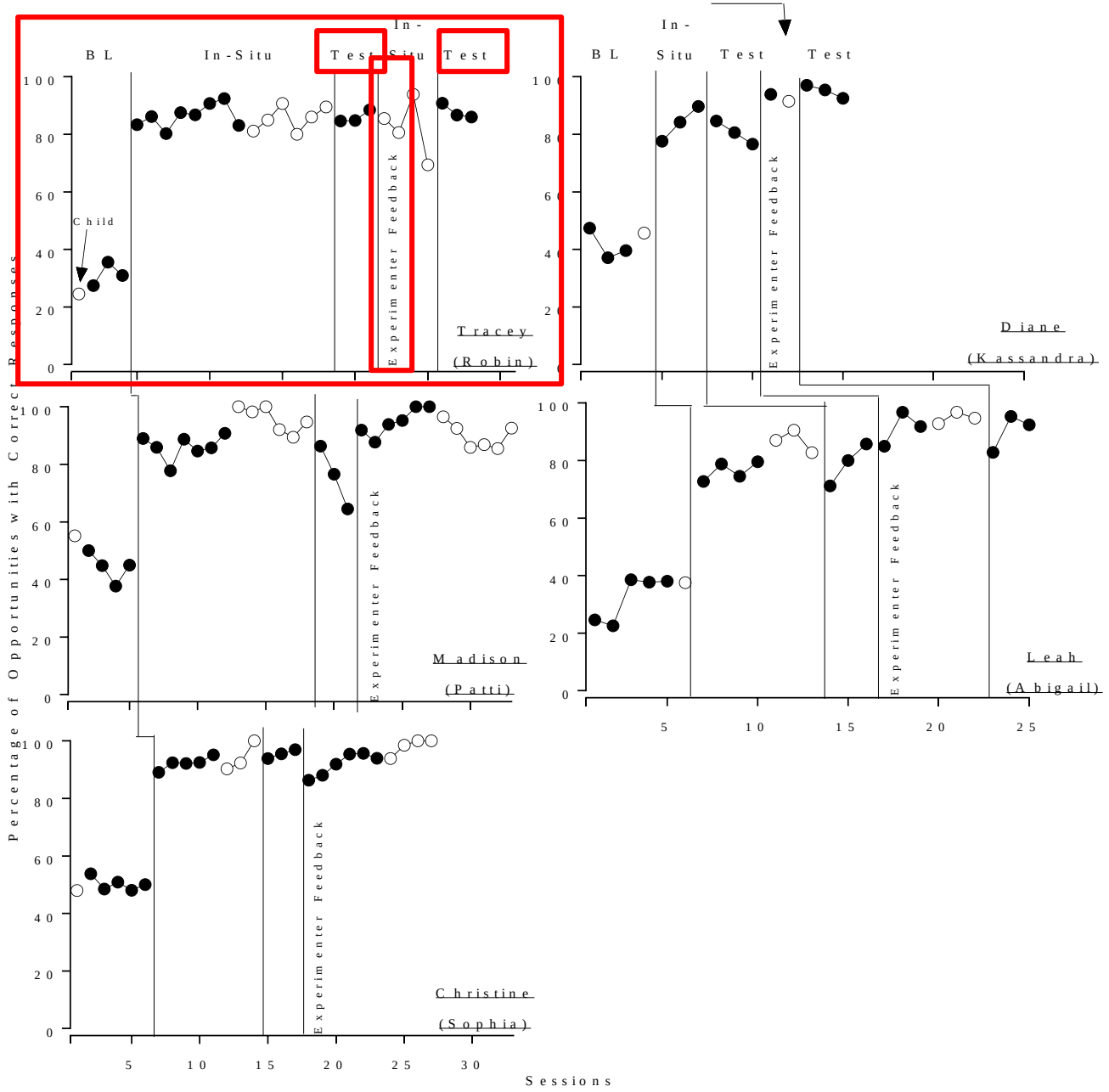
Outcomes for Paraprofessionals:



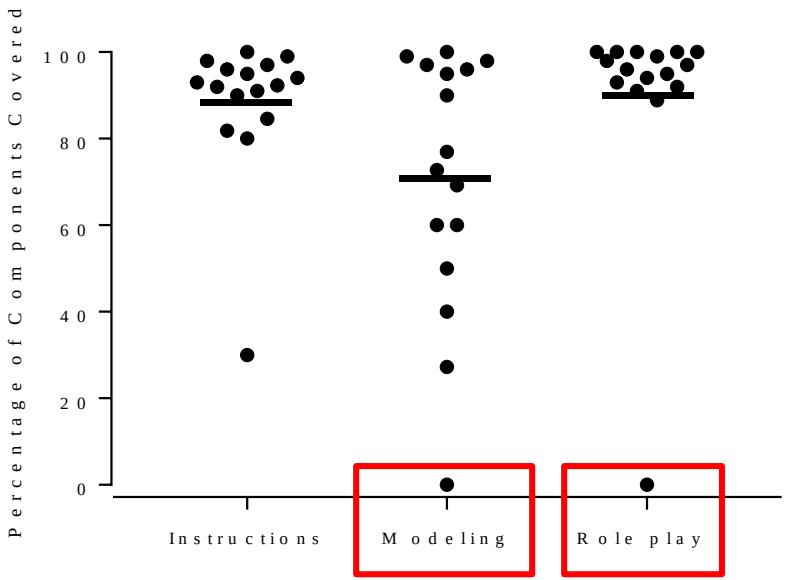
Outcomes for Paraprofessionals:

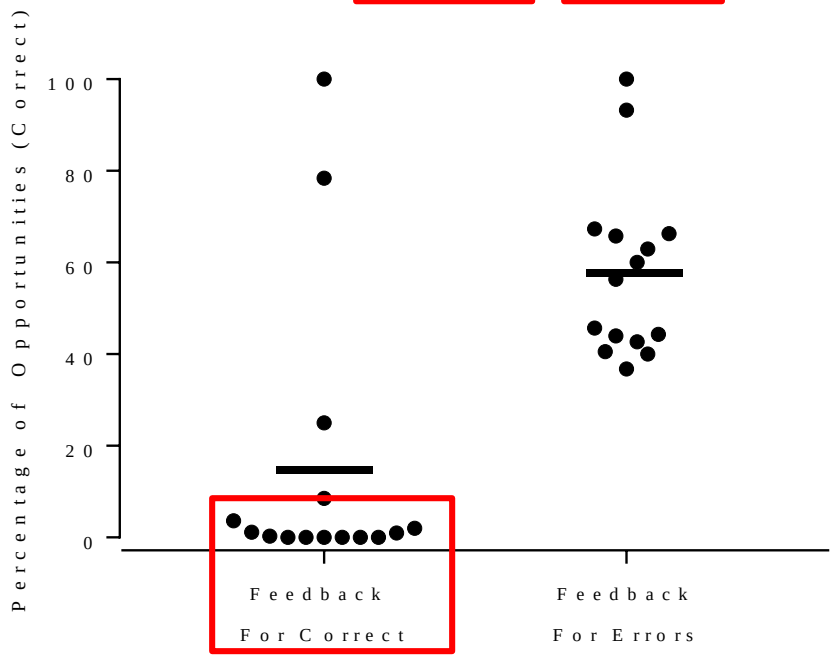


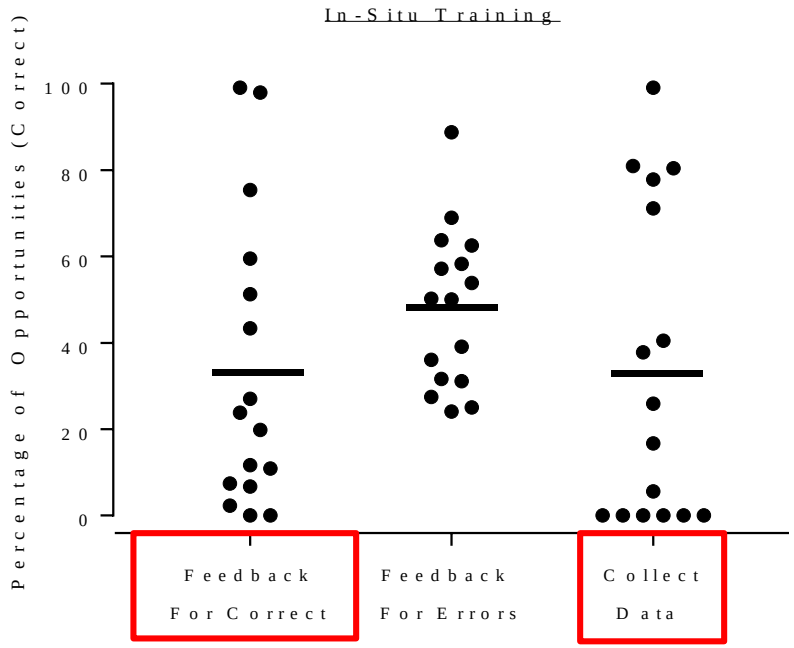
Outcomes for Paraprofessionals:



Trainer (Teacher) Integrity – Use of Components







Other Results

- Average training was 263 min (125-325 min)
- “Best” versus “Worst” outcomes → little difference
- Responses on social validity survey mirrored use of BST components
- Conclusion: Training teachers to use BST with their paraprofessionals is effective, socially valid approach

Additional Research on Our Model

- Comparison of written, vocal, and video-assisted feedback

  Luck, Lerman, Wu, Dupuis, & Hussein (2017)

- Teacher preference for different error correction procedures

  Luck, Lerman, Zey, & Campbell (in preparation)

- Training to select prompting strategies

  Cowan & Lerman (in preparation)

- Training to detect antecedents/consequences of problem behavior

  Lerman, Hovanetz, Stroble, & Tetreault (2009)

  Scott, Lerman, & Luck (2018)

- Training to select and implement function-based interventions

  Luck, Lerman, & Williams (under review)

- Effects of distractions on teachers' procedural integrity

  Luck, Lerman, Williams, & Fletcher (in preparation)

An Assessment of Teacher Preference for Error Correction Procedures
Luck, Lerman, Zey, & Campbell (in preparation)

- Benefits of error correction procedures
- Relative effectiveness idiosyncratic across learners
- Variables influencing teacher preference?
  - Effectiveness
  - Intrusiveness
  - Feasibility

Barbetta, Heron, & Heward, 1993; Carroll, Joachim, St. Peter, & Robinson, 2015; McGhan &Lerman, 2013; Turan, Moroz, & Croteau, 2012

Teacher Preference for Error Correction Procedures
Luck et al. (in preparation)

- Trained teachers to use three different error correction procedures
- Assessed preference via
  - Choice to practice w/ child
  - Choice to train paraprofessional
- Evaluate impact of effectiveness on preference

