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

John W. Esch, Ph.D.
BCBA-D

National Autism Conference 2016
Pennsylvania State University
August 2, 2016

1

Overview of Talk

- Emergent skills (research & recommendations)

- Instructional sequence (recommendations)

- Verbal communities

- Observational learning

- Discriminations (research & recommendations)

  •simple

  •conditional

- Reinforcement

- Games (prerequisites, types, & development)

Emergent Behavior

Why is this important?

Davis, T.N., Camarata, S., & Camarata, M. (2016); Delfs C..H. & Frampton, (2014); Delfs, C. H., Conine, D.E., Frampton, S.E., Shillingburg, M. A., and Robinson, H.S.   (2014).
3

Emergent Behavior

Behavior learned without direct instruction

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

Davis, T.N., Camarata, S., & Camarata, M. (2016); Delfs C..H. & Frampton, (2014); Delfs, C. H., Conine, D.E., Frampton, S.E., Shillingburg, M. A., and Robinson, H.S.   (2014).
4

What else is in the sky?

VIDEO

5

Emergent Behavior

How does it happen?

Question: with ONLY training listener behavior to compound stimuli would the following speaker behavior emerge:
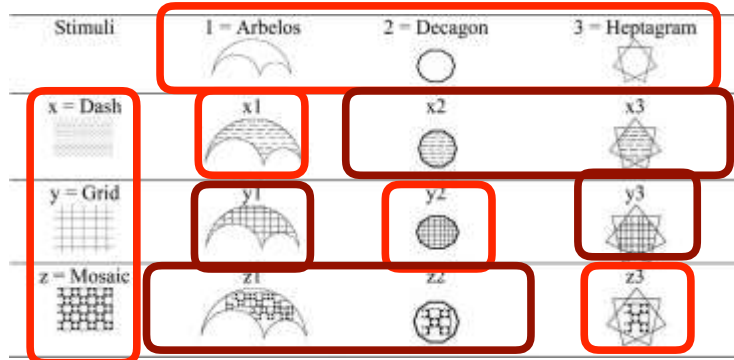
• TACT the LR trained compound stimuli

• LR and TACT of untrained compound stimuli

• LR and TACT of Components of compound stimuli (patterns and shapes)
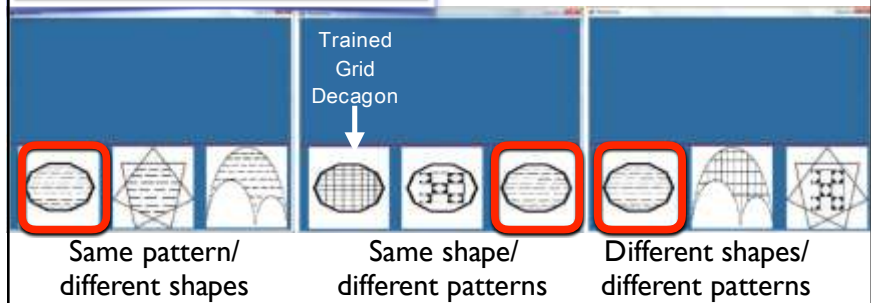
Ribeiro, Miguel, and Goyos (2015)

6

Slide 7

Emergent Behavior

Training: *"Touch DASH ARBELOS"*

Stimuli	1 = Arbelos	2 = Decagon	3 = Heptagram
x = Dash	x1	x2	x3
y = Grid	y1	y2	y3
z = Mosaic	z1	z2	z3

Ribeiro, Miguel, and Goyos (2015)

7

Slide 8

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)

8

Emergent Behavior

Results

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

Ribeiro, Miguel, and Goyos (2015)

9

Emergent Behavior

Jump on the receptive to expressive instructional sequence train to get emergent behavior?

10

Emergent Behavior

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?

Davis, T.N., Camarata, S., & Camarata, M. (2016); Delfs C..H. & Frampton, (2014); Delfs, C. H., Conine, D.E., Frampton, S.E., Shillingburg, M. A., and Robinson, H.S.   (2014).

11

Emergent Behavior

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

Davis, Camarata and Camarata (2016)
Delfs, et al. (2014)

12

Emergent Behavior

Summary

Both listener and speaker training developed emergent behavior.

Speaker better

Possible Prerequisites Skills

Generalized echoic repertoire

Tact and listener responses

Mastered tacts and LR

Davis, T.N., Camarata, S., & Camarata, M. (2016); Delfs C..H. & Frampton, (2014); Delfs, C. H., Conine, D.E., Frampton, S.E., Shillingburg, M. A., and Robinson, H.S.   (2014).

13
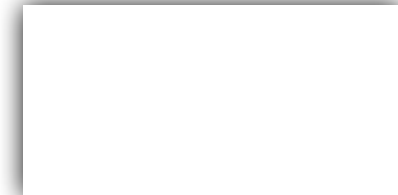
14

8/2/2016

Instructional Sequence

What kind of instruction supports the development of emergent behavior?

15

Instructional Sequence

1. Matching

Receptive
before
Expressive?

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

8

Instructional Sequence

1. Matching

Receptive
before
Expressive?

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

Instructional Sequence

1. Matching
2. Receptive labeling

Receptive
before
Expressive?

"CAT"

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

Instructional Sequence

1. Matching
2. Receptive labeling

Receptive
before
Expressive?
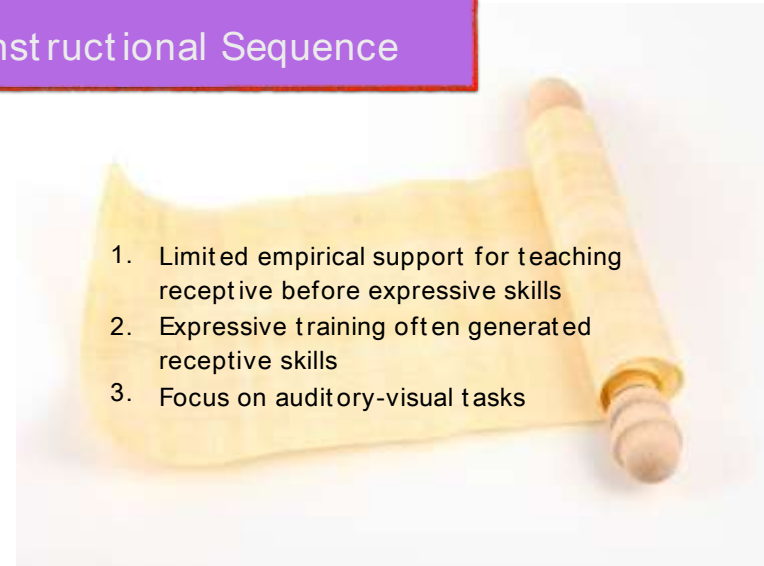
"DOG"

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

Instructional Sequence

1. Matching
2. Receptive labeling

Receptive
before
Expressive?

