Sequence of Instruction from Basic to Complex Skills

Amiris Dipuglia

August 9, 2018

National Autism Conference

Pennsylvania Training and Technical Assistance Network

How do we get there?

- "Mommy, let's go buy a big raft. We'll blow it up and take it to the beach so I can ride the waves!"

- After asking her "Where is your iPad?", she replies… "I'm not sure, I think it's in the basement"

- Was it luck?

- Despite using effective procedures, programming for and teaching discrete skills without regard to how those skills will develop and eventually become part of more complex repertoires, is insufficient
- Non-systematic and non-sequential instruction of mands, tacts, echoics, intraverbals or other skills will unlikely result in establishing functional complex verbal repertoires

A Note On Something Commonly Misunderstood About Behavior Analysis

1. Complex behaviors emitted by competent humans are rarely shaped bit by bit
2. Most human behavior is not directly shaped at all
3. Complex behaviors, however, arise from other response classes that have been shaped bit by bit
4. Palmer calls the building blocks of complex behavior "atomic repertoires" (Palmer, 2012)

Atomic Repertoires and Autism

Common issues:

- Failure to use skills taught in novel ways or under novel circumstances
- Failure to transfer responses to novel exemplars (generalization)
- Responding to a very limited number of cues in their environment.

One Way to Address the Issue: Teach Atomic Repertoires

- Systematic programming that involves teaching some critical atomic repertoires may result in more generalized and generative responding
- Teaching basic repertoires will not suffice, but rather is a necessary step in the process of teaching complex skills
- Determining which repertoires/skills need taught will require assessment processes
- Assessments should be efficient and yield the necessary information to determine what skills need taught

Critical Atomic Repertoires

- Imitation (doing what someone else does)
- Echoic (repeating words said to you)
- Tacts (saying the name of things)
- Textual behavior (reading words)
- Transcriptive behavior (copying a text)

Critical Component Skills

- Teach the concepts not just responses to specific/restricted stimuli
- Concepts taught can then be recombined in novel ways to generate a myriad of responses never directly taught

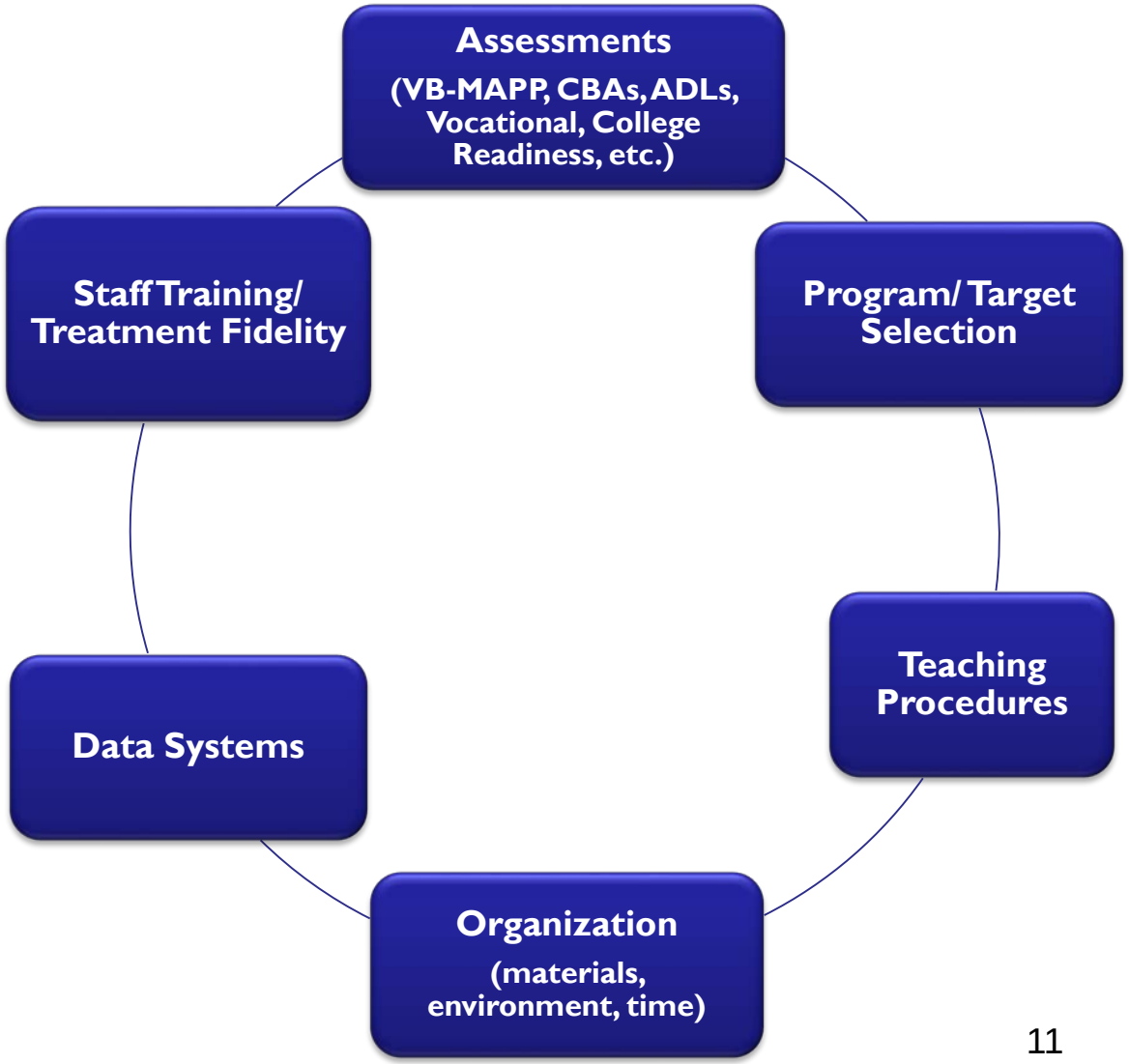
Considerations for Teaching Atomic Repertoires to Build Complexity

Teach Concepts not Items

- What is a concept? An extended tact
  - Teach multiple exemplars (full range)
  - Teach critical features
  - Establish stimulus class formation
  - Generalized to novel examples
- Teach recombination and novel responding
  - How you arrange and populate skill tracking sheets is critical (see examples)
  - Natural environment teaching
- Teach students to respond to all relevant stimuli (multiple control)
- Directly teach complex skills
  - Use of joint control procedures
  - Matrix training (Axe, 2008)

An Integrated System of Instruction

- Assessment and instruction systems are probably most effective when they are integrated and form a feedback loop.



VB-MAPP as an Assessment Tool

- The VB-MAPP was developed as tool to guide programming (**not** a curriculum, but rather a **curricular guide**)
- The tool is based on a functional approach to language acquisition rather than a structural approach
  - Allows us to assess, not only what children say, but also under what conditions they say it
- The tool was meant to be guided by teams skilled in applied behavior analysis, the analysis of verbal behavior, and curricular sequences
- It is criterion referenced; not standardized

VB-MAPP Milestones Assessment

- Three developmentally sequenced levels
  - Level 1= 0-18 months
  - Level 2= 18-30 months
  - Level 3= 30-48 months
- 16 milestone areas
- 170 measurable milestones
- Includes a task analysis which provides a more detailed description of skill sets at operant level for Milestones Assessment
- Allows further specification of instructional programs

Skill Area	Level 1	Level 2	Level 3
Mand	X	X	X
Tact	X	X	X
Listener Resp.	X	X	X
VP/MTS	X	X	X
Play	X	X	X
Social	X	X	X
Imitation	X	X	
Echoic	X	X	
Vocal	X		
LRFFC		X	X
IV		X	X
Group		X	X
Linguistics		X	X
Reading			X
Writing			X
Math			X
TOTAL:	9	12	13

General Programming Considerations

General Guidelines for Programming

1. **Complete** VB-MAPP assessment
2. **Identify** the general level of the child
3. **Analyzing** the scores and note performance level obtained in each column (skill domain)
   - *Determine skill sets in relation to selecting known items, items that can serve as prompts*
   - *Note the gaps (milestones for which student did not meet the criteria) in each column*
4. **Select Instructional Programs** that are balanced across operants and at appropriate instructional level. Must consider:
   - *Component skills (generalization, fluency)*
   - *Acquisition rates*

Caveat: *Remember the criteria are intended for assessment purposes and* ***do not*** *imply mastery of the skill sets*

General Guidelines for Programming

- Select targets for instruction that are relevant for student:
  - Usually valuable to student
  - Common in day-to day life
  - Tied to general education curriculum
  - Will promote and facilitate social initiations and interactions.
  - Will promote independence
- Be sure programming is consistent with student's response form (vocal vs. sign)
- Be sure instructional materials are available for specific items selected within programs

ORGANIZATION SYSTEMS

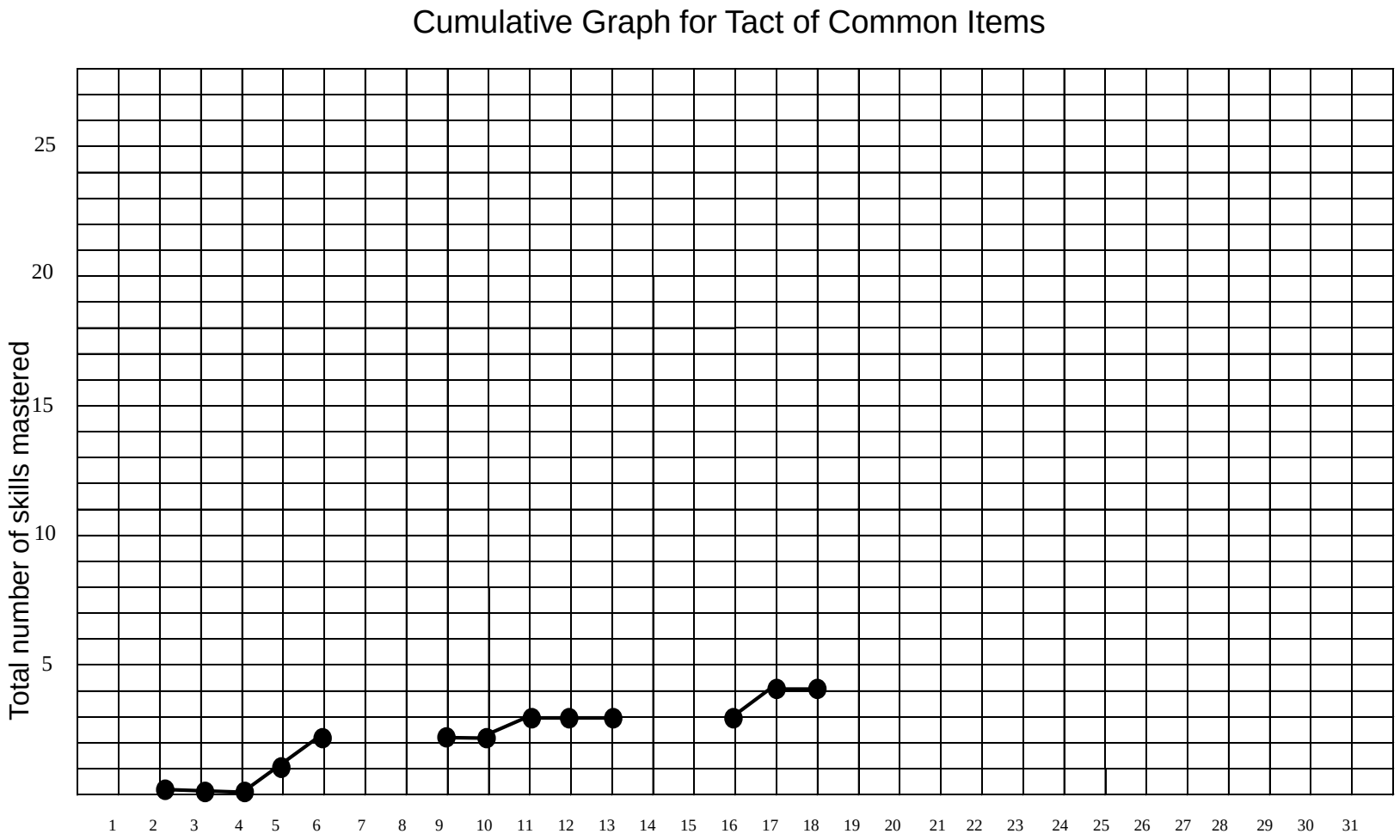
Components of Organization:

- Data Systems
  - Skill Tracking Sheets
  - Cumulative Graph
  - Probe sheet for Targets
- Allocation of instruction (schedule)
- Materials Organization

Data Systems: Cumulative Graph

- A cumulative graph helps instructors visually track student rate of progress.
- In cumulative graphing, increase the dot by the number of skills **mastered** that day.
- Develop a cumulative graph for each active program.

Cumulative Graph



Student: _____ Month: _____

Data Systems: Cold Probe Sheet

- A place to take daily data on target skills.

Name: Week of:

Weekly Probe Sheet

	# days active	Operant	Target Skill	Previous Y	Mon	Tue	Wed	Thur	Fri
1		T	Shirt		Y N	Y N	Y N	Y N	Y N
2		T	Ball		Y N	Y N	Y N	Y N	Y N
3		T	Table		Y N	Y N	Y N	Y N	Y N
4					Y N	Y N	Y N	Y N	Y N
5					Y N	Y N	Y N	Y N	Y N
6					Y N	Y N	Y N	Y N	Y N
7					Y N	Y N	Y N	Y N	Y N
8					Y N	Y N	Y N	Y N	Y N
9					Y N	Y N	Y N	Y N	Y N
10					Y N	Y N	Y N	Y N	Y N
11					Y N	Y N	Y N	Y N	Y N
12					Y N	Y N	Y N	Y N	Y N
13					Y N	Y N	Y N	Y N	Y N
14					Y N	Y N	Y N	Y N	Y N
15					Y N	Y N	Y N	Y N	Y N
16					Y N	Y N	Y N	Y N	Y N
17					Y N	Y N	Y N	Y N	Y N
18					Y N	Y N	Y N	Y N	Y N
19					Y N	Y N	Y N	Y N	Y N
20					Y N	Y N	Y N	Y N	Y N
21					Y N	Y N	Y N	Y N	Y N
22					Y N	Y N	Y N	Y N	Y N
23					Y N	Y N	Y N	Y N	Y N
24					Y N	Y N	Y N	Y N	Y N
25					Y N	Y N	Y N	Y N	Y N
26					Y N	Y N	Y N	Y N	Y N
27					Y N	Y N	Y N	Y N	Y N
28					Y N	Y N	Y N	Y N	Y N
29					Y N	Y N	Y N	Y N	Y N
30					Y N	Y N	Y N	Y N	Y N
31					Y N	Y N	Y N	Y N	Y N
32					Y N	Y N	Y N	Y N	Y N
33					Y N	Y N	Y N	Y N	Y N
34					Y N	Y N	Y N	Y N	Y N
35					Y N	Y N	Y N	Y N	Y N

Red: receptive ID **Green: Tact** **Yellow: Echoic** **Purple: Motor Imitation** **Blue: Intraverbal**

Criteria for mastery: _____ consecutive yes'

If program change made, indicate by drawing a phase change line on the corresponding date of the applicable target.

Notes/Reminders:

Existing Skills vs. Target Skills
Considerations for DTI Materials Organization

- **EXISTING/KNOWNS/EASIES/ MAINTENANCE ITEMS**

  Develop 3x5 index cards and/or pictures of exemplars and place in bank of known items (in our case "easy piles")

  For active programs these items are written on the Skill Tracking Sheet with the word ASSESSED or Probed Out in the date introduced and mastered columns.

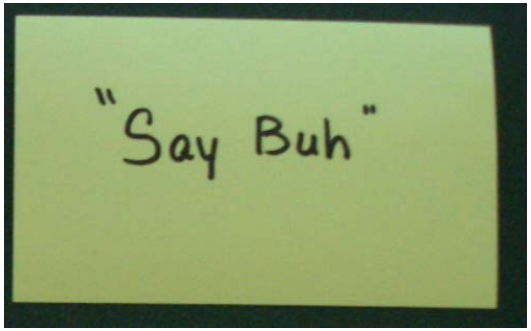
- **TARGET SKILLS**

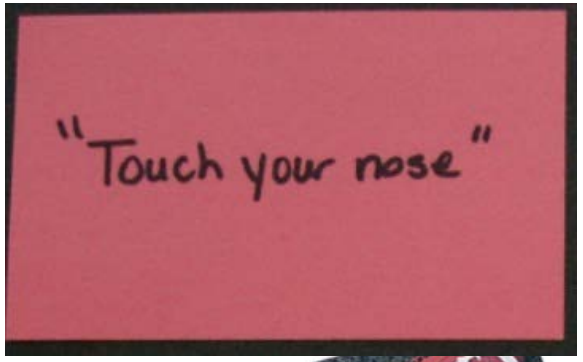
  Develop 3x5 index cards and/or pictures of exemplars and place in bank of items to be targeted for instruction (in our case "target piles" or future targets).

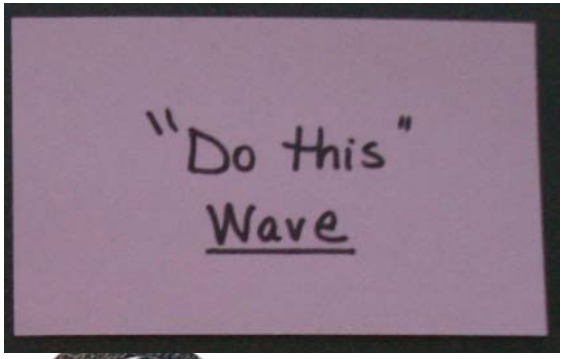
  For active target skills these items are written on the Skill Tracking Sheet with a date introduced as well as listing them on the cold probe sheet

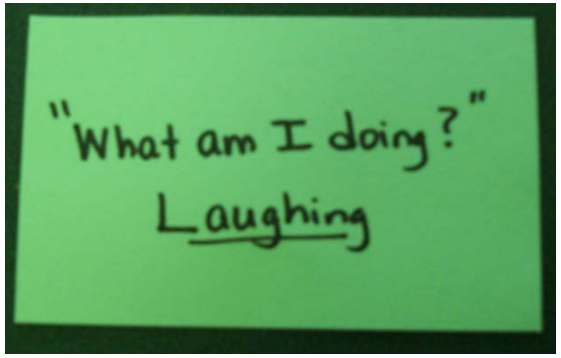
  For items that will be targeted in the future, list on skill tracking sheet with no date introduced.