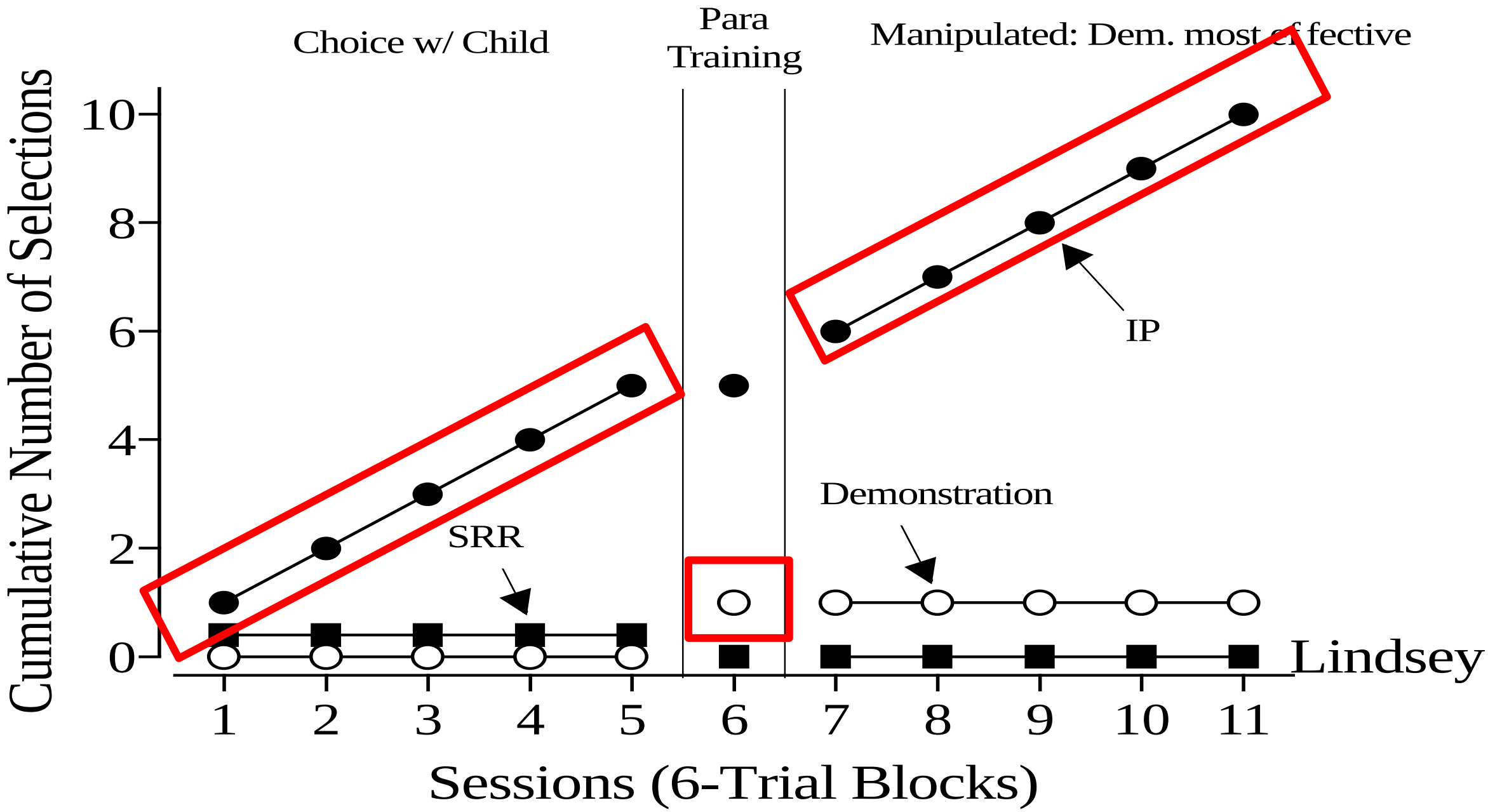
Teacher Preference for Error Correction Procedures
Luck et al. (in preparation)

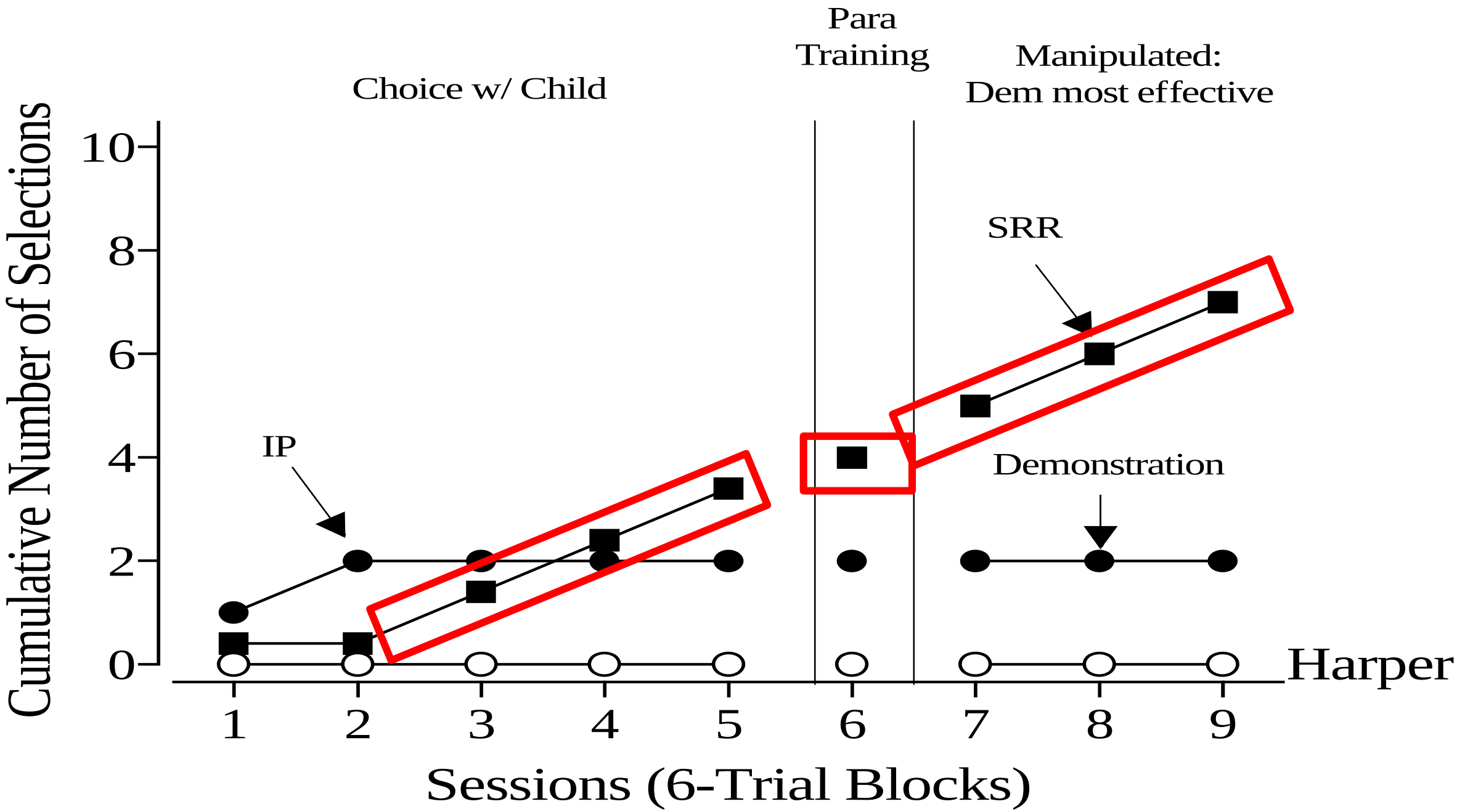
- 9 teachers and 9 paraprofessionals participated
- Preference = 3 consecutive selections of same procedure
- BST with teachers: (a) Demonstration, (b) Single Response Repetition, (c) Independence Probe
- Initial preference assessment
  - Choice to practice (“select the one[s] most likely to use in classroom”)
  - Choice to train paraprofessional (“select the one[s] you’d like your paraprofessional to use in classroom”)

Teacher Preference for Error Correction Procedures
Luck et al. (in preparation)

- “Manipulated” choice condition
  - Nonpreferred procedure most effective (16-trial exposure)
  - Teachers introduced new targets as current ones mastered
  - Experimenter absent

- Post-manipulation preference assessment


Choice w/ Child
Para
Training
Manipulated: Dem. most effective
Cumulative Number of Selections
10
8
6
4
2
0
IP
Demonstration
SRR
Lindsey
1
2
3
4
5
6
7
8
9
10
11
Sessions (6-Trial Blocks)


Para
Training
Choice w/ Child
Manipulated:
Dem most effective
SRR
IP
Demonstration
Harper
Cumulative Number of Selections
0
2
4
6
8
10
1
2
3
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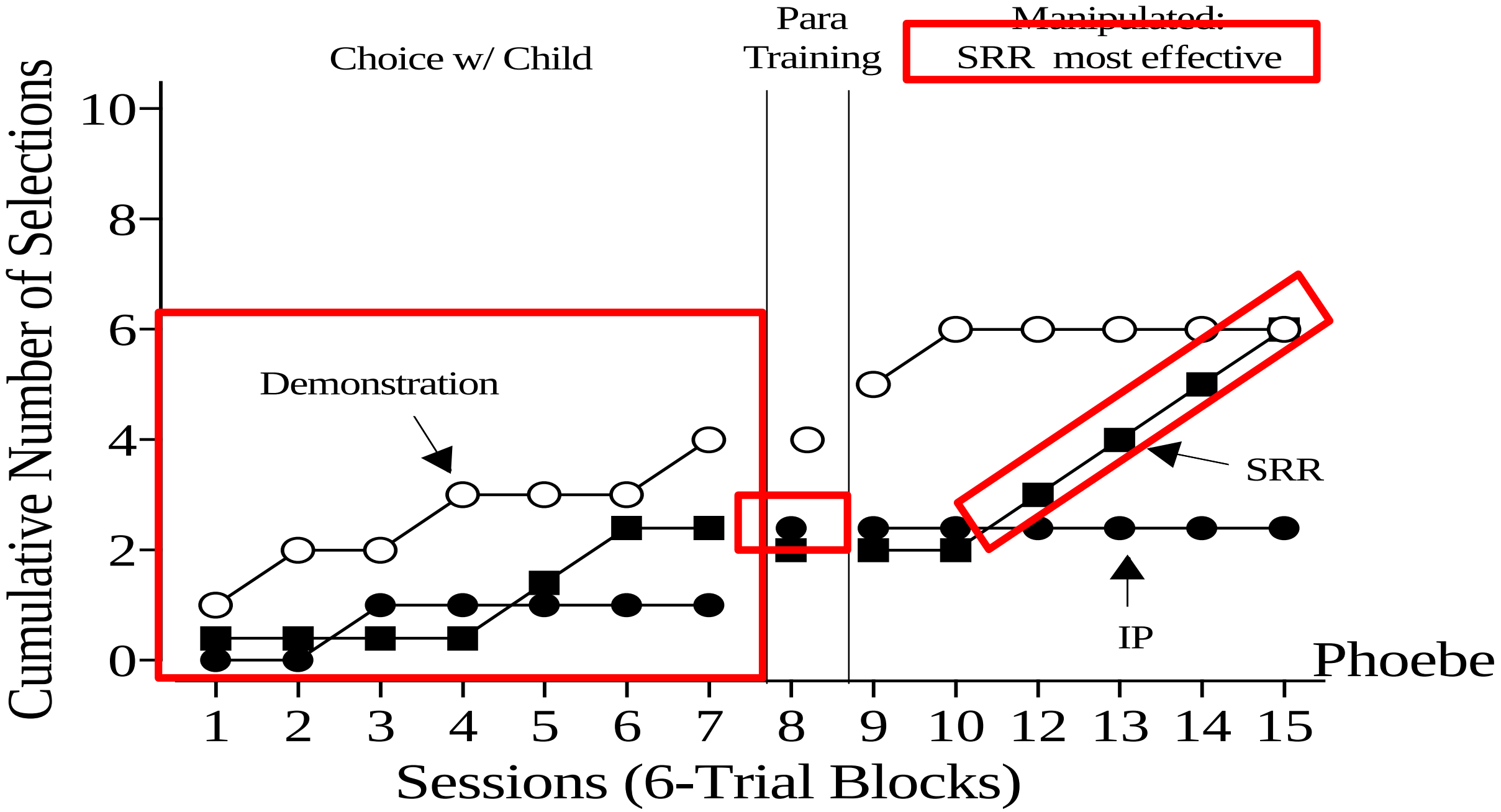
5
6
7
8
9
Sessions (6-Trial Blocks)