"MOUSE"

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

Instructional Sequence

1. Matching
2. Receptive labeling
3. Tact

Receptive
before
Expressive?

"What's this?"   MOUSE DOG

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

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

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

Instructional Sequence

Caveats

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

Petursdottir and Carr, 2011; Grow, Kodak, and Carr, 2014; Grow , Carr, and Kodak, 2011

24

Verbal Communities

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

25

Verbal Communities

| The Family	The School
• Members: mom, dad, sister, brother, other grandparents…	• Members: Teacher, teaching assistant, other children
• Member responsibility: cooking, cleaning, care taking, sharing…	• Member responsibility: teach, follow class rules, be nice to others, do work…
• Family members interactions: direct playing/ helping younger sibling, mom, dad…; indirect observations of interactions between family members	• School interactions: direct teacher-student, student-teacher, and student-student; indirect observations others interacting

13

Verbal Communities

Have learned to get
and give (reinforcement):
- talk to each other
- laugh with each other
- help each other
- play games
- support each other

ASD

Mom → **Dad**

Child 1 → **Child 2**

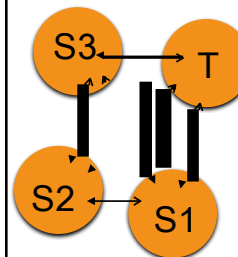**Typical Family**

Mom

Dad
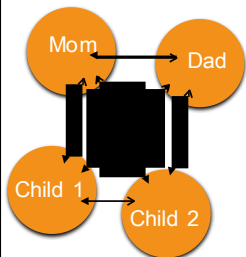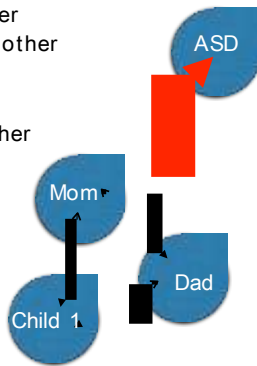
Child 1

**Typical Family and
Child with ASD Dx**

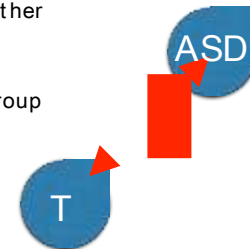## Verbal Communities

Have learned to
- learn by observing
- get and give
  (reinforcement):
- talk with each other
- play and work together
- resolve problems
- play games
- complete task in group

S3 → **T**

S2 → **S1**

Typical Classroom

ASD

T

**ASD Classroom**

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
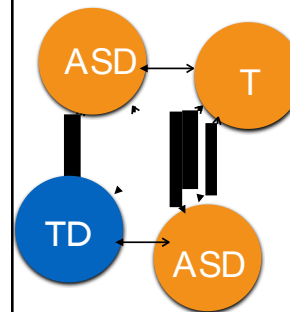
- VBCs establish motivators (MO, AO)
  - to attend to people ("ADAM! your turn")
  - observing others (peers getting things)
  - to learn to learn (without direct instruction)

- 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?

31

32

Observational Learning

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

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

33

Observational Learning

Video

34

Observational Learning

Formal definition:

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

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

35

Observational Learning

Prerequistes

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

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

36

Observational Learning

Instructional Methods

Live Modeling	Student S*EES (staff or peer) target behavior then.* *Must have: S^D and consequences*
Video Modeling	Watch video of target with S^D and consequent.
Group Dyadic Instruction	Student SEES model and then DOES action. Then MODEL for the next student.
Explicit Instruction in the Observation of Others	Student taught to observe behavior of others and the consequences of that behavior

Plavnick and Hume (2014)

37

Observational Learning

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

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

38

Observational Learning

Evidenced-based instructional formats

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

May not encourage observational learning

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

39

Observational Learning

Typical educational setting

- Group instruction
- Infrequent direct reinforcement
- Learning by observing

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

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

40

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.

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

41

Observational Learning

Recommendations for ASDVBC

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

Taylor, B.A. and DeQuinzio, J.A. (2012)
Townley-Cochran, Leaf J. ,Taubman, Leaf, R., McEachin, 2015

42

What we know so far

Verbal Communities

Observational learning

Emergent Behavior

Instructional Sequence

Games with peers?

43

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?

44

Observational learning (teacher model)	Stimulus Discrimination 3-5	MTS 3 to 3	Sequence 1-5

