Teaching Problem Solving to Increase Academic, Communication, and Social Skills

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Overview, Co-Authors

- Definitions/background on problem solving
- Applied research on problem solving
- Applications of problem solving in practice

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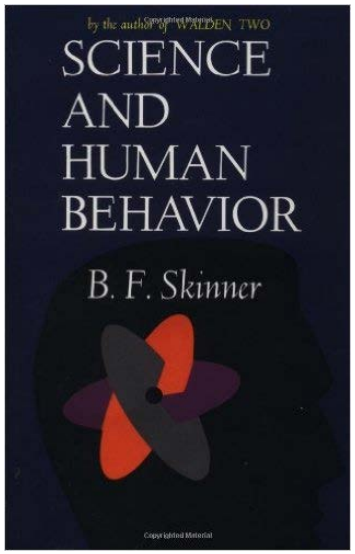
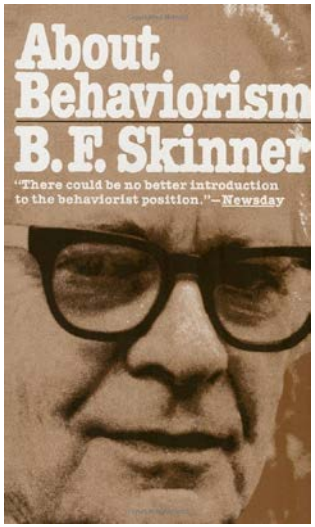
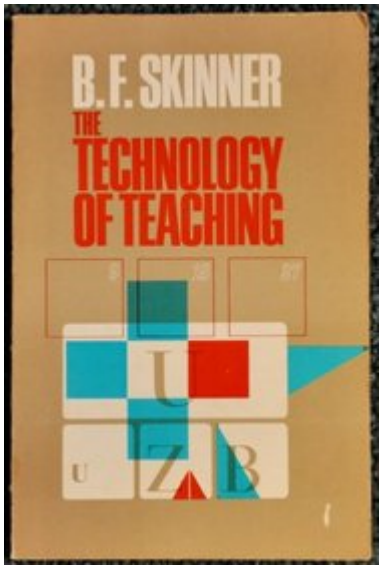
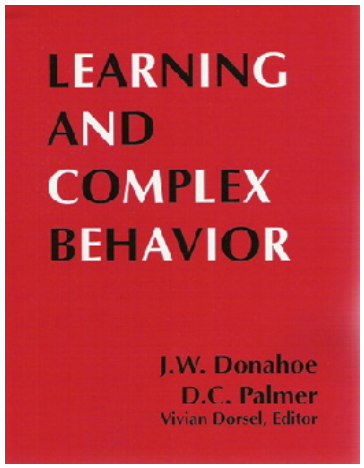
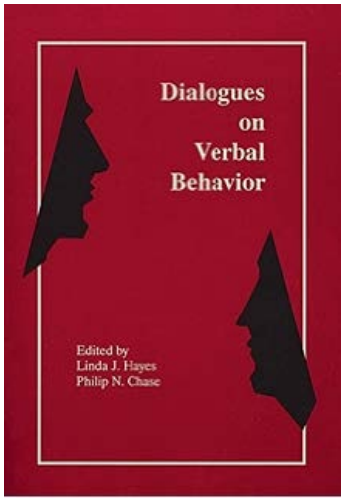
Acknowledge the Idea Havers











Common Skills We Teach

Mand:	MO → request → get reinforcer
Tact:	Item → say its name → SR+
Echoic:	Word → repeat → SR+
Listener:	Word + pictures → point → SR+
Match:	Picture → put with same → SR+
Intraverbal:	Question/fill-in → word(s) → SR+
Textual:	Printed word → say word → SR+
Chain:	Turn on water, rinse hands, etc.

But, What Happens When:

- Child has MO, but no way to mand
- Child given sight word never seen before
- Child given math problem never seen before
- Child's teacher wants more elaborate intraverbal responses
- Child enters a playroom with other children and doesn't know what to do or say

These are all "Problems"

Why Problem Solving is Important

"Despite its impressive effects in terms of teaching important behaviors to children with autism, the **highly structured discrete trial model** encountered problems with generality. Specifically, some of the problems noted included cue dependency, lack of spontaneity and self-initiated behavior, rote responding, and failure to generalize behavior gains across settings and responses." (Schreibman, 1997)

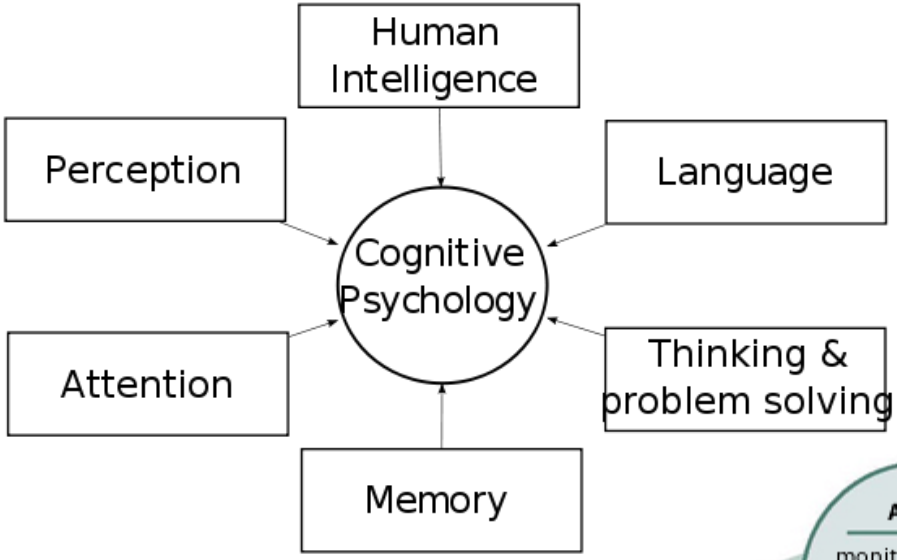
Why Problem Solving is Important

Current problem-solving standards for math curricula demonstrates:

‘‘a shift from a behaviorist approach of teaching rote learning of facts and procedures to a constructivist approach’’

(Butler et al., 2001, p. 20; cited in Neef et al., 2003)

Three Parts of the Mind



Cognitive

Thinking

IQ
Skills
Reason
Knowledge
Experience
Education

Conative

Doing

Drive
Necessity
Innate Force
Instinct
Mental Energy
Talents

Affective

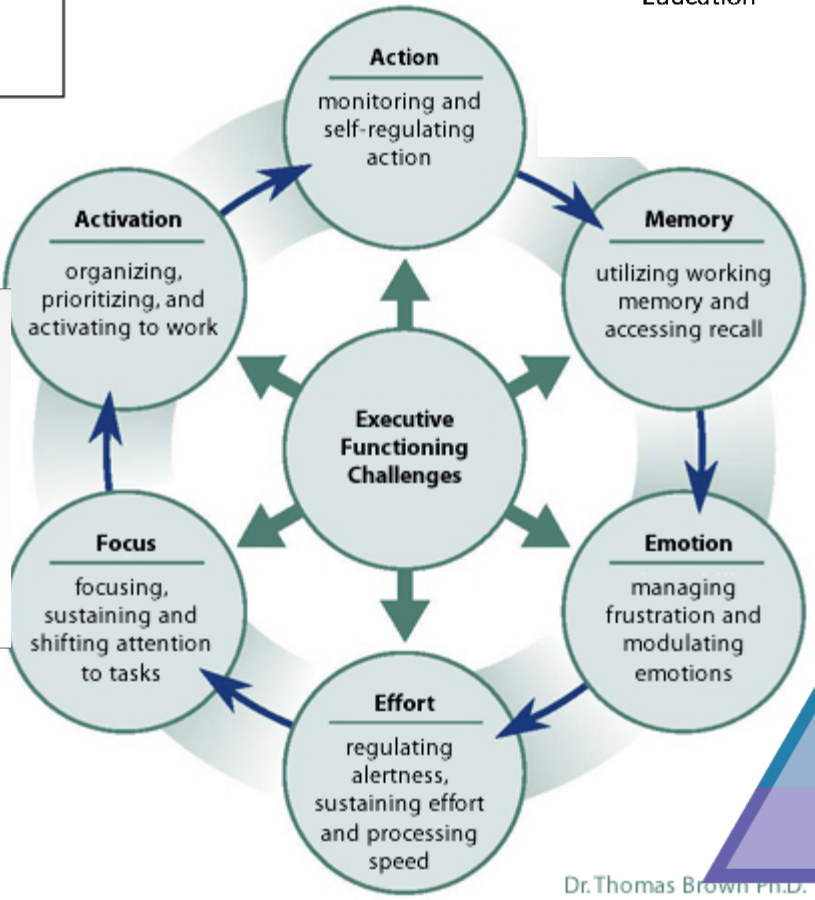
Feeling

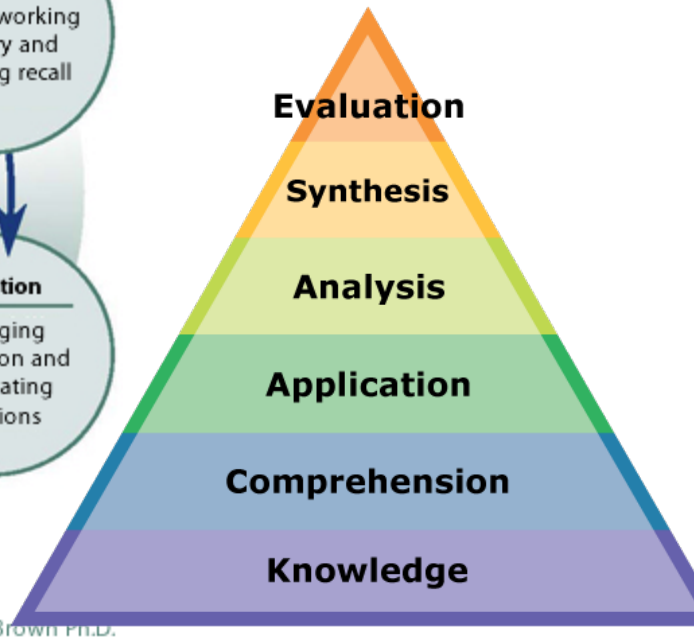
Desires
Motivation
Attitudes
Preferences
Emotions
Values

To Think Critically, Think RED

Keys to CRITICAL THINKING

- **R**ecognize Assumptions
- **E**valuate Arguments
- **D**raw Conclusions





Dr. Thomas Brown Ph.D.

Skinner's Definition of a "Problem"

"In the true 'problem situation' the organism has no behavior immediately available which will reduce the deprivation or provide escape from aversive stimulation" (Skinner, 1953)

MO/S^D → ???

Three Criteria of a Problem

(Donahoe & Palmer, 1994)

1. The target response is in your repertoire
2. The target response is scheduled for reinforcement
3. The current S^D and environmental context are not enough to directly evoke the target response

Becker, Engelmann, & Thomas (1975)

Problem-solving: tasks that "demand a novel (untrained) synthesis [combination] of responses in the presence of a novel stimulus"

