Overview, Co-Authors

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

Co-Authors – Simmons Ph.D. Students:

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Clinical Director, ABACS, Inc.

Caitlin Irwin, M.S., BCBA
Behavior Analyst, Newton Public Schools
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)
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)
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

ANTECEDENT

MO
(Deprivation or Aversive Stimulation)

+ SD
(Stimulus that signals availability of reinforcement)

BEHAVIOR

Precurrent / Mediating Responses

Target Response

CONSEQUENCE

Problem is Solved!
(Reduction in Deprivation or Aversive Stimulation)
### MATH PROBLEM

<table>
<thead>
<tr>
<th>ANTECEDENT</th>
<th>BEHAVIOR</th>
<th>CONSEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO</td>
<td>Precurrent / Mediating Responses</td>
<td>Reinforcer</td>
</tr>
<tr>
<td>Momentary Value of Teacher Feedback</td>
<td>Write down the problem</td>
<td>“Right!”</td>
</tr>
<tr>
<td>$+$</td>
<td>Add the ones column</td>
<td></td>
</tr>
<tr>
<td>$S^D$</td>
<td>Add the tens column</td>
<td></td>
</tr>
<tr>
<td>“What is 23 + 22?”</td>
<td>Target Response</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saying/Writing “45”</td>
<td></td>
</tr>
</tbody>
</table>
### FINDING YOUR KEYS

<table>
<thead>
<tr>
<th>ANTECEDENT</th>
<th>BEHAVIOR</th>
<th>CONSEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO</td>
<td>Precurrent / Mediating Responses</td>
<td>Reinforcer</td>
</tr>
<tr>
<td>Need to go to work, no keys</td>
<td>Looking around, Picking things up</td>
<td>Presence of the keys</td>
</tr>
<tr>
<td>$S^D$</td>
<td>Target Response</td>
<td></td>
</tr>
<tr>
<td>Clock with time to leave for work</td>
<td>Looking at the keys</td>
<td></td>
</tr>
</tbody>
</table>
### Recalling the Past

<table>
<thead>
<tr>
<th>ANTECEDENT</th>
<th>BEHAVIOR</th>
<th>CONSEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO</td>
<td>Precurrent / Mediating Responses</td>
<td>Reinforcer</td>
</tr>
<tr>
<td>Current value of listener’s response</td>
<td>Intraverbal (“Saturday it was raining”)</td>
<td>Verbal Response “Which one?”</td>
</tr>
<tr>
<td>$S^D_+$ “What did you do last weekend?”</td>
<td>Self-Questioning (“Where did I go? Who did I see?”)</td>
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<tr>
<td></td>
<td>Visualization (close eyes and picture the rain, your house, your friends)</td>
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<tr>
<td></td>
<td>Target Response</td>
<td></td>
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<tr>
<td></td>
<td>“I watched a movie”</td>
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</tbody>
</table>
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
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

<table>
<thead>
<tr>
<th>Domain</th>
<th>Skill</th>
<th>Strategy</th>
</tr>
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<tbody>
<tr>
<td>Math</td>
<td>Solving word problems</td>
<td>Behavior chains</td>
</tr>
<tr>
<td>Social Skills</td>
<td>Initiating interactions</td>
<td>Self-Questioning</td>
</tr>
<tr>
<td>Communication</td>
<td>Manding using PECS</td>
<td>Recombining Units</td>
</tr>
<tr>
<td>Communication</td>
<td>Intraverbal categorization</td>
<td>Self-Rules, Chains</td>
</tr>
<tr>
<td>Communication</td>
<td>Intraverbal categorization</td>
<td>Visual Imagining</td>
</tr>
<tr>
<td>Spelling</td>
<td>Writing dictated words</td>
<td>Visual imagining</td>
</tr>
</tbody>
</table>
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
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 taught problems during probes and that once the precurrent behaviors were established, the number of correct problem solutions increased.

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

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

\[ \square \quad \bigcirc \quad \square \quad = \quad \square \quad (A - B = ?) \]

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

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THE OHIO STATE UNIVERSITY

AND

TRACI M. CIHON
THE CHICAGO SCHOOL OF PROFESSIONAL PSYCHOLOGY

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

Hyun-Sook Park
UNIVERSITY OF CALIFORNIA, BERKELEY, AND SAN FRANCISCO STATE UNIVERSITY

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

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

• Work: dishwashing
• Work: break
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.
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
Table 1
Descriptors and Examples of Improvised Requests

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

Marckel, Neef, & Ferreri (2006)
“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 novel synthesis of responses 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
THE ROLE OF PROBLEM SOLVING IN COMPLEX INTRAVERBAL REPERTOIRES

RACHAEL A. SAUTTER, LINDA A. LEBLANC, ALLISON A. JAY, TINA R. GOLDSMITH, AND JAMES E. CARR
WESTERN MICHIGAN UNIVERSITY

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
Figure 1. Items and groups of one target category.