45

46

Simple discriminations

Conditional discriminations

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

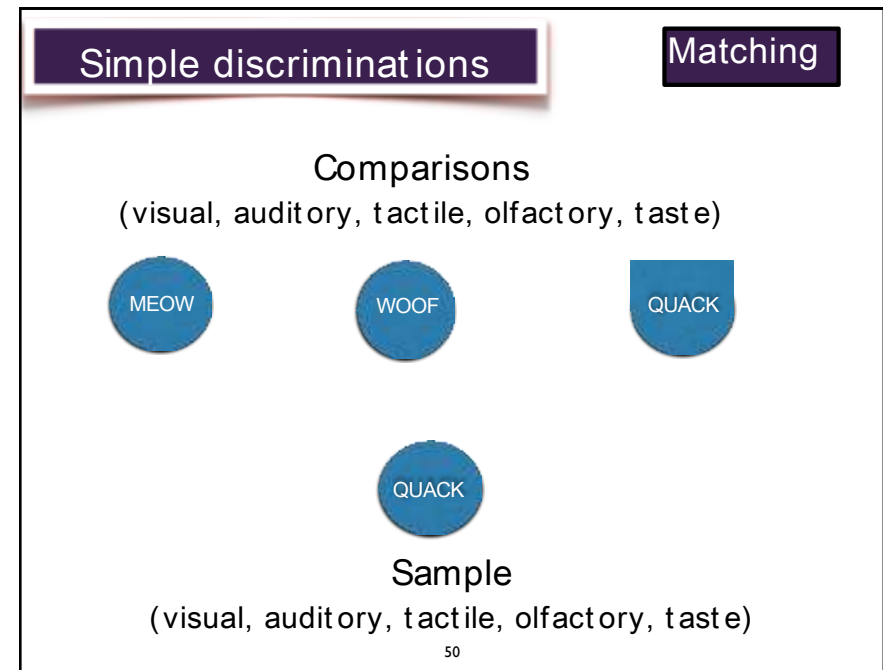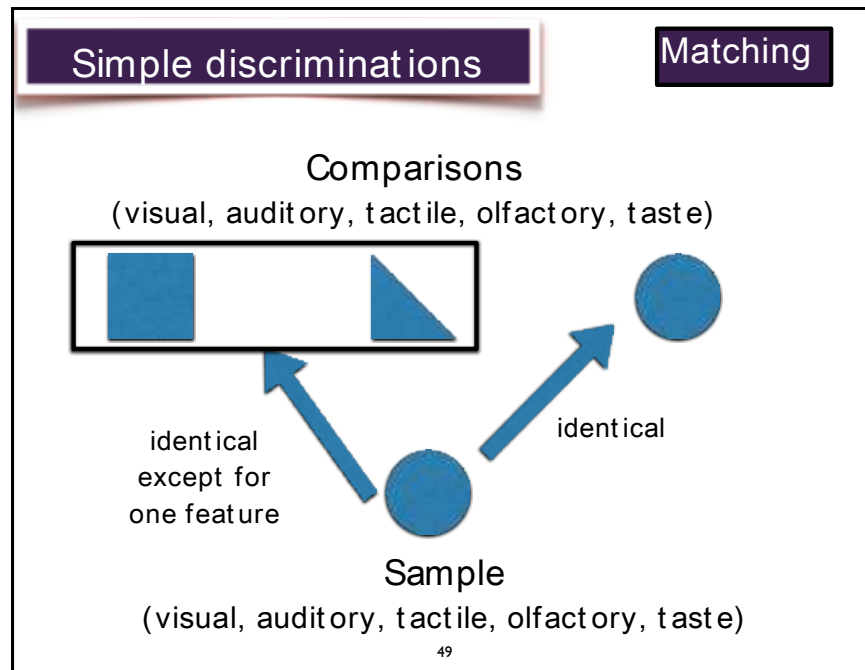47

Simple discriminations

Matching

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)…

Slide 53

Simple discriminations

Large array

in

on

under

behind

in front of

under

above

below

between

next to

53

Slide 54
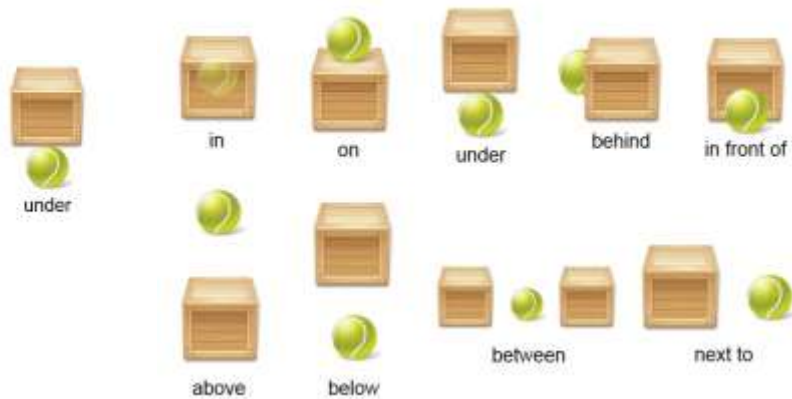
Simple discriminations

Matching

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

"Match truck"

54

Simple discriminations

Matching

Recent Research and Recommendations

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…

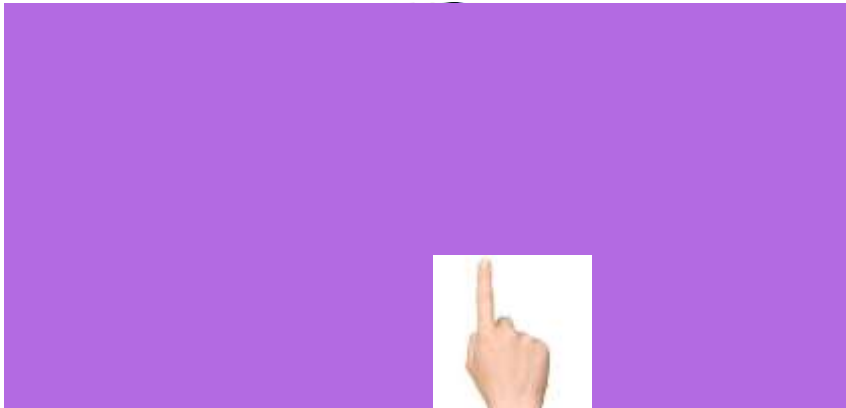## Simple discriminations

Matching

Observing response

56

Simple discriminations

Observing response

57

Simple discriminations

Matching

Differential Observing Responses (DOR)

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

Grow & LeBlanc, 2016

Simple discriminations

Matching

Differential Observing Responses (DOR)

Grow & LeBlanc, 2016

Simple discriminations

Matching

Recent Research and Recommendations

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

  Which is better?