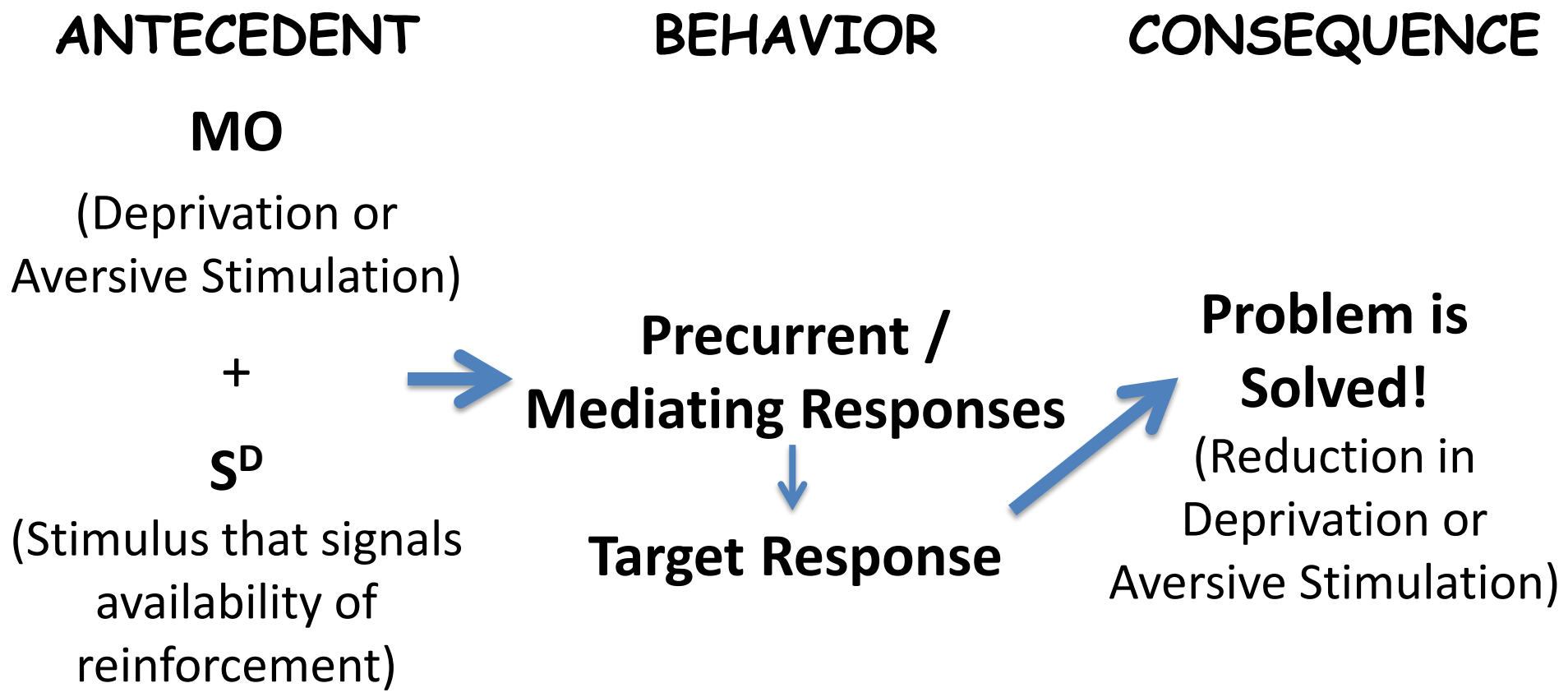
(quoted in Mayfield & Chase, 2002, p. 106)

Math problems

Read this: Honorificabilitudinitatibus

(longest word in Shakespeare's works)

The Analysis of Problem Solving



MATH PROBLEM

ANTECEDENT	BEHAVIOR	CONSEQUENCE
MO Momentary Value of Teacher Feedback + **S^D** "What is 23 + 22?"	**Precurrent / Mediating Responses** Write down the problem Add the ones column Add the tens column **Target Response** Saying/Writing "45"	**Reinforcer** "Right!"

FINDING YOUR KEYS

ANTECEDENT	BEHAVIOR	CONSEQUENCE
MO Need to go to work, no keys + **S^D** Clock with time to leave for work	**Precurrent / Mediating Responses** Looking around Picking things up **Target Response** Looking at the keys	**Reinforcer** Presence of the keys



RECALLING THE PAST

ANTECEDENT	BEHAVIOR	CONSEQUENCE

MO

Current value of listener's response

+

S^D

"What did you do last weekend?"

Precurrent / Mediating Responses

Intraverbal

("Saturday it was raining")

Self-Questioning

("Where did I go? Who did I see?")

Visualization

(close eyes and picture the rain, your house, your friends)

Target Response

"I watched a movie"

Reinforcer

Verbal Response

"Which one?"

Definition of Problem Solving

"Problem-solving may be defined as any behavior which, through the manipulation of variables, makes the appearance of a solution more probable." (Skinner, 1953)

"The behavior of supplementing or manipulating discriminative stimuli until a particular response in the organism's repertoire becomes prepotent over many other responses that are changing in probability." (Donahoe & Palmer, 1994)

How do we Supplement or Manipulate Discriminative Stimuli?

Donahoe & Palmer (1994)

- Change our orientation
- Ask for advice
- Look for instructions
- Working backward
- Breaking a problem into parts

LaFrance & Miguel (2014)

- Engage in intraverbal behavior

Skinner (1953)

- Engage in conditioned seeing

Skinner (1968): “Teaching Thinking”

“Thinking is often called problem-solving” (p. 131)

“we cannot learn problem solving…by acquiring a few special techniques. There are many ways of changing a situation so that we are more likely to respond to it effectively. We can clarify stimuli, change them, convert them into different modalities, isolate them, rearrange them to facilitate comparison, group and regroup them, ‘organize’ them, or add other stimuli” (p. 132)

Problem Solving in Two Domains

1. **Overt Problem Solving**

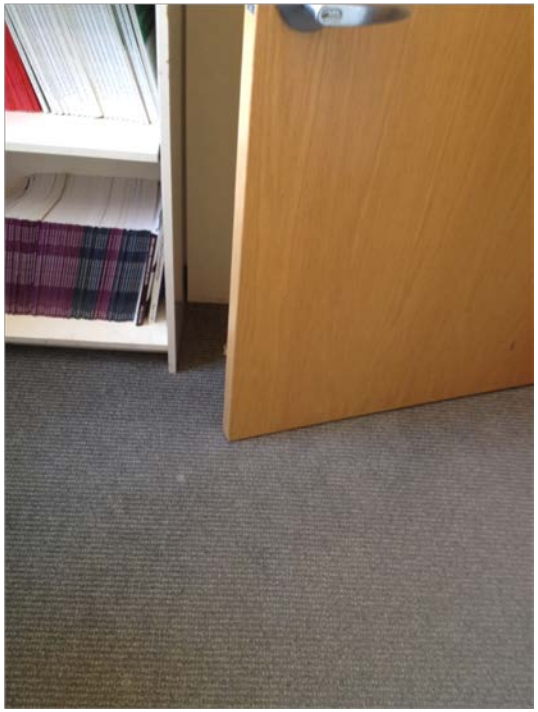
   Observable, happens “outside the skin”

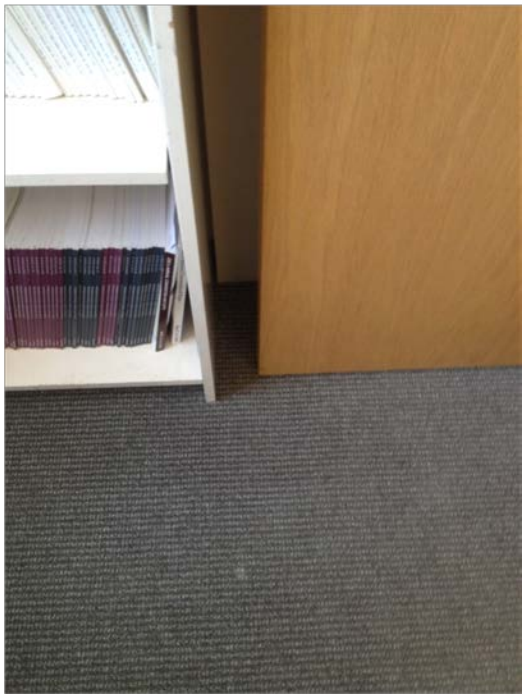
2. **Covert Problem Solving**

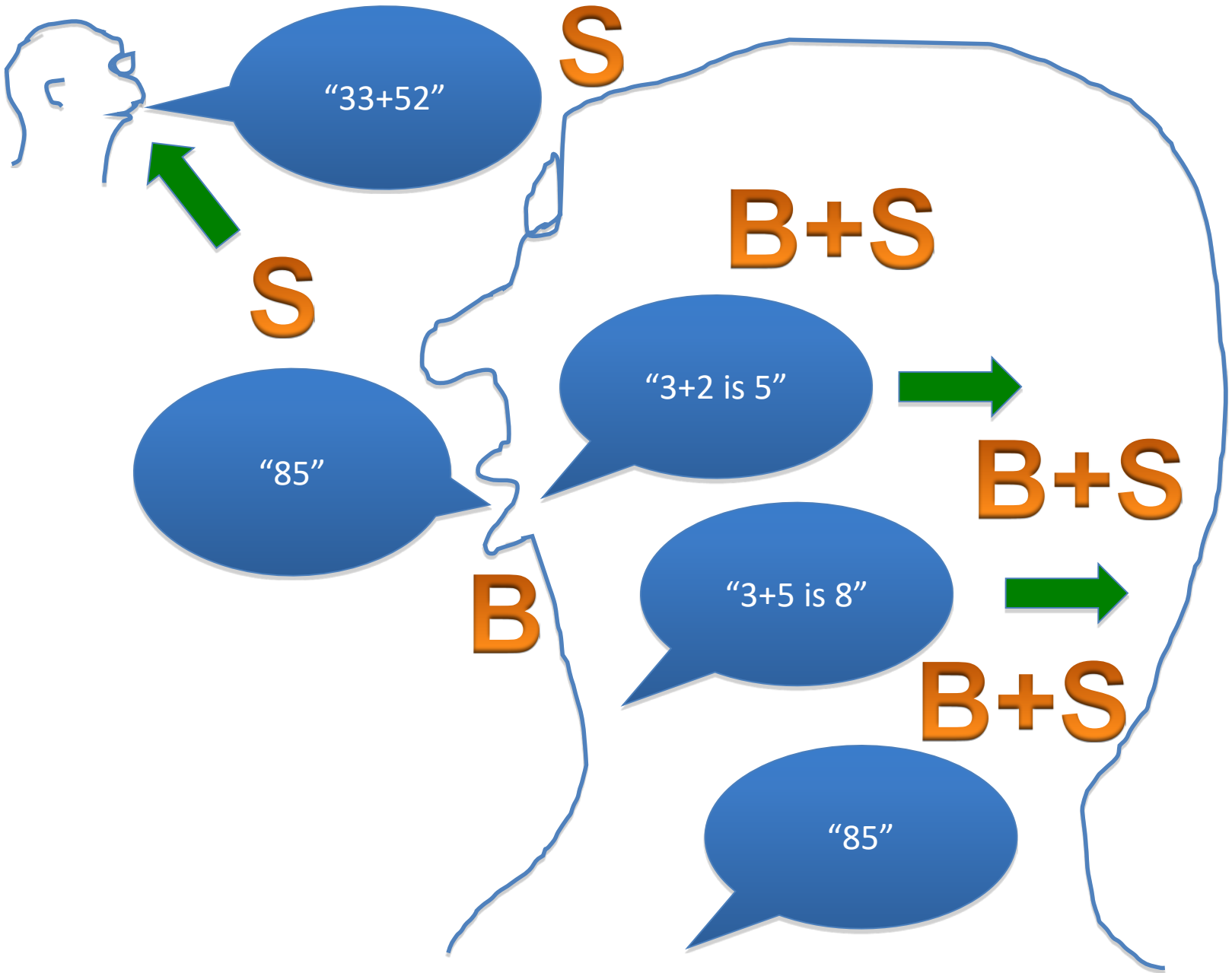
   Problem solving often takes place “within the skin” – covertly, privately

Not much of a distinction between these

My Own Overt Problem Solving






"33+52"
S
S
"85"
B+S
"3+2 is 5"
B+S
B
"3+5 is 8"
B+S
"85"

Radical Behaviorism

"a thoroughgoing form of behaviorism that attempts to understand all human behavior, including private events such as thoughts and feelings, in terms of controlling variables in the history of the person (ontogeny) and the species (phylogeny)"

(Cooper, Heron, & Heward, 2007; based on Moore, 2008; Skinner, 1974)

Six Problem Solving Studies

Domain	Skill	Strategy
Math	Solving word problems	Behavior chains
Social Skills	Initiating interactions	Self-Questioning
Communication	Manding using PECS	Recombining Units
Communication	Intraverbal categorization	Self-Rules, Chains
Communication	Intraverbal categorization	Visual Imagining
Spelling	Writing dictated words	Visual imagining

Common in all 6 Studies

No prompting, prompt fading, reinforcement – no direct training – on **target behavior/skill**

Prompting, prompt fading, and reinforcement on **precurrent behaviors** that students had to use to emit target/current behavior

Precurrent = mediating = problem solving

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2003, **36,** 21–33 NUMBER 1 (SPRING 2003)

ANALYSIS OF PRECURRENT SKILLS IN SOLVING MATHEMATICS STORY PROBLEMS

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2 students with DD

19 and 23 years old

IQs: 46 and 72

We conducted an analysis of precurrent skills (responses that increase the effectiveness of a subsequent or "current" behavior in obtaining a reinforcer) to facilitate the solution of arithmetic word (story) problems. Two students with developmental disabilities were taught four precurrent responses (identifying the initial value, change value, operation, and resulting value) in a sequential manner. Results of a multiple baseline design across behaviors showed that the teaching procedures were effective in increasing correct performance of each of the precurrent behaviors with untaught problems during probes and that once the precurrent behaviors were established, the number of correct problem solutions increased.

