

Reducing Challenging Behavior in Students with Autism: Merging Visual Language and Applied Behavior Analysis

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Monarch Center for Autism



Learning Objectives

- Participants will be able to define functional communication training and discuss why it can significantly reduce challenging behaviors.
- Participants will be able to take a step-by-step approach to identifying and assessing problem behaviors as well as visual language strengths and weaknesses.
- Participants will be able to map visual language onto Applied Behavior Analysis (ABA) teaching strategies.
- Participants will be able to learn how to use systematic strategies to teach replacement communication and behaviors.
- Participants will examine case studies that demonstrate how to scaffold visual supports for different types of students, based on baseline data collection and the results of language assessments.
- Participant will be able to monitor and generalize these skills in students with Autism.

A hand is shown writing on a dark blue chalkboard with a yellow highlighter. The text is written in a white, handwritten font. The background is a dark blue chalkboard with some faint, light blue lines. A yellow highlighter is visible in the bottom left corner of the image.

Teaching is the
arrangement of
contingencies to
facilitate learning--
B.F. Skinner

Visual Processing Strengths

....people with autism concentrate more brain resources in the areas associated with visual detection and identification..... might explain outstanding capacities in visual tasks.

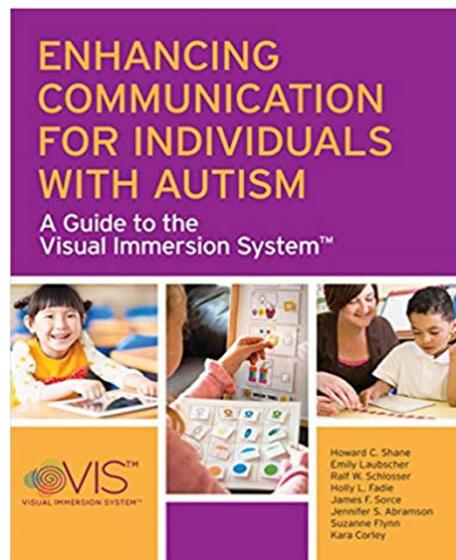
Mottron, L., (April, 2011). *Visual Processing Strengths in Autism, Human Brain Mapping.*

Why are visuals important?

- Most students with Autism Spectrum Disorders have difficulty processing information auditorily.
- Visuals have staying power.
- Visuals give more information than speech alone.
- Visuals are more concrete. There is nothing about tone of voice, sarcasm, etc. that you need to interpret.
- Visuals can help decrease anxiety.

Visual Immersion Programming

- “A visually based approach to communication intervention that provides strategies and techniques for treating communication impairment based on a combination of evidence-based practices and clinical experiences.”



Key Advantages of Visual Immersion Programming

- Visual Symbols are the foundation of speech and language acquisition
- Uses all types of visual symbols (drawings, photos, objects, text, moving images)
- Makes **optimal use of electronic screen displays**
- Emphasizes comprehension as the foundation for communication while also providing an avenue for expression.
- Promotes the use of a range of parts of speech (**not just nouns!**)
- Allows the learner to move between broad dynamic and static scenes to single and multi-element cues.

Behavior & Communication

Elementary Verbal Operants

- Mand
- Tact
- Echoic
- Intraverbal
- Codic
 - Textual
 - Transcription
- Duplic



“7 Functions of Communication”

- Protesting and Refusal
- Organization and Transitions
 - Requests
 - Directives
 - Comments
 - Questions
- Social Pragmatics

Functions of Behavior

Socially-Mediated

- Attention: contingent on the behavior, the learner has obtained attention in the past
- Escape: contingent on the behavior, the learner has escaped or avoided a stimulus (usually aversive) in the past
- Tangible: contingent on the behavior, the learner has accessed preferred stimuli (items or activities) in the past

Automatic

- Positive: contingent on the behavior, the learner has experienced a pleasurable experience tied to the sensory receptors
- Negative: contingent on the behavior, the learner has experienced pain or aversive attenuation

Functional Communication Training (FCT)

- Based on differential reinforcement of alternative behavior (DRA)
- Once the function of a problem behavior is determined, that function, or reinforcer, is provided for more socially appropriate behavior.
- Typically thought of as a “replacement” behavior

Step 1

- Identify and define problem behavior
 - Repetitive and disruptive
 - Aggression, self-injurious behaviors, property destruction, elopement, verbal threats
 - How are these behaviors affecting others?