Choice w/ Child
Para
Training
Manipulated:
SRR most effective
Cumulative Number of Selections
10
8
6
4
2
0
Demonstration
SRR
IP
Phoebe
1 2 3 4 5 6 7 8 9 10 12 13 14 15
Sessions (6-Trial Blocks)

Teacher Preference for Error Correction Procedures
Luck et al. (in preparation)

- Initial preference varied but majority preferred active student responding (SRR/IP)
- Less than half trained their paraprofessional on preferred procedure
  - Verbal report indicated that choice based on ease of training
- Effectiveness did not impact preference in our contrived setting

A Self-Instructional Manual for Selecting and Evaluating Prompting Strategies
Cowan & Lerman (in preparation)

- Variety of effective prompts and prompt-fading strategies
  - Vocal
  - Gestural
  - Model
  - Physical
  - Least-to-Most (LTM)
  - Most-to-Least (MTL)
  - Delayed Most-to-Least (MTLD)
  - Prompt Delay (PD)
  - Graduated Guidance (GG)
- Relative effectiveness idiosyncratic across learners and skills
- Consideration of various factors could maximize instructional time

General Applications

LTM	MTL	MTLD	Prompt Delay	Graduated Guidance
• Previously learned skills • "Quick" learners	• Novel skill • "Slow" learners • Challenging behavior when they error • Cannot wait for prompt	• Novel skill • "Moderate-to-slow" learners • Prompt dependent	• Previously learned skills • "Quick" learners • Prompt dependent • Use of only one type of prompt	• Difficult motor skills • Limited imitative repertoire

Wolery et al., 1992; Green, 2001; MacDuff et al., 2001; Libby et al., 2008

Systematic Worksheet for the Evaluation of Effective Prompting Strategies (“SWEEPS”)

- Series of worksheets, flowcharts, and supplemental instructions
- Includes a variety of potential variables that may influence learning
- Guides decision-making process
- Produces recommendations
- Produces permanent product for IEP files

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How to Use and Choose Effective Prompting Strategies for Your Students

Created By: Landon Cowan and Dr. Dorothea Lerman

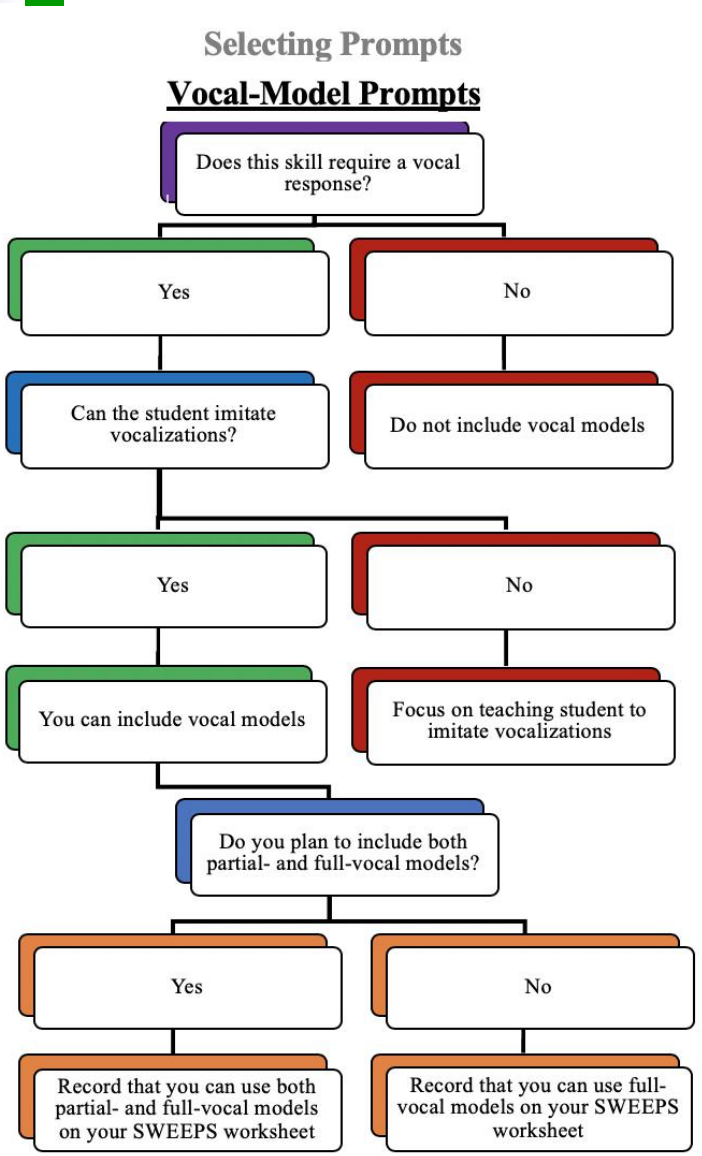
Table of Contents

Step I. Selecting Prompts (Mark "Yes," "No," "N/A," or "Unsure" for each line)

1. Does the skill require a vocal response? (If no, 1a and 1b are N/A) **Yes** **No**
   - **a.** If yes, can the student imitate vocalizations? **Yes** **No** **Unsure** **N/A**
   - **b.** Do you plan to include both partial- and full-vocal models? **Yes** **No** **N/A**
2. Does the skill require a motor response? (If no, 2a, b, and c are N/A) **Yes** **No**
   - **a.** Are physical prompts possible for this skill? **Yes** **No** **N/A**
     - **i.** If yes, does the student:
       - Resist or avoid physical prompts? **Yes** **No** **Unsure** **N/A**
       - Overly enjoy physical prompts? **Yes** **No** **Unsure** **N/A**
     - **ii.** Do you plan to include both partial- and full-physical prompts? **Yes** **No** **N/A**
   - **b.** Can the student imitate motor movements? (N/A if vocal response) **Yes** **No** **Unsure** **N/A**
   - **c.** Do you plan to include gesture prompts for this skill? (e.g., pointing, tapping, nodding, etc.; N/A if "no" on 2b) **Yes** **No** **N/A**

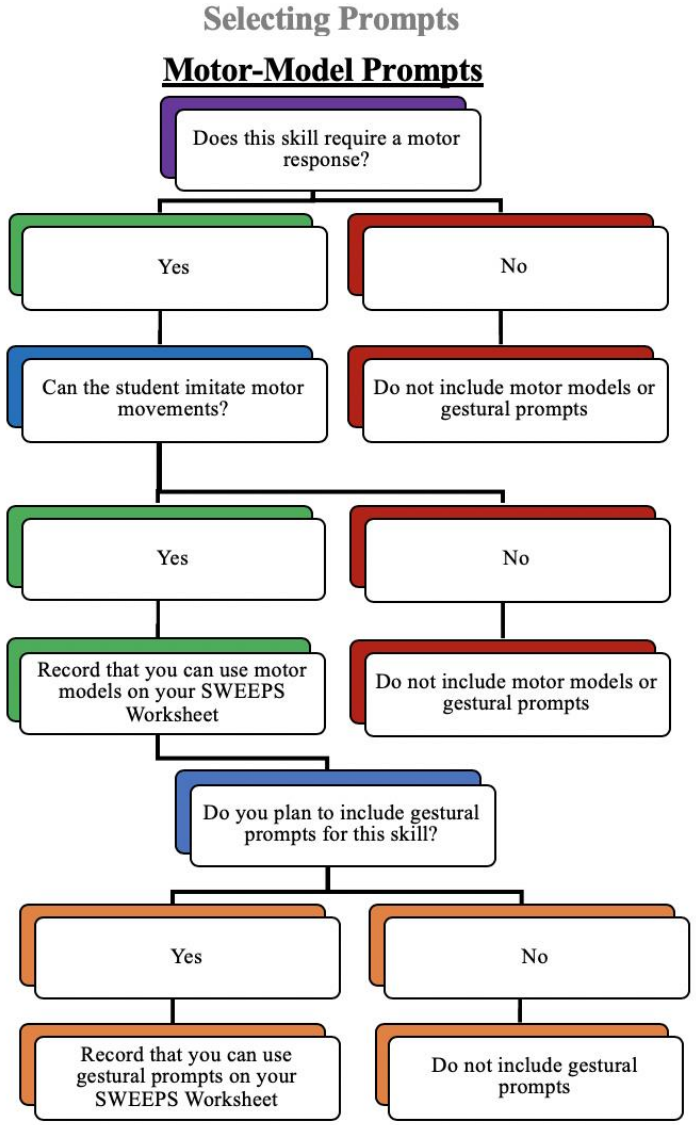
Important! If you marked "Unsure" for any of these questions, be sure to reference the "What to Do if You Marked 'Unsure'" materials before continuing to the next step.

Step 1a. Selecting Prompts Flowcharts



Examples of Vocal-Model Prompts:

- "App-" (partial-vocal model if the answer is "apple")
- "Car" (full-vocal model if the answer is "car")

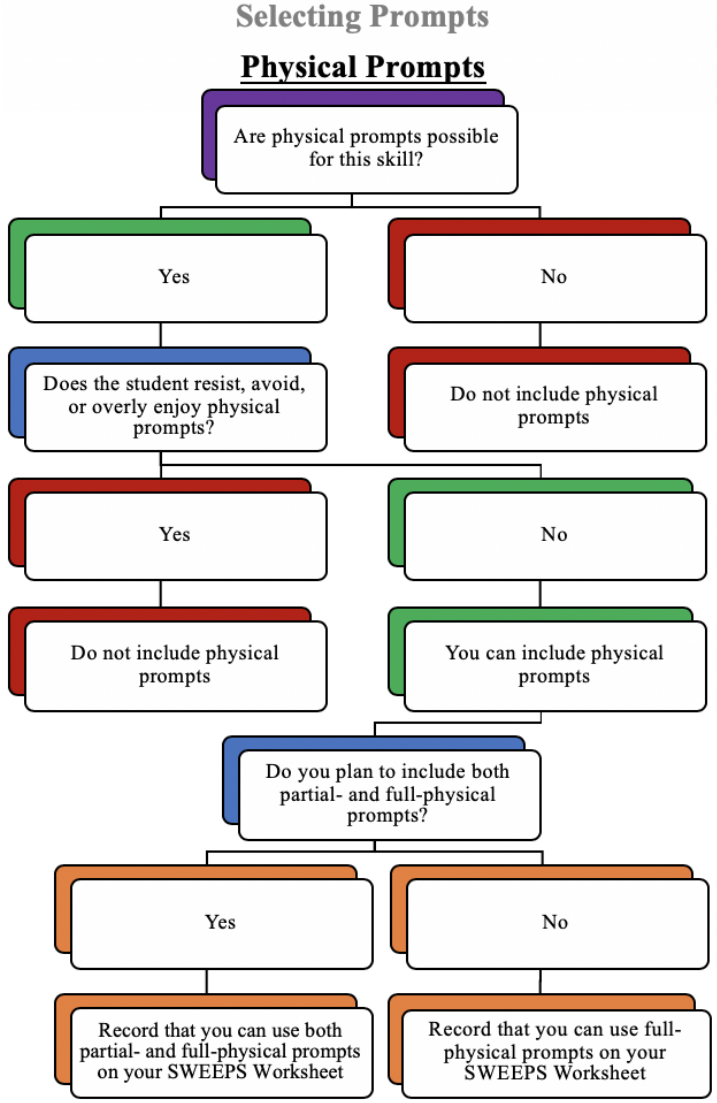


Examples of Motor-Model Prompts:

- Touching the correct item (if student is supposed to touch the item
- Demonstrating the next step in making a sandwich

Examples of Gestural Prompts:

- Pointing at the correct item (if the student is supposed to pick up the item)
- Pointing at a loaf of bread (if the student is supposed to pull out a slice)



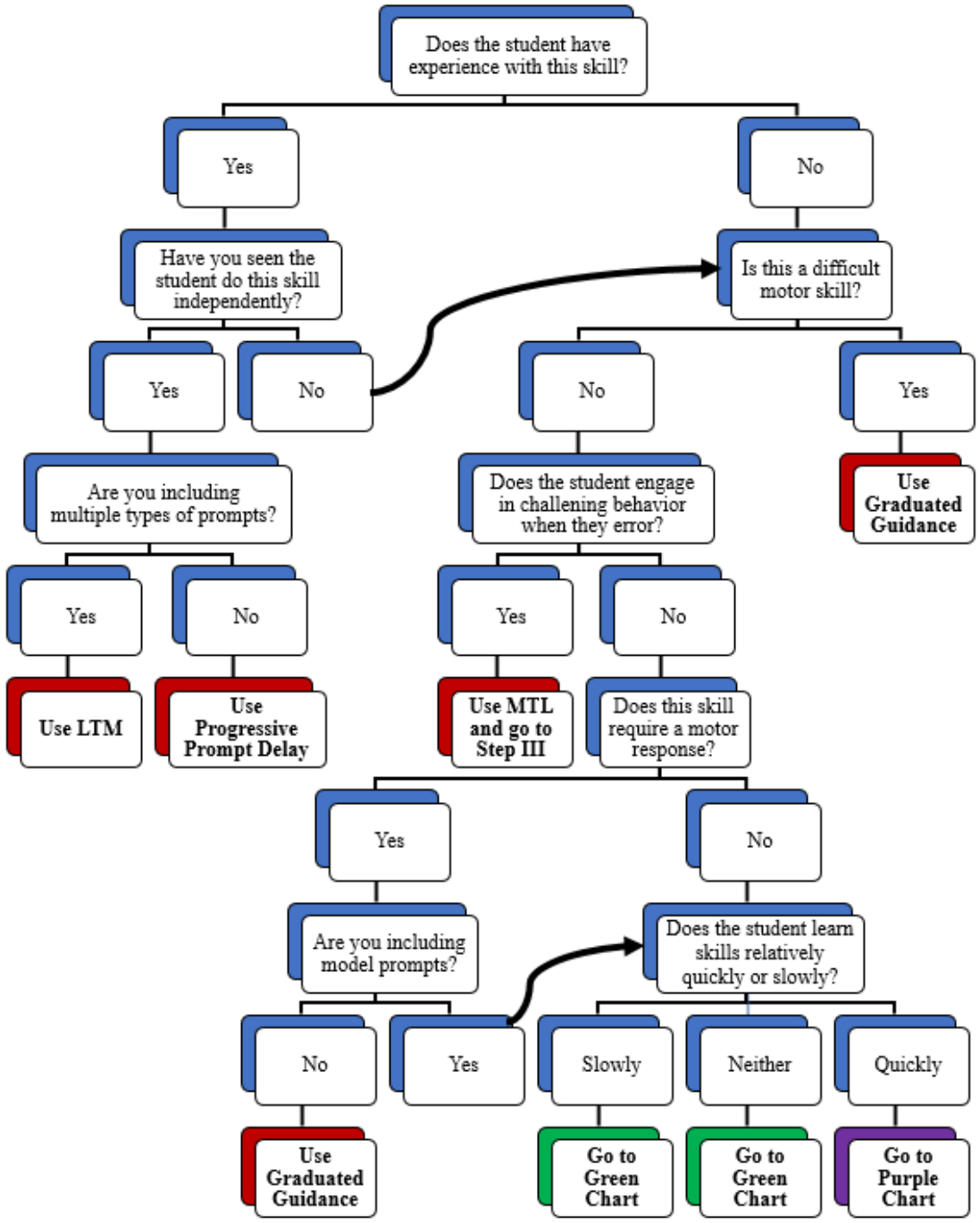
Examples of Physical Prompts:

- Lifting student's arm above the correct picture in the array on the table (partial-physical prompt)
- Guiding the student's arms and hands through each step of making a sandwich (full-physical prompt)

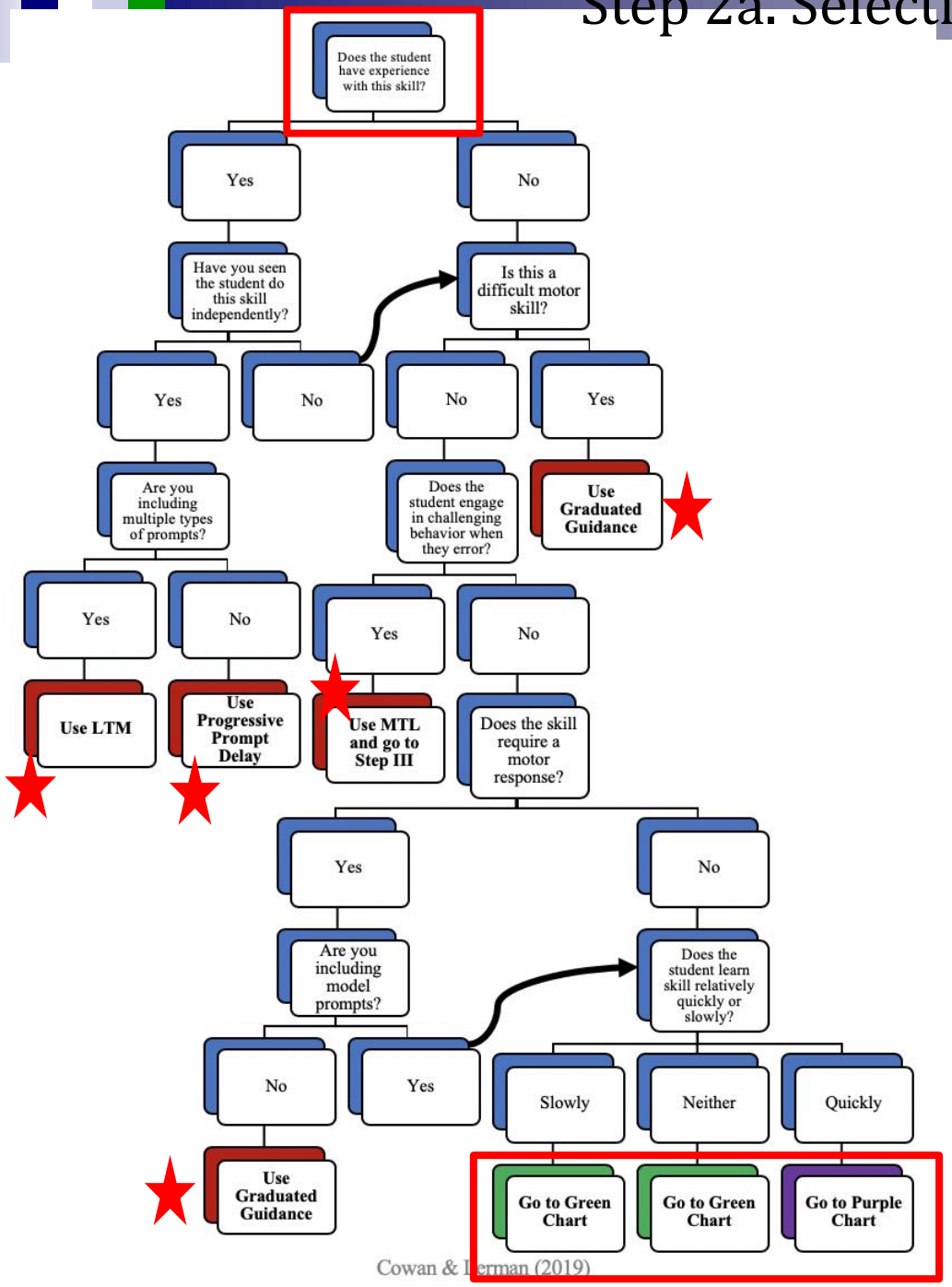
Step II. Selecting the Prompt-Fading Strategy (Mark "Yes," "No," "N/A," or "Unsure" for each line)

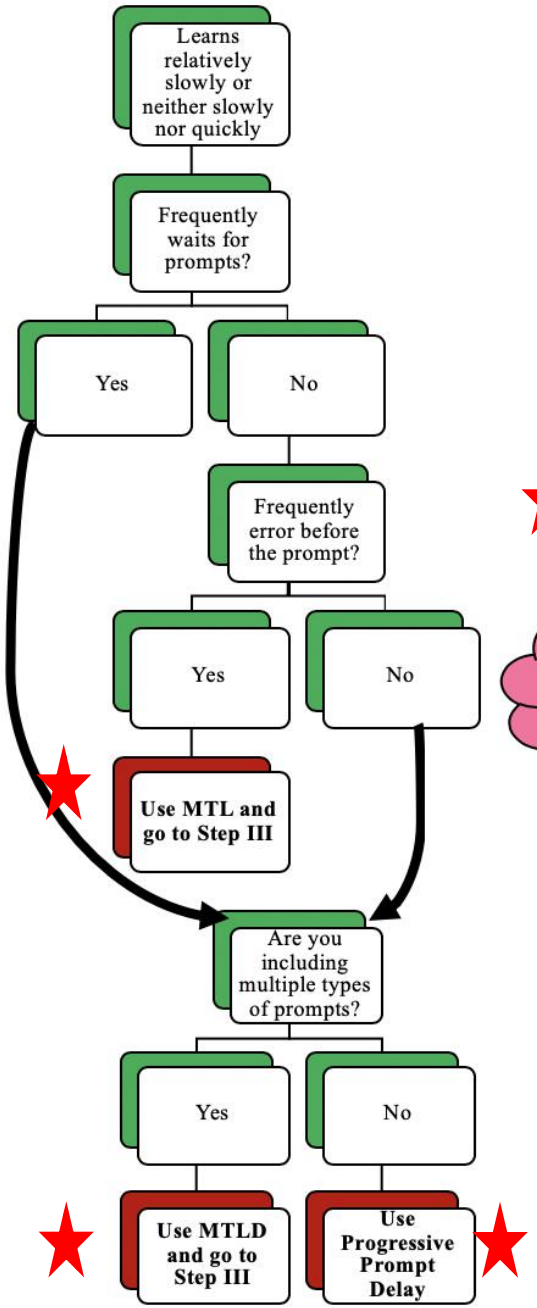
3.	Does the student have experience with this skill or other similar skills?	**Yes**	**No**	**Unsure**
4.	Have you seen the student do the skill independently before?	**Yes**	**No**	
5.	Does the skill require motor responses that are difficult for the student?	**Yes**	**No**	**Unsure**
6.	Does the student get upset, engage in challenging behavior, or work more slowly when they respond incorrectly or must wait for a prompt?	**Yes**	**No**	**Unsure**
7.	If the skill requires a motor response, are you including model prompts?	**Yes**	**No**	**N/A**
8.	Are you going to include multiple types of prompts? (Based on Step 1a)	**Yes**	**No**	
9.	Does the student typically learn new skills relatively quickly or slowly?	**Quickly**		**Slowly**
		Neither		**Unsure**
10.	Does the student tend to wait for prompts before responding?	**Yes**	**No**	**Unsure**
11.	Does the student tend to respond (incorrectly) before a prompt or without fully attending to the learning materials or your instructions?	**Yes**	**No**	**Unsure**