Card Sort System







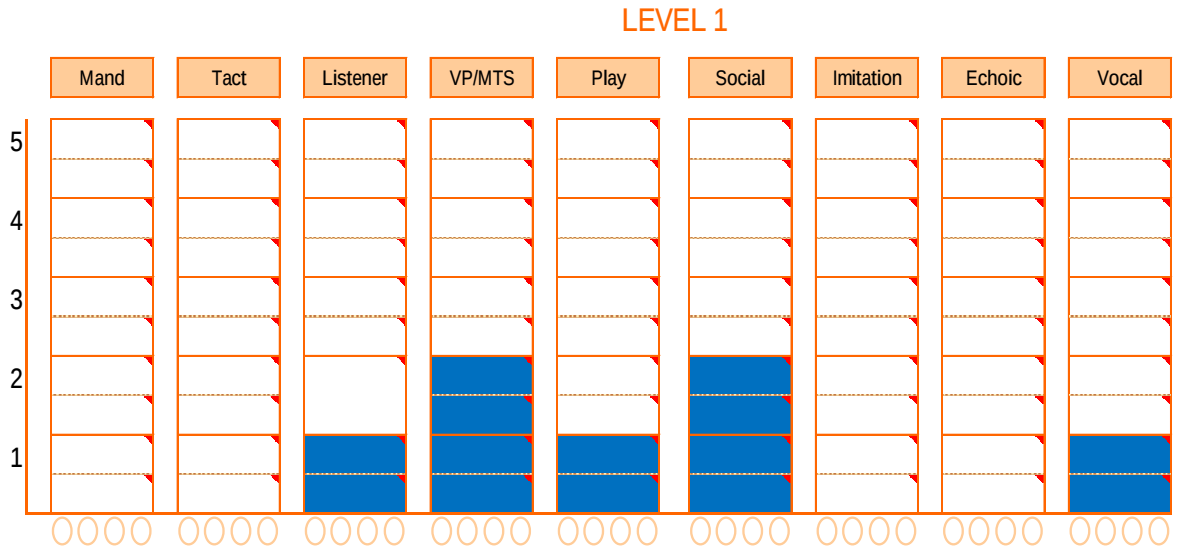


" Moo says a _____"
Cow

Card Sort System: “Knowns” Bins

Establishing Initial Repertoires: Common Programming Procedures for Level 1 and Related Protocols

Level 1: A Typical Profile



Early Level 1 Learner: Supplemental Assessments

- Approach frequencies
  - How often child walks toward, reaches for or otherwise physically moves toward other people?
- Observational responding
  - Degree to which child's eyes and face turn toward changes that occur in the environment
- Potential preferred items and activities that may serve as reinforcement
  - What does the child do on their own?
  - What events, objects, or people do they stay near or manipulate the longest?
- Response variability
  - What is the range of behaviors the child emits?
  - How many different things do they do?

Common Programming Issues

- Tendency to program for what is already known or easy: match to sample, imitation with objects, task completion
  - These "knowns" are a consideration for programming easies
  - They are not necessarily the important target domains
- Failure to teach verbal behavior (speaker behavior) or have a plan to extend verbal skills
- Challenge of selecting response form
- Repetitive behaviors/"self-involvement"
- Limited reinforcers

Earliest Learners in Level 1

- Establish instructional control- approach behavior
  - Are adults established as conditioned reinforcers for the student: pairing process; "free" delivery (in absence of problem behavior)
- Saliency of attending response (attending to speakers voice, instructional materials)
- Identification and conditioning of adequate pool of reinforcers
- First programs:
  - Approach behavior
  - Mand
  - Imitation (objects and motor)
  - Tact
  - Match to sample
  - LR in context

The Importance of Early Mand Training

- Social Initiation
- "Control" of the environment
- Reduction of problem behavior (for problem behavior function of socially mediated positive reinforcement)
- An entry point for development of verbal repertoires
  - Critical issue for students who may lack almost all opportunities for verbal responding
- The tie to motivation and its implications for relative ease of instruction

Establishing Mand Repertoires: Level One

- Schedule adequate opportunities to mand
- Provide mand trials across a variety of motivational classes, across a variety of listeners, and across settings.
- **Always** check for motivation (or contrive motivation)
- Have a systematic plan to fade mand prompts
  - Two types of mand transfer trials: within trial and second trial transfer
- Consistently use correction procedures
- Avoid "generalized mands"
- Avoid chaining extraneous behaviors into mand responses (reach first, then sign)
- Select target responses that will be relatively easy for child to produce
- Sequence mand skills carefully: don't move too early to multiple component mands or increased MLU for mands; to yes/no mands…Focus on building full range and independent responding!

Teaching First Signed Mands

- Shaping: The process of teaching new behaviors through systematic use of differential reinforcement of successive approximations – critical with early learners
- Need to shape several signs at one time
- Always model the response form

Systematic Prompt Fading

- Fading across topography
  - Fade initial physical prompt to begin motion
  - Fade latter parts as student begins emitting response
- Within and second trial transfers to fade prompts:
  - Within trial: prompt faded before delivery of mand item
  - Second trial: prompt faded on a second trial
- With earliest learners, fading prompts will likely involve use of faded prompts on the transfer

Mand Video

Tact Training

- Early programming should lead to the initiation of tact training
- Tact training is a critical skill in the process of teaching complex verbal behavior
- Tact training should be initiated when:
  - Initial mand repertoire is sufficiently developed
  - Methods of prompting tacts are available (student has adequate imitative or echoic skills)
  - Responses used for tacts can be effectively discriminated by the listener

Establishing Tact Repertoires: Level One

- Teach many tacts
- Teach **sufficient exemplars** for tact targets (will cover in more detail later)
- Be sure student can tact objects
- Provide sufficient tact training opportunities to establish new skills as well as assist with generalization and fluency
- Sequence tact instruction carefully: do not stop at tacting objects
- Initially, keep verbal S^D consistent
- Be sure controlling variables are right (that what you think is a tact is really a tact and not a mand, or in the case of prompt dependency, an echoic)

Tact Video

Establishing Imitation Repertoires: Level One

- Schedule adequate opportunities for imitation trials
- Sequence action to be imitated carefully (from easy to hard)
  - Easier movements to produce will include grounded movements, bidirectional, do not involve crossing midline, are in their view)
- Prompts
  - Physical
  - Context for actions on objects
  - Plan to fade prompts (appropriate use of transfer trials)
- Be sure imitative discrimination is taught

Establishing Imitation Repertoires: Level One

- For imitation with objects teach each movement across several objects and several movements across each object
- Initially, keep verbal SD consistent and teach using identical items
- Provide sufficient training to teach new skills as well as establish generalized imitation repertoire and fluency of responses

- Imitation Video

Motor Imitation with Objects

	Target	Date introduced	Date Mastered
1	**Push: button on spinner toy**		
2	**Push: key on piano**		
3	**Push: button on toy phone**		
4	**Push:**		
5	**Push:**		
6	**Push:**		
7	**Push:**		
8	**Push:**		
9	**Push:**		
10	**Push: (ANY NOVEL ITEM)**		
11	**Put in: bear in cup**		
12	**Put in: bean bag in bowl**		
13	**Put in: block in bowl**		
14	**Put in: block in basket**		
15	**Put in: crayon in basket**		
16	**Put in: spoon in cup**		
17	**Put in: peg in bowl**		
18	**Put in: craft stick in basket**		
19	**Put in:**		
20	**Put in: (ANY NOVEL ITEM IN ANY CONTAINER)**		
21	**Put on: peg on board**		
22	**Put on: ring on stacker**		
23	**Put on: lid on playdough container**		
24	**Put on: lid on container**		
25	**Put on: bowl on plate**		
26	**Put on: bear on block**		
27	**Put on: block on eraser**		
28	**Put on:**		
29	**Put on:**		
30	**Put on: (ANY NOVEL ITEM)**		
31	**Stack: Legos**		
32	**Stack: cups**		
33	**Stack: plates**		
34	**Stack: bowls**		
35	**Stack: blocks**		
36	**Stack: lids**		
37	**Stack: (ANY NOVEL ITEM)**		
38	**Put together/snap: pop beads**		
39	**Put together/snap: pegs**		
40	**Put together/snap: Legos**		

Motor Imitation with Objects

	Target	Date introduced	Date Mastered
1	**Put together/snap: toothbrush case**		
2	**Put together/snap:**		
3	**Put together/snap:**		
4	**Put together/snap:**		
5	**Put together/snap:**		
6	**Put together/snap:**		
7	**Put together/snap: (ANY NOVEL ITEM)**		
8	**Pull/take apart: pop tube**		
9	**Pull/take apart: lever on See 'n Say**		
10	**Pull/take apart: toothbrush case**		
11	**Pull/take apart: pop beads**		
12	**Pull/take apart:**		
13	**Pull/take apart:**		
14	**Pull/take apart:**		
15	**Pull/take apart:**		
16	**Pull/take apart: (ANY NOVEL ITEM)**		
17	**Tap on table: block**		
18	**Tap on table: bear**		
19	**Tap on table: cup**		
20	**Tap on table: spoon**		
21	**Tap on table: peg**		
22	**Tap on table: eraser (board eraser)**		
23	**Tap on table: car**		
24	**Tap on table: ruler**		
25	**Tap on table: craft stick**		
26	**Tap on table: (ANY NOVEL ITEM)**		
27	**Slide back and forth on table: car**		
28	**Slide back and forth on table: cup**		
29	**Slide back and forth on table: spoon**		
30	**Slide back and forth on table: peg**		
31	**Slide back and forth on table: eraser**		
32	**Slide back and forth on table: block**		
33	**Slide back and forth on table: ruler**		
34	**Slide back and forth on table: craft stick**		
35	**Slide back and forth on table: glue stick**		
36	**Slide back and forth on table: (ANY NOVEL ITEM)**		
37	**Tap on belly: ruler**		
38	**Tap on belly: craft stick**		
39	**Tap on belly: block**		
40	**Tap on belly: bowl**		

Transition from Actions on Objects to Motor Imitation: If Needed

- Consider a transition program of "actions of objects on self"
  - Tap belly with object
  - Tap block on palm of opposite hand
- The action on object can be used as prompt for the motor action (faded on the transfer trial)

Motor Imitation

	Target	Date introduced	Date Mastered
1	Tap table (one hand)		
2	Slide one hand back & forth on table (like wiping)		
3	Clap hands		
4	Tap hand on opposite forearm		
5	Slide hand up and down opposite forearm		
6	Pat legs both hands		
7	Tap belly		
8	Rub hands together		
9	Rub hand on belly		
10	Tap table both hands		
11	Tap side of leg with one hand (like sign for dog)		
12	Knock on table		
13	Place one hand on top of other on table (palms down)		
14	Touch arm		
15	Fold hands with fingers interlocked on table (“ready hands)		
16	Tap head (Sign for “hat”)		
17	Touch cheeks		
18	Touch nose		
19	Stomp feet		
20	Sign for “piano”		
21	Touch ears		
22	Touch chin		
23	Cross arms on chest (like hugging self)		
24	Stand up		
25	Sit down		
26	Pat elbow		
27	Jump		
28	Touch shoulders		
29	Arms up		
30	Pointer finger taps table		
31	Pointer finger to palm of opposite hand		
32	Fist to palm of opposite hand		
33	Right hand over heart		
34	Hand over mouth		
35	Sign for “pig”		
36	Hands on knees		
37	Sign for “book”		
38	Sign for “cup”		
39	Sign for “paint”		
40	Sign for “shoes”		

Listener Responding

- While listener skills are important to teach early on, such skills may be facilitated through an emphasis on speaker skills
  - Mand, echoic, tact
- There are two types of early listener responding skills targeted for instruction:
  - Following verbal directions
  - Discriminating objects in the environment when named

Listener Responding (LR): Level One

- Schedule adequate opportunities for instruction
- Sequence skills from easy to hard
  - Begin with following instructions in context
  - Teach targets for actions already mastered in imitation
  - For selecting named items, begin with small field size and far out non-exemplars (items that are not similar to the target being taught)
- Keep in mind that the tact may facilitate the development of LR discrimination
- Plan to fade prompts (appropriate use of transfer trials)
- Teach discrimination as early as possible
- Consistently use correction procedures
- Provide sufficient training to establish generalization and fluency
- May need to teach scanning and/or selection response in isolation from the discrimination

Following Verbal Directions

- This skill is taught through several processes:
  - Condition following the direction as a reinforcer
    - State direction in simple terms
    - Use promise reinforcer or teach in context of strong MO
    - "Come here" program as an example
  - Teach through transfer from context controlled responses
  - Teach following the direction using imitation to LR transfers
    - Generally imitation of the action to be followed is taught first

Discriminating Named Objects in the Field

- Also referred to as LR discrimination
- Often difficult to teach at earliest levels of skill acquisition (it is unmediated unless child has tact or echoic skills)
- Easier to teach when tact is acquired
- May start with selecting reinforcers when named (this may not be advised if MO between items in field is not of equivalent strength)
- May also begin with teaching "give" item in isolation on table
  - Teach skill with common items or items student regularly encounters
- Field size faded in gradually
- Discrimination for any item is not mastered until the discrimination occurs in a field size of three

Match to Sample

- Similar criteria to LR discrimination
- Generally, begin match to sample training with objects
- Fade in picture to picture
- Object to picture match next level
- Use identical items

Match to Sample

	Target	Date Introduced	Date Mastered
	NO DISCRIMINATION-Use identical items		
1	**Give (block)-staff holds item up and one hand out-item in front of student on table**		
2	**Give (bear)**		
3	**Give (ball)**		
4	**Give (cup)**		
5	**Give (marker)**		
6	**Give (eraser)**		
7	**Give (book)**		
8	**Give (peg)**		
9	**Give (spoon)**		
10	**Give (any novel item)**		
11	**Give (block)-staff holds item up and one hand out-item on R bottom side of table**		
12	**Give (bear)**		
13	**Give (ball)**		
14	**Give (cup)**		
15	**Give (marker)**		
16	**Give (eraser)**		
17	**Give (book)**		
18	**Give (peg)**		
19	**Give (spoon)**		
20	**Give (any novel item)**		
21	**Give (block)-staff holds item up and one hand out-item on top (1 foot away) of table**		
22	**Give (bear)**		
23	**Give (ball)**		
24	**Give (cup)**		
25	**Give (marker)**		
26	**Give (eraser)**		
27	**Give (book)**		
28	**Give (peg)**		
29	**Give (spoon)**		
30	**Give (any novel item)**		
31	**Give (block)-staff holds item up and one hand out-item on R top (1 foot away) of table**		
32	**Give (bear)**		
33	**Give (ball)**		
34	**Give (cup)**		
35	**Give (marker)**		
36	**Give (eraser)**		
37	**Give (book)**		
38	**Give (peg)**		
39	**Give (spoon)**		
40	**Give (any novel item)**		

Establishing Social and Play Skills: Level One

- The main focus for early learners is conditioning items, activities and peers as reinforcers
- Motivational variables: establishing the value of social interactions
- Be careful not to target eye contact too early (rather condition others as reinforcers as above)
- Spontaneity: hard to program for! (Comes from multiple exemplar training and fluent responding)

Object Sort System: Active Box-Done Box

- Use boxes that are large enough to hold all items used in object sort system
- Clearly label boxes with moveable labels
- Use Velcro for small items
- Make boxes with interchangeable labels
- Place boxes in a position where they can be easily accessed to promote short inter-trial intervals
- Use chart to guide trials

Early Learner: Object Sort Poster Examples

Straw	Ball	Spoon	Crayon	Sponge
"do this" (put in cup or bowl or basket)	*"Do this" Rolling ball*	*"do this" (put in basket)*	*"do this" (move here to there)*	*"do this" (put in basket)*
"do this" (tap on desk)	*"Do this" put in cup*	*"do this" (tap on desk)*	*"do this" (put in cup)*	*"do this" (tap on desk)*
"do this" (slide on desk)	*"Do this" pick up*	*"do this" (slide on desk)*	*"do this" (tap on desk)*	*"do this" (slide on desk)*
"do this" (pick up)	*"Do this" take*	*"do this" (pick up)*	*"do this" (pick up)*	*"do this" (pick up)*
"do this" (put on book)	*"Do this" touch*	*"do this" (touch)*	*"do this" (touch)*	*"do this" (put on book)*
"do this" (touch)	*"tap" (on desk)*	*"do this" (put on bowl)*	*"do this" (put on book)*	*"do this" (touch)*
"do this" (put on book)	*"touch"*	*"do this"(tap on cup)*	*"do this"(tap on cup)*	*"put in" (cup or bowl)*
"do this"(tap on cup)	*"give"*	*"do this" (move here to there)*	*"do this" (move here to there)*	*"put on" (book)*
"do this" (move here to there)	*"take"*	*"give"*	*"give"*	*"give"*
"put in" (cup)	*"put on" (book or cup)*	*"touch"*	*"touch"*	*"touch"*
"touch"	*"pick up"*	*"take"*	*"take"*	*"take"*
"give"	*"put in" (bowl)*	*"pick up"*	*"pick up"*	*"pick up"*
"take"	"Match Ball"	*"put in" (cup or bowl)*	*"put in" (cup or bowl)*	* "Match Sponge"
"pick up"		*"tap"(on desk)*	*"tap"(on desk)*	
"tap"		"Match Spoon"	"Match Crayon"	
"Match Straw"				

Sample Chart for Object Sort

Blocks:

LR: Give	I: Tap on table
LR: Touch (held in front)	I: Tap on belly
LR: Touch (on table)	I: Slide back and forth on table
	I: Put in any container

Pull Tube:

LR: Pull	I: Tap on table
LR: Give	I: Tap on belly
LR: Touch held in front	I: Put item in
	I: Slide back and forth on table

Blue's Clues Book

LR: Give	I: Tap
LR: Open	I: Open
LR: Push (button)	I: Tap on table
LR: Touch (held in front)	