DESCRIPTORS: precurrent behavior, problem solving, mathematics, story problems, developmental disabilities

Neef, Nelles, Iwata, and Page (2003)

3. If Sam had 10 pens and then lost 8, how many did he have left?

PROBLEM COMPONENTS

1. The Initial Set
2. The Change Set
3. The Operation
4. The Resulting Set
5. The Solution

- Trained one component at a time
- One word problem per trial; 10 trials per session
- Modeling and praise for training

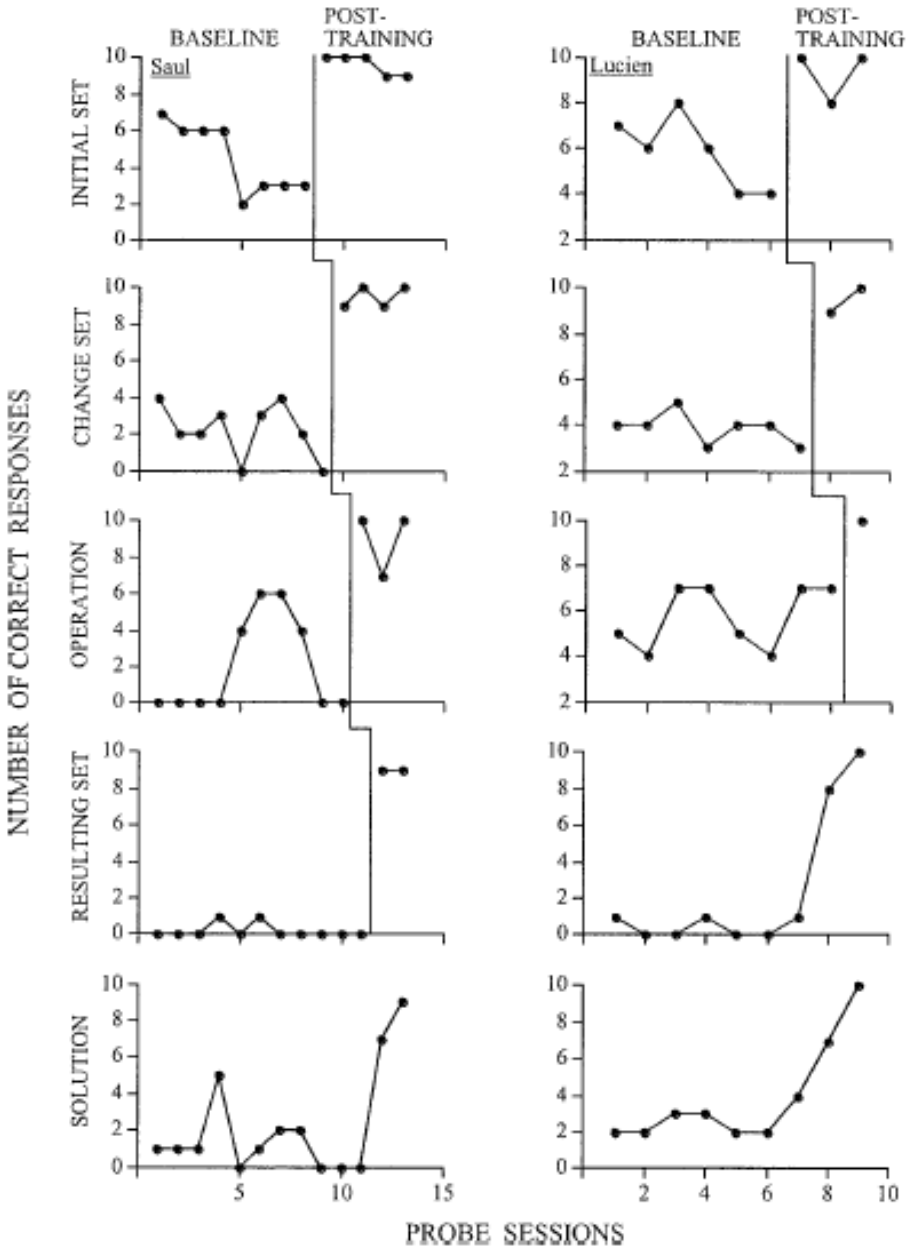

Figure 3. The number of correct responses during mathematics probes across baseline and posttraining conditions.

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2009, 42, 361–367 NUMBER 2 (SUMMER 2009)

THE EFFECTS OF TEACHING PRECURRENT BEHAVIORS ON CHILDREN'S SOLUTION OF MULTIPLICATION AND DIVISION WORD PROBLEMS

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We examined the effects of teaching overt precurrent behaviors on the current operant of solving multiplication and division word problems. Two students were taught four precurrent behaviors (identification of label, operation, larger numbers, and smaller numbers) in a different order, in the context of a multiple baseline design. After meeting criterion on three of the four precurrent skills, the students demonstrated the current operant of correct problem solutions. These skills generalized to novel problems. Correct current operant responses (solutions that matched answers revealed by coloring over the space with a special marker) maintained the precurrent behaviors in the absence of any other programmed reinforcement.

DESCRIPTORS: mathematics, precurrent behaviors, problem solving, word problems

- Younger students: autism, typical
- Multiplication and division
- Self-checking procedure
- Assessed without spaces

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1989, 22, 373–380 NUMBER 4 (WINTER 1989)

A PROBLEM-SOLVING APPROACH TO SOCIAL SKILLS TRAINING IN EMPLOYMENT SETTINGS WITH MENTALLY RETARDED YOUTH

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ROBERT GAYLORD-ROSS

SAN FRANCISCO STATE UNIVERSITY

The present study examined two approaches to teaching social behaviors to 3 developmentally disabled youths in work contexts. In one approach, a problem-solving procedure was learned and transferred to different materials. Conversational probes monitored interactions between disabled employees and their co-workers and customers. A multiple baseline design demonstrated that the training produced generalization and maintenance of the targeted social behaviors to the work settings. A second approach based on a role-playing intervention produced no substantial generalization in the work setting. A social validation questionnaire administered to co-workers supported the efficacy of the problem-solving training procedure. The efficacy of social problem-solving training was discussed in terms of sufficient exemplars, common stimuli, and self-mediations.

DESCRIPTORS: social skills training, problem solving, supported employment

- 3 students with intellectual disability
- Ages: 18, 16, 18
- IQs: 58, 65, 45

- Work: dishwashing
- Work: break

Problem: "A client approaches you at work, what are you supposed to say?"

Dependent Variables

Initiations: begin conversation, change topic

Expansions: continue conversation

Terminating: appropriately end conversation

Mumbling: non-understandable utterance

Procedures

Baseline: audiocassettes recording for 30 min

Role-Playing Training:

- Instructor showed a picture of a situation
- Example: A client approaches you at work. What are you supposed to say?
- Correct (greet) → praise, rationale, role play
- Incorrect → explain, rationale, modeling, role play

Problem-Solving Training

Show picture, explaining, modeling, praise (30 min)

Rule 1: decoding – “What’s happening?”

Rule 2: decision – describe 3 available choices

Rule 3: test each alternative – “What might happen if?”

Rule 4: decision – “Which is better?”

Rule 5: select the behavioral response

Rule 6: emit the behavioral response

Rule 7: evaluate – “How did I feel about how it went?”

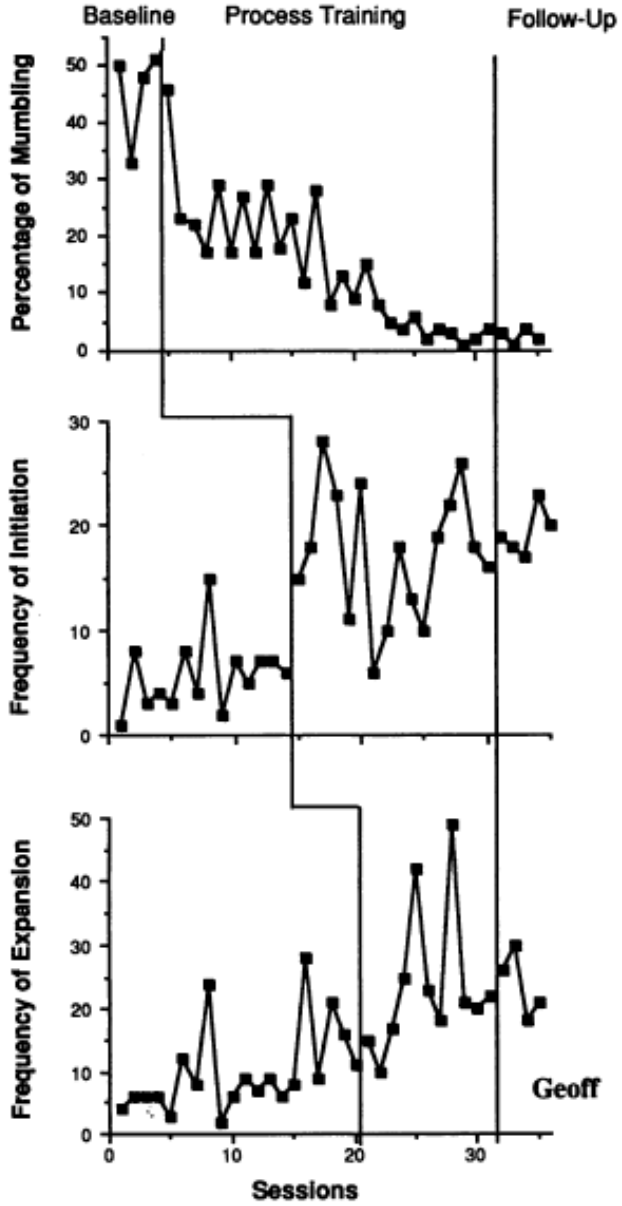
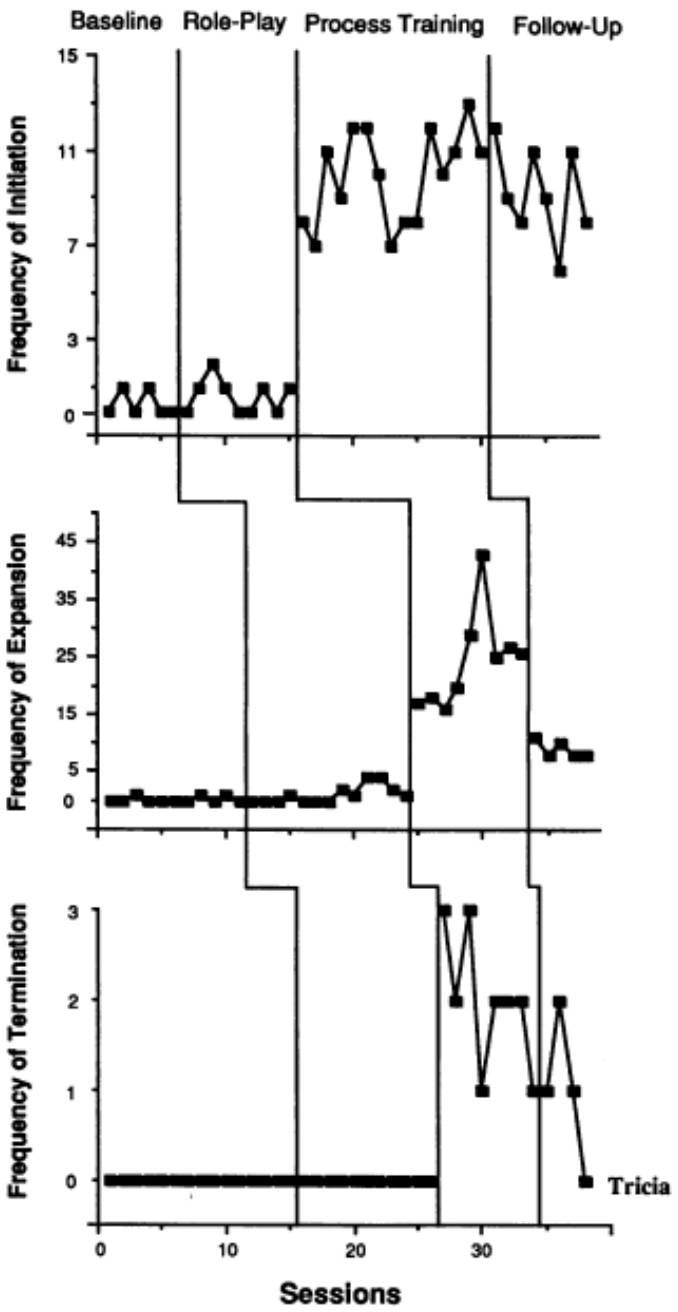


Figure 1. The generalization of social behaviors for Geoff.



JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2006, **39,** 109–115 NUMBER 1 (SPRING 2006)

A PRELIMINARY ANALYSIS OF TEACHING IMPROVISATION WITH THE PICTURE EXCHANGE COMMUNICATION SYSTEM TO CHILDREN WITH AUTISM

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THE OHIO STATE UNIVERSITY

Two young boys with autism who used the picture exchange communication system were taught to solve problems (improvise) by using descriptors (functions, colors, and shapes) to request desired items for which specific pictures were unavailable. The results of a multiple baseline across descriptors showed that training increased the number of improvised requests, and that these skills generalized to novel items, and across settings and listeners in the natural environment.

DESCRIPTORS: improvisation, problem solving, picture exchange communication system, augmentative and alternative communication, autism

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- 2 boys with autism (ages 4 and 5)
- Prerequisite: MTS color, shape, action
- Prerequisite: use PECS

Marckel, Neef, & Ferreri (2006)

Table 1
Descriptors and Examples of Improvised Requests

	Ike	Khan
Functions	Eat, drink, play	Eat, drink, read, watch, listen
Colors	Red, blue, green, pink, orange, purple, black, white, brown, yellow, gray	Red, blue, green, pink, orange, purple, black, white, brown, yellow
Shapes	Circle, square, triangle, rectangle, heart, moon, star, oval, line, diamond, hexagon	Circle, square, triangle, rectangle, heart, moon, star, oval, line
Preferred stimuli	Crackers, chips, pretzels, water, sandwich, cookie, granola bars, cantaloupe, toys, balloon, books, balls, CDs, tapes	Sausage, cupcakes, milk, bread, pancakes, waffle, chicken nuggets, banana, hot dogs, french fries, water, videos, CDs, books
Examples of trained requests	"I want eat white square" for a sandwich	"I want watch green rectangle" for a video
Examples of untrained requests	"I want play green circle" for toy coins	"I want eat brown rectangle" for sausage








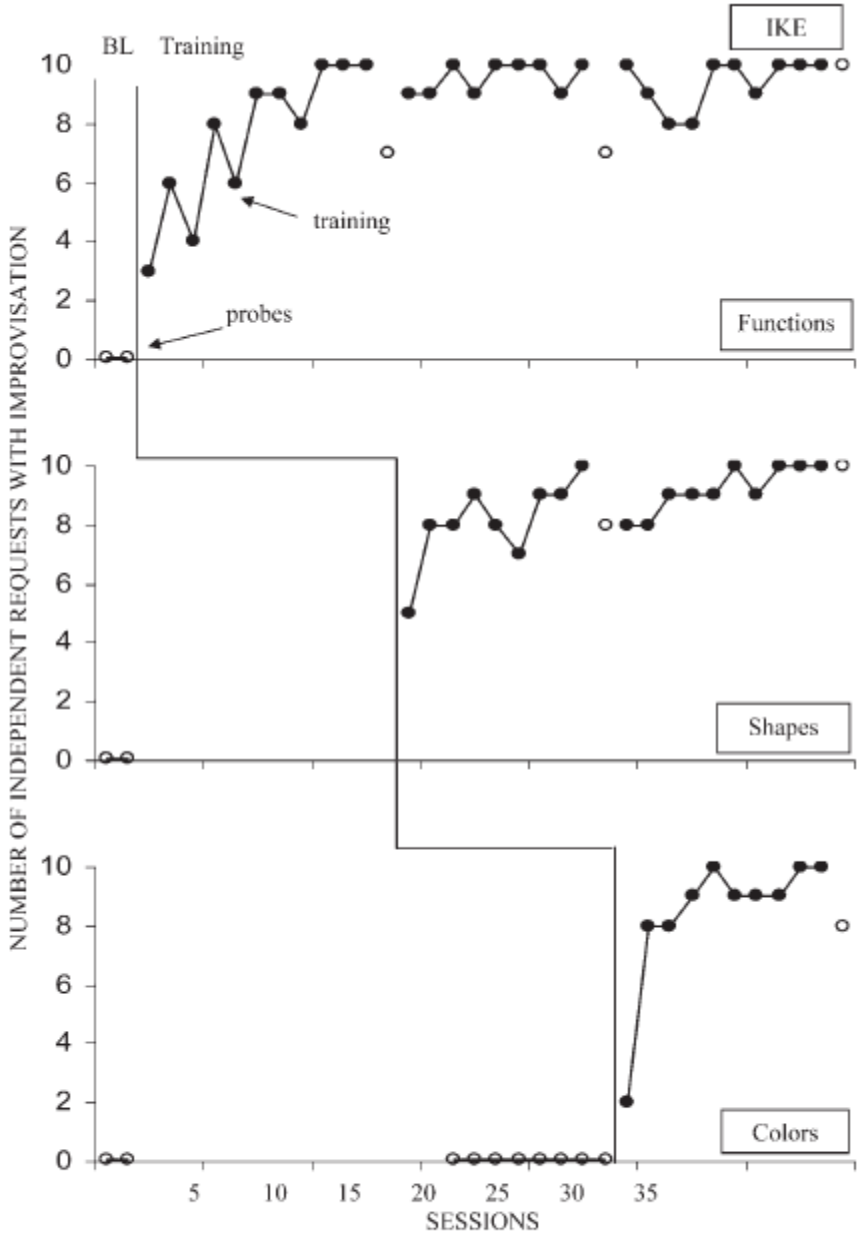

Figure 1. The number of independent improvised requests in the multiple probe across classes of descriptors for Ike. Filled data points represent trained exemplars. Open data points represent untrained requests during baseline and generalization probes.

"when presented with a **problem** (the unavailability of a single specific graphic symbol to communicate a request for a desired item), the children used a <u>novel synthesis of responses</u> or **precurrents** (selecting descriptors from different stimulus classes) that generated a reinforceable (**current**) response (a mand that produced the desired item)." (p. 112)

Discrimination and generalization are required

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2011, **44,** 227–244 NUMBER 2 (SUMMER 2011)

THE ROLE OF PROBLEM SOLVING IN COMPLEX INTRAVERBAL REPERTOIRES

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We examined whether typically developing preschoolers could learn to use a problem-solving strategy that involved self-prompting with intraverbal chains to provide multiple responses to intraverbal categorization questions. Teaching the children to use the problem-solving strategy did not produce significant increases in target responses until problem solving was modeled and prompted. Following the model and prompts, all participants showed immediate significant increases in intraverbal categorization, and all prompts were quickly eliminated. Use of audible self-prompts was evident initially for all participants, but declined over time for 3 of the 4 children. Within-session response patterns remained consistent with use of the problem-solving strategy even when self-prompts were not audible. These findings suggest that teaching and prompting a problem-solving strategy can be an effective way to produce intraverbal categorization responses.

Key words: categorization, intraverbal, meditating response, multiple tact training, problem solving

Sautter, LeBlanc, Jay, Goldsmith, & Carr (2011)

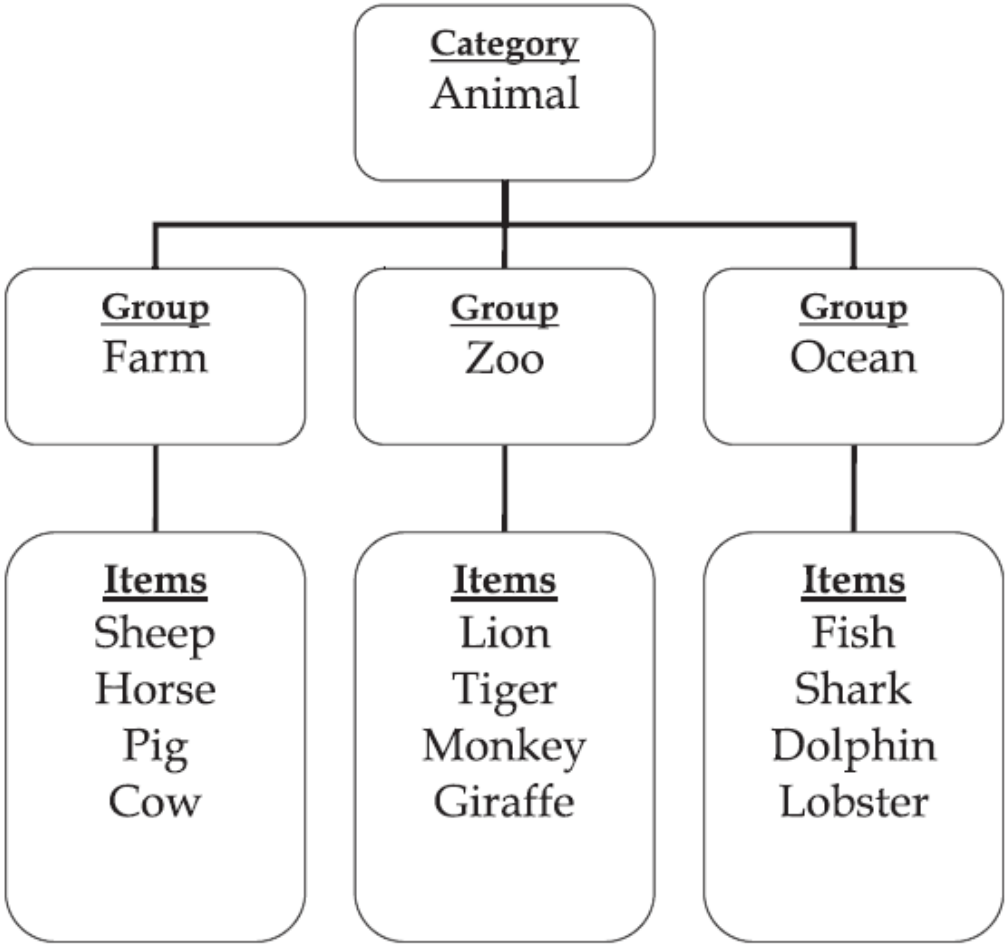

Figure 1. Items and groups of one target category.

2 more categories:

Vehicles
- Land
- Water
- Air

Kitchen items
- Appliances
- Dishes
- Utensils

Test: “Tell me some animals”

Prompts: Use your rules…next rule

Training

- **Multiple tact training 1**: item + group (sheep & farm)
- **Multiple tact training 2:** group + cat. (farm & animal)
- **Intraverbal training 1:** Tell me some farm animals
- **Intraverbal training 2:** Tell me the groups of animals
- **Med. response training 1:** What are your 4 rules?
  - Say 3 groups, pick a group, pick another, say the last
- **Med. response training 2:** What’s your 1st rule? 2nd?
- **Med. response training 3:** Exp. modeled rule use

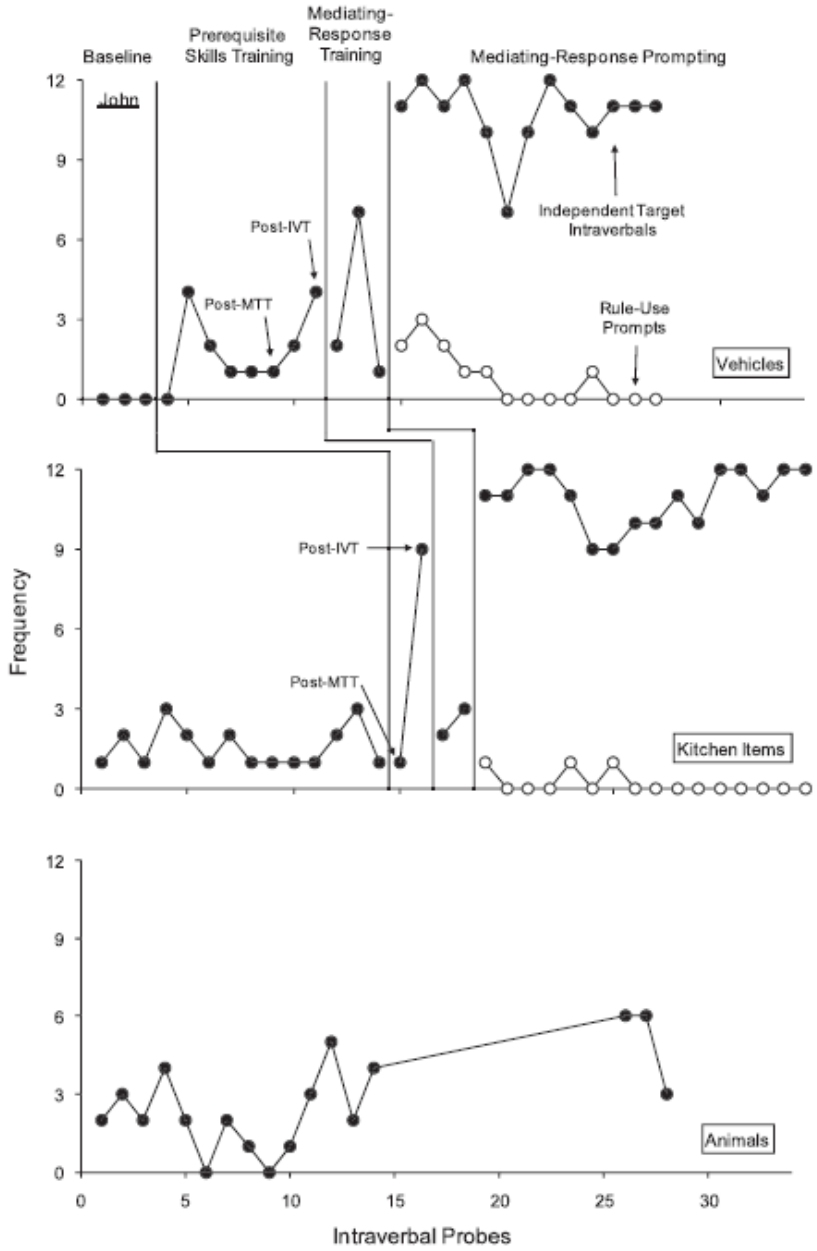

Figure 3. Correct target responses (filled circles) and number of experimenter prompts to use the rules (open circles) during intraverbal probes across categories for John. MTT = multiple-tact training; IVT = intraverbal training; MRT = mediating-response training.