Petursdottir & Aguilar, 2016
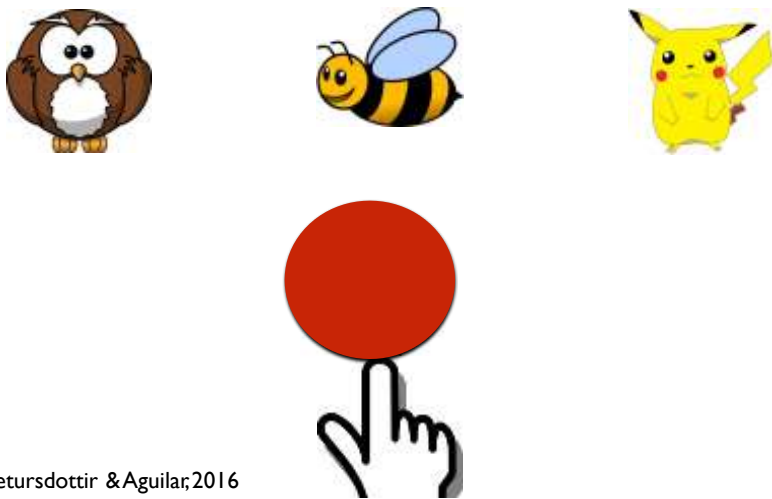
Simple discriminations (Simultaneous Presentation) — Matching

Petursdottir & Aguilar, 2016

Simple discriminations (Comparison First Presentation) — Matching

Petursdottir & Aguilar, 2016

Simple discriminations

Sample First Presentation

Simple discriminations

Matching

Good
comparison
(only one common
stimulus)

Simple discriminations

Matching

Confusing comparisons

Sample and 2 comparison have 1 feature in common

Simple discriminations

Matching

Little white dog

Big white sheep

Big black cow

Little black sheep

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

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

Conditional discriminations   Listener

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)

Conditional discriminations   Listener

Conditional Verbal Discrimination (VC^D)

Comparisons

Visual

Different
Modalities

Auditory
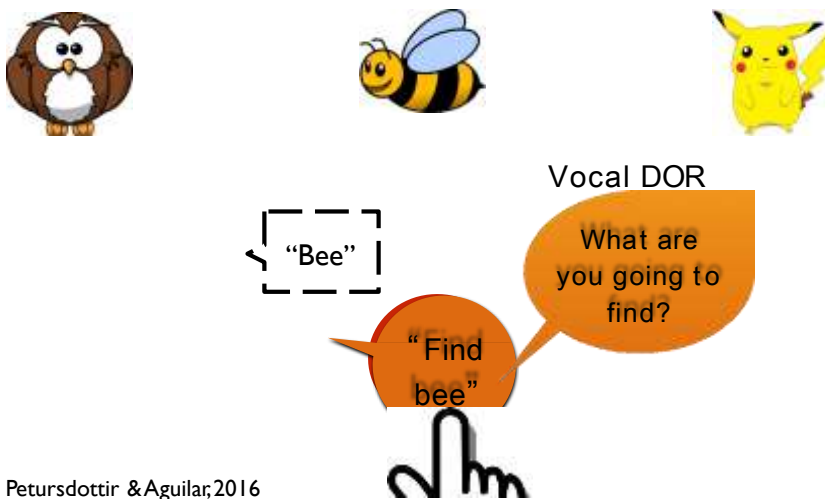
"CIRCLE"

Sample (verbal)

70

Conditional discriminations — Listener

To teach listening: repeat the sample

Vocal DOR

"Bee"
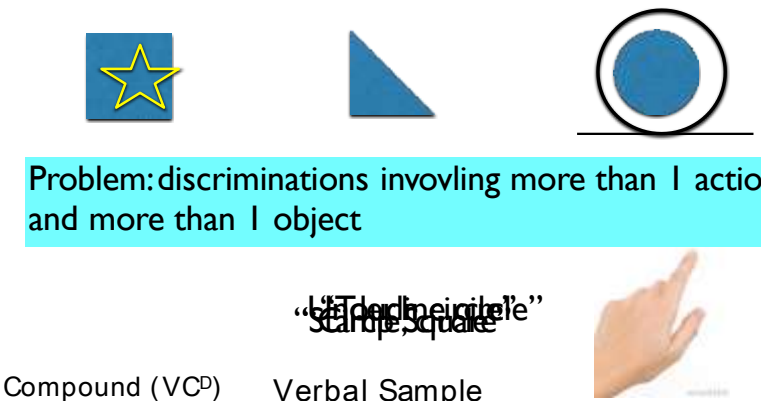
"What are you going to find?"

"Find bee"

Petursdottir & Aguilar, 2016

Conditional discriminations — Listener

Compound Stimuli: 2 or more components

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

Compound (VC^D)   Verbal Sample

72

36

73

Reinforcement as Stimulus Change

74

Reinforcement as Stimulus Change

75

Reinforcement as Stimulus Change

Stimulus 1   Changes to   Stimulus 2

MO:money

What is Stimulus 2?

Reinforcement   Punishment   Neutral

Michael, J. 2004

76

Reinforcement as Stimulus Change

Stimulus 1   Changes to   Stimulus 2

MO:money

What is Stimulus 2?

Reinforcement   Punishment   Neutral

Michael, J. 2004   77

Reinforcement as Stimulus Change

Stimulus 1   Changes to   Stimulus 2

NO MO:Money

What is Stimulus 2?

Reinforcement   Punishment   Neutral

Michael, J. 2004   78

Reinforcement as Stimulus Change

Changes to

Michael, J. 2004

79

Reinforcement as Stimulus Change

Changes to

Michael, J. 2004

80

Reinforcement as Stimulus Change

VIDEO

Michael, J. 2004

81

Kids Playing Uno

VIDEO

83

GAMES

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

84

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 card
- Jeopardy: answering question

Clear beginning and ending

Social observing and interactions

Thinking [verbal behavior]

85

GAMES

Can we develop fun games to firm language skills

Echoic	Tact	LR
MTS	Tffc	LRffc
Mand	IV	IVffc

Combinations of operants

Convergent or divergent stimulus control

86

Can we develop fun games that addresses language difficulties

IV Subtest groups

Prepositions

Wh questions

Pronouns

Math Facts

Reading
Comprehension

87

GAMES

Games Environments

- Create environments for
  - new MOs and AOs
  - observational learning
  - remembering
  - emergent behavior
  - social behavior and interactions

GAMES

Some Possible Prerequisite Skills

- Non-verbal
  - stay and play skills
  - task completion
  - waiting turn
  - following directions
- A few verbal skills
  - Mands, Tact, Echoics, Intraverbals...

