Turning research into fun group games to strengthen language and social skills

Overview of Talk

- Emergent skills (research & recommendations)
- Instructional sequence (recommendations)
- Verbal communities
- Observational learning
- Discriminations (research & recommendations)
  - simple
  - conditional
- Reinforcement
- Games (prerequisites, types, & development)
Why is this important?

Behavior learned without direct instruction

Importance
- learn to learn without direct teaching
- time savings
- efficient

What else is in the sky?

VIDEO

**Emergent Behavior**

Question: with ONLY training listener behavior to compound stimuli would the following speaker behavior emerge:

- TACT the LR trained compound stimuli
- LR and TACT of untrained compound stimuli
- LR and TACT of Components of compound stimuli (patterns and shapes)

Ribeiro, Miguel, and Goyos (2015)
**Emergent Behavior**

Training: "Touch DASHARBELOS"

- **Stimuli**
  - x = Dash
  - y = Grid
  - z = Mosaic

- **Patterns**
  - 1 = Arbelos
  - 2 = Decagon
  - 3 = Heptagram

- **Rx1**
  - x1

- **Rx2**
  - x2

- **Rx3**
  - x3

- **Sy1**
  - y1

- **Sy2**
  - y2

- **Sy3**
  - y3

- **Sz1**
  - z1

- **Sz2**
  - z2

- **Sz3**
  - z3

Ribeiro, Miguel, and Goyos (2015)

---

**Emergent Behavior**

- **Trained Grid Decagon**

- **Same pattern/different shapes**

- **Same shape/different patterns**

- **Different shapes/different patterns**

Would “DASH DECAGON” emerge?

- **Post-test Emergent Listener Screens**

Ribeiro, Miguel, and Goyos (2015)
Question: with ONLY listener behavior to a compound stimulus would speaker behavior emerge:

- TACT the trained LR compound stimuli
  
  Learned to TACT compound stimuli

- LR and TACT of untrained compound stimuli
  
  Learned LRs and TACTs of untaught compound stimuli

- LR and TACT of Components of compound stimuli
  
  Learned LR and TACTS of shapes and patterns
Cross Modal Generalization

"When a target word is taught in one modality (e.g., expressive) and accurately identified in another modality without direct instruction."

Taught: (see/ hear - echo "mouse")

Would listener emerge?: “Find mouse” Point to mouse?

Question: which is a better instructional method for the development of emergent behavior:

Listener to Speaker or Speaker to Listener

- Speaker to listener instruction superior
- Listener behavior emerge from training speaker behavior
- Speaker behavior didn’t consistently emerge from listener instruction
Both listener and speaker training developed emergent behavior.

Speaker better

Possible Prerequisites Skills

- Generalized echoic repertoire
- Tact and listener responses
- Mastered tacts and LR

Instructional Sequence

What kind of instruction supports the development of emergent behavior?

1. Matching

Receptive
before
Expressive?

Instructional Sequence

1. Matching
Receptive before Expressive?


Instructional Sequence

1. Matching
2. Receptive labeling
Receptive before Expressive?

“CAT”

Instructional Sequence
1. Matching
2. Receptive labeling

Receptive before Expressive?

“DOG”


Instructional Sequence
1. Matching
2. Receptive labeling

Receptive before Expressive?

“MOUSE”

**Instructional Sequence**

1. Matching
2. Receptive labeling
3. Tact

Receptive before Expressive?

“What's this?” **MOOSE**


---

**Instructional Sequence**

1. Limited empirical support for teaching receptive before expressive skills
2. Expressive training often generated receptive skills
3. Focus on auditory-visual tasks

Caveats

1. Compared only 2 approaches (others: Greer & Ross)
2. ID critical VB skills (e.g., ECH-SE: Lowenkrone)
3. Identify requisite histories and VB repertoires for results

What kind of verbal environments might support the development of emergent behavior?