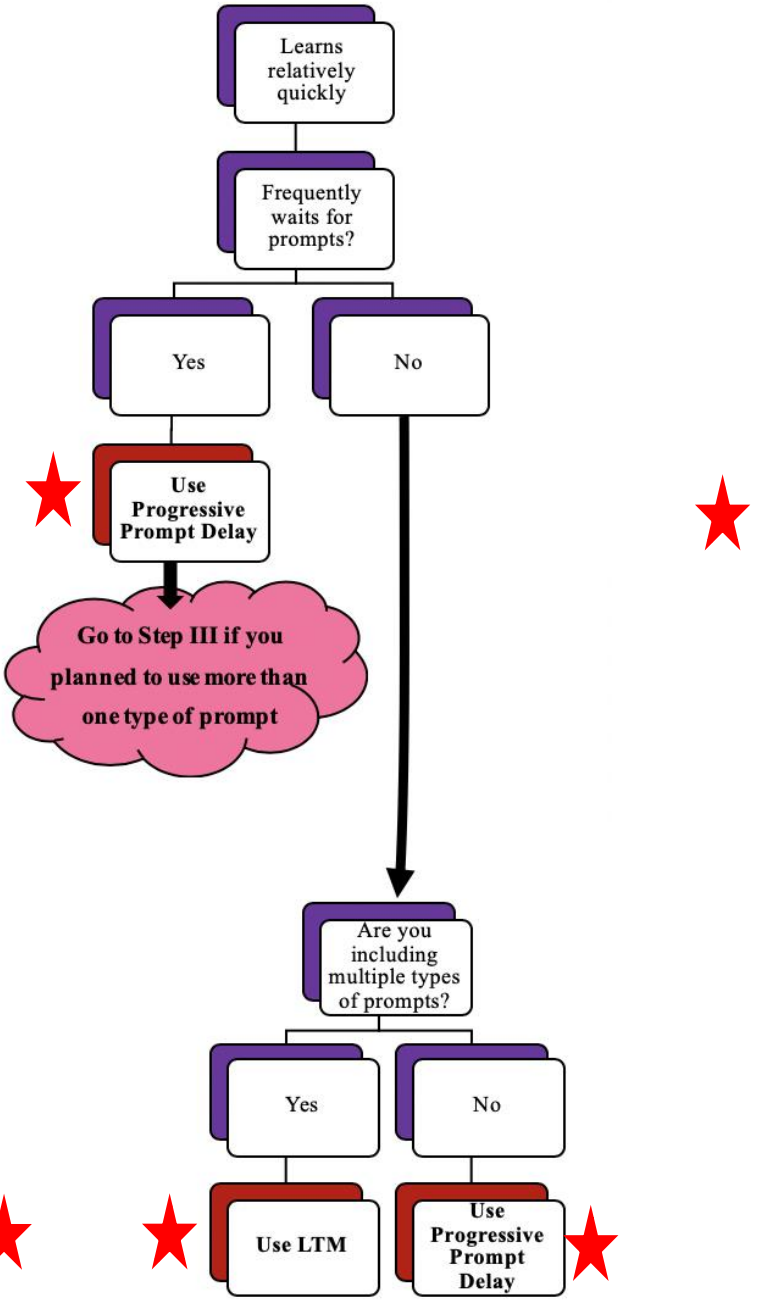
Selecting the Prompt-Fading Strategy



Step 2a. Selecting the Prompt-Fading Strategy







Cowan & Lerman (2019)

What to Do If You Marked "Unsure"

Refer to the below considerations for each item on the SWEEPS that you marked as "Unsure." As an initial step, consult the student's previous IEPs, teachers, parents, therapists, and others who know the student whenever possible to gain more information. For items which call for the evaluation of the specific skill (e.g., motor imitation), conduct the test using least-to-most (LTM) prompting. Keep in mind that it may take several attempts to get a definite answer. It is important to evaluate a wide variety of responses and instructions during these assessments. It is possible that the student simply hasn't learned the specific responses (e.g., touching the correct color, animal, etc.) or instruction (e.g., "Touch blue," "Find blue," "Show me blue," etc.) you initially test but may know others. For each tested item below, deliver at least 5 instructional trials. **MAKE SURE YOU IDENTIFY A REINFORCER FOR THE STUDENT TO KEEP THEM MOTIVATED!**

Table of Contents

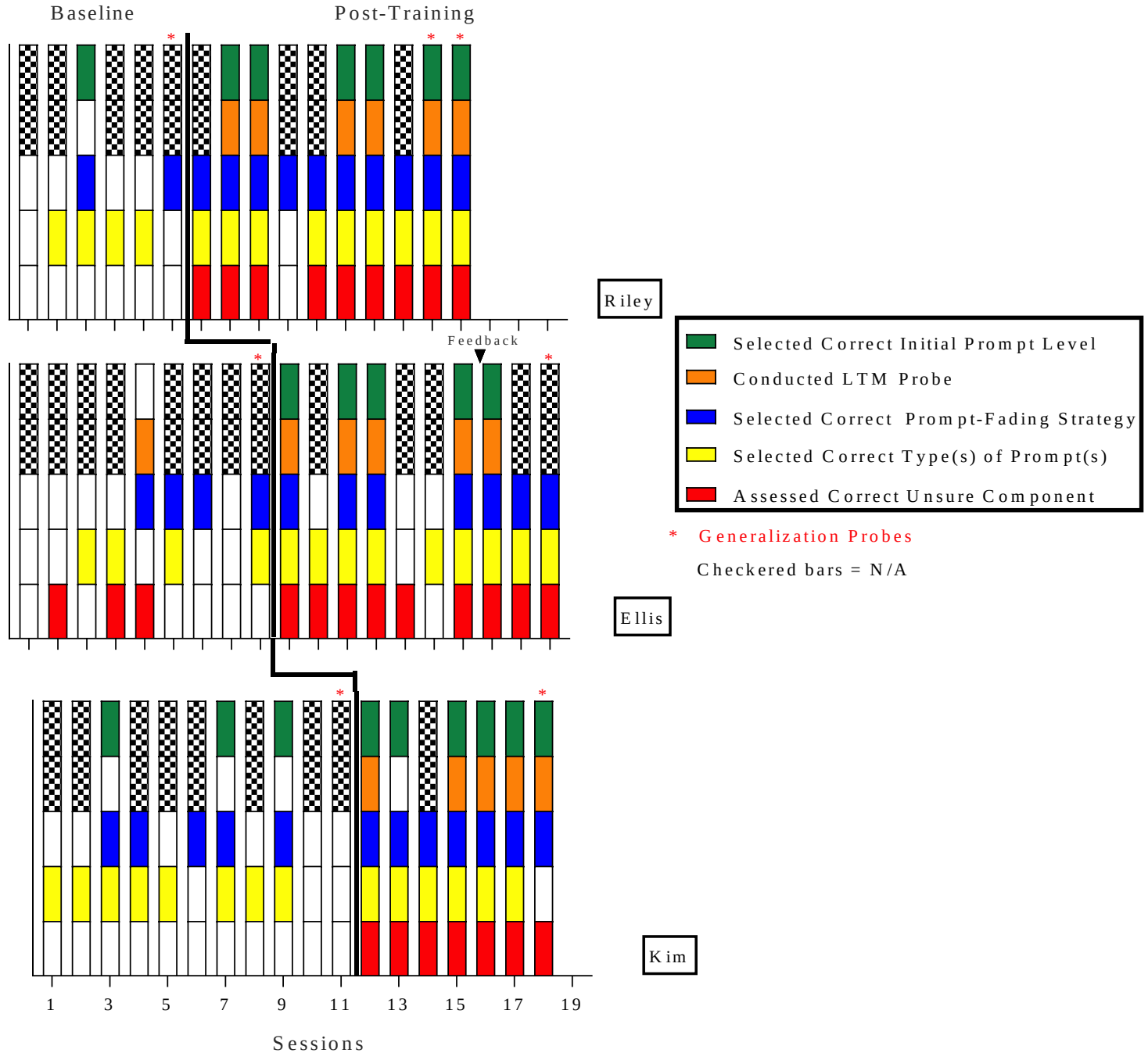
Participants

- 11 teachers
- 5 first-year graduate students in behavior analysis

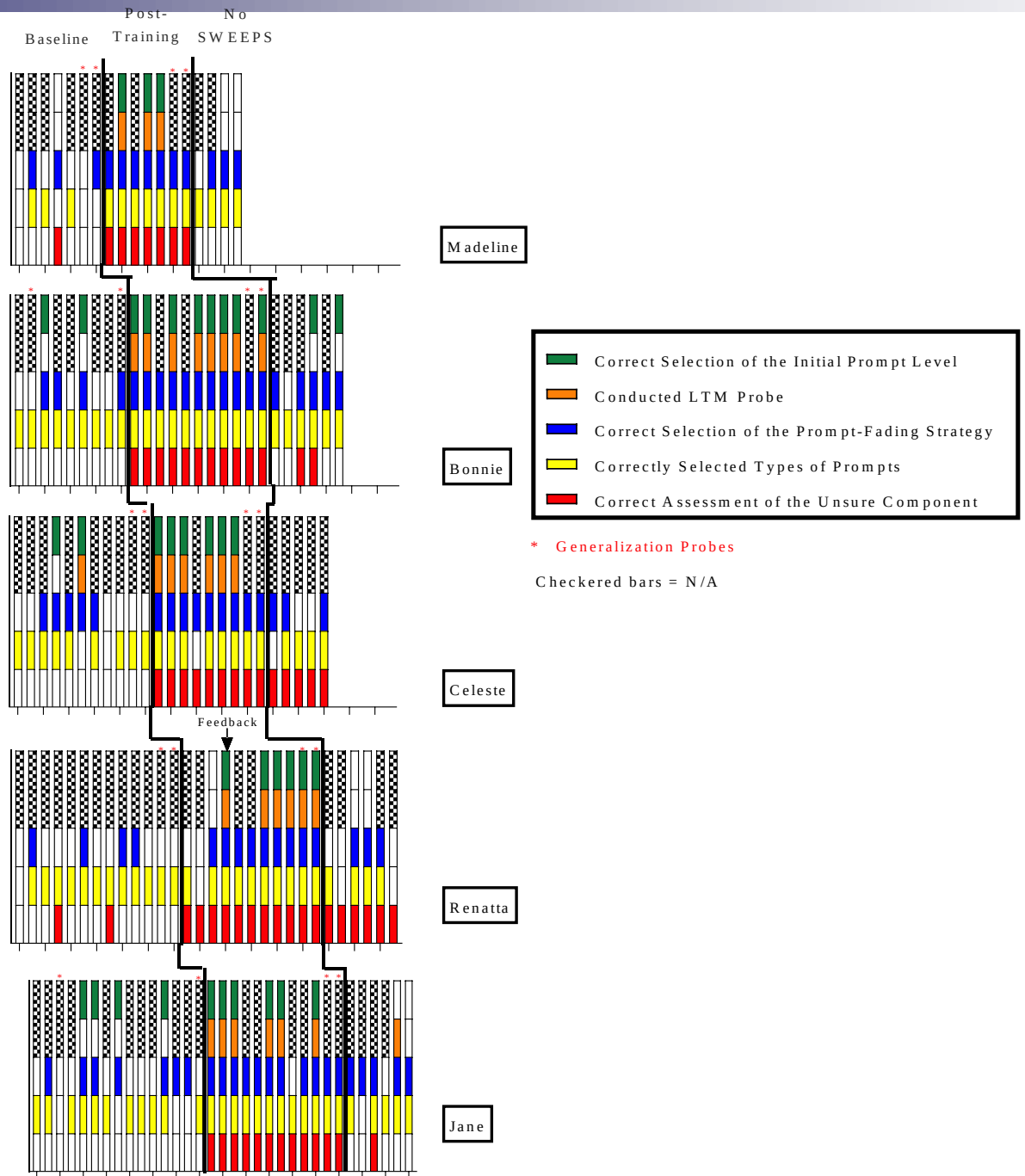
Written Scenarios

- Variety of target skills
- All potential combinations of student characteristics
- One “unknown” component per scenario
  - “It is unclear if Sam knows how to imitate motor movements”
- Scenario randomly determined for each session