Playdough Can:

LR: Stack	I: Tap on table
LR: Give	I: Tap on belly
LR: Touch (held in front)	I: Slide back and forth on table
LR: Put in any item	

Cups:

LR: Stack	I: Tap on table
LR: Put in any item	I: Tap on belly
LR: Give	I: Put item in
	I: Slide back and forth on table

Tooth Brush Case

LR: Give	I: Tap on table
LR: Open	I: Open
LR: Touch (held in front)	I: Slide back and forth on table
LR: Touch (on table)	

Sample Charts for Generalized Skills

Generalized LR

"Put in"

- Item in hand/container held in front
- Item in hand/container on table directly in front

"Touch"

- Item held in any position
- Item anywhere on table within reach

"Give" (with hand out as context)

- Item in hand
- Item anywhere on table within reach

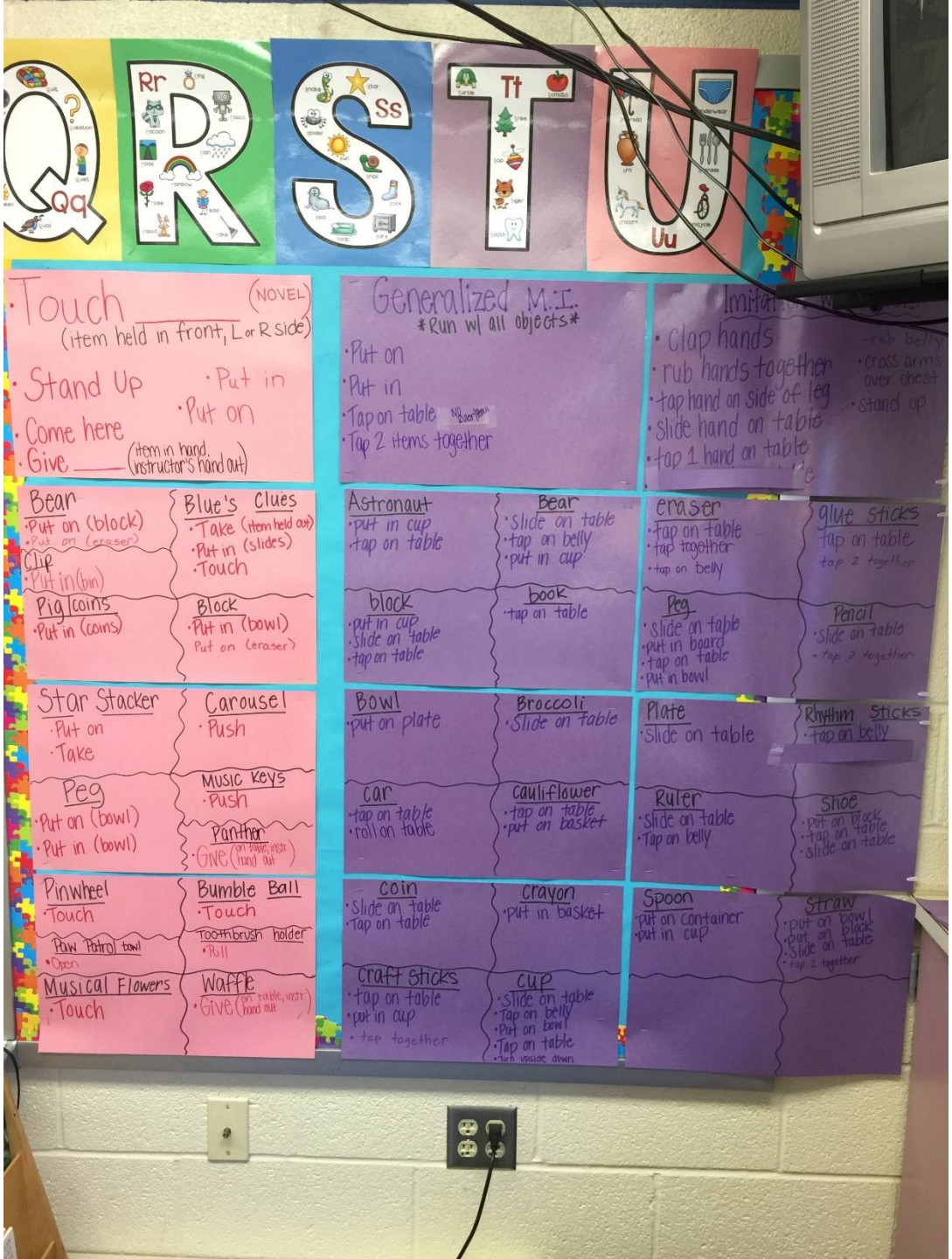
Sample Charts for Generalized Skills

Imitation

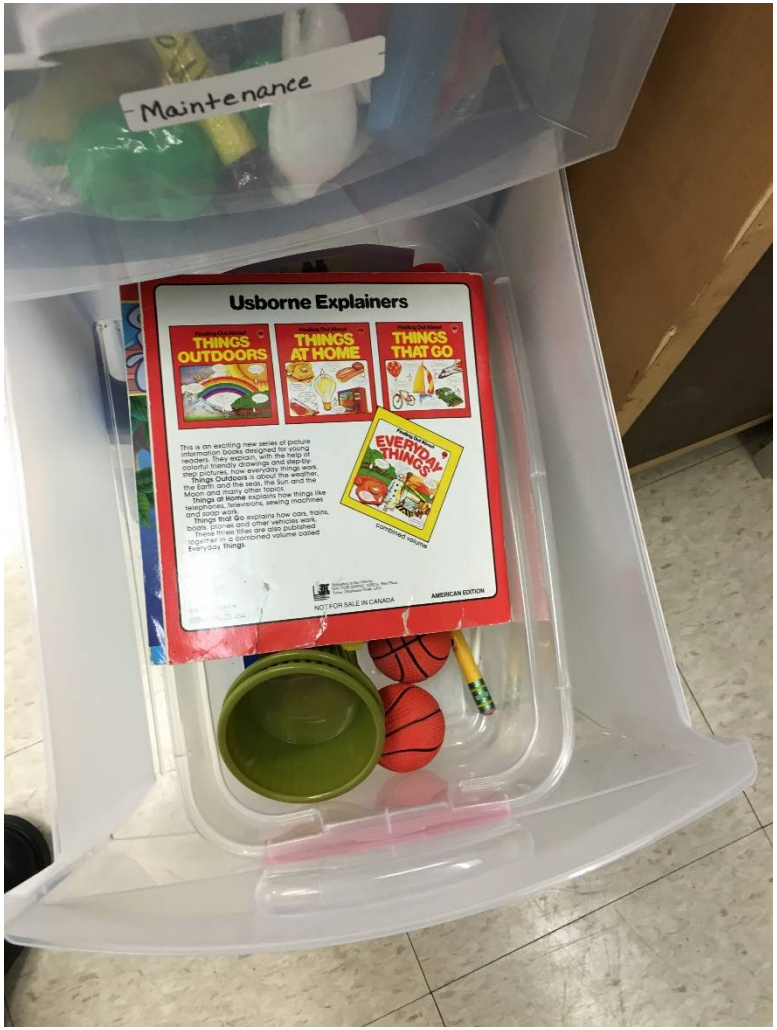
- Clap
- Tap Table

Imitation w/Object

- Tap item on table
- Put item in container
- Push button on toy
- Slide item back and forth on table


Qq
Rr
Ss
Tt
Uu
Touch _____ (NOVEL)
(item held in front, L or R side)
Stand Up
Put in
Come here
Put on
Give ____ (item in hand, instructor's hand out)
Generalized M.I.
Run w/ all objects
Put on
Put in
Tap on table
Tap 2 items together
Imitation
Clap hands
rub hands together
tap hand on side of leg
slide hand on table
tap 1 hand on table
rub belly
cross arms over chest
stand up
Bear
Put on (block)
Put on (eraser)
Blue's Clues
Take (item held out)
Put in (slides)
Touch
Clip
Put in (bin)
Pig/coins
Put in (coins)
Block
Put in (bowl)
Put on (eraser)
Astronaut
put in cup
tap on table
Bear
slide on table
tap on belly
put in cup
eraser
tap on table
tap together
tap on belly
glue sticks
tap on table
tap 2 together
block
put in cup
slide on table
tap on table
book
tap on table
Peg
slide on table
put in board
tap on table
put in bowl
Pencil
slide on table
tap 2 together
Star Stacker
Put on
Take
Carousel
Push
Peg
Put on (bowl)
Put in (bowl)
Music keys
Push
Panther
Give (on table, instr hand out)
Bowl
put on plate
Broccoli
slide on table
Plate
slide on table
Rhythm Sticks
tap on belly
car
tap on table
roll on table
cauliflower
tap on table
put on basket
Ruler
slide on table
Tap on belly
Shoe
Put on block
tap on table
slide on table
Pinwheel
Touch
Paw Patrol towel
Open
Musical Flowers
Touch
Bumble Ball
Touch
Toothbrush holder
Pull
Waffle
Give (on table, instr hand out)
coin
slide on table
Tap on table
crayon
put in basket
Spoon
put on container
put in cup
Straw
put on bowl
put on block
slide on table
tap 2 together
craft sticks
tap on table
put in cup
tap together
cup
slide on table
Tap on belly
Put on bowl
Tap on table
Turn upside down

Early Learner: Object Sort Bins

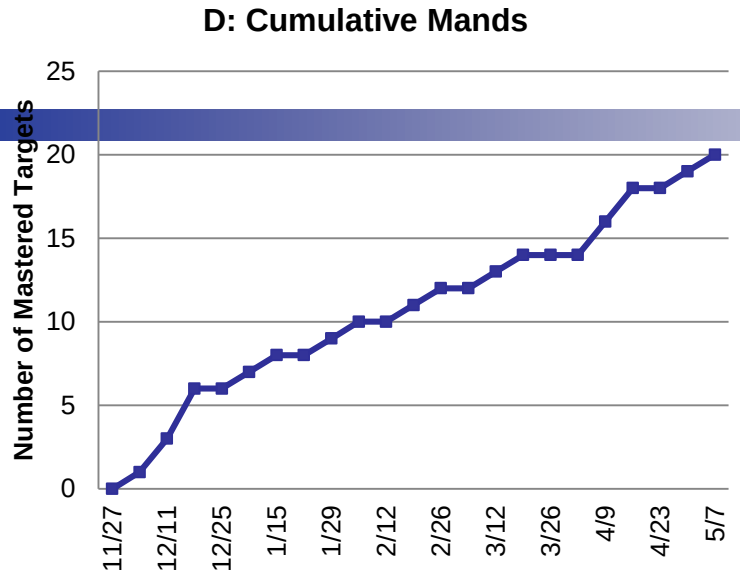


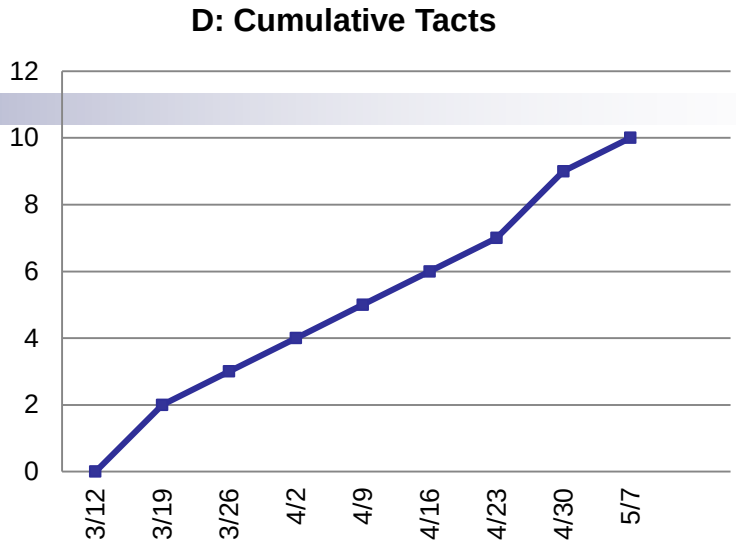
D

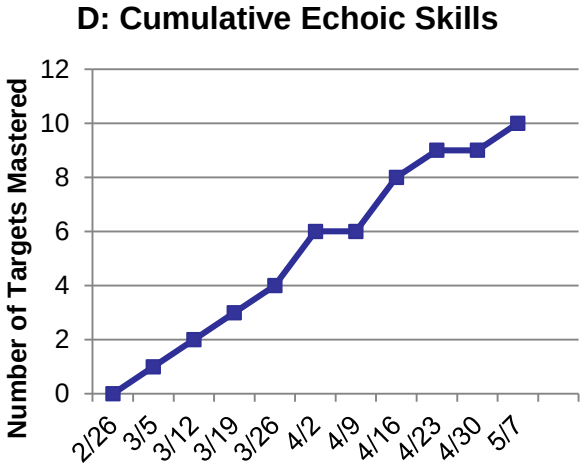
- 6 Years old
- Attends Autism support classroom (elementary)
- 1st year in classroom
- Barriers included instructional control issues, response requirement weakening MO, and impaired mand repertoire

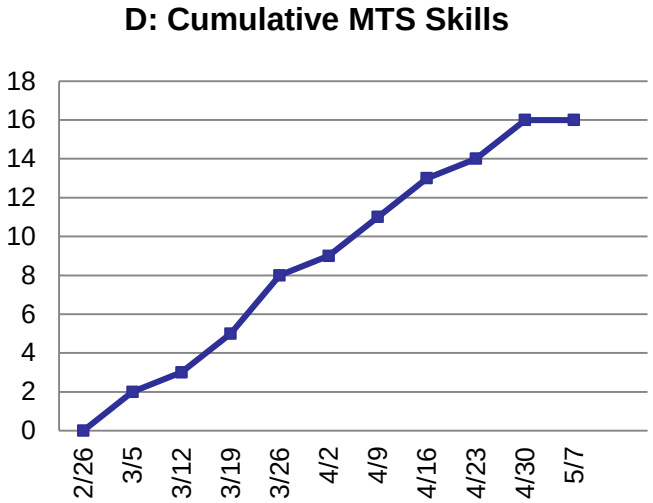
D-Programming

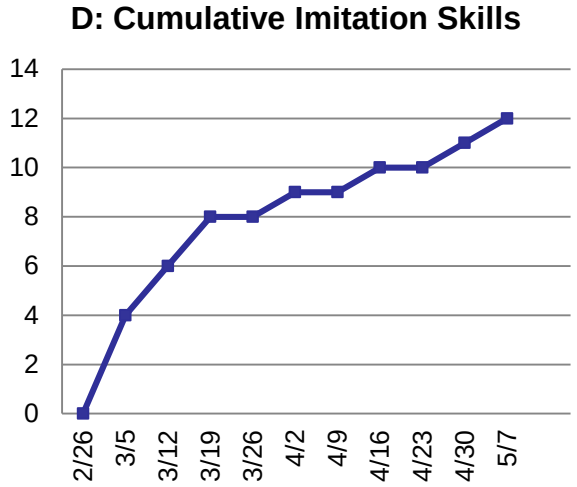
- Initial Programming:
  - Intensive mand training
  - Establishing instructional control
- 2nd Phase Programming:
  - Imitation
  - Match to sample
  - Tacting common items
  - Vocal Shaping
  - Conditioning peers as reinforcers





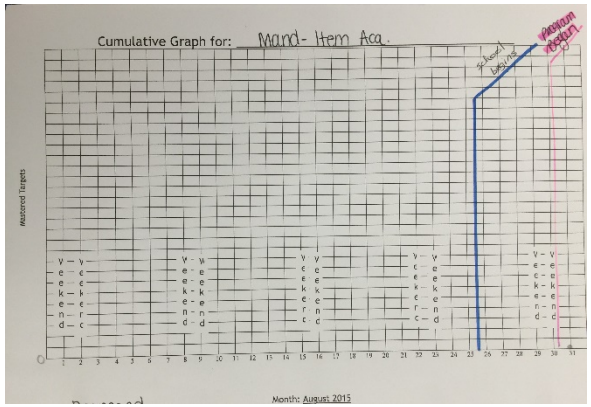


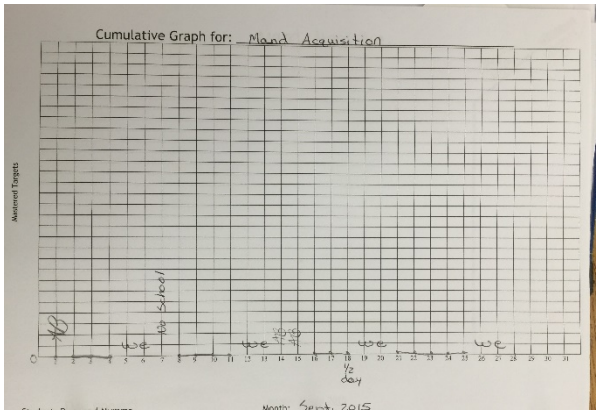


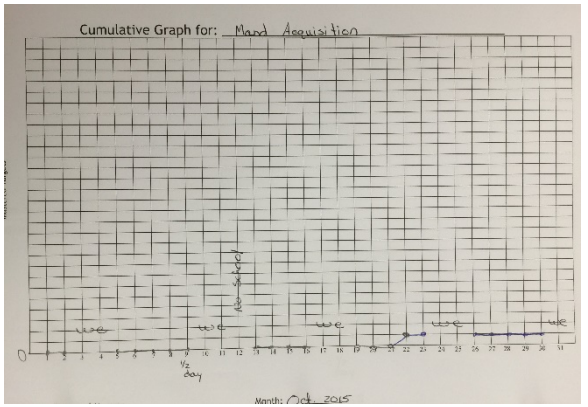


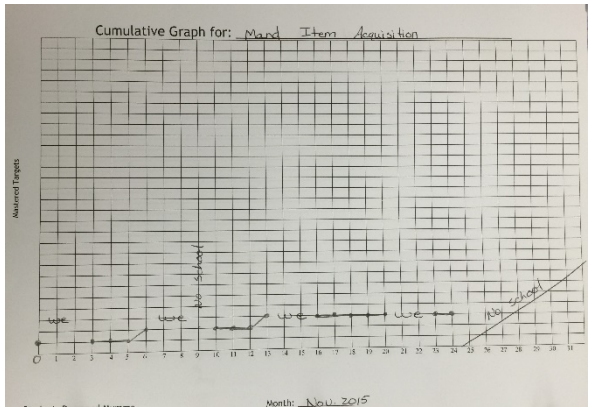
Total Cumulative Skills in 20 weeks: 68 (20 Mands)