**Verbal Communities**

**The Family**
- Members: mom, dad, sister, brother, other grandparents...
- Member responsibility: cooking, cleaning, care taking, sharing...
- Family members interactions: direct playing/helping younger sibling, mom, dad...; indirect observations of interactions between family members

**The School**
- Members: Teacher, teaching assistant, other children
- Member responsibility: teach, follow class rules, be nice to others, do work...
- School interactions: direct teacher-student, student-teacher, and student-student; indirect observations others interacting
Have learned to get and give (reinforcement):
• talk to each other
• laugh with each other
• help each other
• play games
• support each other

Typical Family

Typical Family and Child with ASD Dx
Verbal Communities

The Family with ASD Child
- Members: one caregiver for ASD child
- Member responsibility: Keep ASD child “happy” and “safe,” ASD child has few responsibilities
- Family members interactions: ASD child’s interactions often with ONE caregiver (mom), few interactions and observations of other family members

The School
- Members: RBT or teacher
- Member responsibility: teach, follow class rules
- School interactions: direct teacher-student, student-teacher, few interactions with and observations of peers

Verbal Communities

- VBCs establish motivators (MO, AO)
- to attend to people (“ADAM! your turn”)
- observing others (peers getting things)
- to learn to learn (without direct instruction)
- Opportunities
- to observe behavior-consequent relations
- to experience behavior-consequent relations
- Practice and be reinforced for VB and Non-verbal skills in more natural environment

Can we improve the verbal community of ASD children in School (Games?)
Observational Learning

What is observational learning and why is it important?
Observational Learning

Learning by observing others coming into contact with response-stimulus contingencies

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015

Video
Observational Learning

Formal definition:

Process of acquiring skills as a result of observing others come into contact with contingencies of reinforcement of punishment.

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015

Observational Learning

Prerequisites

- Attend to others
- Imitate after a delay
- Identify and discriminate contingencies

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015
## Observational Learning

### Instructional Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Modeling</td>
<td>Student SEES (staff or peer) target behavior then. Must have: S₀ and consequences</td>
</tr>
<tr>
<td>Video Modeling</td>
<td>Watch video of target with S₀ and consequent.</td>
</tr>
<tr>
<td>Group Dyadic Instruction</td>
<td>Student SEES model and then DOES action. Then MODEL for the next student.</td>
</tr>
<tr>
<td>Explicit Instruction in the Observation of Others</td>
<td>Student taught to observe behavior of others and the consequences of that behavior</td>
</tr>
</tbody>
</table>

Ravnicke and Hume (2014)

### Review Summary: 20 studies

- Most ASD participants learned by observing
  - but possibly at a slower rate than typically developing children
- Exposure (indirect instruction) only may not be enough for some children

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015
Observational Learning

Evidenced-based instructional formats

- 1-1 instruction
- Highly structured
- Well-planned and repeated learning opportunities

May not encourage observational learning

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015

Typical educational setting

- Group instruction
- Infrequent direct reinforcement
- Learning by observing

Do we need to prepare ASD children for these kinds of environments?

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015
Observational Learning

If the goal of intervention is to not only treat deficits areas but also to establish a rate of learning similar to typically developing peers then observation learning is vital.

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015

Observational Learning

Recommendations for ASDVBC

- Teach sustained attention to peers
- Promote imitation of peer vocal motor responses
- Teach discrimination of consequences
- Practice above skills

Townley-Cochran, Leaf J., Taubman, Leaf, R., McEachin, 2015
What we know so far

Verbal Communities

Observational learning

Emergent Behavior

Instructional Sequence

Games with peers?

Something to Think About:

Verbal communities are environments that can encourage Observational Learning and Emergent Behavior. How can we develop verbal communities in our classrooms?
<table>
<thead>
<tr>
<th>Observational learning (teacher model)</th>
<th>Stimulus Discrimination</th>
<th>MTS</th>
<th>Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 to 3</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-5</td>
<td></td>
</tr>
</tbody>
</table>
Simple discriminations

Conditional discriminations

What’s the best way to teach [discrimination] skills?