GAMES

Stay and Play

Interesting materials

A task to do   VIDEO

A beginning and end

GAMES

Stay and Play with Put Tasks
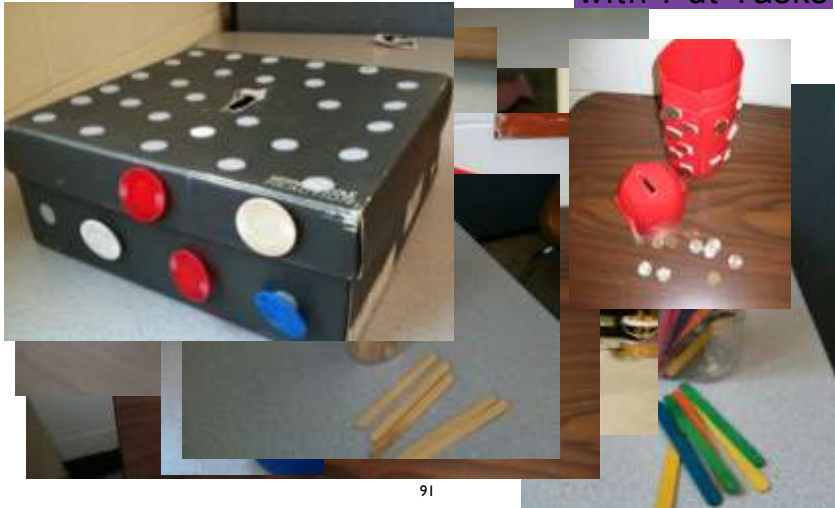
91

GAMES

Stay and Play

VIDEO

Training PUT responses with new "toy" (CMO-T)

Responses with existing reinforcer (Slinky) are stereotypic

GAMES

Games alone

VIDEO

Mastered PUT task competes effectively with Slinky as reinforcer

GAMES
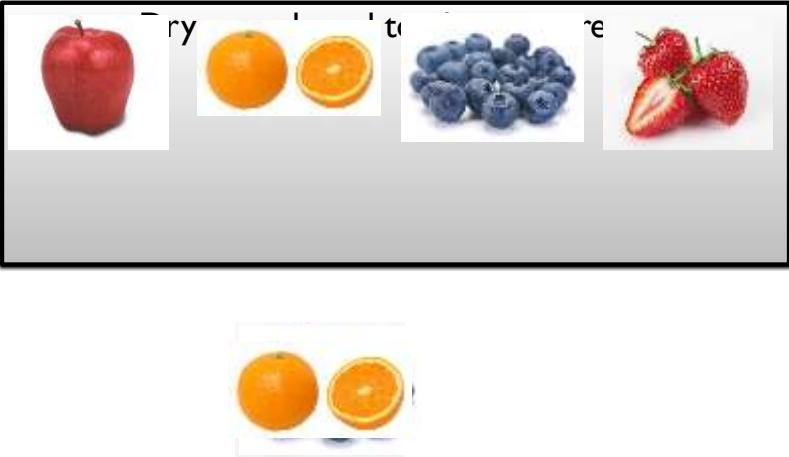
Games with teacher

For Acquisition Targets

94
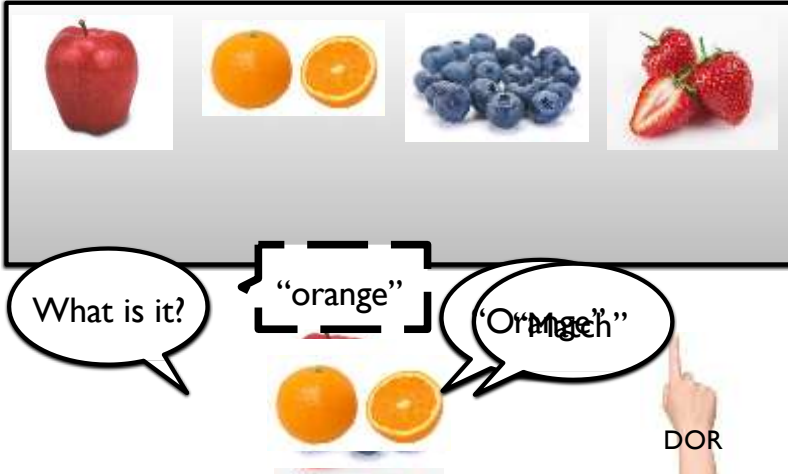
Slide 1

GAMES

"Match fruit. Which one do you want to match first?"

"orange"
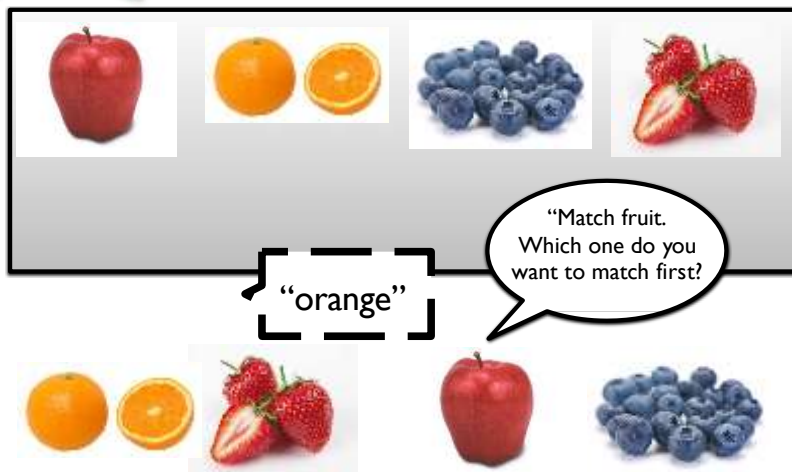
Target: mand/tact fruit. Activity: mand/tact-MTS

Slide 2

GAMES

Games with teacher

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

98

GAMES

Common Instruction

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"

Match. What are you matching? Yellow apple?

Target: tact features Activity: echoic-tact-MTS

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

100

50

GAMES

Games with teacher

Listener (receptive)

Tact/Intraverbal (expressive)

Point to dog eating

ignore

sleeping

running

jumping

What component controls the response?

Point to

Point to

Every word counts.

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?