11 teachers
4 required feedback



5 graduate students
1 required feedback



Training Teachers to Select and Implement Appropriate Function-Based Interventions

- Reduce teacher's reliance on specialists
- Prevent more restrictive placements/formal BIPs
- Limited research

Detecting Antecedents/Consequences of Problem Behavior Through A-B-C Recording

- Teacher-collected A-B-C data provides information to
  - Generate hypotheses
  - Design functional analysis
- Narrative vs structured A-B-C recording
  - Lerman, Hovanetz, Strobel, & Tetreault (2009)
- Computer-based training (detection of multiple/subtle events)
  - Scott, Lerman, & Luck (2018)

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2018, 51, 784–801 NUMBER 4 (FALL)

COMPUTER-BASED TRAINING TO DETECT ANTECEDENTS AND CONSEQUENCES OF PROBLEM BEHAVIOR

JELISA SCOTT, DOROTHEA C. LERMAN AND KALLY LUCK

UNIVERSITY OF HOUSTON, CLEAR LAKE

Goals:

- Evaluate outcomes of a stand-alone computer-based program

  Elements of BST (lecture, models, practice)

  Progress from simple to more complex:

  Single exemplars →

Single Exemplars

Function	Antecedent	Consequence
Attention	Teacher discontinues interaction with student by walking away.	Teacher delivers reprimand, tells student to stop.
Tangible	Teacher removes toy in student's possession or stops ongoing activity.	Teacher returns the removed toy or permits resumption of activity.
Escape	Teacher delivers vocal instruction to student (with or without materials).	Teacher removes task materials, does not follow through with demand.

Computer-Based Training
(Scott et al., 2018)

Goals:

- Evaluate outcomes of a stand-alone computer-based program

  Elements of BST (lecture, models, practice)

  Progress from simple to more complex:

  Single exemplars → Multiple exemplars →

Additional Exemplars

Function	Antecedent	Consequence
Attention	Teacher ignores vocal or physical (hand raise) request for attention.	Teacher delivers statements of concern. Teacher touches student without saying anything.
Tangible	Student attempts to grab item that is out of reach.	Teacher delivers an item that is different than the one desired/requested.
Escape	Teacher hands task materials to the student with no vocal instruction.	Teacher delays task Student leaves area or activity.

Computer-Based Training
(Scott et al., 2018)

Goals:

- Evaluate outcomes of a stand-alone computer-based program

  Elements of BST (lecture, models, practice)

  Progress from simple to more complex:
  Single exemplars → Multiple exemplars → Simultaneous

- Identify important elements of training

- 20 “Test” Videos

STRUCTURED ABC DATA ANALYSIS FORM

Date:	Name:

INSTRUCTIONS

- Each row represents an EPISODE of behavior.
- Document any antecedents and/or consequences that occur within 10s of the target behavior by placing an 'X' in the corresponding box.

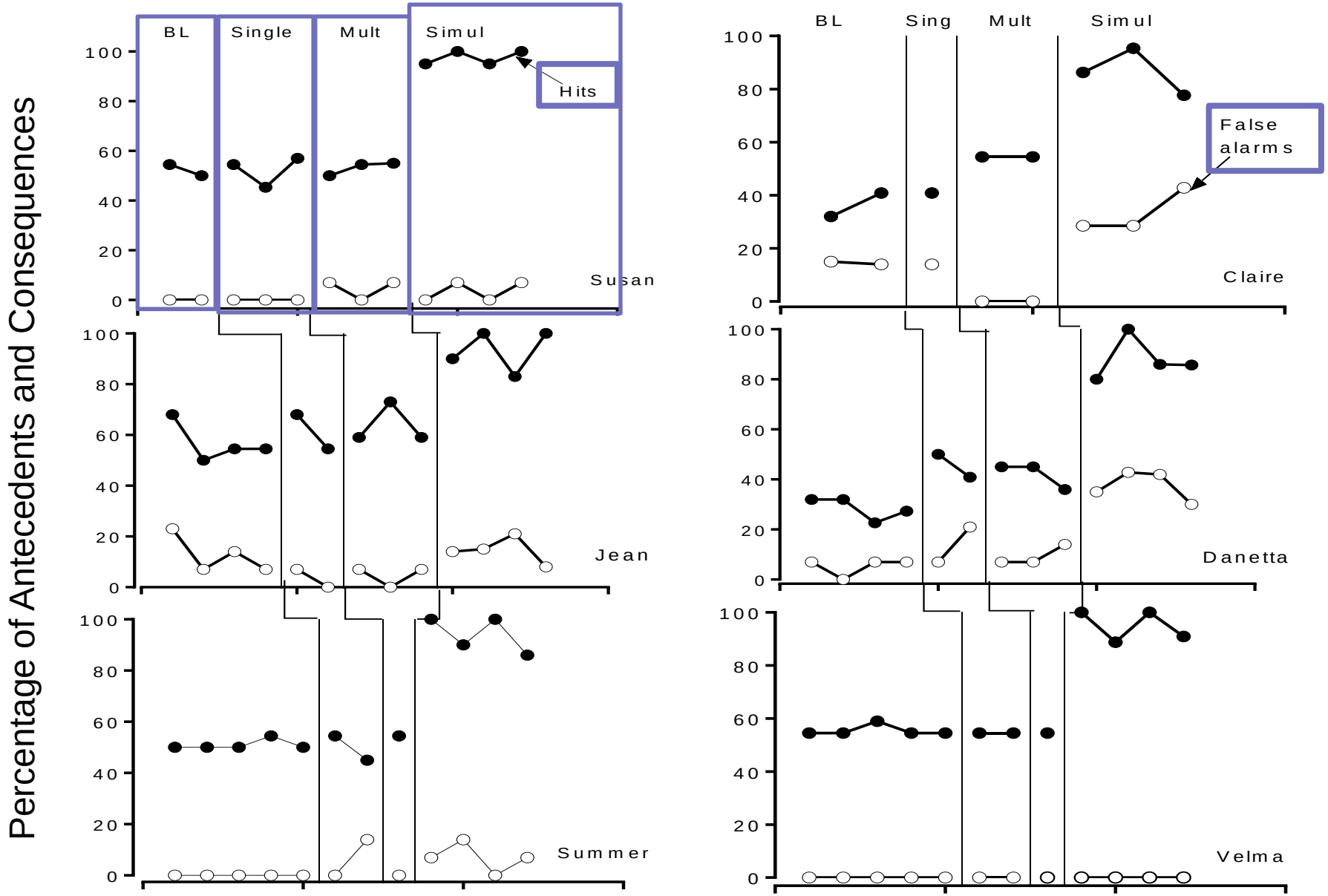
Target Behavior: Screaming – Any sound that is not a clear word and is vocalized above conversation level.

	Antecedent (Before Behavior)		Consequence (After Behavior)	
1	Demand Placed		Escaped Demand	
	Attention Withheld		Got Attention	
	Tangible/Activity Withheld		Got Tangible/Activity	
	None		None	

Computer-Based Training
(Scott et al., 2018)

- Experiment 1: (N = 19)

Single Exemplars → Multiple Exemplars → Simultaneous Events

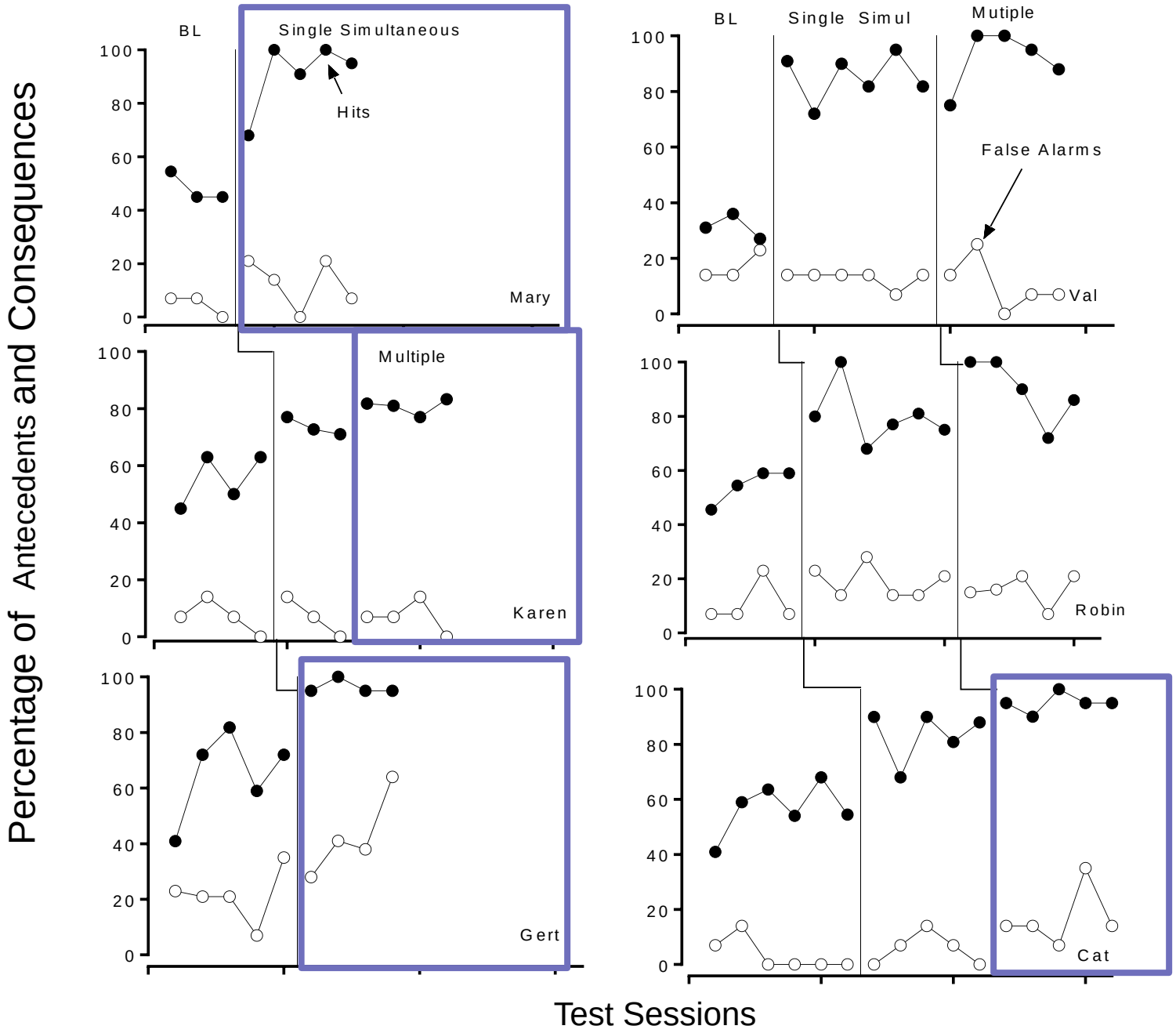

Percentage of Antecedents and Consequences
BL
Single
Mult
Simul
Hits
Susan
Jean
Summer
BL
Sing
Mult
Simul
False alarms
Claire
Danetta
Velma
100
80
60
40
20
0
Test Sessions