Simple discriminations

Components: Sample and Comparison
Sample/comparison: same modality (visual, auditory)
Comparison: array of 3 or more
Sample and comparisons: visual, auditory... stimuli
Materials: Colors, shapes, objects (bears), pictures (cows)...
Simple discriminations

Comparisons
(visual, auditory, tactile, olfactory, taste)

Sample
(visual, auditory, tactile, olfactory, taste)

identical except for one feature

Matching

Simple discriminations

Comparisons
(visual, auditory, tactile, olfactory, taste)

Sample
(visual, auditory, tactile, olfactory, taste)

identical

Matching
Simple discriminations

Matching

Large array

under

in

on

under

behind

in front of

above

below

between

next to

Problem discrimination:
- vocal isn’t needed
- no assurance vocal is attended to

“Match truck”

53

54
Observing Responses

- Purpose: draw attention to instructional materials (SAMPLE)
- Observing responses: pointing to picture, uncover sample stimulus, turning sample stimulus over, asking for sample object...
**Observing response**

**Differential Observing Responses (DOR)**

- Purpose: draw attention to specific instructional materials ($S^D$)

Grow & LeBlanc, 2016
Simple discriminations

Differential Observing Responses (DOR)

Grow & LeBlanc, 2016

Matching

Simple discriminations

Recent Research and Recommendations

• Presentation Sequence
  • Simultaneous Sample and Comparison
  • Comparison first, then Sample
  • Sample first, then Comparison

Which is better?

Petursdottir & Aguilar, 2016
Matching Simultaneous Presentation

Matching Comparison First Presentation

Petursdottir & Aguilar, 2016
Simple discriminations

Sample First Presentation

Petursdottir & Aguilar, 2016

Matching

Simple discriminations

Matching

Good comparison (only one common stimulus)
Matching

Simple discriminations

Confusing comparisons
Sample and 2 comparison have 1 feature in common

Matching

Simple discriminations

Bad instructional design for simple discriminations.
color?
animal?
size?

Little black sheep
What we know so far

- Present SAMPLE first then comparisons
- Use differential observing response (DOR)
  - to sample: point to, turn over, uncover...
- Simple discriminations: avoid confusing displays e.g., (compound stimuli)
  - 2 or more comparisons share a common component with sample
Conditional discriminations

Components: Sample and Comparison

Sample/Comparison:

DIFFERENT MODALITIES (visual, auditory, tactile, olfactory, taste)
E.g. verbal/text-match, verbal/vocal-listener
COMPOUND STIMULI (little black sheep)

Conditional discriminations involves LISTENER BEHAVIOR (without listening can't do task)

Conditioned Discriminations

Conditional Verbal Discrimination (VC)

Comparisons

Visual

Different Modalities

Auditory

“CIRCLE”

Sample (verbal)
To teach listening: repeat the sample

Vocal DOR

What are you going to find?

“Find bee”

Conditional discriminations

Compound Stimuli: 2 or more components

Problem: discriminations involving more than 1 action and more than 1 object

Compound (VC^2) Verbal Sample

Petursdottir & Aguilar, 2016
Reinforcement as Stimulus Change

Stimulus 1 | Changes to | Stimulus 2
---|---|---
Reinforcement | MO: money | Neutral

What is Stimulus 2?

Michael, J. 2004
### Reinforcement as Stimulus Change

<table>
<thead>
<tr>
<th>Stimulus 1</th>
<th>Changes to</th>
<th>Stimulus 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Money" /></td>
<td><img src="image2.png" alt="Neutral" /></td>
<td><img src="image3.png" alt="Money" /></td>
</tr>
</tbody>
</table>

**MO: Money**

*What is Stimulus 2?*

- **Reinforcement**
- **Punishment**
- **Neutral**

*Michael, J. 2004 77*

---

### Reinforcement as Stimulus Change

<table>
<thead>
<tr>
<th>Stimulus 1</th>
<th>Changes to</th>
<th>Stimulus 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4.png" alt="Money" /></td>
<td><img src="image5.png" alt="Neutral" /></td>
<td><img src="image6.png" alt="Money" /></td>
</tr>
</tbody>
</table>