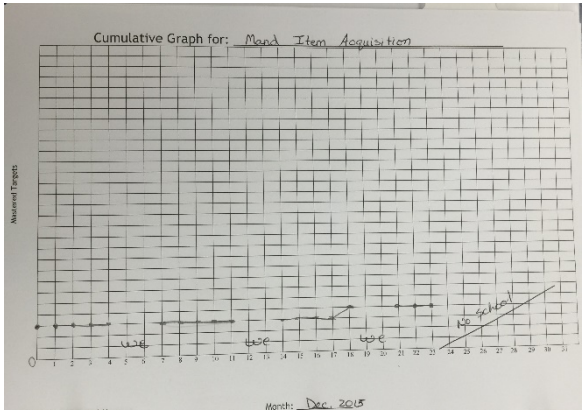
D2-Mand Acquisition

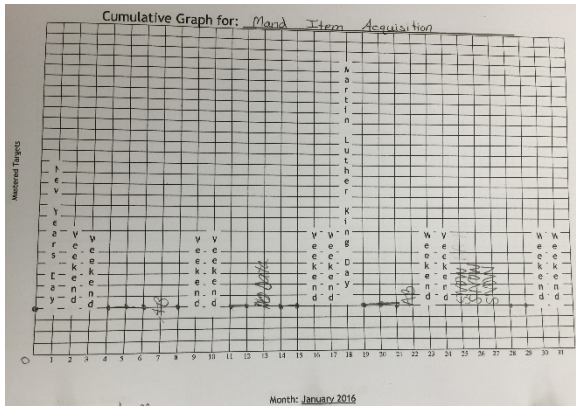


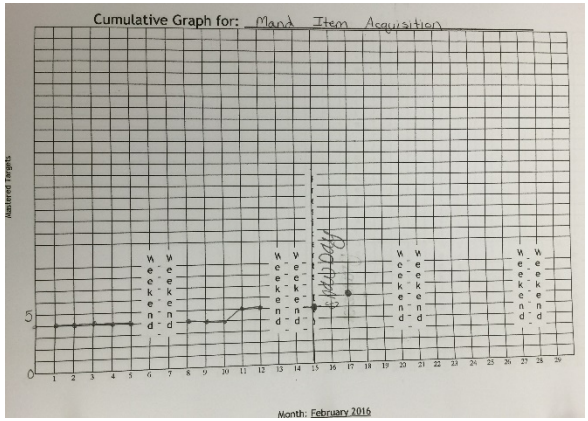




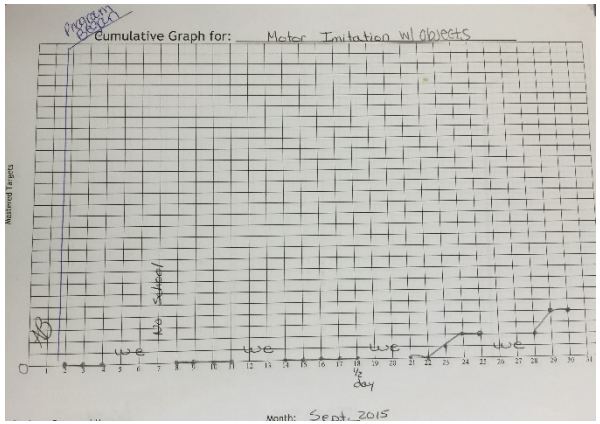


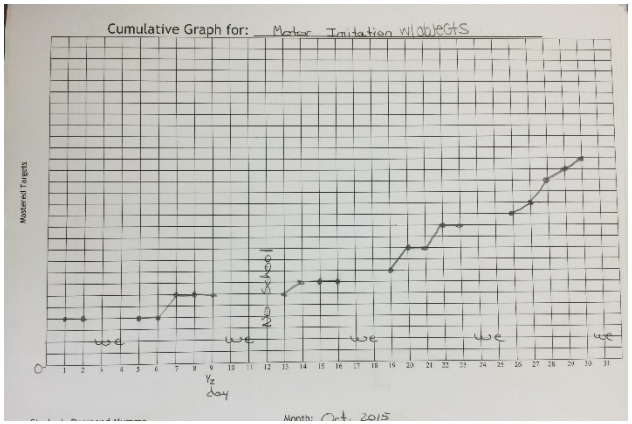


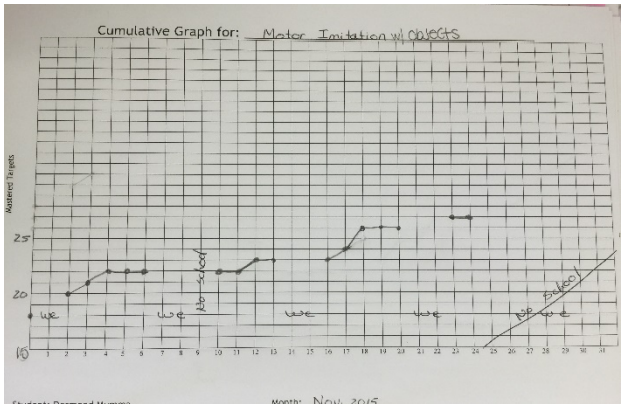


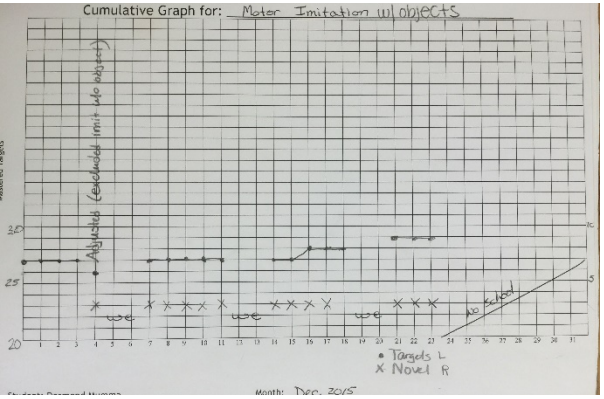


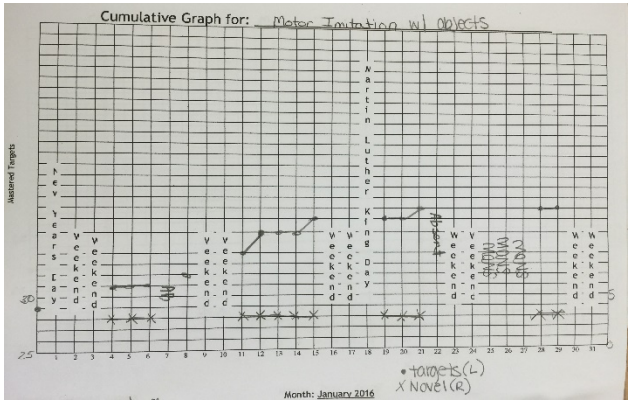
Imitation with Objects

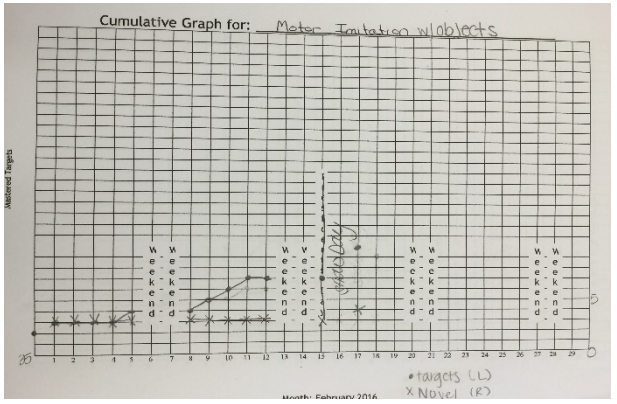




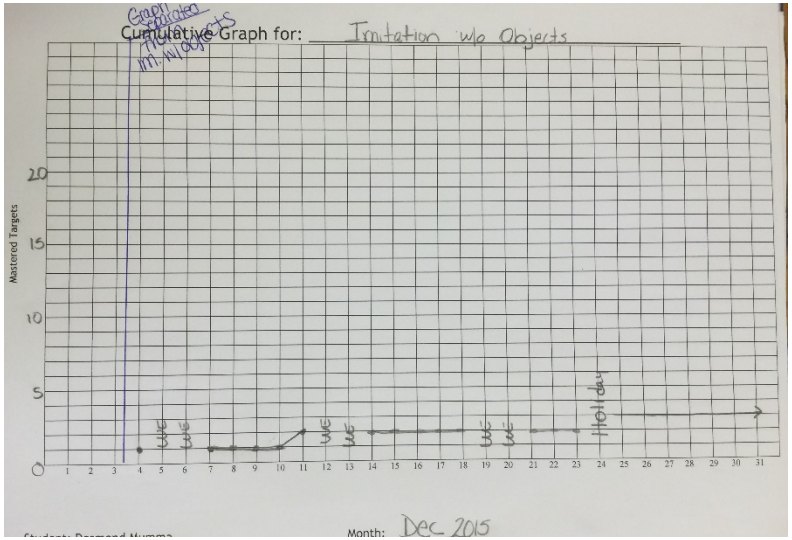


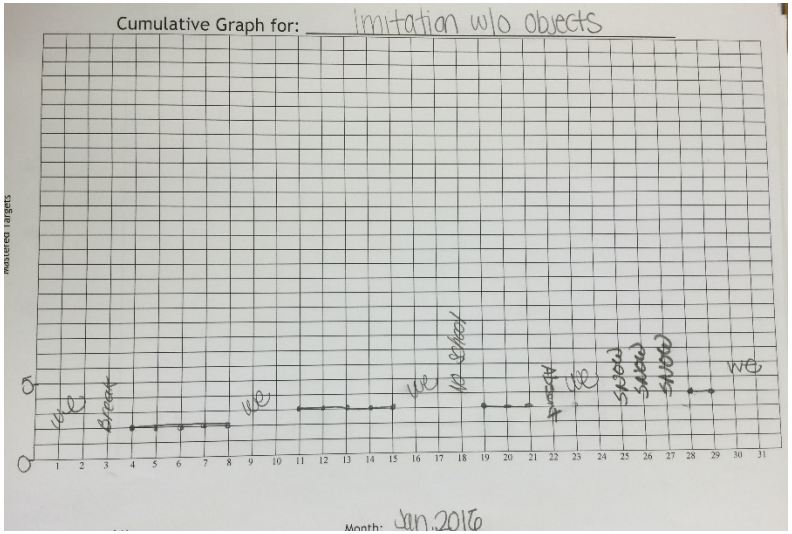


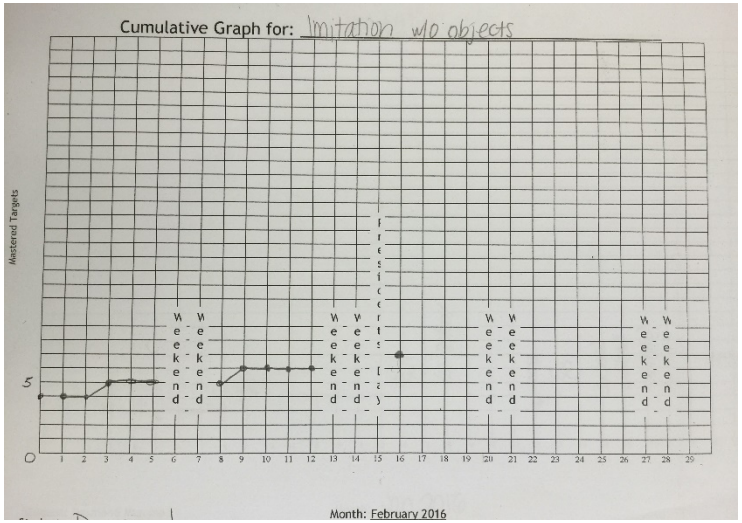




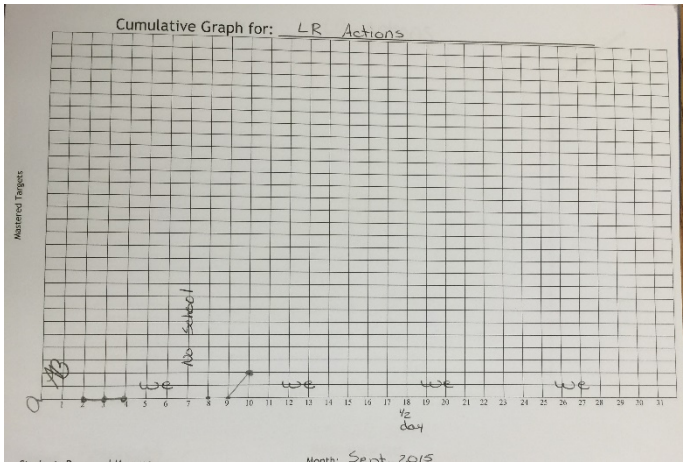
Motor Imitation Data

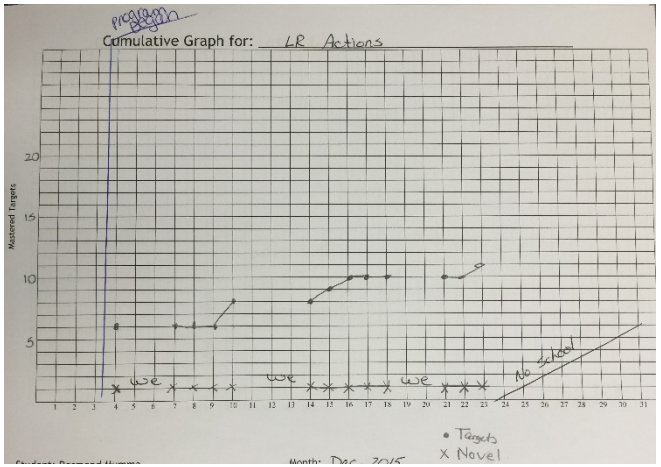


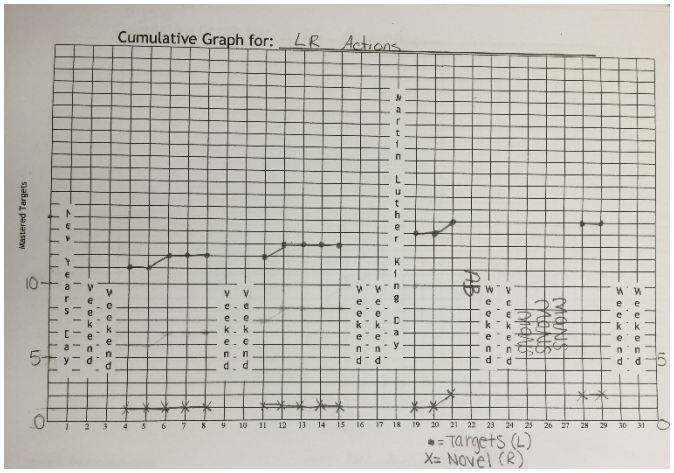


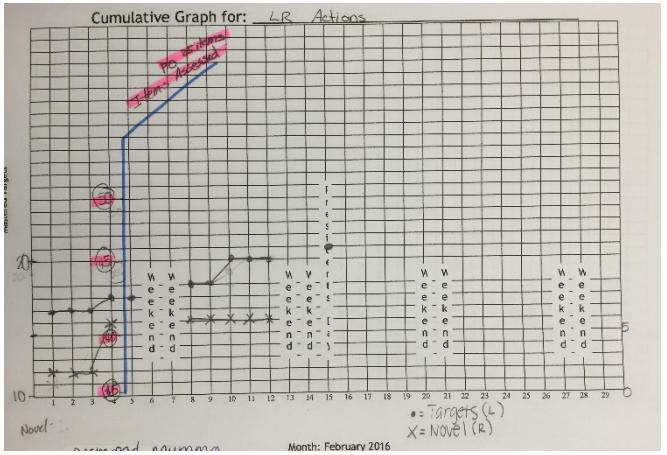


Listener Responding









Broadening Repertoires: Common Programming Procedures for Level 2 and Related Protocols

Level 2 Programs: Purpose and Considerations

- Careful programming and sequencing of skills helps avoid producing unwanted barriers that will impede development of a broad language repertoire and which we must eventually address in the future.

- Considerations:
  - Don't be tempted to move too fast through these intervention programs.
  - Careful analysis of the appropriates sources of control.
  - Build a solid foundation of skills on which to base advanced skills…**build atomic repertoires!**

Mand Program Considerations

- Expand mands for items, activities, actions: be careful not to stop #5 from level 1 at the 10 criteria
- Increase rate of manding
- Mands for missing items
- Spontaneous mands and acquiring novel mands without specific training will often come with multiple exemplar training and density of opportunity to mand (may be necessary to teach spontaneous mands)
- Two-component mands (action-item, adjective item, action-adverb)
- Multiple component mands
- Y/N mands:
  - Child is not the one to initiate
  - Can become a generalized mand

Imitation Program Considerations

- Imitation of objects requiring discrimination
- Fine motor imitation
- Imitation fluency
- Multiple step motor imitation (beyond two steps generally require mediating responses)
- Imitation free of verbal S^D (fluency drills may help in teaching this step)

Tact Program Considerations

- Expand tacts for items
- Tacting ongoing actions
- Tact parts of items
- Tacting Locations
- Two component tacts (noun-noun, noun verb)
- Tact adjectives
- Tact class of items
- Tact Fluency

Listener Responding Program Considerations

- Responding to varied verbal instructions (verbal S^D)
- Discriminating items in larger fields, in messy arrays, and with similar stimuli
- Continue expanding performing motor actions on command
- Multiple component LR
- Discriminating items in picture/book scenes and/or the natural environment
- Discriminate parts of items

Visual Performance/Match-to-Sample

- Match identical items in larger fields, messy arrays, and with similar stimuli
- Match non-identical items- use items student can tact
- Replicating 3-D block designs, block designs on pictures as well as from pictures
- Replicate sequence patterns
- Extending sequence patterns

Social and Play Skills

- Peer-Peer pairing
- Peer-Peer manding
- Play/Leisure skills: can, and should, include independent engagement.