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

102

GAMES

Matrix Instruction

	Sleeping	Running	Eating	Drinking
Girl	X	?	?	?
Dog	?	X	?	?
Boy	?	?	X	?
Cat	?	?	?	X

Axe and Saintato (2010)

103

GAMES

Matrix Instruction

	Sleeping	Running	Eating
Girl	X	?	?
Dog	?	X	?
Boy	?	?	X

Axe and Saintato (2010)

104

GAMES

Games with teacher

"What?"

"boy eating"

"boy eating"

"Match"

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

GAMES

Games with teacher

dog eating

"What is it?"

"Match"

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

GAMES

Games with teacher

Matrix Instruction

	Sleeping	Swimming	Eating
Duck	X	?	?
Dog	?	X	?
Cat	?	?	X

Axe and Saintato (2010)

107

GAMES — Variation of N-V Game — Games with teacher

"Duck swimming"

Target: noun-verb. Activity: signed Mand-MTS

108

GAMES

VIDEO

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

109

GAMES

Games with teacher

VIDEO

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

110

GAMES

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.

111

GAMES

Games with teacher

Matrix Instruction to teach (action-object) components of two-step directions with prompts

112

GAMES

Games with teacher

"Dog running"

"Match these. What do you want to match first

Target: mand/tact with N-V. Activity: Mand

GAMES

Games with teacher

Lamp

Dresser

Bed

Sally

Sofa

Chair

116

58

GAMES

Matrix Instruction

	In	On	On top	Beside	Under	Behind
Sally						
Lamp						
Sofa						
Chair						

Mand, Tact, or LR targets

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

Axe and Saintato (2010)

117

GAMES

Games with peers

118

GAMES

Games with peers

For Mastered or near mastered targets

Teaching/ assessing for observational learning

119
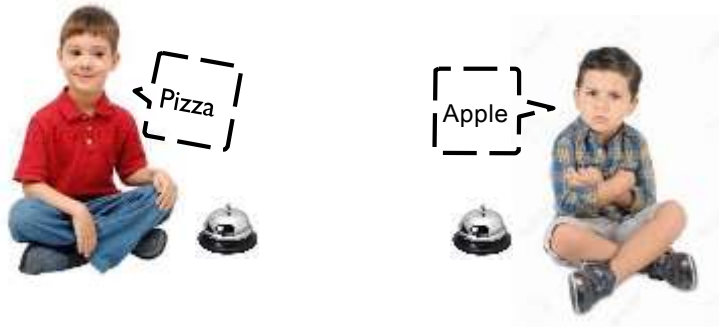
GAMES

Games with peers

Turn Taking

120

GAMES | Turn Taking | Games with peers

Pizza

Apple

Student 1

Student 2

S^D to start turn

Rfmt for
responding

121

GAMES | Turn Taking

VIDEO

122

GAMES

Turn Taking

Game Analysis

Turn Taking
No verbal/vocal prompts

Clear beginning and end

SD, MO and Rfmt
are build in
(no need for other rfmt)

Interesting materials and activity

Opportunity for social interactions and contingencies
["your turn/my turn"]

123

GAMES

Games with peers

Student 1

Student 2

"drink"

"cookie"

Target: mand/tact and match

124

GAMES

Games with peers

VIDEO

125

GAMES

Games with peers

Materials Variation

126

GAMES

Games with peers

Board Games with peers

When and Why use board games with peers

127

GAMES

Games with peers

When?
- Classrooms with 1 teacher, 1 assist, 6 plus kids
- Organized group instruction of masted or near masted skills

Why?
- Efficient use of time
- Social interactions peers
- Observational learning
- Decrease problem behavior
- Generality of games

128

GAMES

Board Games with peers

129

GAMES

Games with peers

Board Games with peers

130

GAMES

Board Games with peers

131

GAMES

Games with peers

Board Games with peers

132
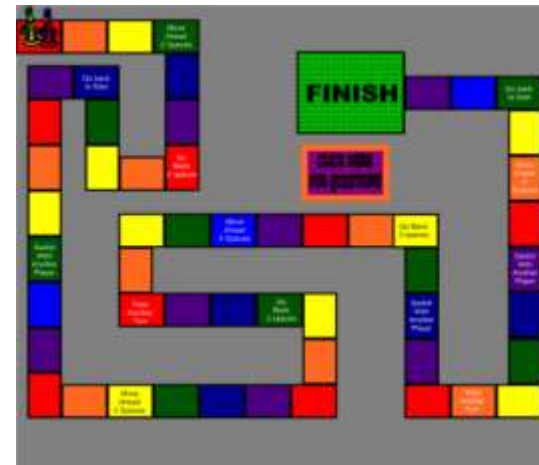
GAMES

Board Games with peers

133

GAMES

Board Games with peers

134

GAMES

Board Games with peers   Games with peers

Start		Prize!		22 Go Back 4	21	20
1		33		23		19
2		32 Go Back 4		24		18 Go Back 3
3		31		25		17
4		30		26		16
5 Go forward 2		29	28	27 Go Back 5		15
6						14
7	8	9	10	11 Go forward 2	12	13
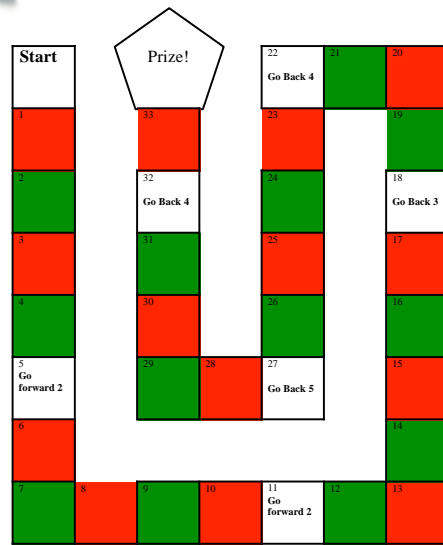
Esch Behavior Consultants, LLC.

Instructions:
1. Roll the die
2. On red answer a red question
3. On green the a green question
4. On white do what it says

GAMES

Board Games with peers   Games with peers

Start		Prize!		22 Go Back 4	21	20
1		33		23		19
2		32 Go Back 4		24		18 Go Back 3
3		31		25		17
4		30		26		16
5 Go forward 2		29	28	27 Go Back 5		15
6						14
7	8	9	10	11 Go forward 2	12	13

Esch Behavior Consultants, LLC.