**NO MO: Money**

*What is Stimulus 2?*

- **Reinforcement**
- **Punishment**
- **Neutral**

*Michael, J. 2004 78*
Reinforcement as Stimulus Change

Changes to

Michael, J. 2004

Reinforcement as Stimulus Change

Changes to

Michael, J. 2004
Reinforcement as Stimulus Change

VIDEO

Kids Playing Uno

VIDEO

Michael, J. 2004
Can we teach using games that are fun, where children learn necessary language and social skills, and that produce stimulus change reinforcement?
GAMES

Characteristics of many games

- Built in stimulus changes
  - Clue: Finding who did it
  - Monopoly: who has the most $
  - Pictionary: silly drawings
  - Memory: finding matching cards
  - Jeopardy: answering question

- Clear beginning and ending

- Social observing and interactions

- Thinking [verbal behavior]

GAMES

Can we develop fun games to firm language skills

- Echoic
- MTS
- Mand

- Tact
- Tffc
- IV
- IVffc

Combinations of operants

Convergent or divergent stimulus control
Can we develop fun games that address language difficulties
IV Subtest groups
- Prepositions
- Wh questions
- Pronouns
Math Facts
- Reading
- Comprehension

Games Environments
- Create environments for
  - new MOs and AOs
  - observational learning
  - remembering
  - emergent behavior
  - social behavior and interactions
Some Possible Prerequisite Skills

- Non-verbal
- Stay and play skills
- Task completion
- Waiting turn
- Following directions
- A few verbal skills
  - Mands, Tact, Echoics, Intraverbals...

Stay and Play

Interesting materials

A task to do

VIDEO

A beginning and end
STAY and PLAY with PUT Tasks

Training PUT responses with new “toy” (CMO-T)
Responses with existing reinforcer (Slinky) are stereotypic
Mastered PUT task competes effectively with Slinky as reinforcer
Target: tact fruit. Activity: echoic-tact-MTS
Compound Stimuli

Two or more features or directions e.g., (black bear, big white dog, cross out circle, underline the square),

These stimuli require special attention: prompting and instructional design
Child doesn't need to attend to vocal instruction to match. May be useful for teaching tact. May cause problems for developing listener behavior. Only discriminating ONE component (color) of the compound stimulus

"What is it?" "Yellow apple" "Yellow apple"

Target: tact features Activity: echoic-tact-MTS

Match: What is you matching? "Yellow apple"

Common Instruction

Games with teacher

Only teaching color discrimination:
Red, Yellow, Green.
NOT Green apple v. green bear

Problem: Complete stimulus control not taught

GAMES

Games with teacher

Common Instruction

Only teaching color discrimination:
Red, Yellow, Green.
NOT Green apple v. green bear

Problem: Complete stimulus control not taught

GAMES

Games with teacher

Common Instruction

Only teaching color discrimination:
Red, Yellow, Green.
NOT Green apple v. green bear

Problem: Complete stimulus control not taught
Games with teacher

Listener (receptive)
- Point to dog eating
- Point to sleeping
- Point to running
- Point to jumping

What component controls the response?

Tact/Intraverbal (expressive)
- What do you write?
- What do you write with?
- What do you see?
- What do you see with?

Why do children have trouble learning these?

Every word counts.

Student error
- Hasn’t learn to respond to compound stimuli.
- Over-selectivity to one component of the compound stimulus
  (history of instruction?)

Instructional design error
- Failure to establish stimulus control of both components
- Failure to teach each components in discrimination with others

Matrix Instruction
GAMES

Games with teacher

What?

“boy eating”

Target: noun-verb on diagonal. Activity: echoic-tact-MTS

“boy eating”

“Match”

Target: noun-verb off matrix. Activity: echoic-tact-MTS

GAMES

Games with teacher

“What is it?”

“Match”

dog eating
### Matrix Instruction

<table>
<thead>
<tr>
<th></th>
<th>Sleeping</th>
<th>Swimming</th>
<th>Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duck</td>
<td>X</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Dog</td>
<td>?</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>Cat</td>
<td>?</td>
<td>?</td>
<td>X</td>
</tr>
</tbody>
</table>

Axe and Saint a (2010)

### Variation of N-V Game

Target: noun-verb. Activity: signed Mand-MTS
Target: Mand N-V [duck swimming]. Activity M-MTS

Target: M object, Mand/Tact placement [put cow on table]
Activity: M/M/MTS
Other Compound Stimuli

Following directions 2-step directions
In context, repeated and rote: No Problem
“get your backpack and line up”

These can be problems: “put an X on the duck, stamp the cow, and circle the pig.