Intraverbal Program Considerations

- Fill in responses
  - Fun activities
  - songs
- Responding to questions regarding personal information
- Intraverbal by feature, function, and class
- Answering what, who, where questions

Classroom Routines and Group Instruction

Classroom Routines

- Completing classroom routines (e.g., packing, unpacking, lining up, etc.)
- Work independently for brief periods of time and stay on task

Group Instruction

- Respond in dyads and small groups to known instructions (unison/choral responding)
  - Choral/unison responding: Students' ability to respond along with others in a group setting (responding on signal).
  - Individual Responding: Student's ability to respond when called on in a group setting.
  - Waiting for others individual responses: Student's ability to remain quiet and attentive when it is another student's individual turn to respond.

Level 2 Protocols and Guidelines

Tact of Actions

- Tact of actions introduced when
  - Student has acquired a wide range of tacts of objects and pictures
    - 100+ approximately: this is not set in stone
  - Fluency in the tact repertoire
  - When student can tact several examples of items (some generalization established)
  - When student is learning new tacts for items within only a few teaching trials

Tact of actions

- Two types of actions to teach as tacts:
  - Tacts of motor actions
  - Tacts of actions on objects
- Tacts of actions on objects: usually pulled from known tacts of objects
  - The tact of the item may interfere with acquisition of tact of the action (a discrimination is involved.)
  - Tacts of actions on objects have some advantages for teaching verb-noun (and noun verb combinations.)

Protocol for Tacts of Actions

- Assess known tacts for objects if the action involves an object
- Assess tact of action repertoire
  - some tacts of actions may be learned prior to explicit instruction
- Teach through errorless process
  - Prompt Transfer Distract Check
- For tacts of actions with objects will need to run discrimination trials:
  - What is it?
  - What is it doing?
- Show actual model of ongoing action (act out or show video)
  - Avoid two-dimensional static pictures and pretend actions
- Data collected through cold probe procedures

Teaching the Tact of Action

- Basic Steps: Tact of Action
  - Model action and prompt tact of action with Echoic Prompt
  - Model action and Run second trial with No echoic prompt (Transfer)
  - Run distract Trial
  - Run contrast trial with item used (if applicable)
    - *before prompt, after transfer, before check (can do more than one)*
  - Model action, run check trial for tact of Action

➢ Demonstration

Data On Object/Action Tacts

- Cold probe mastery
- Decisions on discontinuing program:
  - When novel tacts of actions are acquired with very few teaching trials
  - When tacts of actions are easily generalized to novel examples

Multiple Component Tacts: Actions-Objects

- Taught directly through discrimination training under conditions in which both components (verb-noun) exert functional control
  - The tacting of the action and the object makes sense!
- Establishing the appropriate source of control
- Program for generalization:
  - Each action across objects (rolling marker; rolling pencil, rolling ball)
  - Each object across actions (rolling ball, bouncing ball, throwing ball)

Teaching the Two Component Tact

- Run a trial for tact of action
- Run a trial for tact of object
- Prompt the student to emit the two component tact, usually with an echoic prompt and a verbal S^d to "say the whole thing about what you see"
- Fade prompt with a transfer trial
- Distract
- Check

» *Demonstration*

Data On Object/Action Tacts

- Cold probe mastery
- Decisions on discontinuing program:
  - When novel combinations are emitted for known tacts of items/tacts of actions without direct teaching

Skill Tracking Sheet

Student Name: _____ Skill: Tact of Verb-Noun Combinations

	Target	Date introduced	Date Mastered
1	**Tapping: Block**		
2	**Tapping: Pencil**		
3	**Tapping: Book**		
4	**Tapping: Marker**		
5	**Tapping: Ball**		
6	**Tapping: Car**		
7	**Tapping: Cup**		
8	**Tapping: Assess at least 10 novel**		
9	**Rolling: Block**		
10	**Rolling: Pencil**		
11	**Rolling: Crayon**		
12	**Rolling: Marker**		
13	**Rolling: Ball**		
14	**Rolling: Egg**		
15	**Rolling: Cup**		
16	**Rolling: Assess at least 10 novel**		
17	**Shaking: Block**		
18	**Shaking: Pencil**		
19	**Shaking: Crayon**		
20	**Shaking: Marker**		
21	**Shaking: Ball**		
22	**Shaking: Egg**		
23	**Shaking: Cup**		
24	**Shaking: Assess at least 10 novel**		
25	**Spinning: Block**		
26	**Spinning: Pencil**		
27	**Spinning: Crayon**		
28	**Spinning: Marker**		
29	**Spinning: Ball**		
30	**Spinning: Egg**		
31	**Spinning: Cup**		
32	**Spinning: Assess at least 10 novel**		
33	**Blowing: Bubbles**		
34	**Blowing: Tissue**		
35	**Blowing: Crayon**		
36	**Blowing: Hand**		
37	**Blowing: Ball**		
38	**Blowing: Book**		
39	**Blowing: Cup**		
40	**Blowing: Assess at least 10 novel**		

Tacts of Parts/Features

Tacting Parts/Features of Items

- The student tacts parts or features of objects. Also can be described as Parts/Whole Tacting
- When presented with an object or picture of an object can the learner label its parts?
  - For bicycle the child tacts the wheel, seat, handlebars, pedals, and chain
- The stimuli that evokes the response is the specific part/feature.
- Pre-requisites similar to ongoing actions

Teaching and Programming Considerations:

- Choose targets that are relevant for the learner from the mastered tacts on the skill tracking sheet.
  - Is the target commonly what the learner would come in contact with in his/her environment? (e.g., phones – there are many different styles of phones including cell phones verses house phones)
- Start teaching this skill with objects that have very discrete parts.
- If not feasible to teach skill with object , use pictures to teach tact of parts and features
  - Pictures must have distinct/discernable parts if they are to be used.
- LR can be taught in tandem

Steps in Teaching Tact of Part/Feature

- Prompt trial with echoic for the part
- Transfer to tact of part with no prompt
- Distract trials
- Run contrast trial with whole item in any of the following positions:
  - *before prompt, after transfer, before check (can do more than one)*
- Check trial for part

➢Demonstration

Data for Tacts of Parts/Features

- Cold probe mastery
- Decisions on discontinuing program:
  - When novel tacts of parts are acquired with very few teaching trials
  - When tacts of parts are easily generalized to novel examples

	Target		Date Introduced	Date Mastered
1	Pencil:	Eraser		
2		Point		
3	Car:	Wheels		
4		Wipers		
5		Headlights		
6		Door		
7		Seatbelt		
8		Seat		
9		Window		
10		Trunk		
11		Steering wheel		
12	Bus:	Yellow		
13		Wheels		
14		Door		
15		Windows		
16		Stop sign		
17		Headlights		
18		Wipers		
19		Seat		
20		Steps		
21		Steering wheel		
22	Shirt:	Sleeves		
23		Collar		
24		Buttons		
25		Tag		
26	Pants:	Legs		
27		Zipper		
28		Snap		
29		Button		
30		Pockets		
31		Tag		

Tacts Adjectives

Adjectives as Comparative Concepts

- This skill is related to teaching parts/features of items
  - The feature to be tacted is somewhat more abstract (not about the "name" of the part)
- Many adjectives involve making a comparison about some characteristic of an item or items
  - Examples: Size, shape, color, texture
- Teaching will necessarily involve making sure that the characteristic involved is what evokes the tact and not any other attribute

Tacting Adjectives

- Start programming for adjectives when the student has acquired many tacts (100+)
- Will likely be more easily acquired if tacts of parts and actions are already mastered
- Student has acquired some level of verbal conditional discrimination

Tacting adjectives: considerations

- Make the critical attribute clearly distinguishable
  - Initially, use only items that are EXACTLY the same but that differ in only one attribute, which is the attribute that you are teaching.
- At first, avoid using pictures.
  - A red card does not convey redness
  - A picture of a fire does not convey hot
  - A picture of an ice cube does not convey cold
- Use objects that are fluent as tacts
- May teach receptive and tact at the same time.
- Teach items that are relevant to the student.
- Teach discrimination from the start
- Change your field around every time you teach to prevent rote responding.
- Randomize the presentation of trials (Teach big, big, little, big – mix it up).

Teaching Adjectives: Protocol

- Begin instruction by teaching several sets of identical stimuli for each attribute that vary only in the dimension you are teaching.
  - Big/little identical dogs
  - Big/little identical balls
- Be sure that the adjective controls the response and not any other variable
  - For size: use the same object as an exemplar of both bigness and smallness; same for length and most other comparative adjectives
- As soon as possible be sure that the identical sets involve three or more exemplars varying only in the relevant attribute
- Once sets are mastered, probe novel sets that are also identical but differ in the dimension you are teaching.
- Eventually introduce comparative exemplars that vary by other irrelevant attributes

Tacting Adjectives: Teaching Trial Example

Trial	Teacher's Response	Learner's Response
Tact trial with echoic prompt	The S^d is two identical bears, one is big and one is small. The teacher points to the big bear and states… "Let's talk about size". "What size?"… " Big"	"Big"
Tact transfer	"What size?"	"Big"
Tact trial with Echoic prompt	Teacher points to small bear and states… "What size?"… " Small"	"Small"
Tact transfer	"What size?"	"Small"
Receptive distract	"Touch your ear"	Touches ear
Tact check	"What size?"	"Small"
Intraverbal distract	"What's your name?"	"Jacob"
Tact check	"What size?"	"Big"
Continue with tact checks. Vary asking big and small with distracter trials in-between as shown above. End run through with the below tact check.		
Tact check	"What is this thing called"?	"A bear"

Skill Tracking Adjectives

	Date Introduced	Date Mastered
Target: Long/Short		
Identical Sets:		
Pencils		
Straw		
String		
Probe Novel Identical Sets		
Previously taught as alternate attribute (if comparative)		
Non-identical pairs		
NET		
Intraverbal Opposites:		

Tacting Adjectives: Data-Based Decision Making

- Ongoing analysis of student responding to determine when and how to fade prompts.
- Decisions on when to discontinue program should be based on student's ability to tact a wide variety of adjectives, follow instructions that involve adjectives in novel (untrained) situations, across settings, and instructors.
- Student's ability to acquire novel targets without intensive teaching.

Tacting Category/Class

Tact of Item when Provided with Named Class:

- In this verbal conditional discrimination, the name of the class is used to evoke a tact of the whole item:
  - In the presence of an array of items that includes a cat:
    - S^d: "Tell me the one that's an animal" R: student scans, tacts "cat" upon seeing the cat
- Usually only introduced once the discrimination of the tact of item is strong
- Response involves both responding as a listener and emitting the tact
- Often introduced as part of intraverbal training

Sample Array: Tacting Item by Named Class

Tacting Item by its Class

- The student tacts the category/class of objects. When presented with an object or picture of an object can the student names the class
    - S^d: in the presence of a cat "a cat is a kind of_____" R: "animal"
- The stimuli that evoke the response are the relevant features that are necessary criteria for inclusion in a particular class of items

Skills Needed Before Teaching Tact Class

- Mastered many tacts
  - At least 150 mastered tacts of objects/pictures
  - About 40 tacts of ongoing actions
  - About 25 tacts of parts/features across many items
  - Tacts of adjectives across many items
  - Multiple exemplars of most tacts mastered
  - Fluency of tact response should be considered
  - Learning novel tacts of items, actions, and parts within few teaching trials
- Receptive discrimination for the objects or items involved

Teaching and Programming Considerations:

- Teach tact of class on items that are strongly acquired as tact
- During training, intersperse trials for tacting the whole item
- Tact and LR class are taught at the same time
- At any one time, teach two classes
- Teach each class until the student can tact novel items when provided with the named class as well as provide the class of items not previously targeted

Tact Class of Items: Teaching Trial Example

Trial	Teacher's Response	Learner's Response
Tact item by class-prompt	"Tell me an animal" (picture of cat in array with other items)- prompt by pointing out cat	Learner sees and says "Cat"
Tact item by class transfer	"Tell me an animal" (picture of cat in array with other items in different location)	"Cat"
Tact distracter	"What is this part called" (while pointing to whiskers)	"whiskers"
Echoic distracter	"Say baby""	"baby
Tact item by class check trial	"Tell me an animal" (picture of cat in array with other items)	"Cat"

Skills Tracking Sheet:

Student Name:_____ Skill: Tact by Class/Tact Item of a Class

	Target	Date introduced	Date Mastered
1	**Tell me an animal: Cat**		
2	**Dog**		
3	**Horse**		
4	**Pig**		
5	**Cow**		
6	**Elephant**		
7	**Lion**		
8	**Zebra**		
9	**Sheep**		
10	**(Any novel animal)**		
11	**Tell me a food: Pizza**		
12	**Hamburger**		
13	**Hotdog**		
14	**Sandwich**		
15	**Spaghetti**		
16	**Soup**		
17	**Rice**		
18	**Chicken**		
19	**French Fries**		
20	**(Any novel food)**		
21	**Tell me a clothing: Shirt**		
22	**Pants**		
23	**Socks**		
24	**Shoes**		
25	**Underwear**		
26	**Belt**		
27	**Hat**		
28	**Swimsuit**		
29	**Pajamas**		
30	**(Any novel clothing)**		
31	**Tell me a furniture: Bed**		
32	**Chair**		
33	**Table**		
34	**Desk**		
35	**Dresser**		
36	**Bookshelf**		
37	**Couch**		
38	**Crib**		
39	**Rocking chair**		
40	**(Any novel furniture)**		

	Target	Date introduced	Date Mastered
1	**A cat is a type of: Animal**		
2	**A dog is a type of: Animal**		
3	**A horse is a type of: Animal**		
4	**A pig is a type of: Animal**		
5	**A cow is a type of: Animal**		
6	**An elephant is a type of: Animal**		
7	**A lion is a type of: Animal**		
8	**A zebra is a type of: Animal**		
9	**A sheep is a type of: Animal**		
10	**(Any novel animal) is a type of: Animal**		
11	**A pizza is a type of: Food**		
12	**A hamburger is a type of: Food**		
13	**A hot dog is a type of: Food**		
14	**A sandwich is a type of: Food**		
15	**Spaghetti is a type of: Food**		
16	**Soup is a type of: Food**		
17	**Rice is a type of: Food**		
18	**Chicken is a type of: Food**		
19	**French fries are a type of: Food**		
20	**(Any novel food) is a type of: Food**		
21	**A shirt is a type of: Clothing**		
22	**Pants are a type of: Clothing**		
23	**Socks are a type of: Clothing**		
24	**Shoes are a type of: Clothing**		
25	**An underwear is a type of: Clothing**		
26	**A belt is a type of: Clothing**		
27	**A hat is a type of: Clothing**		
28	**A swimsuit is a type of: Clothing**		
29	**Pajamas are a type of: Clothing**		
30	**(Any novel clothing) is a type of: Clothing**		
31	**A bed is a type of: Furniture**		
32	**A chair is a type of: Furniture**		
33	**A table is a type of: Furniture**		
34	**A desk is a type of: Furniture**		
35	**A dresser is a type of: Furniture**		
36	**A bookshelf is a type of: Furniture**		
37	**A couch is a type of: Furniture**		
38	**A crib is a type of: Furniture**		
39	**A rocking chair is a type of: Furniture**		
40	**(Any novel furniture) is a type of: Furniture**		

Tacts of Prepositions

Scope of Teaching Prepositions

- Prepositions may involve:
  - Tacting a relative spatial location of one object to another (static items: over/under; in front/behind)
  - Tacting the relative temporal location of one event to another (before/after)
  - Tacting the relative dynamic motion of one object to another (towards, going over; going around)
- We will focus only on teaching static prepositions in this training
- The principles will transfer to other types of prepositions

Tacting Prepositions

- A tact of a preposition is tact of the relative position of two items

- Be sure that such tacts are under the correct stimulus control:
  - Student may inadvertently learn to tact some other attribute of the arrangement other than the position one item to the other (such as differences of the items in features or other characteristics.)
- In order to ensure that the relative position of one item to the other is learned, design instruction to flawlessly teach the relation

Prerequisites to Tacts of Prepositions

- Broad tact repertoire (100+ tacts for items, tacts for actions, adjectives, multiple component tacts (noun-verb, adjective-noun), and acquiring about at least 3 novel tacts per week)
- Ability to echo phrases.
- Verbal conditional discriminations

Tacting Prepositions: Considerations

- Teach prepositions in sets of two and use several pairs (3-6 pairs) of stimuli to teach each set
- Use echoic prompts on errorless trials
- Response to be prompted is multiple component tact of the prepositional arrangement
  - "under the table"
  - "behind the box"
  - "between the shoe and the cat"
- Intersperse trials for tact of items involved
- Use arrangements of stimulus items so that they present the full range of relative positions targeted for the concept
  - Coin on the top right side of a box
  - Coin on the top left side
  - Coin on the center of box
  - Coin on the top edge of the box
- Have student master through cold probe each of the sets you have selected
- When all sets are mastered probe a novel sets

Tacting Prepositions: Teaching Trial Example

Trial	Teacher's Response	Learner's Response
Tact trial with echoic prompt	S^d's – bear and a car. The bear positioned in front of the car S^d: "Where is the bear?" Prompt: "on the car"	"in front of the car"
Tact transfer	S^d: "Where is the bear?"	"in front of the car"
Tact trial with echoic prompt	"Where is the bear?" "behind the car"	"behind the car"
Tact transfer	"Where is the bear?"	"behind the car"
Distractor	"What part of the car is this?"	"bumper"
Tact check	"Where is the bear?"	"in front of the car"
Distractor	"What is it?"	"bear"
Tact check	"Where is the bear?"	"Behind the car"

Integration with Other Operants

- Remember the LR must be taught across a variety of response formats
  - S^d: "put this on the box"
  - S^d : "touch the one that is on the box"
  - S^d : "get on the box"
  - S^d : "get the book that is on the box"

- Again: note the role of verbal conditional discriminations.