Case Study- Luka

- 10 year-old student
- **Physical Aggression (PA) is defined as any occurrence of the following:**
 - Hitting: characterized as any occurrence of making contact with any part of another person's body with an open or closed hand from a distance of six inches or more
 - Kicking: characterized as any occurrence of making contact with any part of another person's body using a foot from a distance of six inches or more
 - Scratching: characterized as any occurrence of digging the fingernails into another person's skin and/or moving them across another person's skin or clothing
 - Biting: characterized as opening and closing of jaw with upper and lower teeth making contact with any part of a person's body part
 - Pinching: characterized as any occurrence of making contact with another person's skin or clothing with fingers shaped like forceps
 - Grabbing: characterized as any occurrence of making contact with another person's skin or clothing with an open hand and closing the hand forcibly around the skin or clothing
 - Lunging: characterized as a quick and sudden movement of the upper body with arms outstretched toward staff (may or may not involve contact, may or may not involve movement of the lower half of the body)
 - Hair-Pulling: characterized as any occurrence of making contact with another person's hair and grasping with a closed fist and/or pulling hair away from the person's head.
 - Head-Butting:: characterized as any occurrence of using head to make contact with another person's body

Case Study - Luka

- Luka's aggression can range in intensity from mild (disruptive with little risk of harm) or moderate (causing minor injuries) to severe (a significant threat to health or safety). Scratching, pinching and biting can cause redness or break the skin, while grabbing the hair of staff or peers without letting go can cause hair to be pulled out. Head butting, pinching, kicking, and hitting can cause redness or bruising. These instances result in Luka being unavailable for instruction, disrupt his ability to learn, and require full adult attention.
- Luka's self-injurious behavior can range in intensity from mild (disruptive with little risk of harm) or moderate (causing minor injuries) to severe (a significant threat to health or safety).

Step 2

- Complete a Functional Behavior Assessment
 - Completed by behavior analyst/specialist
 - Identifies a target behavior
 - Collects baseline data
 - Develops hypothesis statement – the “why”
 - Tests hypothesis
 - Develops interventions

Note:

If the behavior is serious or harmful, consult with a behavior analyst before implementing an intervention for behavior reduction.

Go to www.bacb.com to find a behavior analyst

Results of the FBA

- Attention: comments, pragmatics
- Escape: protest, O&T, directives
- Tangible: request, O&T
- Automatic (sensory/pain attenuation): comments

Case Study - Luka

Based on staff interviews, direct observations, and narrative antecedent behavior consequence data, the following hypotheses remain regarding Luke's target behaviors:

- When presented with non-preferred work tasks, Luke will engage in the target behaviors of physical aggression, because in the past, Luke has escaped the non-preferred work tasks. (socially-mediated negative reinforcement)
- During periods of low attention or when wanting to access attention, Luke will engage in the target behaviors of physical aggression, because in the past, Luke has obtained attention from staff. (socially-mediated positive reinforcement)