Instructions:
1. Answer red or green question
2. If correct roll die and move
3. If not correct stay

What we know so far

Verbal conditional
discriminations

Reinforcement as
stimulus change

Compound
stimuli

Games

Matrix
Instruction

137

GAMES   Games with peers

How do we incorporate
games into a classroom?

139

GAMES   For Classrooms

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

140

GAMES — For Classrooms

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

GAMES — For Classrooms

For complex language to be acquired, it's cri<cal to teach responses that require divergent and convergent s<mulus control.

This type of SC is involved in verbal condi<onal discrimina<ons (VBCDs).

GAMES

For Classrooms

cow

pig

lion

bird

dinosaur

This s0mulus controls the number of response

LiLle words count

IV Frame

Name some

animals

This s0mulus controls the class of response

Divergent SC

A single s<mulus can evoke many different responses

GAMES

For Classrooms

cow

pig

lion

bird

This s0mulus controls the sub–case of response

ex0nct animals

This s0mulus controls the class of response

dinosaur

Convergent SC

A compound s<mulus evokes one of many possible responses

Slide 1

GAMES

For Classrooms

cow

LiLle words count

pig

This s0mulus controls the sub-class of responses

Na jungle

Name

a jungle   animal

animal

lion

This s0mv⌄ controls ⌄class

This s0mulus controls the number of responses

bird

dinosaur

Convergent SC

A compound s<mulus evokes one of many possible responses

Slide 2

GAMES

For Classrooms

INTRAVERBAL Subt est s

Subtest	Content	
1	Animal sounds & song fill-ins	Rote or ***divergent*** SC (many Rs correct)
2	Name, function fill-ins, related items	
3	Simple ***What*** questions	
4	Age, simple ***Who, Where*** questions	
5	Categories, function, features	Condi<onal VB discrimina<on s requiring ***convergent*** SC
6	Adjectives, prepositions, adverbs	
7	Multiple part questions	
8	Multiple part questions	

Sundberg, M. L., & Sundberg, C. A. (2011). Intraverbal behavior and verbal condi<onal discrimina<ons in typically developing children and children with au<sm. *The Analysis of Verbal Behavior.*

Simple Intraverbals

Grp 1: Animal sounds & songs fill-Ins	Score TD	ASD
A kitty says...	1	1
Twinkle, twinkle, little...	1	1
Ready, set …	1	1
The wheels on the bus go...	1	1
Rock a bye...	1	0
A dog says...	1	1
Peek-a…	1	1
The itsy bitsy...	1	1
Head, shoulders, knees and...	1	1
Happy birthday to...	1	1
Total points (10 max)	**10**	**9**

Grp 2: Name, fill-ins, associations	Score TD	ASD
What is your name?	1	1
You brush your...	1	1
Shoes and...	0	0
You ride a...	1	1
You flush the...	1	1
You sleep in a...	1	1
You eat…	1	1
One, two...	1	1
You wash your...	1	1
You sit on a…	1	1
Total points (10 max)	**9**	**9**

See/say (tact)	Hear/say (echoic)	See/do (imita<on)	Rote ac<ons (Foll dirs/LR)

Other simple discrimina8ons

Sundberg, M. L., & Sundberg, C. A. (2011).

Grp 5: Categories function. features	Score TD	ASD
What shape are wheels?	1	1
What grows outside?	1	1
	1	0
Can you name sou...		
What's something...		
What do you wear on your head?	1	1
Total points (10 max)	**10**	**3**

Grp 6: adjectives, prepositions, adverbs	Score TD	ASD
What color is my shirt?	1	1
What do you eat with?	1	0
What's up in the sky?	1	1
What's above a house?	1	0
What do you sweat with?	1	0
What are some hot things?	1	0
What grows on your head?	0	1
What is under a boat?	1	0
What animal has stripes?	1	0
What color is your shirt?	1	1
Total points (10 max)	**9**	**4**

"write on" (class but not same as "write") [divergent]

[convergent]

[divergent]

VB condi<onal discrimina<ons (VBCDs)

Response has to come under control of
2 or more antecedent VB s<muli

Sundberg, M. L., & Sundberg, C. A. (2011).

74

GAMES   For Classrooms

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

GAMES   For Classrooms

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

75

GAMES

Step 2
Select Students and Define Common Deficits

Student deficits:

Quantity.

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

---

GAMES

For Classrooms

Developing Targets

Features	Class	Function
• shape	• food	• take you places
• color	• animals	• play with
• position (outside)	• vehicles	• hold things
• legs, arms,eyes	• fruit, vegetables	• put thing in
• seat, back	• containers	• drink
• hard/ soft	• drinks	• eat
• hair, feathers	• toys	• write with
• quantity (no legs, 2 legs)	• school things	• wear on...
• are/are not	• clothing	
• have/have not	• things that fly, crawl, walk	

152

GAMES — For Classrooms

Step 3
Select Objectives and Discriminations

Student will correctly:

Quantity.

Name <u>some</u> animals.   v. Name <u>an</u> animal.

Class and sub-class and reversal

Name <u>some</u> animals with <u>no legs.</u>

Probe for Observational learning

After hearing and seeing a peer name an unknown animal will that student later name that animal

GAMES — For Classrooms

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

GAMES — For Classrooms

Step 4 (continued) 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:
(not directly taught)
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.

GAMES — Picture Board 1 — For Classrooms

GAMES

Quantity: a, an v. some of a class

For Classrooms

*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.

157

GAMES

For Classrooms

Start | Prize! | 22 Go Back 4 | 21 | 20

Instructions:
1. Answer red or green question
2. If correct roll die and move
3. If not correct stay

33 | 23 | 19
32 Go Back 4 | 24 | 18 Go Back 3
1 | 31 | 25 | 17
2 | 30 | 26 | 16
3 | 29 | 28 | 27 Go Back 5 | 15
4 | | | 14
5 Go forward 2 | | |
6 | | |
7 | 8 | 9 | 10 | 11 Go forward 2 | 12 | 13

Esch Behavior Consultants, LLC.