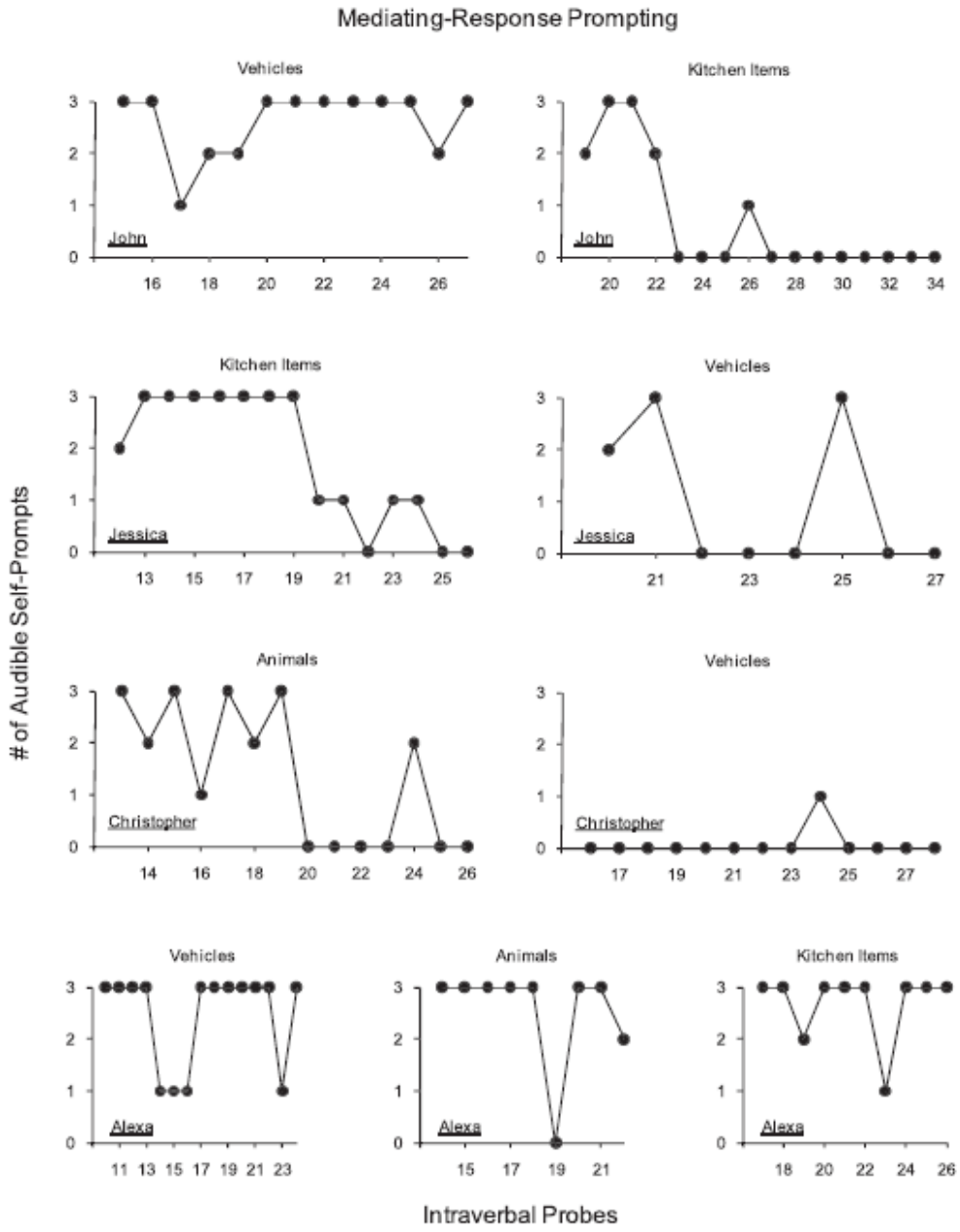

Figure 7. Number of audible self-prompts during MRP phases for each target category across participants.

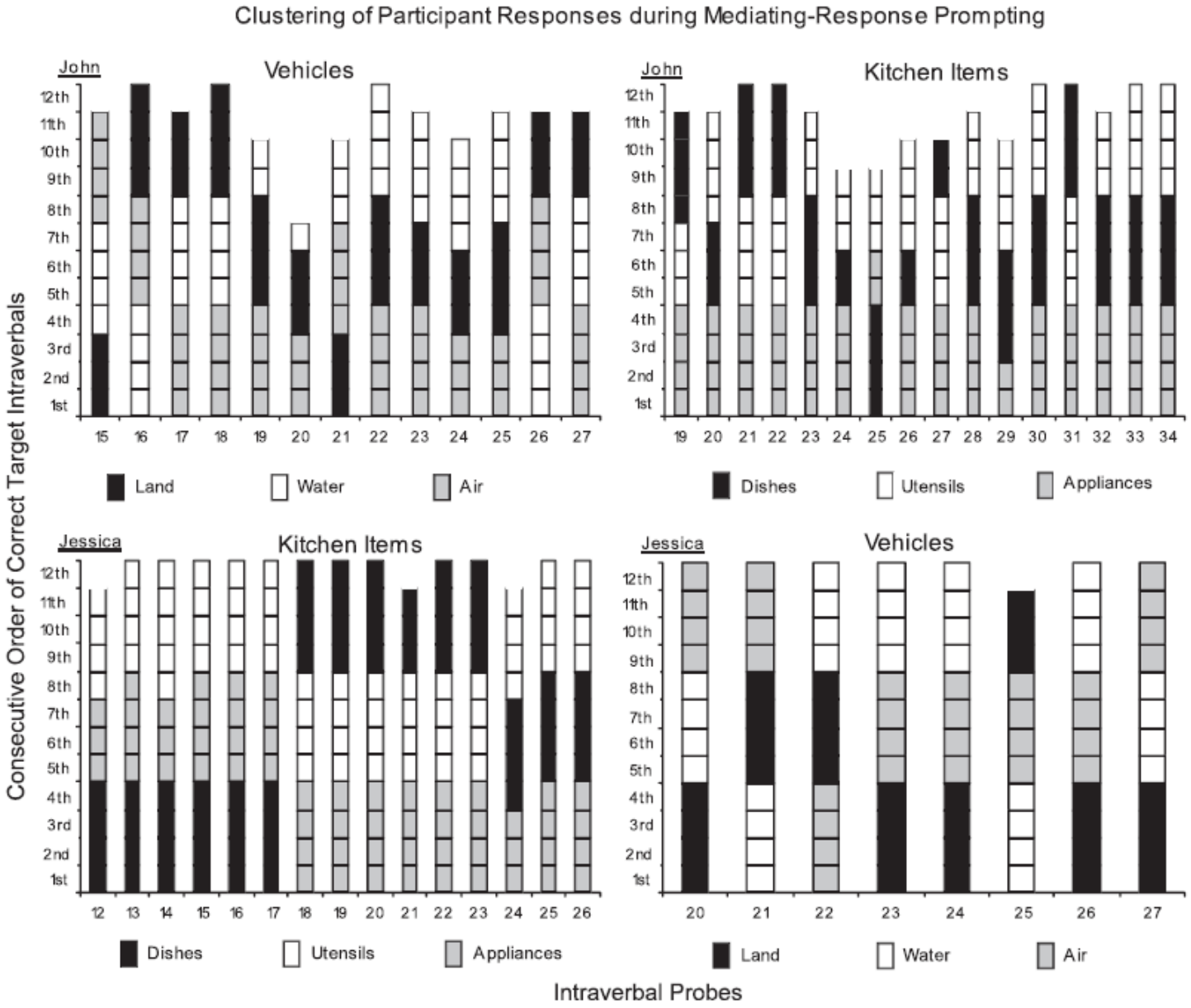

Figure 8. Within-session response patterns depicting the order (from first to 12th) and group membership of correct target intraverbals during MRP phases for each target category for John (top) and Jessica (bottom).

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2011, 44, 255–278 NUMBER 2 (SUMMER 2011)

TRAINING PRESCHOOL CHILDREN TO USE VISUAL IMAGINING AS A PROBLEM-SOLVING STRATEGY FOR COMPLEX CATEGORIZATION TASKS

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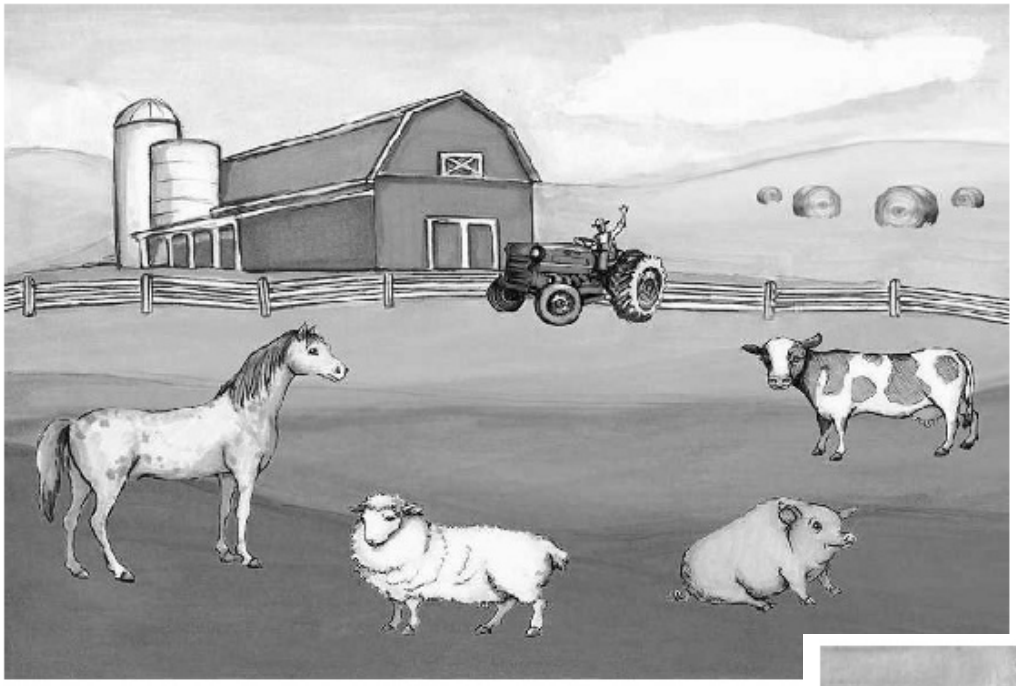
It has been suggested that verbally sophisticated individuals engage in a series of precurrent behaviors (e.g., covert intraverbal behavior, grouping stimuli, visual imagining) to solve problems such as answering questions (Palmer, 1991; Skinner, 1953). We examined the effects of one problem solving strategy—visual imagining—on increasing responses to intraverbal categorization questions. Participants were 4 typically developing preschoolers between the ages of 4 and 5 years. Visual imagining training was insufficient to produce a substantial increase in target responses. It was not until the children were prompted to use the visual imagining strategy that a large and immediate increase in the number of target responses was observed. The number of prompts did not decrease until the children were given a rule describing the use of the visual imagining strategy. Within-session response patterns indicated that none of the children used visual imagining prior to being prompted to do so and that use of the strategy continued after introduction of the rule. These results were consistent for 3 of 4 children. Within-session response patterns suggested that the 4th child occasionally imagined when prompted to do so, but the gains were not maintained. The results are discussed in terms of Skinner's analysis of problem solving and the development of visual imagining.