Computer-Based Training
(Scott et al., 2018)

- Experiment 2: (N = 20)

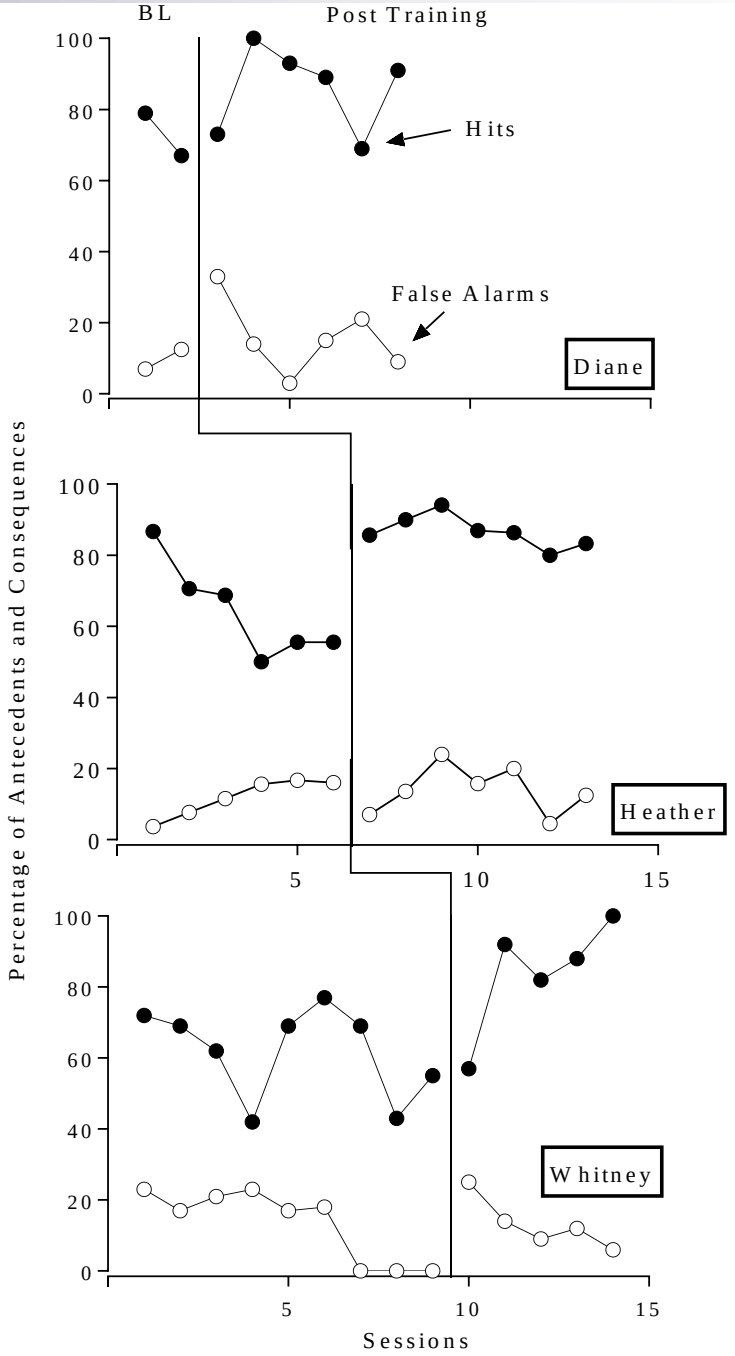
Was multiple exemplar training critical to success?

Simultaneous Single Exemplars →Multiple Exemplars


Percentage of Antecedents and Consequences
BL
Single Simultaneous
Hits
Mary
Multiple
Karen
Gert
BL
Single Simul
Mutiple
False Alarms
Val
Robin
Cat
Test Sessions

Conclusions

- Efficient alternative to traditional BST
- Training on simultaneous events critical
- But false alarms!
- Improves detection in the classroom?



Training Teachers to Select and Implement Appropriate Function-Based Interventions

Luck, Lerman, & Williams (under review)

- Evaluated the effectiveness of brief training
  - Identify function via examination of descriptive data
  - Select and implement the appropriate procedural variation of functional communication training (FCT)

Training Teachers to Select and Implement Appropriate Function-Based Interventions

Luck, Lerman, & Williams (under review)

- Participants
  - Five special education teachers (27-51 years old)
  - 1-18 years of teaching experience
  - Limited prior training/experience

- Response Measurement
  - Each FCT component correct / incorrect / not applicable

Training Teachers to Select and Implement Appropriate Function-Based Interventions

Luck, Lerman, & Williams (under review)

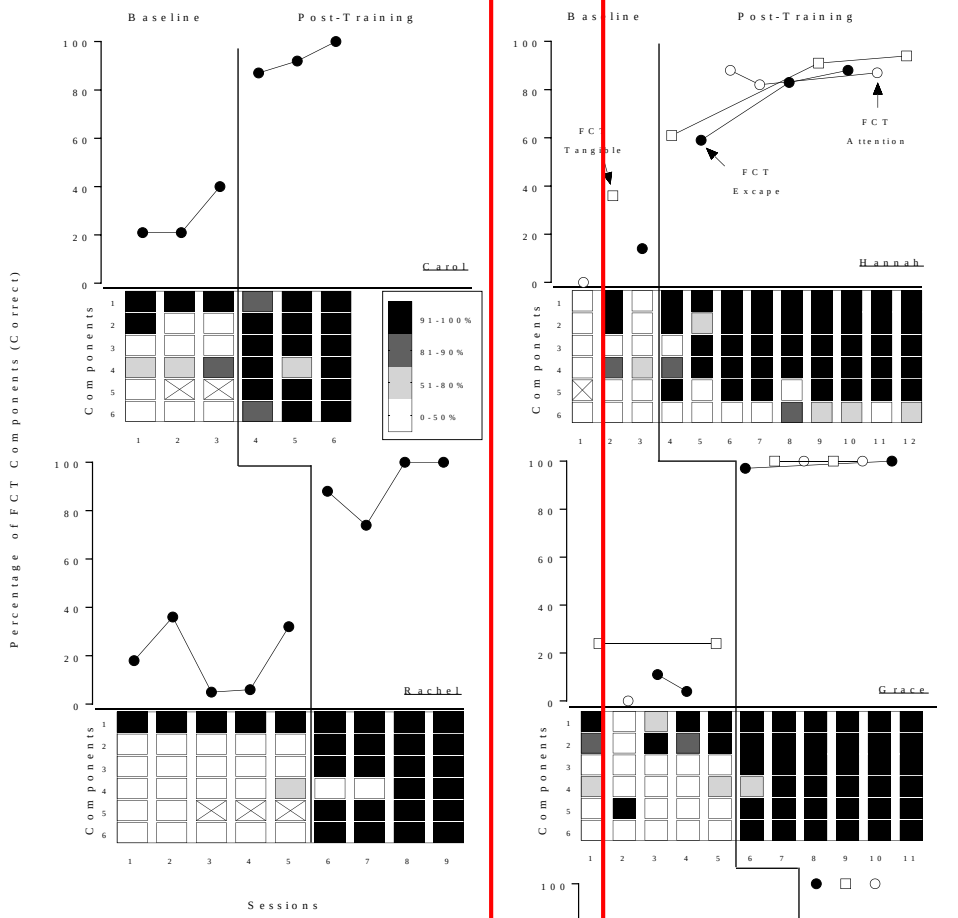
- FCT Components (escape, tangibles, attention)
  - Establish the relevant antecedent
  - Provide the correct communication card
  - Prompt card exchange at appropriate time
  - Implement extinction for problem behavior
  - Provide 20 s – 40 s of functional reinforcer for card exchanges
  - Collect data accurately
- Sessions = six trials or 6 min
- Multiple baseline design

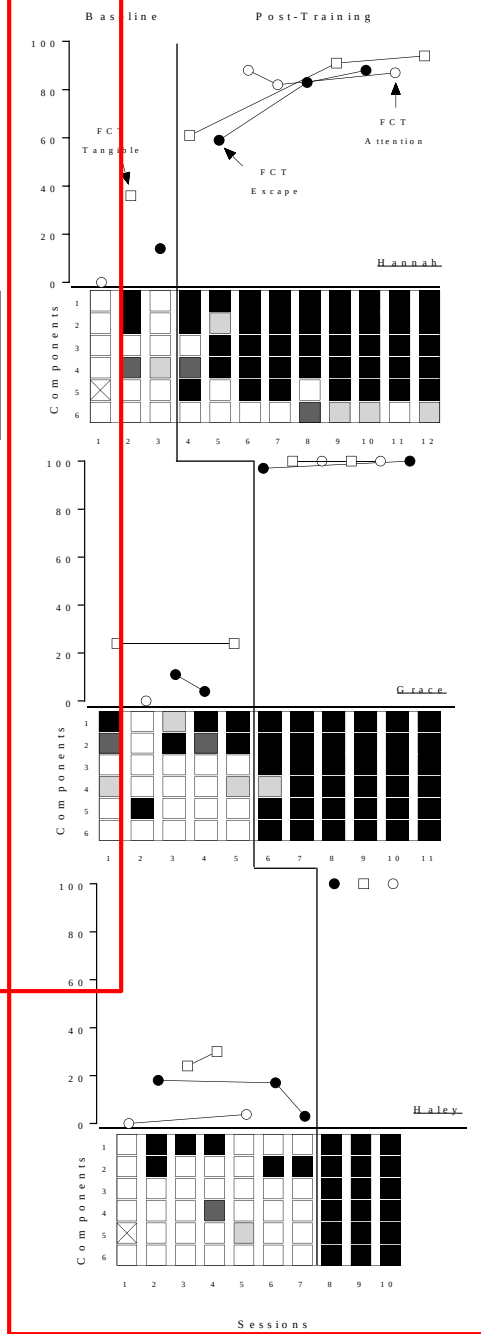
Training Teachers to Select and Implement Appropriate Function-Based Interventions

Luck, Lerman, & Williams (under review)

- Baseline / Post-Training Sessions
  - Received completed checklist A-B-C (from Scott et al., 2018)
  - "Determine why the behavior is happening and implement an intervention that will teach a new response and decrease the problem behavior over time."