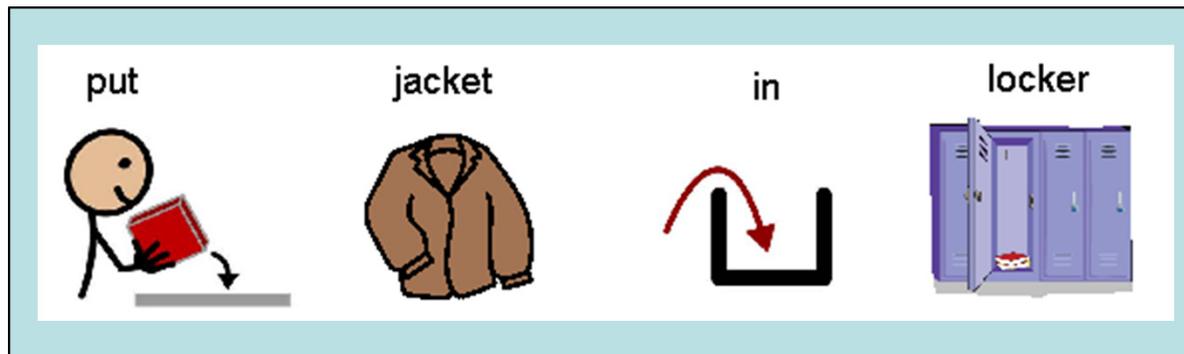
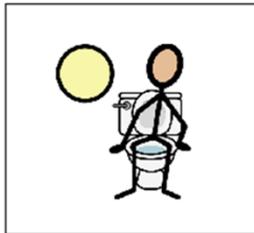
Step 3

- Develop replacement behavior
 - Once you have identified the target behavior for reduction, what would you like the student to do instead?
 - Consider Speech/Language Assessments
 - Would the student be expected to perform the replacement behavior in all environments with all staff?
 - Is the replacement behavior more effective than engaging in the problem behavior?
 - Is the replacement behavior low effort enough?

Considerations for Replacement Behavior

- *Speech and Language Assessments*
 - VRA
 - Which visual representation does the student understand best?
 - MAIVS
 - Which type of visual support helps the student learn best?
 - Mode of communication
 - PECS book, SGD, Sign?
 - Receptive and Expressive measures
 - Standardized or informal

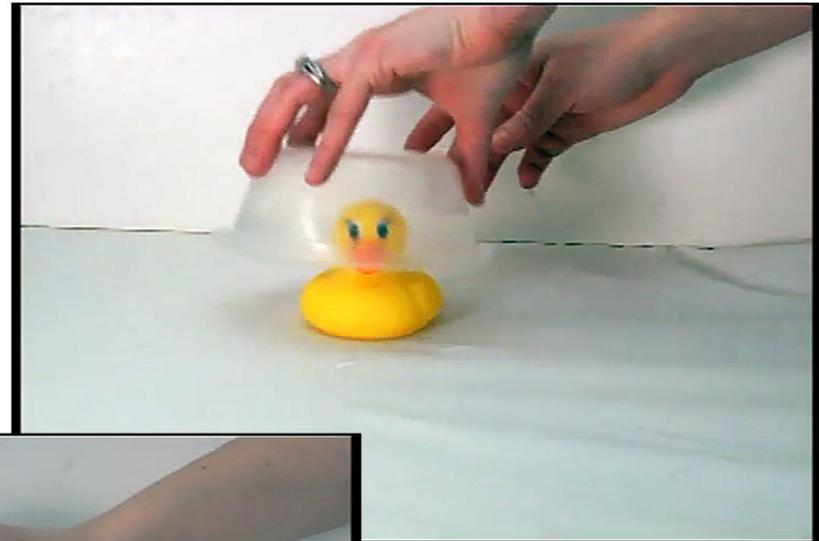
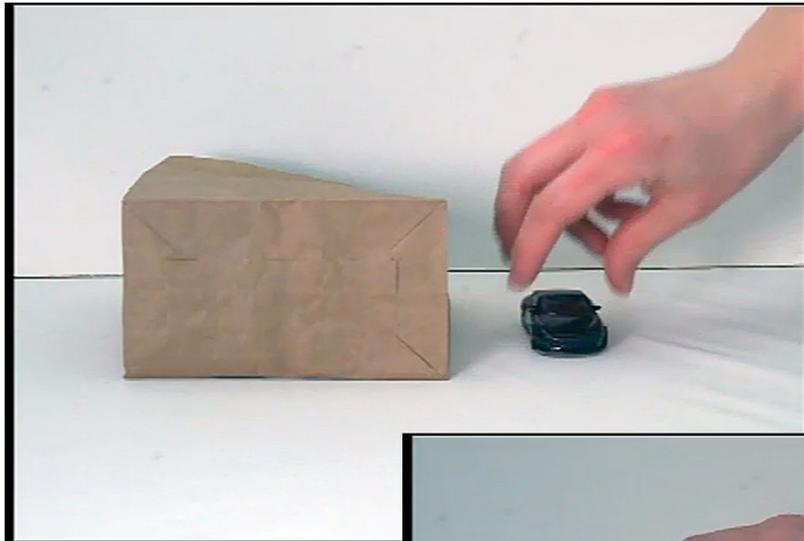
Find the symbol system that works best for your student