Matrix Instruction to teach (action-object) components of two-step directions with prompts
"Put an "X" on the camera"

Target: select 2-step direction
Target: mand/tact with N-V. Activity: Mand

“Match these. What do you want to match first?

“Dog running”
### Matrix Instruction

<table>
<thead>
<tr>
<th>Location</th>
<th>Sally</th>
<th>Lamp</th>
<th>Sofa</th>
<th>Chair</th>
</tr>
</thead>
</table>

Where do I put Sally?
Put the lamp behind the sofa?

---

**Games with teacher**

**Mand, Tact, or LR targets**

---

**Games with peers**

---

Axe and Santato (2010)
Games with peers

For Mastered or near mastered targets

Teaching/assessing for observational learning

Turn Taking

Games with peers
Student 1

SP to start turn
Rfmt for responding

Student 2

Games with peers

GAMES

Turn Taking

GAMES

Turn Taking

VIDEO
**Game Analysis**

**Turn Taking**

- No verbal/vocal prompts
- Clear beginning and end
- SD, MO and Rfmt are built in (no need for other fmt)
- Interesting materials and activity
- Opportunity for social interactions and contingencies ["your turn/my turn"]

**Games with peers**

Target: mand/tact and match

- Student 1: "drink"
- Student 2: "cookie"
GAMES

Games with peers

VIDEO

GAMES

Materials Variation

Games with peers
Board Games with peers

When and Why use board games with peers

• Classrooms with 1 teacher, 1 assist, 6 plus kids
• Organized group instruction of mastered or near mastered skills

Why?
• Efficient use of time
• Social interactions peers
• Observational learning
• Decrease problem behavior
• Generality of games
Board Games with peers

Board Games with peers
Board Games with peers

Jelly Bean Race

131

Board Games with peers

132
Board Games with peers

What gets a capital letter?
Instructions:
1. Roll the die
2. On red answer a red question
3. On green the green question
4. On white do what it says
What we know so far

Verbal conditional discriminations

Compound stimuli

Reinforcement as stimulus change

Matrix Instruction

Games
How do we incorporate games into a classroom?

Classroom Considerations
Not a replacement when 1-1 instruction is necessary

Use games with children strategically:
• more natural reinforcement
• better use of time
• teach/ assess observational learning
• teach/ assess emergent behavior
• practice social and language skills
• generality to other social behavior
• firming common learning difficulties
**Common Difficulties**

- Convergent stimulus control responses
- Divergent stimulus control responses
- IV subtest errors (compound verbal stimuli)
- Important Small Words
  - some v. a
  - is not v. is...
  - with, in, on
- Discriminating Wh questions
- Intraverbal reversals
- Pronouns possessive adjectives

**For complex language to be acquired, it’s critical to teach responses that require divergent and convergent stimulus control.**

This type of SC is involved in verbal conditional discriminations (VBCDs).
This stimulus controls the number of response.

Little words count.

This stimulus controls the class of response.

Name some animals

Divergent SC
A single stimulus can evoke many different responses.

For Classrooms

cow

pig

lion

bird

dinosaur

For Classrooms

Extinct animals

Convergent SC
A compound stimulus evokes one of many possible responses.
This stimulus controls the sub-class of responses.

For Classrooms

INTRAVERBAL Subtests

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Animal sounds &amp; song fill-ins</td>
</tr>
<tr>
<td>2</td>
<td>Name, function fill-ins, related items</td>
</tr>
<tr>
<td>3</td>
<td>Simple <em>What</em> questions</td>
</tr>
<tr>
<td>4</td>
<td>Age, simple <em>Who, Where</em> questions</td>
</tr>
<tr>
<td>5</td>
<td>Categories, function, features</td>
</tr>
<tr>
<td>6</td>
<td>Adjectives, prepositions, adverbs</td>
</tr>
<tr>
<td>7</td>
<td>Multiple part questions</td>
</tr>
<tr>
<td>8</td>
<td>Multiple part questions</td>
</tr>
</tbody>
</table>

GAMES

Convergent SC
A compound stimulus evokes one of many possible responses.