Skill Tracking Prepositions

	Date Introduced	Date Mastered
Target: In		
Target Sets:		
Coin/Box		
Clip/Cup		
Bear/House		
Novel sets		
Pencil/Bag		
NET:		

	Date Introduced	Date Mastered
Target: On		
Target Sets:		
Coin/Box		
Clip/Cup		
Bear/House		
Novel sets		
Pencil/Bag		
NET:		

Teaching Prepositions:

- Decisions on when to discontinue program should be based on student's ability to tact a wide variety of prepositions and novel examples, follow instructions that involve prepositions in novel (untrained) situations, across settings and instructors.
- Student's ability to acquire novel targets without intensive teaching.

Listener Responding and Multiple Discriminations

Multiple LR Discrimination

- Usually taught at a level similar to tacts of actions and parts
- Do not teach until student has acquired wide range of single LR discriminations and responds easily to such tasks.
- Student must have strong echoic/imitation and tact repertoire for items to be discriminated

Demonstration of Teaching Procedure Multiple LR Discrimination with Joint Control

- Steps:
  - S^d presented (select 3 items in sequence)
  - Do not use imitative prompts
  - Rehearsal phase: have student echo or imitate the 3 item sequence and then self-echo or self-imitate
  - Have the student rehearse more than you think is necessary, but a minimum of 3 times
  - Re-present the S^D and have student respond
  - Model with vocal and signed responses

Skills Tracking Sheet: Multiple Component LR

- Cold probe mastery
- Decisions on discontinuing program:
  - When novel complex directions are followed without direct teaching
  - Student generalizes "joint control" (rehearsing instruction given to mediate their response)

	Target	Date introduced	Date Mastered
1	2 items: neat array FS 10+		
2	3 items: neat array FS 10+		
3	2 items: messy array FS 10+		
4	3 items: messy array FS 10+		
5	2 items: messy array FS 10+ with 3 sec delay		
6	3 items: messy array FS 10+ with 3 sec delay		
7	2 items: natural environment		
8	3 items: natural environment		
9	2 items: messy array FS 10+ with 5 sec delay		
10	3 items: messy array FS 10+ with 5 sec delay		
11	4 items: neat array FS 10+		
12	4 items: messy array FS 10+		
13	4 items: messy array FS 10+ with 3 sec delay		
14	4 items: natural environment		
15	4 items: messy array FS 10+ with 5 sec delay		
16	2 actions (at table)		
17	3 actions (at table)		
18	1 action 2 items (at table-random presentation)		
19	2 actions 1 item (at table-random presentation)		
20	4 actions (at table)		
21	1 action 3 items (at table-random presentation)		
22	2 actions 2 items (at table-random presentation)		
23	3 actions 1 item (at table-random presentation)		
24	2 actions (in NET)		
25	3 actions (in NET)		
26	1 action 2 items (in NET)		
27	2 actions 1 item (in NET)		
28	4 actions (in NET)		
29	1 action 3 items (in NET)		
30	2 actions 2 items (in NET)		
31	3 actions 1 item (in NET)		
32			
33			
34			
35			
36			
37			
38			
39			
40			

Yes No “Tacts”

GENERAL OVERVIEW OF PROCEDURES

- Answering "yes" or "no" in response to questions about a non-verbal stimulus. For example:
  - When shown a pencil and asked "Is this a pencil?" the participant would say "yes."
  - When shown a pencil and asked "Is this a drum?" the participant would say "no."
- Yes and No responses are actually:
  - Verbal behavior about verbal behavior (autoclitics)
  - The speakers tendency to say whether they would tact the item as spoken.
- No errorless teaching – teach student to generate mediating responses (joint control)

CONCEPTUAL ANALYSIS

Teacher Says:
Is this a pencil?

"pencil"

(covert echoic)

Teacher Says:
Is this a drum?

"drum"

(covert echoic)

"pencil"

(tact)

Rehearsal: "pencil, pencil, pencil…"

(covert self-echoic)

Rehearsal: "drum, drum, drum…"

(covert self-echoic)

(presence of joint control)

(absence of joint control)

"YES"

(descriptive autoclitic)

"NO"

(descriptive autoclitic)

Teaching Procedures

- Place object on table directly in front of Student.
- Point to the object and ask the specified question
- If **correct response**, reinforce
- If **incorrect response**, teach using joint control:
  - Point to the object again and repeat the question.
  - Next the instructor draws the Student's attention to the object.
  - Have student tact and rehearse the name of the object three to five times
  - Following this rehearsal, the instructor pauses for 1 to 2 seconds and then represents the question while pointing to the object.
  - If correct, reinforce

Second Error Correction

1. Pause and model the correct response (i.e., "yes" or "no")
2. Pause again and state the correct tact of item: "This is a *(object name)*."
3. Have student tact the item
4. Represent question and follow teaching procedure with rehearsal strategy

1. After baseline assessment, select the first training item (one not acquired during the baseline probe).

2. Develop 20 questions (10 yes as correct response and 10 no as correct response).

3. Randomize sequence of questions across all presentations for each item.

- video

Data Collection

- Use trial by trial data
- Data is recorded by scoring each question as correct (+) or incorrect (-).
- Mastery: 90% correct for 2 sessions on both "yes" and "no"
- Graph
  - % correct
  - Acquisition of trained stimuli
  - Acquisition of novel stimuli

Question	Correct/Incorrect
Is this a marker? ("yes")	+ -
Is this a shovel? ("no")	+ -
Is this a marker? ("yes")	+ -
Is this a zebra? ("no")	+ -
Is this a marker? ("yes")	+ -
Is this a marker? ("yes")	+ -
Is this a Play-doh? ("no")	+ -
Is this a bike? ("no")	+ -
Is this a sandwich? ("no")	+ -
Is this marker? ("yes")	+ -
Is this glue? ("no")	+ -
Is this a marker? ("yes")	+ -
Is this a book? ("no")	+ -
Is this a fence? ("no")	+ -
Is this a marker? ("yes")	+ -
Is this a marker? ("yes")	+ -
Is this a marker? ("yes")	+ -
Is this a donut? ("no")	+ -
Is this a marker? ("yes")	+ -
Is this an Ipod? ("no")	+ -

Teaching Intraverbals

The Relation Between Tacts and Intraverbals

- We talk of things that are present before we talk about things that others say to us
- Intraverbal relations/interactions evoke more relevant responses when the speaker and listener share actual experiences regarding content of verbal behavior ("words" can evoke private events that are tact-like)

Intraverbal Webbing

Intraverbal Feature, Function, Class (FFC's)and Webbing

- The student will fill in phrases and answer questions regarding the feature, function, and class of items.

- **Example**: When presented with the question (item not present) "What do you write with?" the student will answer "pencil".

- The stimuli that evoke the response is the other person's verbal behavior (the fill in the blank phrase or question).

Prerequisite Skills and Considerations for IV-FFC Training:

- Many tacts items (tact for item involved must be known)
- For function: Tact and LR of item and ongoing action involved.
- For features: Tact and LR of the items, parts and features of the item involved.
- For class: Tact and LR of items in the class as well as tacting the class of items.
- Having a solid base of these skills will avoid establishing intraverbal rote responding. For example, some children may be able to respond "car" when asked to name something with wheels, but may not know what wheels are.
  - *When prompting the intraverbal, generally, use mastered tacts.*

Intraverbal FFC's and Webbing

Stimulus and Response Classes

Car		Bed		Ball		Cat	
Stimulus Class (Convergent)	**Response Class (Divergent)**	**Stimulus Class (Convergent)**	**Response Class (Divergent)**	**Stimulus Class (Convergent)**	**Response Class (Divergent)**	**Stimulus Class (Convergent)**	**Response Class (Divergent)**
Something you drive is a	What do you do with a car?	Sleep in a	What do you do with a bed?	You throw a	What do you do with a ball?	You pet a	What do you do with a cat?
Something you ride is a	What do you do with a car?	Something with pillows is a	A bed has	You bounce a	What do you do with a ball?	What has a tail?	A cat has a
Something with wheels is	A car has	Something with blankets is a	A bed has	You kick a	What do you do with a ball?	Something with whiskers is a	A cat has
Something with wipers is a	A car has	Something with a mattress is a	A bed has a	You catch a	What do you do with a ball?	Something with fur is a	A cat has
Tell me a vehicle	A car is a	Tell me a furniture	A bed is a	Something round is a	A ball is	Tell me an animal	A cat is an
Something with a seatbelt	A car has a			Tell me a toy	A ball is a		

Preparation of teaching materials:

- For single responses:

" Moo says a _____" Cow	

Intraverbal FFC: Teaching Trial Example

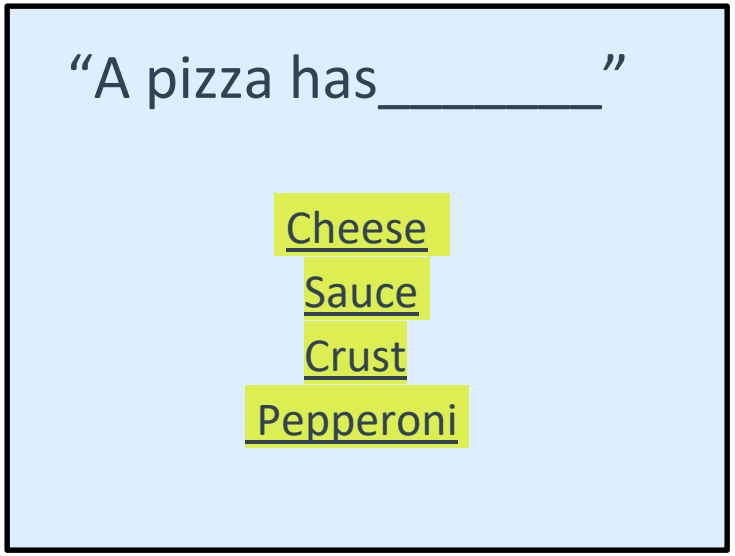
Trial	Teacher's Response	Learner's Response
Intraverbal Trial with Tact Prompt	"Moo says a____" (with picture of cow present)	"Cow"
Intraverbal Transfer	"Moo says a ____" (no picture)	"Cow"
Intraverbal distracter	"Your first name is?"	"Marty"
Receptive distracter	"Give me the popcorn"	"Gives picture of popcorn"
Intraverbal transfer	"Tell me the one that bounces" (no picture)	"Cow"

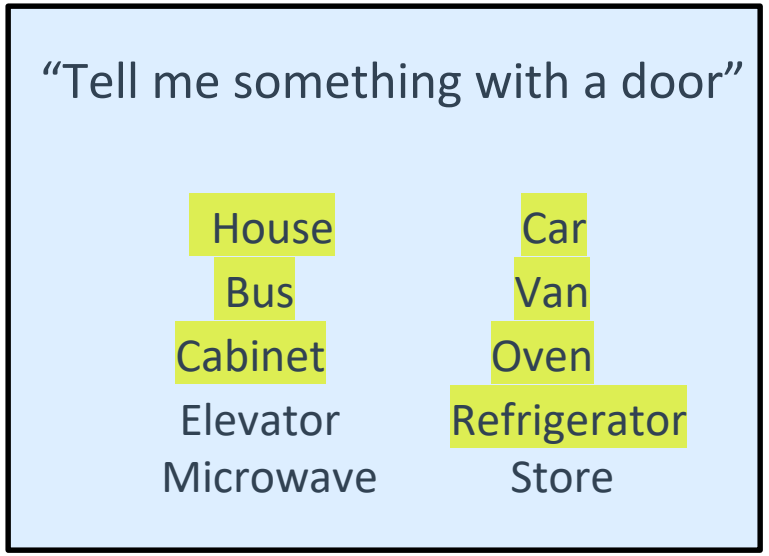
Protocol: Intraverbal FFC's and Webbing Phase 2

- Pick the concepts to teach as web(from FFC's taught). From the examples in the above table these could be: things that have wheels, vehicles, furniture, things that are round, toys, animals, things with tails.
- The student should already have one mastered response to each FFC area.
- Continue to add new responses to each of these classes (one at a time).
- As the student masters each response, require naming all of the previously learned responses when asked for them one at a time. For example: "tell me a vehicle …car". Yes, "tell me another vehicle"…."train"…….

Preparation of teaching materials:

- For concepts with more than one response:



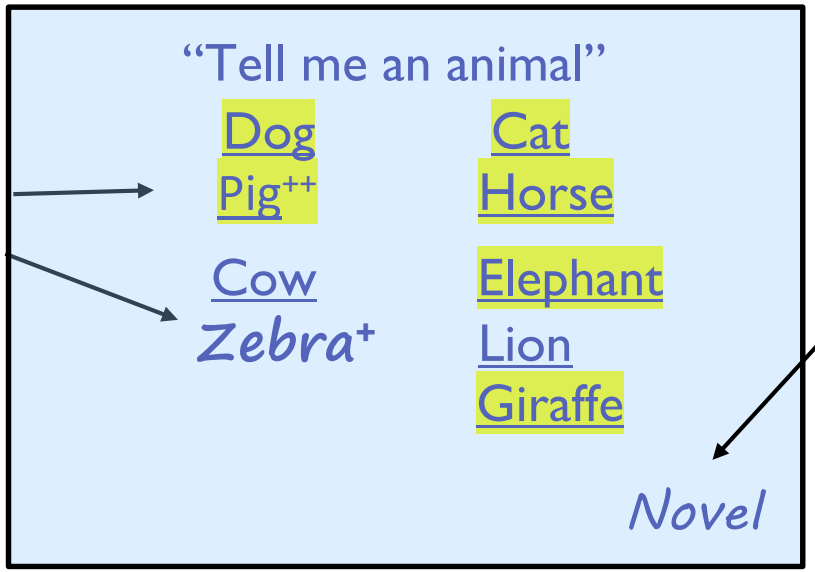


- Write the verbal S^d on a blue 3x5 card and list responses that will be targeted within that concept
- As student masters each item, it should be highlighted on the card

Preparation of Teaching Materials

- If student emits a response for a novel item not currently targeted, mark with a plus (+) as shown below:

- Novel responses



Once student can emit multiple novel items, mark the right bottom corner with word "Novel" and add card to easies

- If you have two consecutive probes correct response for a novel item, it should be highlighted on card and considered mastered
- Responses emitted that are not on card can be added in at any time

Teaching Procedures for additional members of a class:

Seven steps:

1. Present verbal S^d and wait for student to emit response for mastered item (repeat as necessary for all mastered members of the class)
   - Example: "Tell me a vehicle" (student responds with mastered item "car"
2. Repeat verbal S^d followed by an immediate prompt
   - Example: "Tell me another vehicle" and show picture of bus for student to tact (may reinforce here if necessary depending on VR)
3. Distract (Run a few easy trials)
4. Repeat steps 1 and 2 (may need repeated more than once)
5. Distract
6. Check
   - Example: "Tell me a vehicle": "car", "tell me another vehicle": "bus"
7. Differentially reinforce

Intraverbal FFC's and Webbing Phase 3

- As new responses are added to the class, also teach the relevant FFC's of the added response.

- Eventually the student will have mastered several responses for each class and, therefore, be able to emit relevant verbal responses to a randomly varied set of questions/verbal S^ds.

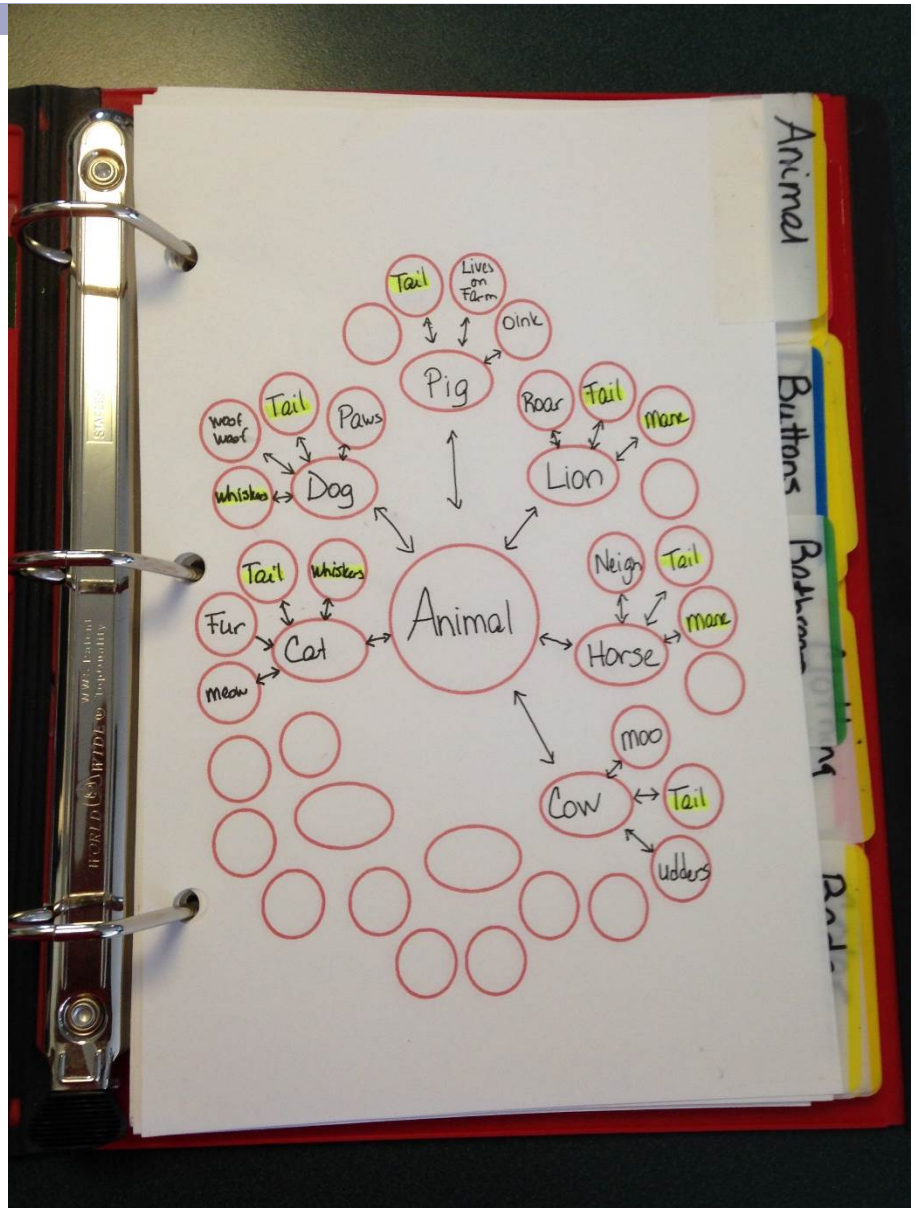
Webbing Maps

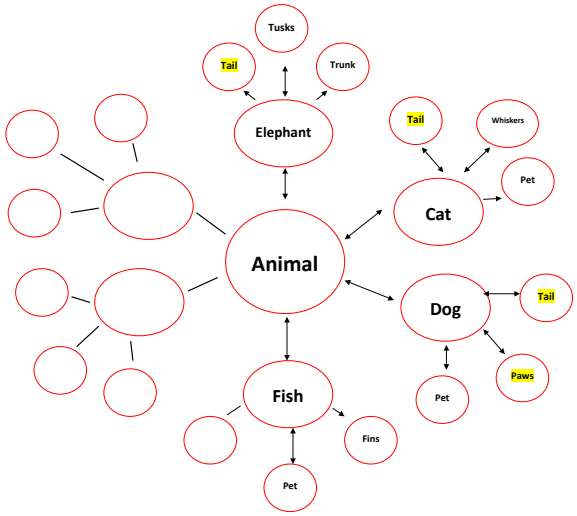
- It is helpful to create summaries of what the student already has mastered (as a prompt for the instructor)
  - This allows instructor to present questions in a flexible manner to whatever responses a student may emit.