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

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

April N. Kisamore
Western Michigan University

AND

James E. Carr and Linda A. LeBlanc
Auburn University

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
<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Item</th>
</tr>
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<tbody>
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<td>Animals</td>
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<td>Farm</td>
<td>Ocean</td>
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<tr>
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<td>dolphin</td>
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<td></td>
<td>tiger</td>
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<td>Furniture</td>
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<td>Bedroom</td>
<td>Living room</td>
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<tr>
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<td>foot stool</td>
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<td>nightstand</td>
<td>TV stand</td>
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<td>Kitchen items</td>
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<td>Appliances</td>
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<tr>
<td>Vehicles</td>
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<td>Land</td>
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<td>hang glider</td>
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<tr>
<td>motorcycle</td>
<td>kayak</td>
<td>helicopter</td>
</tr>
<tr>
<td>truck</td>
<td>ocean liner</td>
<td>hot air balloon</td>
</tr>
</tbody>
</table>
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.
An Evaluation of Instruction in Visual Imagining on the Written Spelling Performance of Adolescents with Learning Disabilities

Angelica A. Aguirre · Ruth Anne Rehfeldt

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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

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<thead>
<tr>
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<tr>
<td>Self-Questioning</td>
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<tr>
<td>Self-Rules</td>
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<td>Recombining Units</td>
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<td>X</td>
<td>X</td>
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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
Increasing recall of information of children diagnosed with Asperger’s Syndrome: Utilization of visual strategies

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Recall

\textbf{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.

\textbf{Problem:} recall what peers said after 5 minutes

\textbf{Solution:} teachers then students recorded responses
<table>
<thead>
<tr>
<th>Part.</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8Y 3M</td>
<td>Male</td>
<td>PDD-NOS</td>
</tr>
<tr>
<td>2</td>
<td>10Y 7M</td>
<td>Female</td>
<td>Autism Spectrum Disorder</td>
</tr>
<tr>
<td>3</td>
<td>13Y 8M</td>
<td>Male</td>
<td>Anxiety Disorder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Autism Spectrum Disorder</td>
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</tbody>
</table>
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

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

- VI/SQ Level 1
  - L2
  - L3
  - L4
  - L3
  - L4

- Q 1, 2
- Q 3, 4, 5
- Q 6, 7

Number of Accurate Statements
Applications
# Common Core

<table>
<thead>
<tr>
<th>ELA</th>
<th>Math</th>
<th>Problem Solving Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CCSS.ELA-LITERACY.RL.K.3</strong></td>
<td><strong>CCSS.MATH.CONTENT.K.OA.A.2</strong></td>
<td>Behavior Chains</td>
</tr>
<tr>
<td>With prompting and support, <strong>identify characters, settings, and major events in a story.</strong></td>
<td>Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</td>
<td></td>
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</tbody>
</table>
# Common Core

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<tr>
<td><strong>CCSS.ELA-LITERACY.SL.K.1</strong> Participate in <strong>collaborative conversations</strong> with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.</td>
<td><strong>CCSS.MATH.CONTENT.K.CC.B.5</strong> Count to answer &quot;how many?&quot; 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.</td>
<td>Self-Rules</td>
</tr>
<tr>
<td>ELA</td>
<td>Math</td>
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<tr>
<td><strong>CCSS.ELA-LITERACY.RF.K.3</strong>&lt;br&gt;Know and apply grade-level phonics and word analysis skills in <strong>decoding words</strong>.</td>
<td><strong>CCSS.MATH.CONTENT.K.G.B.5</strong>&lt;br&gt;Model shapes in the world by <strong>building shapes from components</strong> (e.g., sticks and clay balls) and drawing shapes.</td>
<td>Recombining Units</td>
</tr>
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<tr>
<td><strong>CCSS.ELA-LITERACY.W.K.8</strong>&lt;br&gt;With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.</td>
<td><strong>CCSS.MATH.CONTENT.K.CC.A.2</strong>&lt;br&gt;Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</td>
<td>Visual Imagining</td>
</tr>
</tbody>
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### Goldstein, McGinnis et al. (1997)

<table>
<thead>
<tr>
<th>Skillstreaming</th>
<th>Problem Solving Behaviors</th>
<th>Type of Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Look at the person who is talking</td>
<td>Repeat to self what person says</td>
<td>Covert self-echoic</td>
</tr>
<tr>
<td>Think about what is being said</td>
<td>Tell yourself when person is finished talking</td>
<td>Discriminate – talking or not?</td>
</tr>
<tr>
<td>Wait your turn to talk</td>
<td>Rehearse first, then talk</td>
<td>Rehearsal</td>
</tr>
<tr>
<td>Say what you want to say</td>
<td></td>
<td></td>
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<tr>
<td>Asking a Question</td>
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<tr>
<td>Decide what you’d like to know more about</td>
<td>Brainstorm possibilities; pick one</td>
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<tr>
<td>Decide whom to ask</td>
<td>Brainstorm possibilities; pick one</td>
<td>Discriminate who would have info</td>
</tr>
<tr>
<td>Think about ways to ask question, pick one</td>
<td>Brainstorm possibilities; pick one</td>
<td>Discriminate</td>
</tr>
<tr>
<td>Pick the right time to ask your question</td>
<td>Brainstorm possibilities; pick one</td>
<td>Discriminate</td>
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<td>Skillstreaming</td>
<td>Problem Solving Behaviors</td>
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<td>-----------------------------</td>
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<tr>
<td><strong>Introducing Yourself</strong></td>
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<tr>
<td>Choose right time and place to introduce self</td>
<td>Brainstorm possibilities; pick one</td>
<td>Discriminate</td>
</tr>
<tr>
<td>Greet the other person and tell your name</td>
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</tr>
<tr>
<td>Ask other person his/her name if needed</td>
<td>Decide if you know person’s name or not</td>
<td>Discriminate</td>
</tr>
<tr>
<td>Tell/ask other person something to start conv.</td>
<td>Brainstorm possibilities; pick one</td>
<td>Discriminate</td>
</tr>
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</table>
**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?
      - Yes: Is a holiday coming up or did one just happen?
      - 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

- Ask about the holiday
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=qkXcNFZFsg

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?

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<tr>
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<td>X</td>
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<tr>
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<td></td>
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<td>Recombining Units</td>
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<td>X</td>
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<td>Visual Imagining</td>
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<td>X</td>
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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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