### Simple Intraverbals

<table>
<thead>
<tr>
<th>Group 1: Animal sounds &amp; songs fill-ins</th>
<th>Score</th>
<th>TD</th>
<th>ASD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A kitty says...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Twinkle, twinkle, little...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ready, set...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>The wheels on the bus go...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rock a bye...</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A dog says...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Peek-a...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>The sky is...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Head, shoulders, knees and...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Happy birthday...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total points (10 min)</strong></td>
<td><strong>10</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 2: Name fill-ins associations</th>
<th>Score</th>
<th>TD</th>
<th>ASD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is your name?</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You brush your...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Shoes and...</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>You ride a...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You find the...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You sleep now...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You eat...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>One, two...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You wash your...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You sit on a...</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total points (10 min)</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

---

### VB conditional discriminations (VBCDs)

Response has to come under control of 2 or more antecedent VBs.
Step 1
Identify Common Errors

Class member v. Function of thing
What do you play? v. What do you play with?

Class member v. Reversal
Who fights fires? v. What does a fire fighter do?

Quantity
Name some animals. v. Name an animal.

Quantity. Class, feature by sub-class.
Tell me some animals with no legs

Step 1 (continued)
Identify Common Errors

Class member v. Multiple features and subclasses
Name an animal with no legs that lives on the ground.

No evidence of observational learning
After hearing and seeing a peer name an object
student still can’t name that object without direct
instruction
Step 2
Select Students and Define Common Deficits

Student deficits:

Name some animals. v. Name an animal.
Class, feature by sub-class and reversals.
Name some/ a animal[s] with no legs.
Tell me about snakes.

PROBE for observational learning
After hearing and seeing a peer name an object
student still can’t name that object without direct
instruction

Features
- shape
- color
- position (outside)
- legs, arms, eyes
- seat, back
- hard/soft
- hair, feathers
- quantity (no legs, 2 legs)
- are/are not
- have/have not

Class
- food
- animals
- vehicles
- fruit, vegetables
- containers
- drinks
- toys
- school things
- clothing
- things that fly, crawl, walk

Function
- take you places
- play with
- hold things
- put thing in
- drink
- eat
- write with
- wear on...
Step 3
Select Objectives and Discriminations
Student will correctly:
- Name *some* animals. v. Name *an* animal.
- Name *some* animals with *no* legs.

Class and sub-class and reversal

Probe for Observational learning
After hearing and seeing a peer name an unknown animal will that student later name that animal

Step 4
Prepare Materials
- Tact/IV from picture board
- Game board and tokens
- Instructions
- Data sheets
- Questions
  - discriminations, one v many
  - reversal
  - open-ended
  - Observational learning
    - training trial
    - test probes
### Prepare Materials

**Game Board: Candyland Board**

- Prompts: visual display board, gestural, vocal, point to pictures e.g., (animal, 2 legs, lives on land), instructional (what did he say?)

**Observational Learning:**
- What's the name of this animal? (not directly taught but vocalized)
- Tell me 5 more animals that have 2 legs (not visible).

### Discriminations: Class

- Name "an" animal; Name "some" animals.
- Reversals: A pig is an...
- Open-ended: Tell me about a pig

### Discriminations: Feature

- Name an animal with 2 legs
- Reversal: How many legs does an eagle have?
- Open-ended: What do you know about an eagle.
*What’s this animal (fish)
*A fish is an....
*Name this animal (eagle)
*An eagle is an....(animal)
*What else is an eagle (bird)
*What’s this animal? (chicken)
*Chickens are ..... (animals)
*Name some animals
*Fish, eagles, and chickens are.... (animals)
*This animal is a...(point to pig)
*A pig is an.....
*What’s this animal (cow)
*A cow is an.... (animal)
*A goat, eagle and fish are...