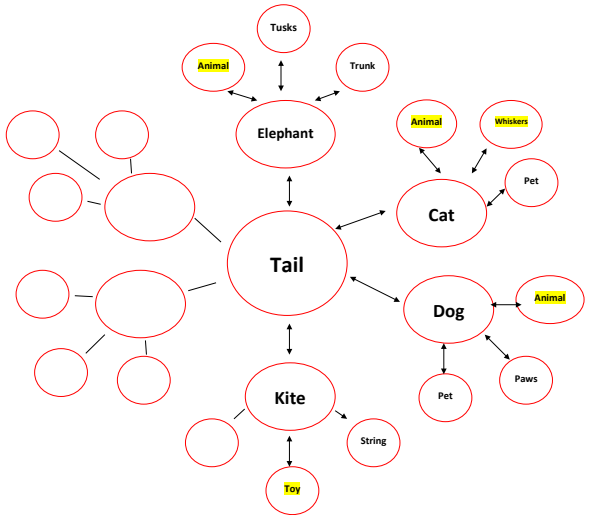
To accomplish this you can set up a binder or folder with clear tabs for each class so you can quickly reference them.

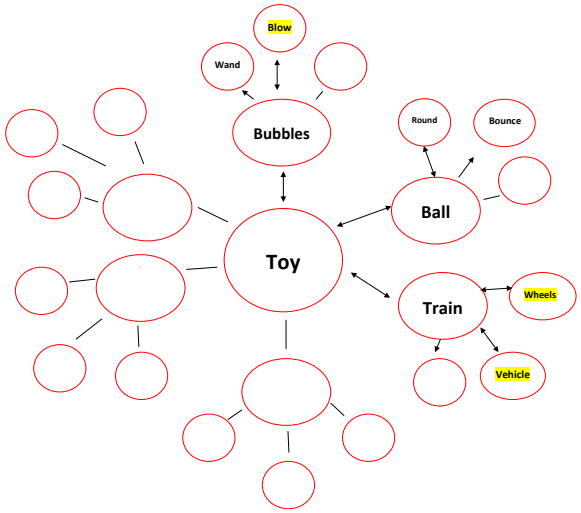
Sample Webbing Map Summary

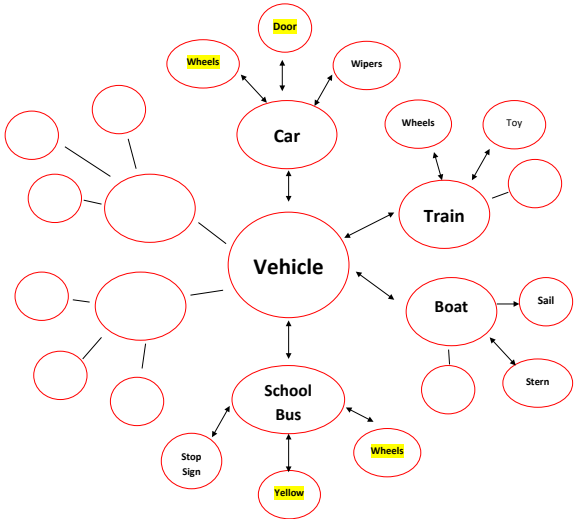
- 2 way arrows indicate student has also mastered the reversal
- Highlight means student has other members of that concept mastered

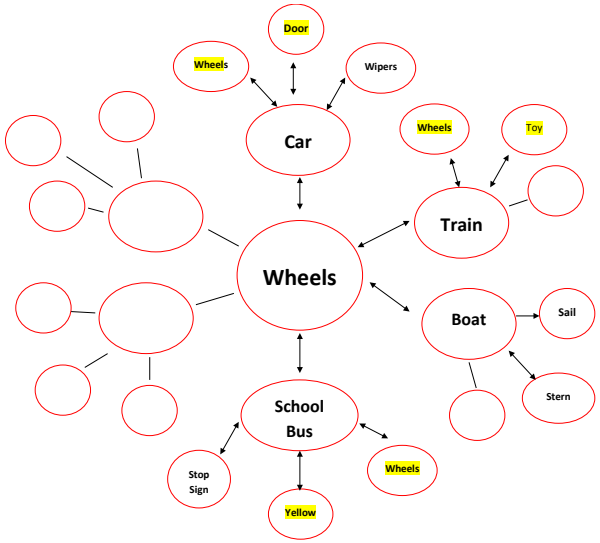



Animal
Elephant
Tusks
Tail
Trunk
Cat
Tail
Whiskers
Pet
Dog
Tail
Paws
Pet
Fish
Fins
Pet


Tail
Elephant
Tusks
Animal
Trunk
Cat
Animal
Whiskers
Pet
Dog
Animal
Paws
Pet
Kite
String
Toy


Toy
Bubbles
Blow
Wand
Ball
Round
Bounce
Train
Wheels
Vehicle


Vehicle
Car
Door
Wheels
Wipers
Train
Wheels
Toy
Boat
Sail
Stern
School Bus
Stop Sign
Wheels
Yellow


Wheels
Car
Door
Wheels
Wipers
Train
Wheels
Toy
Boat
Sail
Stern
School Bus
Stop Sign
Wheels
Yellow

Intraverbal FFC's and Webbing Data Based Decision Making

- Utilize a separate skills tracking sheet for feature, function, and class (see examples)
- Ongoing analysis of student responding to determine when and how to fade prompts.
- Decisions to discontinue program should be based on student's ability to provide novel intraverbal responses within categories, web within and across concepts, across settings and instructors as well as student's ability to acquire novel targets without intensive teaching.

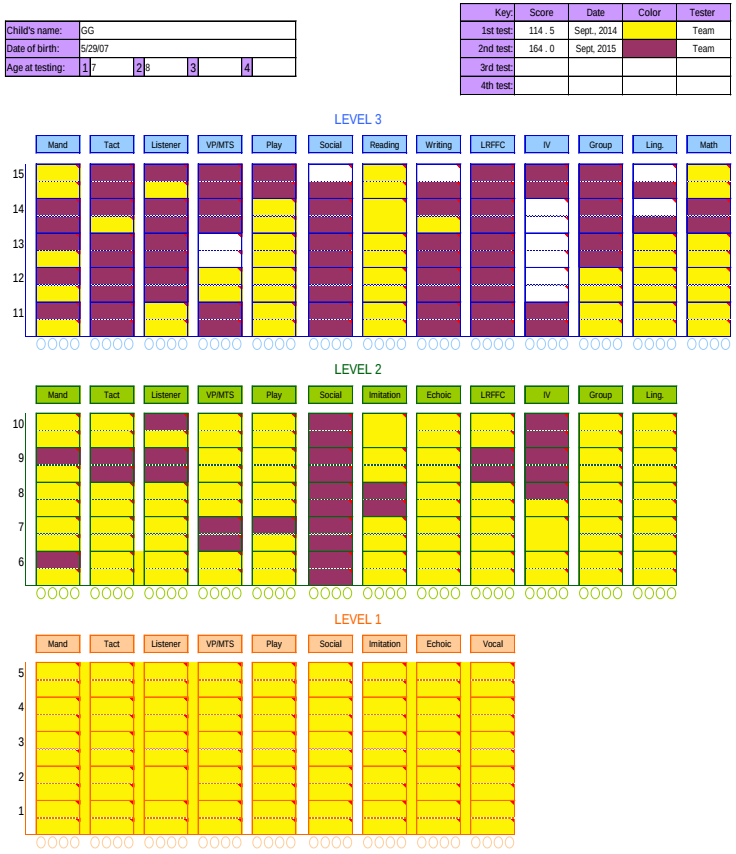
Skills Tracking Sheet for IV Functions

	Target	Date Introduced	Date Mastered
1	"What do you do with a banana?" (Eat it)		
2	"What do you do with pizza?" (Eat it)		
3	"What do you do with a sandwich?" (Eat it)		
4	"What do you do with rice?" (Eat it)		
5	"What do you do with cheese?" (Eat it)		
6	"What do you do with a hamburger?" (Eat it)		
7	"What do you do with cheese?" (Eat it)		
8	"What do you do with (any food)?" (Eat it)		
9	"What do you do with bubbles?" (Blow)		
10	"What do you do with balloons?" (Blow)		
11	"What do you do with a pinwheel? " (Blow)		
12	"What do you do with a whistle? " (Blow)		
13	"What do you do with candles?" (Blow)		
14	"What do you do with (anything you blow)?" (Blow)		
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
30			
32			
33			
34			
35			

	Target	Date introduced	Date Mastered
1	"Tell me something you eat" (Banana)		
2	"Tell me something you eat" (Pizza)		
3	"Tell me something you eat" (Sandwich)		
4	"Tell me something you eat" (Rice)		
5	"Tell me something you eat" (Cheese)		
6	"Tell me something you eat" (Hamburger)		
7	"Tell me something you eat" (Banana)		
8	"Tell me something you eat" (Any Novel Food)		
9	"Tell me something you blow" (Bubbles)		
10	"Tell me something you blow" (Balloon)		
11	"Tell me something you blow" (Pinwheel)		
12	"Tell me something you blow" (Whistle)		
13	"Tell me something you blow" (Candle)		
14	"Tell me something you blow" (Any Novel)		
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
30			
32			
33			
34			
35			

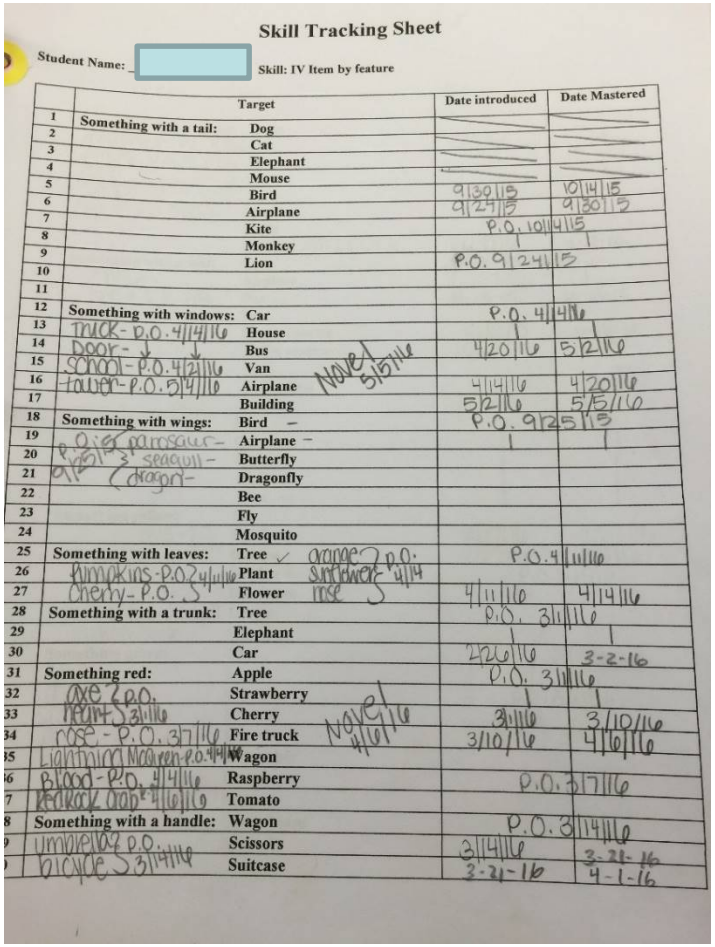
Sample Student Data

G: Data Summary



- Tact Program:
  - Actions (completed)
  - Parts/features
  - Class (completed)
  - Adjectives (completed)
  - Multiple component (completed)
  - Prepositions (completed)
- LR:
  - Actions (completed)
  - Select multiple named items (completed)
  - Adjectives (completed)
  - Follow multiple component directions (completed)
  - Prepositions (completed)
- Intraverbal:
  - IV webbing (feature, function, class)

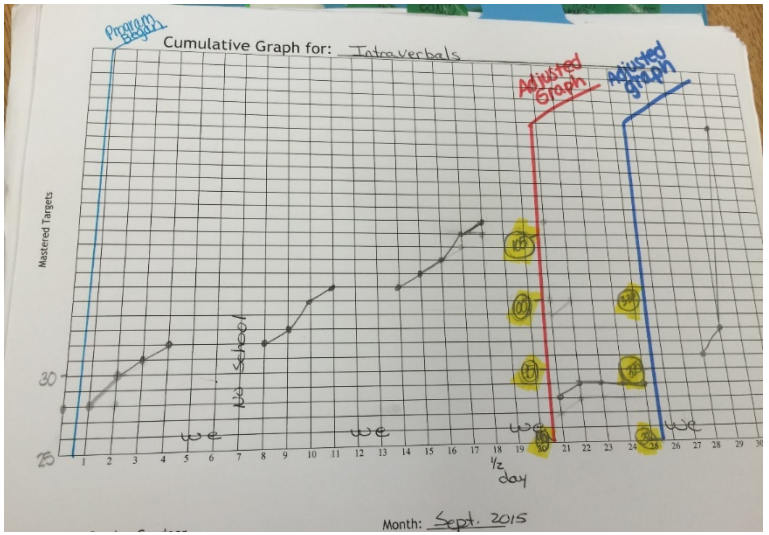
G: IV FFC

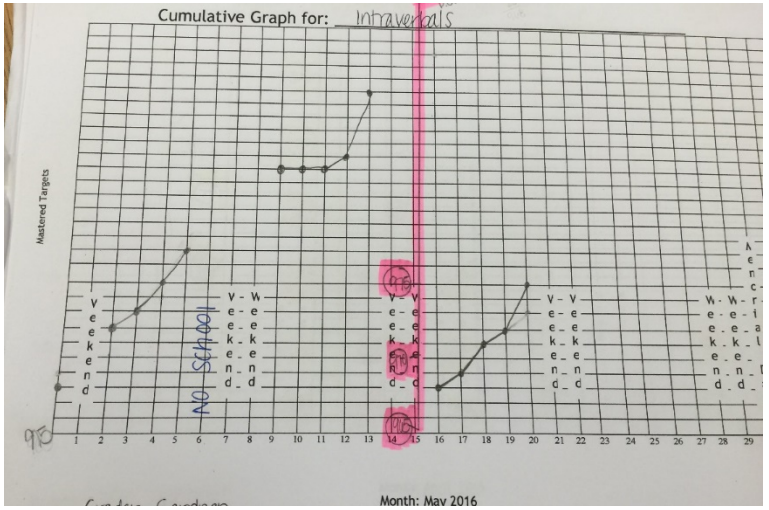


Skill Tracking Sheet

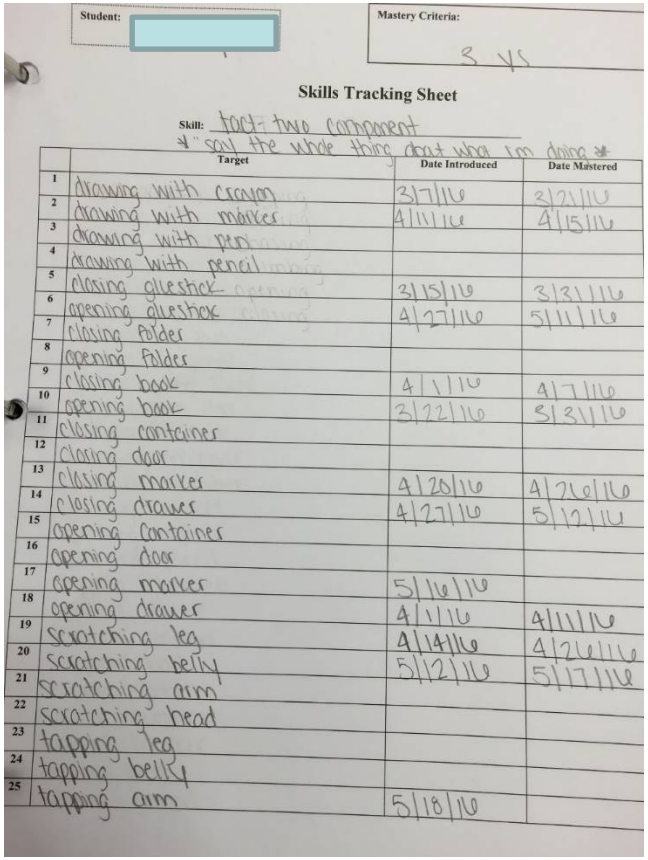
Student Name: _____ Skill: IV Item by feature