- Training
  - Behavioral skills training (instructions, modeling, and role play)


Baseline
Post-Training
Carol
Rachel
Percentage of FCT Components (Correct)
Components
91-100%
81-90%
51-80%
0-50%
Sessions


Baseline
Post-Training
FCT
Tangible
FCT
Escape
FCT
Attention
Hannah
Grace
Haley
Components
Sessions

Effects of Distractions on Procedural Integrity and Preference

Luck, Lerman, Williams, & Fletcher (in preparation)

- Variety of effective function-based treatments for escape behavior
  - Differential reinforcement of alternative behavior (DRA)
  - Differential reinforcement of other behavior (DRO)
  - Noncontingent reinforcement (NCR)
- Limited research on relative ease or on behavioral measures of preference (Gabor et al., 2016)

- Purpose:
  - Compare procedural integrity of DRA, DRO, NCR
  - Examine relative preference
  - Evaluate impact of distractions

Effects of Distractions on Procedural Integrity and Preference

Luck, Lerman, Williams, & Fletcher (in preparation)

- Participants
  - Five special education teachers (23-40 years old)
  - 1-12 years of teaching experience
  - Limited prior training/experience
- Response Measurement
  - Procedural integrity: Each treatment component correct, incorrect, not applicable
  - Preference: Intervention selected to train paraprofessional

Effects of Distractions on Procedural Integrity and Preference

Luck, Lerman, Williams, & Fletcher (in preparation)

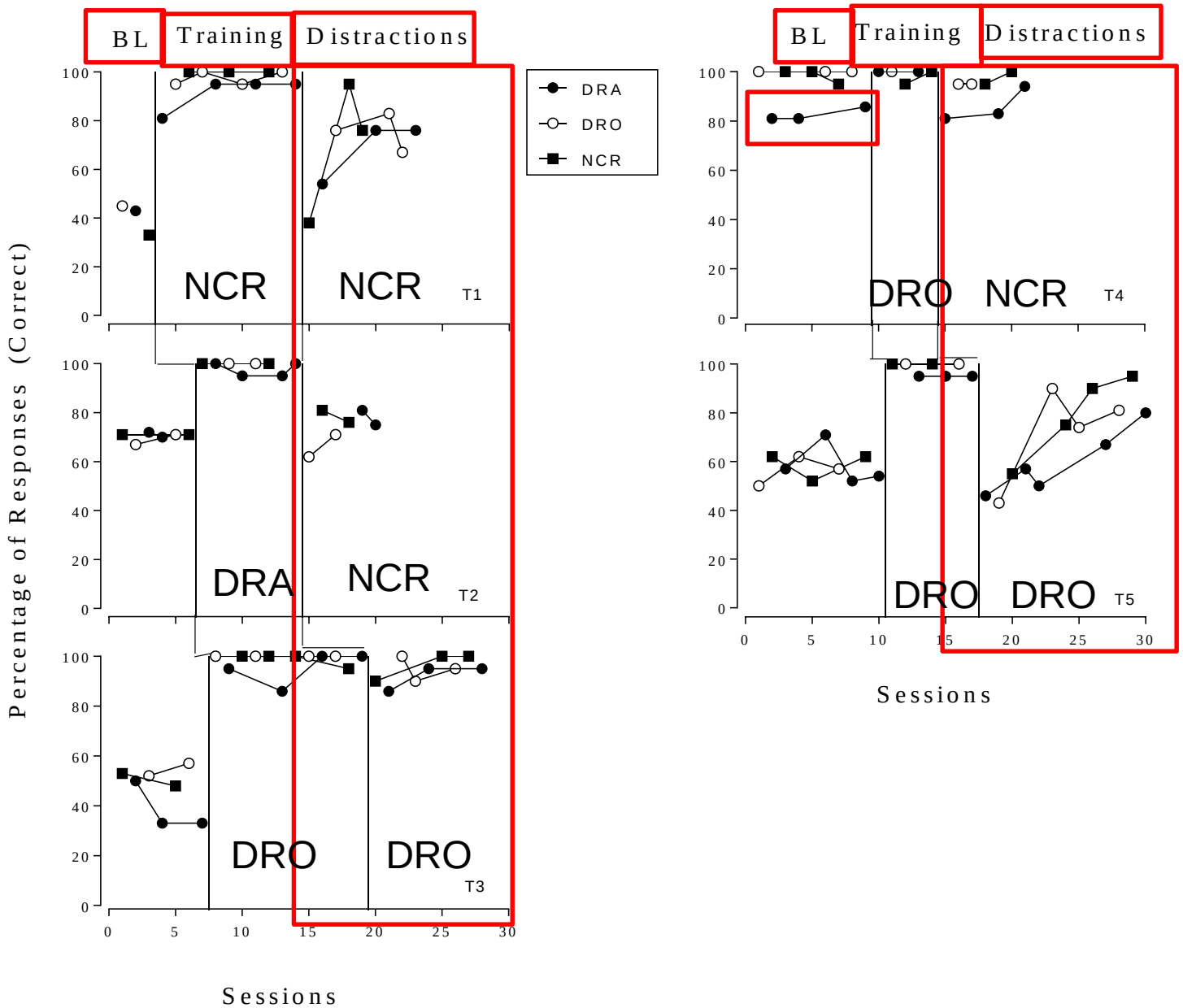
- Treatment Components
  - Establish the antecedent
  - Respond to problem behavior correctly
  - Deliver the reinforcer at appropriate time
  - Collect data accurately
- Multiple baseline design

Effects of Distractions on Procedural Integrity and Preference

Luck, Lerman, Williams, & Fletcher (in preparation)

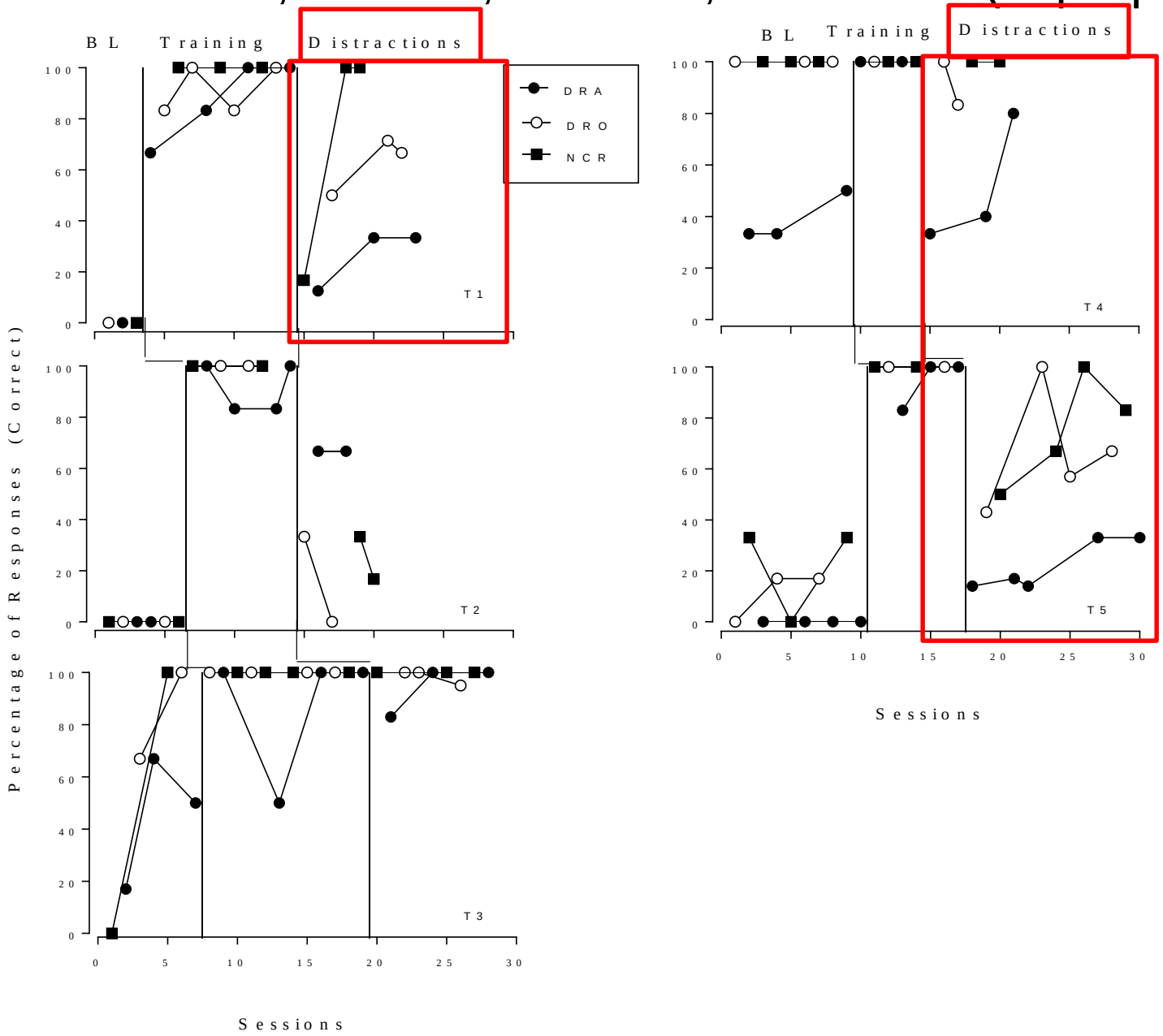
- Baseline
  - 30-min lecture + handouts
  - Instructed to implement each in simulation (prepared scripts)
- Training
  - Same as baseline + feedback
- Distractions
  - Same as baseline + two additional students
    - Distractions every 10 s (requested attention, argued, etc)
- Choice
  - Selected intervention to train paraprofessional
  - Before and after distractions phase

Results: Luck, Lerman, Williams, & Fletcher (in preparation)



Results: Luck, Lerman, Williams, & Fletcher (in preparation)

Sr Delivery



Conclusions

- Model useful for training teachers to select and implement function-based treatments
- But reliance on simulation for research/practical purposes
- Classroom environment an important consideration
- Need to assess generalization to classrooms

Texas Higher Education Coordinating Board Autism Grant 2018-2020

- Two-day group “pull out,” separated by 2 weeks
  - Select one student and target problem behavior
  - Collect A-B-C data in classroom
  - Select, design, and implement a function-based intervention (DRA, DRO, NCR)
  - Train paraprofessional

- Individual follow-up visits in classroom for subset of teachers
  - Observation and feedback
  - Case consultation

Texas Higher Education Coordinating Board Autism Grant 2018-2020

- Outcomes thus far (Sept 1, 2018-August 2019)

One BCBA (plus assistant) has trained 128 teachers and paraprofessionals serving 345 students with autism in six school districts

Project BCBA:
Kelsey Campbell

- A-B-C recording = 95% accuracy
- Intervention (in training) = 92%-100% accuracy
- Intervention (in classroom) = 80%-100% accuracy
- Satisfaction survey = mean 5.7 on 6-pt scale

Project Assistant:
Andrew Bennett

Texas Higher Education Coordinating Board Autism Grant 2018-2020

- Outcomes thus far (Sept 1, 2018-August 2019)

  - Targeted Hypothesized Function

    Escape: 74%

    Tangible: 11%

    Attention: 15%

  - Selected Intervention

    DRA: 78%

    DRO: 13%

    NCR: 9% (attention/tangible only)

Take-Home Points

- Integrate ABA practices into more teacher preparation programs
- Prioritize paraprofessional training
- Use “bootcamps” to disseminate and maintain effective practices

University of Houston Clear Lake

Questions?

Dorothea C. Lerman, Ph.D., BCBA-D

CADD
CENTER FOR AUTISM AND DEVELOPMENTAL DISABILITIES