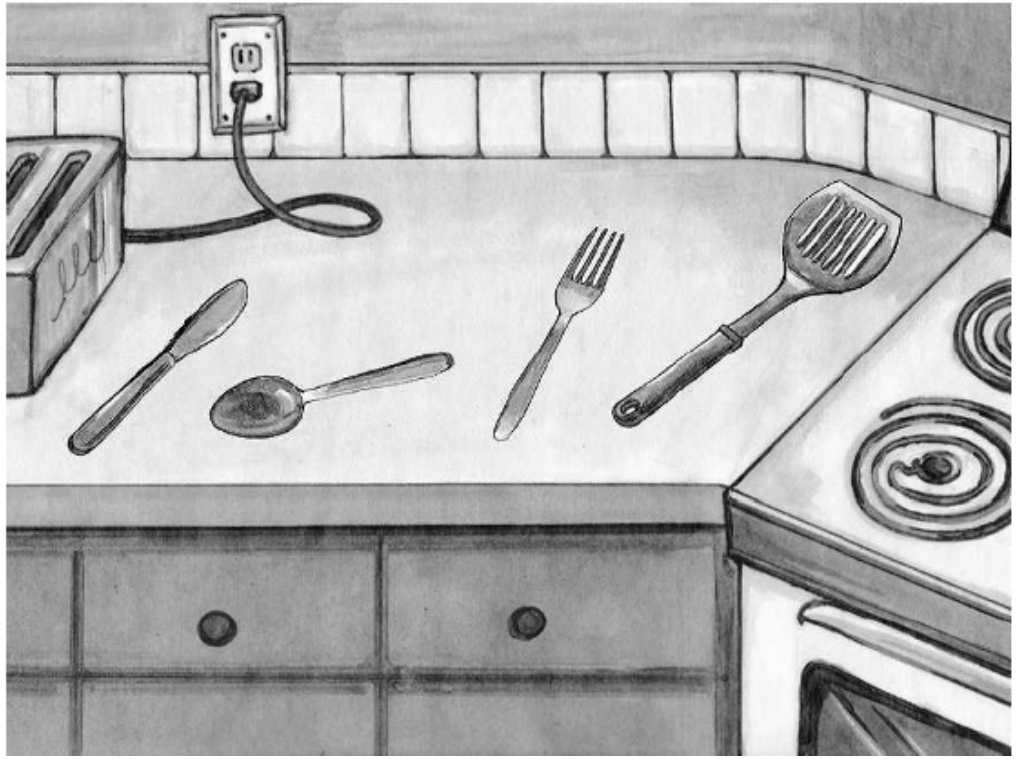
Key words: intraverbals, mediating response, tact training, problem solving, visual imagining

Kisamore, Carr, & LeBlanc (2011)

Table 1
Training Categories, Subcategories, and Items

Animals		
Farm	Ocean	Zoo
cow	dolphin	giraffe
horse	fish	lion
pig	lobster	monkey
sheep	shark	tiger
Furniture		
Bedroom	Living room	Office
bed	coffee table	bookshelf
dresser	couch	desk
mirror	foot stool	desk chair
nightstand	TV stand	lamp
Kitchen items		
Appliances	Dishes	Utensils
dishwasher	bowl	fork
microwave	glass	knife
refrigerator	mug	spatula
stove	plate	spoon
Vehicles		
Land	Water	Air
bus	canoe	airplane
car	jet ski	hang glider
motorcycle	kayak	helicopter
truck	ocean liner	hot air balloon





Kisamore, Carr, & LeBlanc (2011)

- Tact training → "put it in the picture"
- Subcategory IVT: e.g., "What are some places animals go?"
- Multiple tact training: item + place, place + category
- Visual imagining training
  - Show scene and tell child to "look at the place"
  - Experimenter closed eyes and made screen go gray
  - "I see an [item]" and that item appeared on the screen, and the others
  - "Now your turn. Close your eyes. Imagine the place. What do you see?"
  - Fading of screen
- Visual imagining prompts: "Remember, you can imagine," tact prompts
- Visual imagining prompts + rule ("I can imagine places and say what I see")

"SEE IN THE ABSENCE OF THE THING SEEN" (SKINNER, 1953)

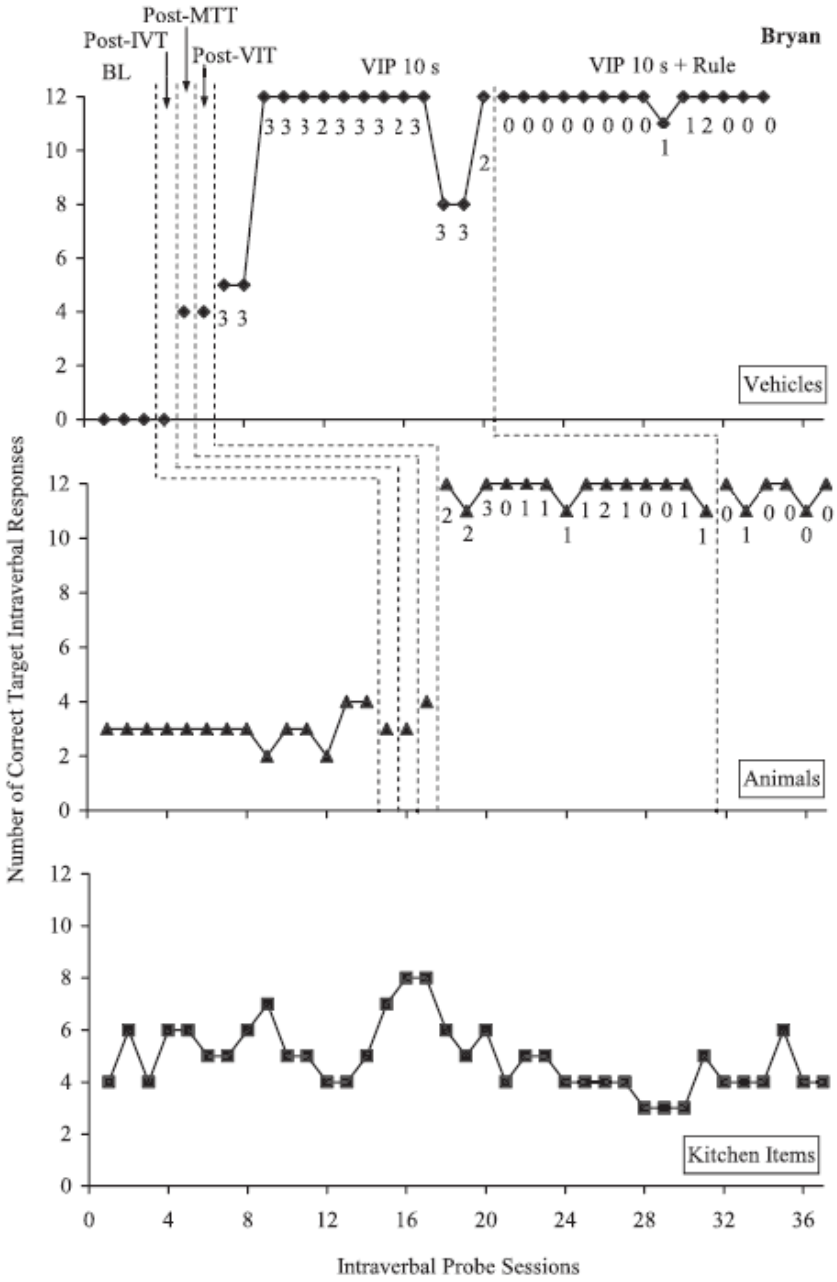


Figure 2. Number of correct independent target responses across training phases and stimulus categories for Bryan. Numbers = number of visual imagining prompts, BL = baseline, IVT = intraverbal training, MTT = multiple-tact training, VIT = visual imagining training, VIP = visual imagining prompting.

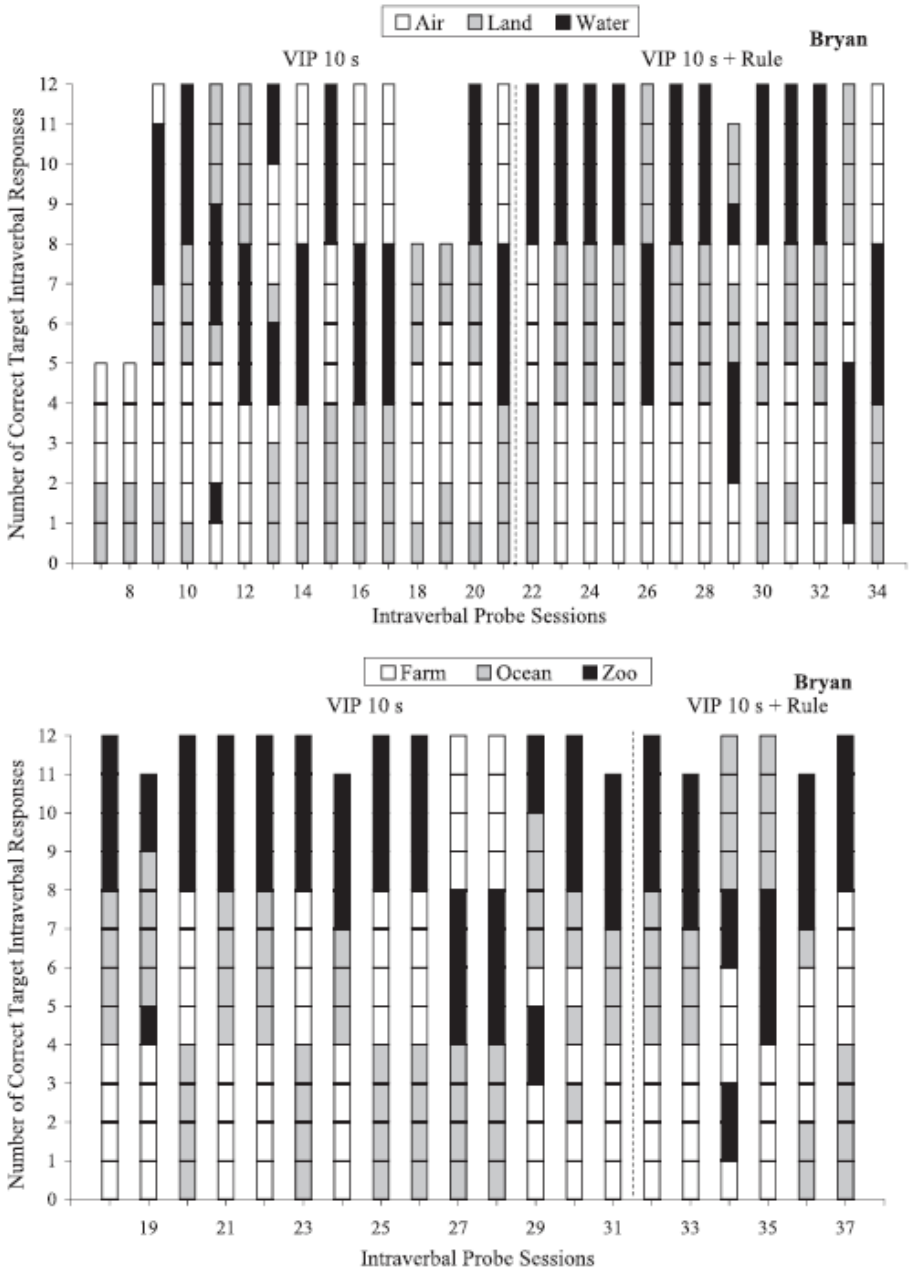


Figure 6. Number of correct target independent intraverbal probe responses in clusters during the prompting phases for Bryan. The data for vehicles are in the top panel, and the data for animals are in the bottom panel. See Figure 2 for definitions.

Analysis Verbal Behav (2015) 31:118–125
DOI 10.1007/s40616-015-0028-0

BRIEF REPORT

An Evaluation of Instruction in Visual Imagining on the Written Spelling Performance of Adolescents with Learning Disabilities

Angelica A. Aguirre · Ruth Anne Rehfeldt

- Connoisseur
- Pendulous
- Complaisant
- Ingratiate

Published online: 19 March 2015

Abstract Recent research has evaluated the utility of teaching potentially covert strategies to mediate overt performance. As an extension of this developing literature, the current study used a multiple-probe design to evaluate the effects of instructing in a visual imagining strategy on correct written spelling responses with three adolescents with various learning disabilities. After the participants were presented with the textual target stimuli, they were instructed to imagine the word in their head before writing it down. All three participants demonstrated improvements in spelling after this instruction, but two of them required additional consequences to meet the mastery criterion.