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 Ob learn)
Fillers LR and tacts of pictures

161

GAMES
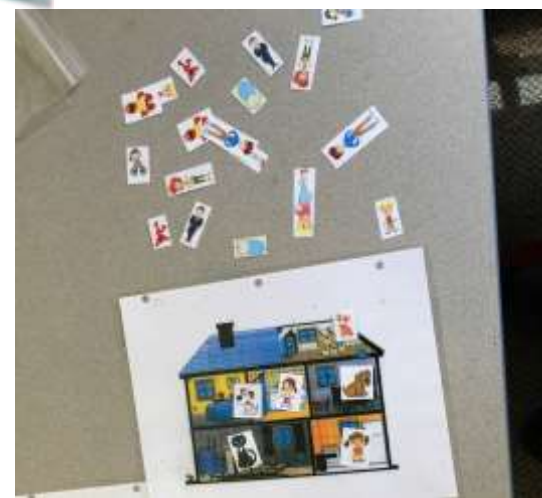
Games with peers

Other Examples

162

GAMES

163

GAMES

Games with peers

164

GAMES

Games with peers

165

166

World of Facts: Teeth Chart

167

World of Facts: Teeth Chart

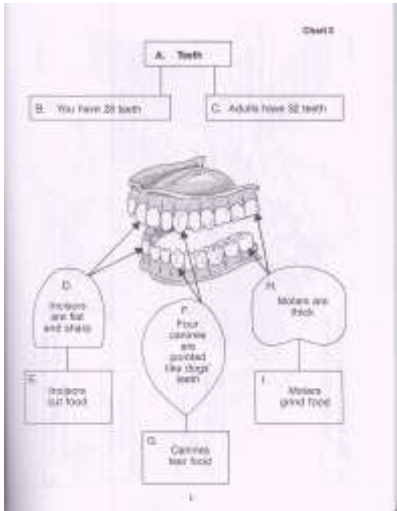SRA / DI curriculum for mid elementary

Group instruction (for 1 or 2)

Instructional design: Echoic - Tact - IV
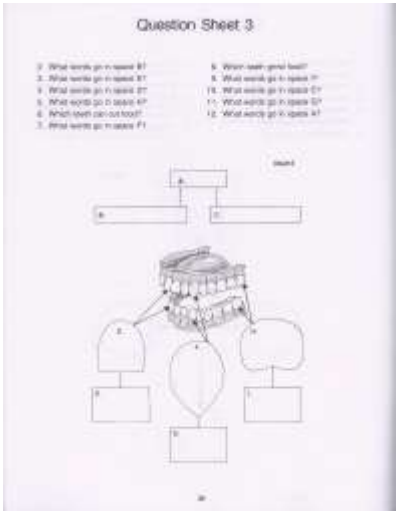
Game build in for groups

Content adaptable for other game formats

168

World of Facts: Teeth Chart

VIDEO

Pronouns in the works

171

GAMES

The Trouble with Pronouns

Changing Speaker		Changing stimulus conditions

Who has the pizza?

		I do
Singular	Plural	you do
I	We	he, she does
You	You	We do
He, she	They	You do
		They do

172

References

Axe, J.B. and Sainato, D.M. (2010) Matrix training of preliteracy skills with preschoolers with autism. Journal of Applied Behavior Analysis, 43, 635-652.

Davis, T.N., Camarata, S., & Camarata, M. (2016). Cross modal generalization of receptive and expressive vocabulary in children with Down Syndrome. Journal of Down Syndrome & Chromosome Abnormality, 2(1), 1-9.

Delfs C..H. & Frampton, (2014). Practical implications of evaluating the efficiency of listener and tact instruction for childern with autism. Journal of Applied Behavior Analysis, 47, 810-813.

Delfs, C. H., Conine, D.E, Frampton, S.E., Shillingburg, M. A., and Robinson, H.S. (2014). Evaluation of the efficiency of listner and tact instruction for children with autism. Journal of Applied Behavior Analysis, 47, 793-809.

Grow, L.L.,Carr, J.E., and Kodak, T. (2011). A comparison of methods for teaching receptive labeling to children with autism spectrum disorders. Journal of Applied Behavior Analysis, 44, 475-498.

Grow, L.L., Kodak, T., and Carr, J.E., (2014). A comparison of methods for teaching receptive labeling to children with autism spectrum disorders: A systematic replication. Journal of Applied Behavior Analysis, 47, 600-605.

Grow, L.L. and LeBlanc, L. (2016) Teaching receptive skills: Recommendations for teaching receptive language. Behavior Analysis in Practice, 6(1), 56-75.

References

Hake, D. F., Vukelich, R. and Kaplan, S. J. (1973) Audit responses: Response maintained by access to existing self or coactor scores during non-social, parallel work, and cooperations procedures. Journal of the Experimental Analysis of Behavior 19, 409-423.

Michael, J. (2004) Concepts and Principles. Association of Behavior Analysis; Revised Edition

Ribeiro, D. M., Miguel, C. F., and Goyos, C. (2015). The effects of listener training on discriminative control by elements of compound stimuli in children with disabilities. Journal of the Experimental Analysis of Behavior 104, 48-62.

Sundberg, M. L., & Sundberg, C. A. (2011). Intraverbal behavior and verbal conditional discriminations in typically developing children and children with autism. The Analysis of Verbal Behavior, 27, 23-43.

Townley-Cochran, D., Leaf, J.B., Taubman, M., Leaf, R., and McEachin, J. (2015). Observational learning for students diagnosed with autism: A review paper. Research. Rev J Autism Dev Disorder. 262-272.

Taylor, B. and DeQuinto, J.A., (2012). Observational learining and children with autism (2012). Behavior Modication, 36, 341-360.

Plavnick, J.B. and Hume, K.A. (2014). Observational learning by individuals with autism: A review of teaching strategies. Autism, 18(4), 458-466.

Petursdottir, A. I., and Carr, J.E. (2011) A review of recommendations for sequencing receptive and expressive language instruction. Journal of Applied Behavior Analysis, 44, 859-876.

Petursdottir, A. I., and Aguilar, G. (2016) Order of stimulus presentation influences children's acquisition in receptive identification tasks. Journal of Applied Behavior Analysis, 49, 58-68.

Thanks

John Esch
jesch1@mac.com

177