	Target		Date introduced	Date Mastered
1	Something with a tail:	Dog		
2		Cat		
3		Elephant		
4		Mouse		
5		Bird	9/30/15	10/14/15
6		Airplane	9/24/15	9/30/15
7		Kite	P.O. 10/4/15	
8		Monkey		
9		Lion	P.O. 9/24/15	
10				
11				
12	Something with windows:	Car	P.O. 4/4/16	
13	truck- P.O. 4/14/16	House		
14	door- ↓	Bus	4/20/16	5/2/16
15	school- P.O. 4/21/16	Van		
16	tower- P.O. 5/4/16	Airplane	4/14/16	4/20/16
17		Building	5/2/16	5/5/16
18	Something with wings:	Bird –	P.O. 9/25/15	
19	P.O. 5/5 pterosaur –	Airplane –		
20	P.O. 5/5 3 seagull –	Butterfly		
21	9/25 dragon –	Dragonfly		
22		Bee		
23		Fly		
24		Mosquito		
25	Something with leaves:	Tree ✓ orange P.O.	P.O. 4/11/16	
26	Pumpkins P.O. 4/11/16	Plant sunflower 4/14		
27	Cherry - P.O. 3	Flower rose 3	4/11/16	4/14/16
28	Something with a trunk:	Tree	P.O. 3/1/16	
29		Elephant		
30		Car	2/26/16	3-2-16
31	Something red:	Apple	P.O. 3/1/16	
32	axe P.O.	Strawberry		
33	heart 3/1/16	Cherry	3/1/16	3/10/16
34	rose - P.O. 3/7/16	Fire truck	3/10/16	4/6/16
35	Lightning Mcqueen P.O. 4/4/16	Wagon		
36	Blood - P.O. 4/4/16	Raspberry	P.O. 3/7/16	
37	Redrock Road 4/6/16	Tomato		
38	Something with a handle:	Wagon	P.O. 3/14/16	
39	umbrella P.O.	Scissors	3/14/16	3-21-16
40	bicycle 3/14/16	Suitcase	3-21-16	4-1-16





D Verb-Noun



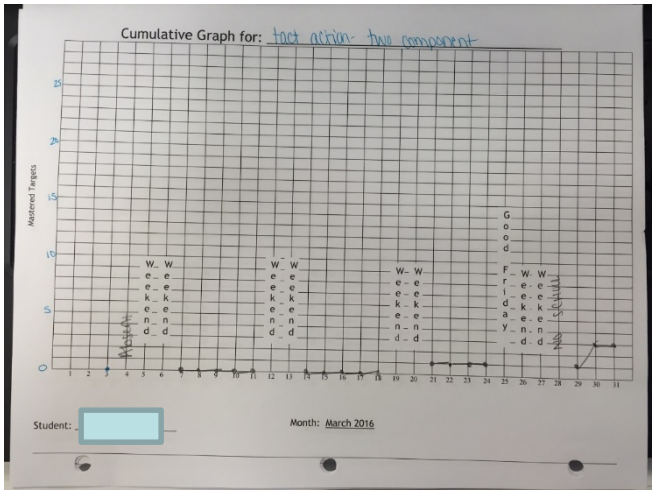
Student:

Mastery Criteria: 3 ys

Skills Tracking Sheet

Skill: tact: two component
4" say the whole thing about what you doing *

	Target	Date Introduced	Date Mastered
1	drawing with crayon	3/7/16	3/21/16
2	drawing with marker	4/11/16	4/15/16
3	drawing with pen		
4	drawing with pencil		
5	closing glue stick	3/15/16	3/31/16
6	opening glue stick	4/27/16	5/11/16
7	closing folder		
8	opening folder		
9	closing book	4/1/16	4/7/16
10	opening book	3/22/16	3/31/16
11	closing container		
12	closing door		
13	closing marker	4/20/16	4/26/16
14	closing drawer	4/27/16	5/12/16
15	opening container		
16	opening door		
17	opening marker	5/16/16	
18	opening drawer	4/1/16	4/11/16
19	scratching leg	4/14/16	4/26/16
20	scratching belly	5/12/16	5/17/16
21	scratching arm		
22	scratching head		
23	tapping leg		
24	tapping belly		
25	tapping arm	5/18/16	

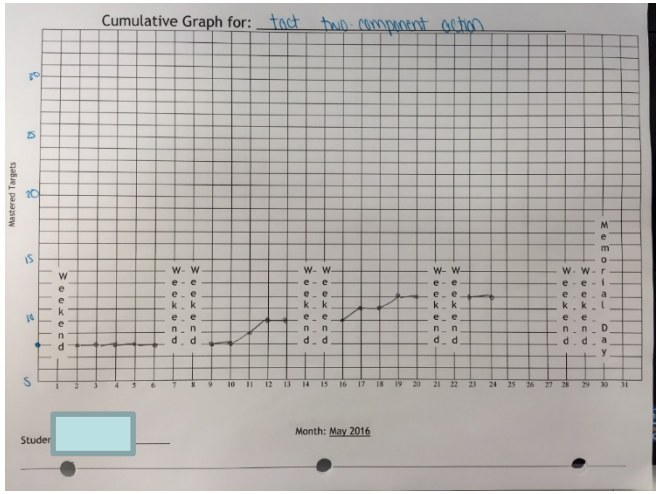


Cumulative Graph for: tact action- two component

Mastered Targets

Student:

Month: March 2016



Cumulative Graph for: tact two component action

Mastered Targets

Studer

Month: May 2016

Beyond the Basics: Common Programming Procedures for Level 3 and Related Protocols

Purpose of Level 3 Programs

- To continue building on basic learning skills that include more complex language skills.
- Building toward academic performance, group instruction and more complex verbal and social relations (will not cover in depth academic components)
- Procedures need to include:
  - Generalization
  - Spontaneity
  - Transfer between operants
  - Social and verbal interactions with peers
  - Use of new skills in a functional and meaningful way in the student's day to day natural environment.

Teaching Mands at Level 3:

- Mands for removal of aversive stimuli (remember why this is at level 3!)
- Mands for attention
- Mands for information

Expanding the Tact Repertoire

- Tact at least 4 specific aspects of items when presented with rotating verbal questions about the item.
- Tact exclusion from category
- Tact pronouns, adverbs
- Tact private events, emotional states, and social situations, tact another person's controlling variables ("theory of mind")

Listener Responding

- Follow instructions regarding pronouns and adverbs
- Discriminate among common social situations and emotional states
- Rule-governed behavior

Social and Play

- Responding to peer mands
- Play/Leisure skills…independent
- Play/Leisure…with peers
- Verbal exchanges with peers
- Other relevant social sequences

Intraverbal

- Increased range of intraverbal responses; can include expanding FFC's
- Respond to "WH" questions
- Answer intraverbal yes/no questions
- Describe events, movies, stories
- Answer questions about a story read
- Answer multiple questions regarding a specific topic

Classroom Routines and Group Instruction

Classroom Routines

- Work independently in a group and stay on task
- Retrieving and putting away materials for instruction

Group Instruction

- Respond in larger groups to known instructions (unison/choral responding)
- Learning new behaviors in a group format

Academic Skills in Conjunction or Beyond VB-MAPP

- If student not at grade level, use sequenced and evidence-based curricula to teach academic skills (Reading Mastery, Corrective Reading, Distar Math, Connecting Math Concepts, Language for Learning, Sensible Pencil).

- Make sure students have necessary skills to begin these programs…Placement test does not necessarily give you this information.

- Curriculum-based assessment and familiarity with PA Core Standars are a critical component of programming for academic skills

D

Age: 9 years

Category of eligibility: Autism

Child's name:							
Date of birth:							
Age at testing:	1	7.2	2		3		4

Key:	Score	Date	Color	Tester
1st test:	158.5	10/1/09		JS
2nd test:				
3rd test:				
4th test:				

D-Programming:

- Mands for Information
- Peer to Peer Mand
- Social Skills Training
- Intraverbal skills (imbedded in social skills training)
- SRA Reading Mastery 1st Grade
- Adapted/sequenced math curriculum

Child's name:							
Date of birth:							
Age at testing:	1	7.2	2	7.10	3		4

Key:	Score	Date	Color	Tester
1st test:	158.5	10/1/09		JS
2nd test:	170	4/1/10		JS
3rd test:				
4th test:				

A Helpful Planning Sheet:

Programming Checklist & Worksheet

Student: _____ Date: _____ Program: _____

Student Checklist	Completed	Notes
Confirmed that program is at proper level (from student's assessment(s)	Y N	
Checked for critical component skills before starting new program or increasing the difficulty level of current program (probe or data)	Y N	
Developed a clear definition of the expected student behavior and mastery criteria	Y N	Behavior: Mastery Criteria:
Scheduled practice opportunities to use skill (NET, contrived, captured)	Y N	How often: When: Where: With Whom: Material(s):

Teacher Checklist	Completed	Notes
Reviewed teaching procedures, including prompt and prompt fade procedures	Y N	
Determined a sequence of instruction	Y N	
Determined targets that are relevant to the student	Y N	
Determined/developed data collection system to monitor progress	Y N	
Determined and gathered materials for instruction	Y N	
Planned for generalization	Y N	People Setting Examples
Provided staff training and resources if necessary	Y N	Who What When

Prior to New Program Selection:

- Issue of response adduction
- Probe for skill acquisition without specific teaching

Some Final Thoughts:

- The challenges presented by many students with autism makes programming an insurmountable task.
- There is much work to be done and efficiency of teaching is not a luxury but a necessity
- The recommendations provided in this presentation are not intended to suggest this is the only way to do things or that there may not be a better was (now or in the future). They are simply considerations, systematic procedures and recommendations for arranging instruction in ways that will likely overcome the common pitfalls
- Teaching basic repertoires for children with autism that lead to combinatorial, novel responding must be a central component of instruction
- Establishing complex repertoires requires an analysis of controlling variables

- http://webapps.pattan.net/files/PaTTANAutismResources.zip

Thank You for Your Participation!

References

- Adams, G. L., Tallon, R. J., & Rimmel, P. (1980). A comparison of lecture versus role-playing in the training of the use of positive reinforcement. *Journal of Organizational Behavior Management*, *2*, 205-212.
- Alessi, G. (1987). Generative strategies and teaching for generalization. *The Analysis of Verbal Behavior:* 5, 15–27.
- Axe, J. (2008) Conditional discrimination in the intraverbal relation: a review and recommendations for future research. The Analysis of Verbal Behavior, V24(1); 159-174.
- *Azrin, N. H., Jamner, J. P., & Besalel, V. A. (1989). Student learning as the basis for reinforcement to the instructor. *Behavioral Residential Treatment*, *4*, 159-170.
- Causin, K., Albert, K., Carbone, V. J., &Sweeney-Kerwin, E. (2012) The Role of Joint Control In Teacing Complex Listener Behavior to Children with Autism. Presentation at 33rd Annual Conference of the Berkshire Association for Behavior Analysis
- Carbone, V. (2003). Workshop Series: Teacher Repertoires Necessary to Teach Language and Basic Learner Skills to Children with Autism; Four Important Lines of Research in Teaching Children with Autism.
- Carbone, V. (2004). Invited Address: Clinical Applications of Verbal Behavior Research with Children with Autism. Presentation at the 30th Annual Convention of the Association of Behavior Analysts: Boston, MA
- Carbone, V.J., Morgenstern, B., Zacchin-Terri, G., & Kolberg, L. (2007). The role of the reflexive conditioned motivating operation (CMO-R) during discrete trial instruction of children with autism. *Journal of Early Intensive Behavioral Interventions, 4,* 658-679.
- Carbone, V. J. (2015) Selected Topics in Behavior Analysis and Teaching Children with Autism. Training Workshop: Harrisburg, PA.

References

- Codding, R. S., Feinberg, A.B., Dunn, E.K., & Pace, G. M. (2005). Effects of immediate performance feedback on implementation of behavior support plans. *Journal of Applied Behavior Analysis, 38*, 205-219.
- Cooper, Heron, and Heward. (2007). Applied Behavior Analysis, 2cd Edition, Prentice Hall: Upper Saddle River, NJ
- Dipuglia, A and Miklos, M. (2014). Instructing Functional Verbal Behavior in Public Schools: Recent Outcomes from the PATTAN Autism Initiative. Symposium presented at the 40th Annual Convention of the Association for Behavior Analysis, Chicago, Il
- Donahoe, J. W., & Palmer, D. C. (2004). Learning and complex behavior. Richmond, MA: Ledgetop Publishing (Originally published in 1994)
- Durcharme, J. M., & Feldman, M. A. (1992). Comparison of staff training strategies to promote generalized teaching skills. *Journal of Applied Behavior Analysis*, *25*, 165-179.
- Engleman, S. & Carnine, D.W. (1982) *Theory of Instruction: Principles and Applications*. New York: Irvinston
- Fleming, R. K., Oliver, J. R., & Bolton, D. M. (1996). Training supervisors to train staff: A case study in a human service organization. *Journal of Organizational Behavior management, 16,* 3-25.
- Ford, J. E. (1984). A comparison of three feedback procedures for improving teaching skills. *Journal of Organizational Behavior Management*, *6*, 65-77.
- Greenwood, C. R., Delquadri, J. C., & Hall, R. V. (1984). Opportunity to respond and student academic achievement. In W. L. Heward, T. E. Heron, D. S. Hill, & J. Trap-Porter (Eds.), *Focus on behavior analysis in education* (pp. 58-88). Columbus, OH: Merrill.

References

- Jones, F. H., & Eimers, R. C. (1975). Role playing to train elementary teachers to use a classroom management skill package." Journal of Applied Behavior Analysis,8, 421-433.
- Keller, F. (1968). "Goodbye teacher..." Journal of Applied Behavior Analysis, 1, 79-89
- Krumhus, K. M., & Malott, R. W. (1980). The effects of modeling and immediate and delayed feedback in staff training. Journal of Organizational Behavior Management, 2, 279-293.
- Lovaas, O. Ivar; Koegel, Robert L.; Schreibman, Laura. (1979) Stimulus overselectivity in autism: A review of research. Psychological Bulletin, Vol 86(6), Nov., 1236-1254.
- Lowenkron, B. (1998.) Some logical functions of joint control. Journal of the Eperimental Analysis of Behavior, 69, 327-354.
- Luiselli, J.K., Russo, D.C., Christian, W.P., Wilczynski, S.M. (2008). Effective Practices for Children with Autism. Oxford University Press, Inc., NY
- Layng, T.V. J. (2012) Analyzing and Teaching Concepts to Higher Functioning Children. Conference presentation: 2012 National Autism Conference, State College, PA
- Maine Department of Health and Human Services and Maine Department of Education. (2009). Interventions for Autism Spectrum Disorders: State of the Evidence. Report of the Children's Services Evidence-Based Practice Advisory Committee
- Michael, J. (1988). Establishing operations and the mand. *The Analysis of Verbal Behavior*, 6, 3-9.
- Michael, J., Palmer, D. C., & Sundberg, M. L. (2011). The multiple control of verbal behavior. The Analysis of Verbal Behavior, 27, 3-22.

References

- Miklos, M. & Dipuglia, A. (2009) Mand training within the Pennsylvania Verbal Behavior Project: a training manual. Pennsylvania Training and Technical Assistance Network: Harrisburg, PA.
- Miklos, M., Dipuglia, A., & Galbraith, W. A. (2010, May). *Changes in student performance: Case studies in verbal behavior within a large-scale public school project.* Symposium presented at the 36th Annual Convention of the Association for Behavior Analysis, San Antonio, TX.
- Missouri Autism Guidelines Initiative (2012.) Autism Spectrum Disorders: A guide to evidence based interventions. Missouri Foundation for Health: St. Louis and Springfiled, MO.
- National Autism Center (2009). *National Standards Project, Findings, and Conclusions, Addressing the need for evidence-based practice guidelines for autism spectrum disorders.* National Autism Center: Randolph, MA
- National Research Council (2001). *Educating Children with Autism.* National Academy Press: Washington, DC
- Neef, N. A., Walters, J., & Egel, A. L. (1984). Establishing generative yes/no responses in developmentally disabled children. *Journal of Applied Behavior Analysis, 17*, 453-460.
- O'Hanlon, J. and Mortensen, L. 1980. "Making Teacher Evaluation work." *Journal of Higher Education,* 51, 664-72
- Palmer 2012 The role of atomic repertoires in complex behavior. *The Behavior Analyst*, Spring; 35(1): 59–73
- Partington, J.W. & Sundberg, M.L . (1998). *The assessment of basic language and learning skills.* Behavior Analysts, Inc., California
- Pennsylvania Department of Education (2012). Annual child count data: 1993-2013. Harrisburg, PA: DOE.

References

- Sautter, R. A. , & LeBlanc, L. A. (2006.) Empirical applications of Skinner's analysis of verbal behavior with humans. *The Analysis of Verbal Behavior*: 22, 35-48.
- Skinner, B.F. (1957). *Verbal Behavior*. New York: Appleton-Century.
- Sundberg, M. L. (2005). A behavioral analysis of motivation and its relation to mand training. In L. W. Williams (Ed.). *Development disabilities: Etiology, assessment and intervention.*
- Sundberg, M. L., & Michael, J. (2001). The Benefits of Skinner's analysis of verbal behavior for teaching children with autism. *Behavior Modification*, 25, 698-724.
- Sundberg M.L. (2008)The verbal behavior milestones assessment and placement program: The VB-MAPP. Concord, CA: AVB Press.
- 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.
- Tu, J. C. (2006). The role of joint control in the manded selection responses of both vocal and non-vocal children with autism. *The Analysis of Verbal Behavior, 22*, 191-207.
- Wolery, M., Bailey, D. B., & Sugai, G. M. (1988). *Effective teaching: Principles of applied behavior analysis with exceptional students.* Boston: Allyn & Bacon
- Wong, C., Odom, S. L., Hume, K., Cox, A. W., Fettig, A., Kucharczyk, S., Brock, M. E., Plavnik, J. B., Fluery, V. P., & Schultz, T. R. (2014). Evidence based Practices for Children, Youth, and Young Adults with Autism Spectrum Disorders. Chapel Hill: University of North Carolina Frank Porter Graham Child Development Center.

Contact Information

www.pattan.net

Amiris Dipuglia

adipuglia@pattan.net

717 901-2214

pennsylvania
DEPARTMENT OF EDUCATION
Bureau of Special Education
Pennsylvania Training and Technical Assistance Network

Commonwealth of Pennsylvania
Tom Wolfe Governor