Aguirre and Rehfeldt (2015)

Ps: 3 adolescents with learning/other disabilities

DV: % of correct written spelling responses

- Collateral: finger/vocal spelling, echoing, looking away

Probe: instructions, “Write __,” no feedback, 30 trials

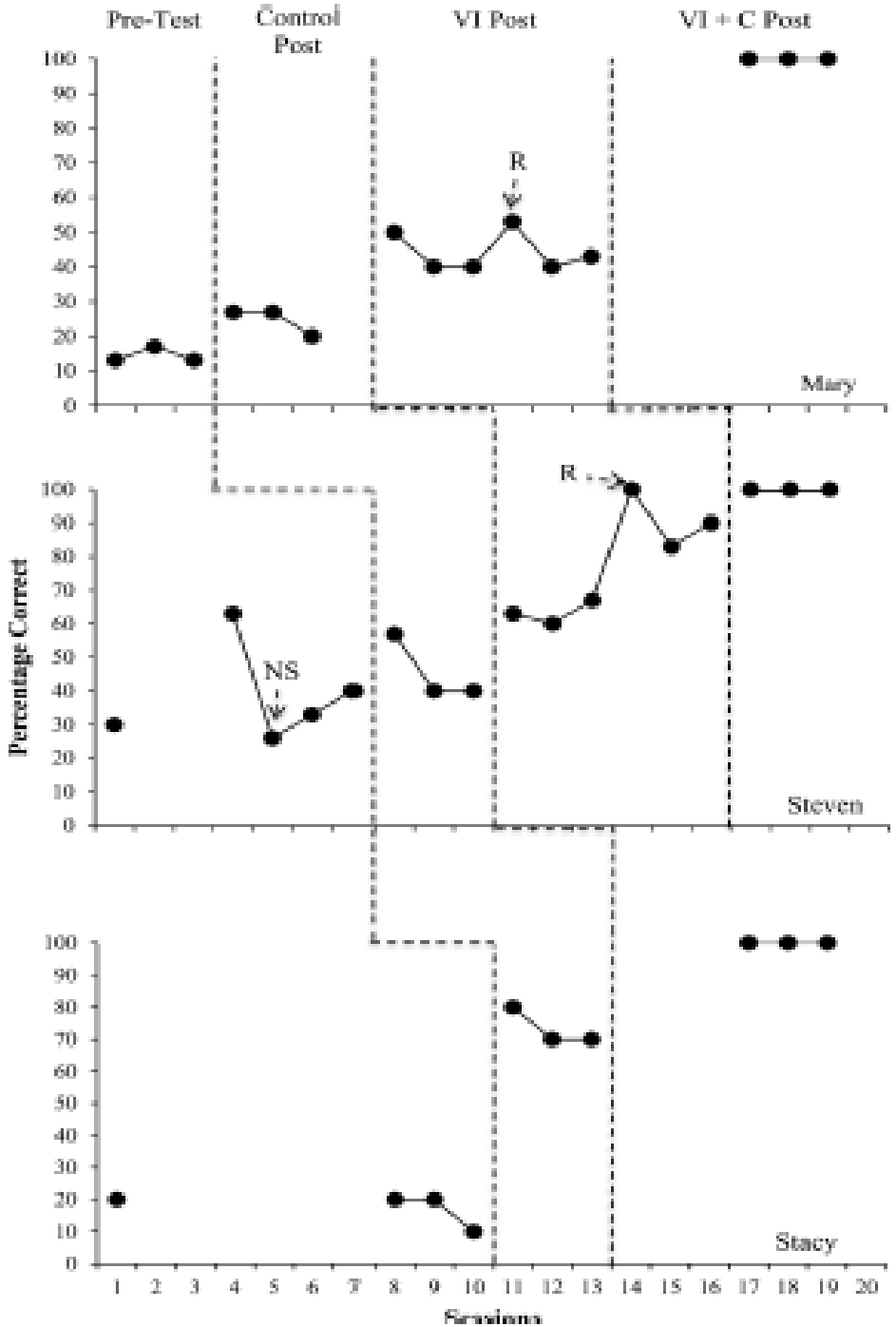
Control: show and say word for 5 s, remove card, write word, no prompts or consequences

Aguirre and Rehfeldt (2015)

VI Instruction: show and say word for 5 s, remove card,

- "See if you can see the written word in your head (3 s)
- Imagine the word on a piece of white paper (3 s)
- Help yourself remember the word by imagining yourself writing over each letter of the word (3 s)
- Write ___"
- No consequences or prompts

VI + Cons.: praise for correct, modeling for incorrect



NS: when new stimuli were presented to Steven.
R: when remedial VI instruction sessions were conducted with Mary and Steve

No collateral relations

Control: no diff SR+ - might have weakened responding

Future: prompt rule

Summary: Problem Solving Matrix

	Math: Word Problems (Neef et al.)	**Social Behavior** (Park & Gaylord-Ross)	**Comm: Intraverbal** (Sautter et al.)	**Comm: Manding** (Marckel et al.)	**Comm: Intraverbal** (Kisamore et al.)	**Spelling** (Aguirre & Rehfeldt)
Behavior Chains	X		X			
Self-Questioning		X				
Self-Rules			X			
Recombining Units				X		
Visual Imagining					X	X

The Effects of a Problem-Solving Strategy on Recalling Past Events with Children with Autism

Stephanie Phelan
ABACS & Simmons College
Judah B. Axe
Simmons College
Ashley Williams
ABACS & Simmons College

Phelan, Axe, & Williams (in progress)

Problem:

- "Tell me about your weekend"
- "What did you do at school today?"
  - We used a 2-hour delay

Problem solving strategies:

- Self-questioning (Park & Gaylord-Ross, 1989)
- Visual imagining (Kisamore et al., 2011)

Tell me about your day

What did I do?
Painted a tree
Who did I play with?
Sara

I painted a tree and I played on the slide with Sara

Research in Autism Spectrum Disorders

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

Increasing recall of information of children diagnosed with Asperger's Syndrome: Utilization of visual strategies

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ABSTRACT

Social skills deficits are a hallmark diagnostic characteristic (American Psychiatric Association, 2013) of individuals diagnosed with Asperger's Syndrome (AS) or Autism. Interventions targeting social skills with this population have highlighted the effectiveness of visual strategies. This investigation examined the effectiveness of visual strategies in improving recall of personal information of others, a key friendship skill. In a social skills group, children played a game requiring them to recall information about each other. Visual prompts were found to be effective in helping children to recall information of other children. Children also demonstrated the ability to generate their own visual prompts to increase recall. Implications and directions for future research are discussed.

Problem: recall what peers said after 5 minutes

Solution: teachers then students recorded responses

Participants

Part.	Age	Sex	Diagnoses
1	8Y 3M	Male	PDD-NOS
2	10Y 7M	Female	Autism Spectrum Disorder
3	13Y 8M	Male	Anxiety Disorder Autism Spectrum Disorder

Setting

Elephant Room

Participant + Therapist

Clinic

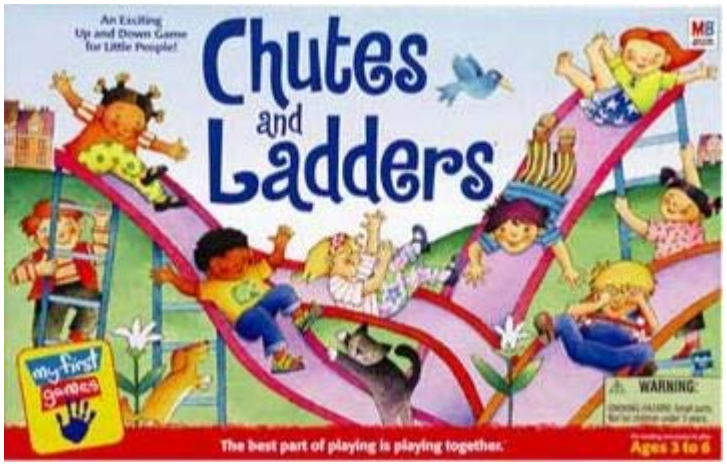
2-hour Social Skills Group

Kitchen

Participant + Therapist + Questioner

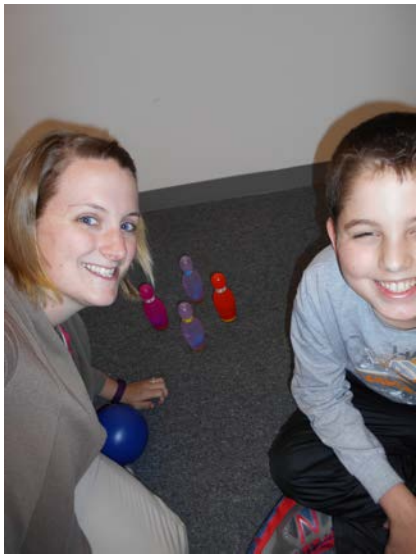
Example of Activities: Different Each Session

- Board games: Chutes & Ladders
- Camping: set up tent, make s'mores
- Art with shaving cream
- Water balloons
- Reading a new book
- Holiday activities
- Planting flowers



Activity (Elephant Room)

- Explained and guided through activity (5 min)
- Took “Selfie” with the participant
- Three contrived events during the activity
- Brought participant back to clinic



Probe (Kitchen)

Baseline 1 & Post-Training Probe

- "[Participant], I want to ask you a question. Tell me about what you did in the elephant room."
- 10 seconds to begin responding
- Stated: "Okay thanks" to all answers

Baseline 2

- Same + "What else can you tell me about what you did in the elephant room?"

Dependent Variable

Number of accurate statements specific to activity:

- **Accurate statement**: verbal response that corresponded with something that occurred during the activity
- Included at least a subject and a verb
- Ex: “We played Chutes & Ladders,” “Tommy cheated”
- Non-Ex: “We played,” “Chutes & Ladders,” “Cheated”

Visual Imagining / Self-Questioning Training Level 1 (Kitchen)

- Visual Imagining: show picture, “Imagine the Elephant Room”
- Ask and answer the following questions:

1. Who was there?
2. What was there?
3. What is one thing that happened?
4. What else happened?
5. What is one more thing that happened?
6. How did I feel?
7. How did [prompter] feel?

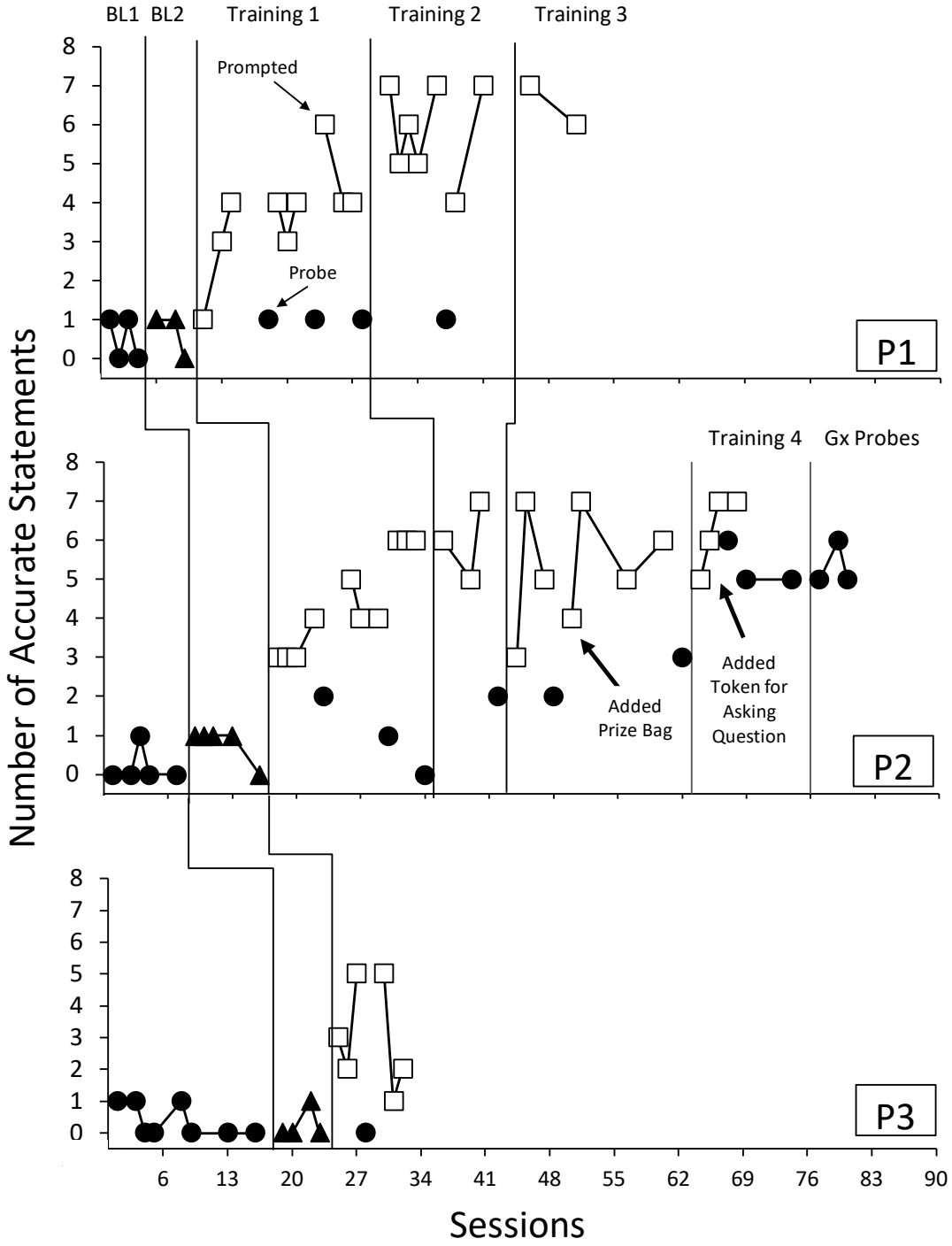
- Modeling
- Praise
- Fading
- Error correction

Error Correction Procedures

1. Therapist: “Close your eyes” and try to imagine [x question].”

2. Therapist shows the picture and says, “Look at the picture (3-5 seconds). Now close your eyes and tell me [x question].”