*Tell me the name of this animal (snake)
*A snake is an .... (animal)
*What’s this animal called? (goat)
*A goat is an .... (animal)
*Tell me some animals.
*Name an animal.
#Tell me 10 animals (2 new)
#What animal is this? (ostrich: set up and probe for Ob learn)
Where’s the eagle?
Where’s the fish.
Is this picture of an animal?
Find the snake.
Show me the chicken.

Instructions:
1. Answer red or green question
2. If correct roll die and move
3. If not correct stay
*What animals have 2 legs (chicken, eagle)*
*What do you know about a chickens and eagles (animals, 2 legs)*
*Tell some me animals with 4 legs. (cow, pig, goat)*
*What do you know about a cow, a pig, and a goat? (animals, 4 legs)*
*Name the some animals with no legs. (fish, snake)*
*What do you know about fish and snakes? (animal, no legs)*
*What animal has no legs?*
*Tell me about a fish? (animal, no legs)*
*Tell me about cows. (animal, 4 legs)*
*Tell me about goats. (animal, 4 legs)*

*Tell me about pigs. (animal, 4 legs)*
*What do you know about eagles (animal, 2 legs)*
*What do you know about chickens? (animal, 2 legs)*
*Tell me about snakes. (animal, no legs)*
*Tell me about fish. (animal, no legs)*

#Tell me 4 animals that have 2 legs?(2 new)
#Can you tell me 10 animals that have 4 legs.
#What animal is this? (ostrich: set up and probe for Ob learn)
#Tell me about an ostrich.
Fillers LR and tacts of pictures
**GAMES**  PLUS where they live ground, water

For Classrooms

*What animals live in the water?  (shark, eel)*
*What do you know about eels and sharks*  
(animals, live in water, 0 legs)
*Tell some me animals live on land  (horse, sheep, alligator, owl, kangaroo, pequin, koala)*
*What do you know about a horse, sheep, alligator, owl?  
(animals, live on land)*
*What do you know about a horse, penguins and owl?  
(animals, live on land, have 2 legs)*
*Name the some animals that live in water.  (shark, eel)*
*What do you know about shark and eel?  
(animal, no legs, live in water)*

*Tell me about shark.  (animal, 0 legs, 
lives in water)*
*What do you know about penquins  
(animal, 2 legs, lives on land)*
*What do you know about alligator?  
(animal, 4 legs, lives on water)*
*Tell me about owl.  (animal, 2 legs, lives on land)*
#Tell me about koala.  (animal, 4 
legs, lives on land)
#Tell me about an eel.  (animal, 0 legs, 
lives in water)
#Name 4 animals that have 2 
legs and live on land?(2 new)
#Can you tell me 10 animals 
that have 4 legs and live on land
#What animal is this?  e.g.  (eel, 
koala... set up and probe for Qb learn)
Fillers LR and tacts of pictures
GAMES

Games with peers

GAMES

Games with peers
GAMES

Games with peers
World of Facts: Teeth Chart

World of Facts: Teeth Chart

SRA / DI curriculum for mid elementary

Group instruction (for 1 or 2)

Instructional design: Echoic - Tact - IV

Game build in for groups

Content adaptable for other game formats
World of Facts: Teeth Chart

Question Sheet 3:

1. What teeth go in mouth?
2. What teeth go in mouth?
3. What teeth go in mouth?
4. What teeth go in mouth?
5. What teeth go in mouth?
6. What teeth go in mouth?

VIDEO
Pronouns in the works

GAMES

The Trouble with Pronouns

<table>
<thead>
<tr>
<th>Changing Speaker</th>
<th>Changing stimulus conditions</th>
</tr>
</thead>
</table>

Who has the pizza?

**Singular**

I

You

He, she

**Plural**

We

You

They

I do

you do

he, she does

We do

You do

They do
The Trouble with Pronouns

Changing Speaker

Who has the banana

Changing stimulus conditions

She does He does I do You do

173

VIDEO

174
References


References


Thanks

John Esch
jesch1@mac.com