3. Therapist models a response. If no imitation, request to repeat the model



Training 1: selfie, modeling, new therapist asking, original therapist modeling

Training 2: no selfie, least-to-most prompting for self-questioning

Training 3: no modeling

Training 4: no original therapist (review video)

Gen Probe: Location, Person, Mom in Waiting Room

Accurate Statements

Question	Overt / Covert	Answer
Who was there?	Covert?	“Weslie and I was there”
What was there?	Covert?	“Golf balls and straws and craft sticks was there”
What was one more thing that happened?	Overt	“We just blow and I win”
What is one more thing that happened?	Overt	“We just played racing games”
How did I feel?	Overt	“I feel happy”
What does Weslie feel?	Overt	“She feels happy”

Study 2

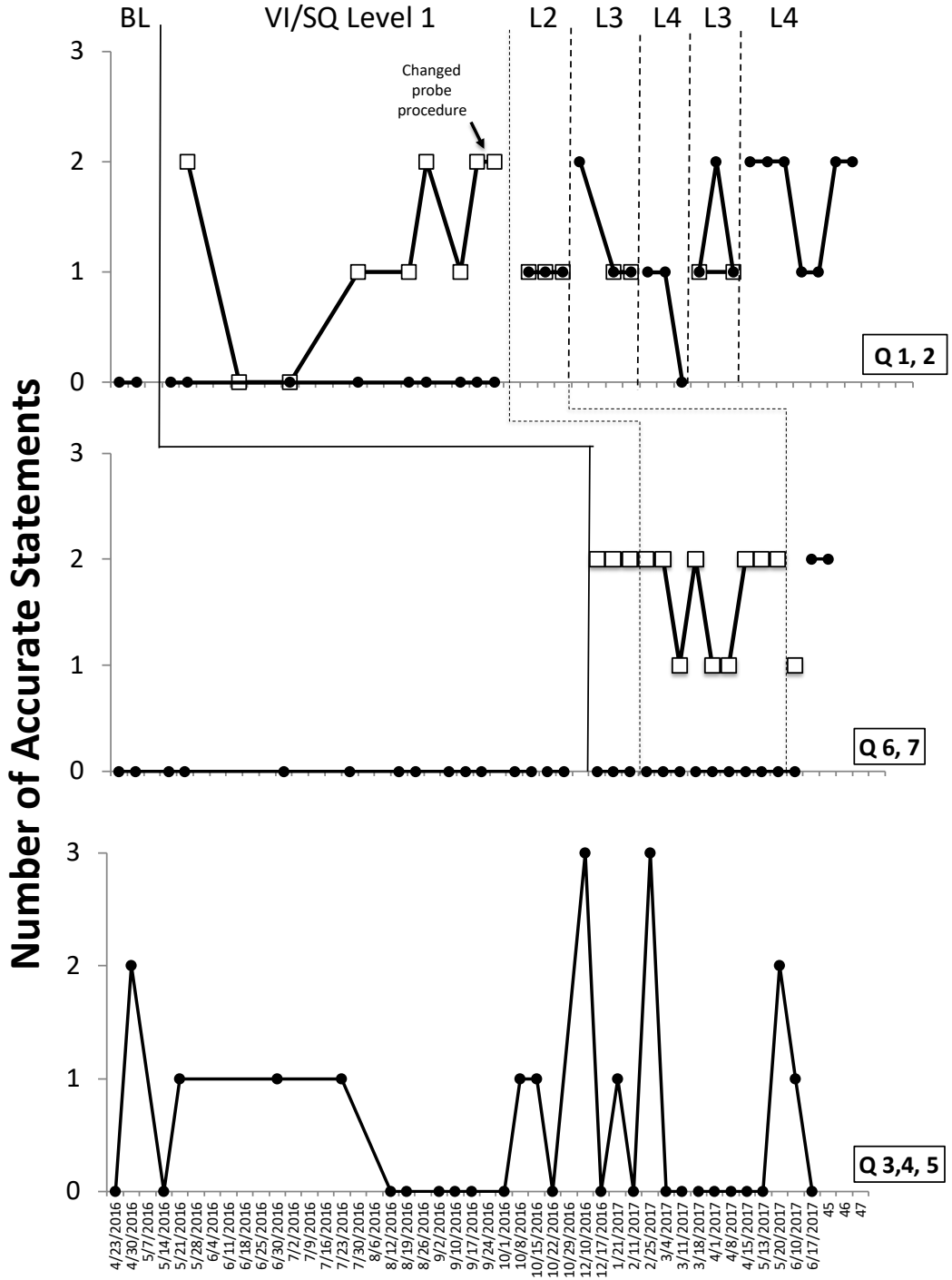
No Baseline 2

Pictures corresponding to each of the 7 Qs

Training condition: probe first, then training

Multiple baseline across sets of questions

Study 2


BL
VI/SQ Level 1
L2
L3
L4
L3
L4
Changed probe procedure
Number of Accurate Statements
Q 1, 2
Q 6, 7
Q 3,4, 5
0
1
2
3
4/23/2016
4/30/2016
5/7/2016
5/14/2016
5/21/2016
5/28/2016
6/4/2016
6/11/2016
6/18/2016
6/25/2016
6/30/2016
7/2/2016
7/9/2016
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7/23/2016
7/30/2016
8/6/2016
8/12/2016
8/19/2016
8/26/2016
9/2/2016
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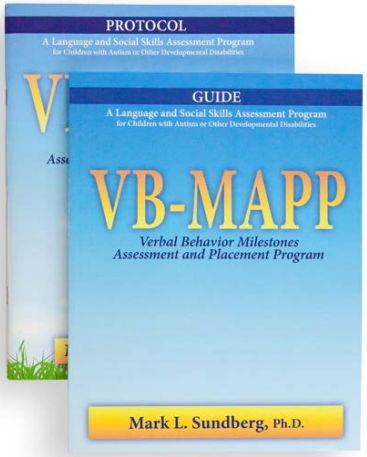
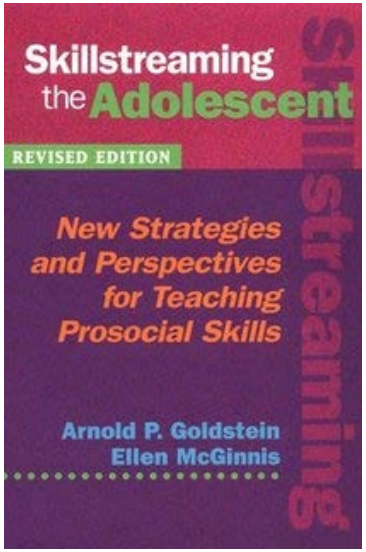
6/17/2017
45
46
47

Applications





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More

Common Core

ELA	Math	Problem Solving Skill
CCSS.ELA-LITERACY.RL.K.3 With prompting and support, **identify characters, settings, and major events** in a story.	CCSS.MATH.CONTENT.K.OA.A.2 **Solve addition and subtraction word problems**, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Behavior Chains

Common Core

ELA	Math	Problem Solving Skill
CCSS.ELA-LITERACY.SL.K.1 Participate in **collaborative conversations** with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.	CCSS.MATH.CONTENT.K.CC.B.5 **Count to answer "how many?" questions** about as many as 20 things arranged in a line, rectangular array, circle, or configuration; given a number from 1-20, count out that many objects.	Self-Rules

Common Core

ELA	Math	Problem Solving Skill
CCSS.ELA-LITERACY.RF.K.3 Know and apply grade-level phonics and word analysis skills in **decoding words**.	CCSS.MATH.CONTENT.K.G.B.5 Model shapes in the world by **building shapes from components** (e.g., sticks and clay balls) and drawing shapes.	Recombining Units

Common Core

ELA	Math	Problem Solving Skill
CCSS.ELA-LITERACY.W.K.8 With guidance and support from adults, **recall information** from experiences or gather information from provided sources to answer a question.	CCSS.MATH.CONTENT.K.CC.A.2 **Count forward** beginning from a given number within the known sequence (instead of having to begin at 1).	Visual Imagining 

Goldstein, McGinnis et al. (1997)

Skillstreaming	Problem Solving Behaviors	Type of Problem Solving
Listening		
Look at the person who is talking		
Think about what is being said	Repeat to self what person says	Covert self-echoic
Wait your turn to talk	Tell yourself when person is finished talking	Discriminate – talking or not?
Say what you want to say	Rehearse first, then talk	Rehearsal

Goldstein, McGinnis et al. (1997)

Skillstreaming	Problem Solving Behaviors	Type of Problem Solving
Asking a Question		
Decide what you'd like to know more about	Brainstorm possibilities; pick one	
Decide whom to ask	Brainstorm possibilities; pick one	Discriminate who would have info
Think about ways to ask question, pick one	Brainstorm possibilities; pick one	Discriminate
Pick the right time to ask your question	Brainstorm possibilities; pick one	Discriminate

Goldstein, McGinnis et al. (1997)

Skillstreaming	Problem Solving Behaviors	Type of Problem Solving
Introducing Yourself		
Choose right time and place to introduce self	Brainstorm possibilities; pick one	Discriminate
Greet the other person and tell your name		
Ask other person his/her name if needed	Decide if you know person's name or not	Discriminate
Tell/ask other person something to start conv.	Brainstorm possibilities; pick one	Discriminate

First Ask: Who am I talking to?

What does he or she like?

I know!

Ask a question about what he or she likes

I don't know

What is today's date?

Is a holiday coming up or did one just happen?

Yes

Ask about the holiday

No

Ask about the person's plans for the weekend

Look Around Me

Ask a question or talk to the person about something that I see

Social Skill

Skill: Deciding Who Goes First in a Game

Problem-Solving Strategy: Fair Decider Strategies

Academic Skill

Skill: Writing an Essay

Problem-Solving Strategy: Brainstorming

Social Skills Videos

http://www.youtube.com/watch?v=F7AZezBeR1E

http://www.youtube.com/watch?v=qkXcNFZFsug

1. What social skill is targeted?
2. What is the antecedent?
3. What is the intervention/teaching?
4. How could you take the skill to the next level by teaching problem-solving?

More Ideas?

	Math: Word Problems (Neef et al.)	**Social Behavior** (Park & Gaylord-Ross)	**Comm: Intraverbal** (Sautter et al.)	**Comm: Manding** (Marckel et al.)	**Comm: Intraverbal** (Kisamore et al.)	**Spelling** (Aguirre & Rehfeldt)
Behavior Chains	X		X			
Self-Questioning		X				
Self-Rules			X			
Recombining Units				X		
Visual Imagining					X	X

Conclusions

We need to get beyond rote, 1:1 skills

Consider the ultimate controlling variables, repertoire

Promising problem solving strategies:

- Teach behavior chains, breaking problems down
- Teach self-questioning, self-rules
- Teach recombining units
- Teach visual imagining

Problem solving: “behavioral cusp,” “pivotal behavior”

Happy Problem Solving!

Thanks for your Attention!

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