Preposition Action Concept Evaluation (PACE):

- PACE evaluates which modality students most effectively understand directives that contain a preposition (e.g. “put the block under the box”); verbal directions, static scene cues, or dynamic scene cues (video models).

Samples of the scene and static cues:



Student Participating in PACE

- Pace Example Video

Case Study - Luka

Results of the VRA: responds to direct objects to introduce new vocabulary/skills

Results of MAIVS: unable to be completed due to attentional considerations and need for object level representations.



Keep in mind...

What is your student trying to communicate by engaging in a specific behavior?



Let's Revisit!

Behavior & Communication

Elementary Verbal Operants

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“7 Functions of Communication”

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Protesting

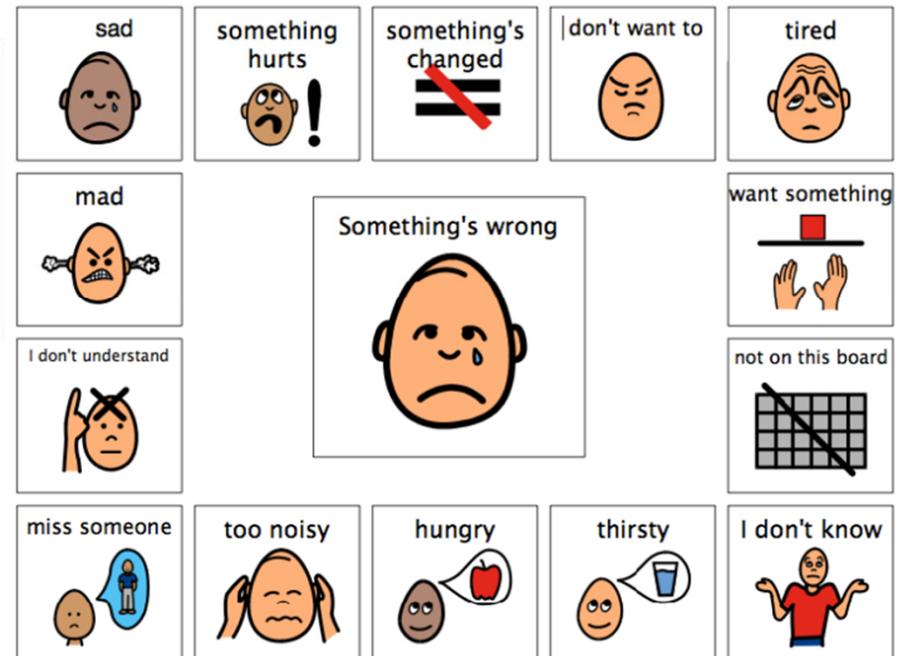
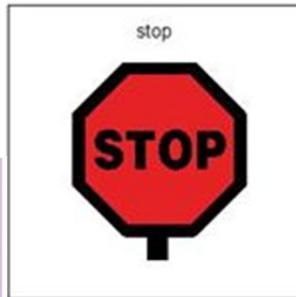
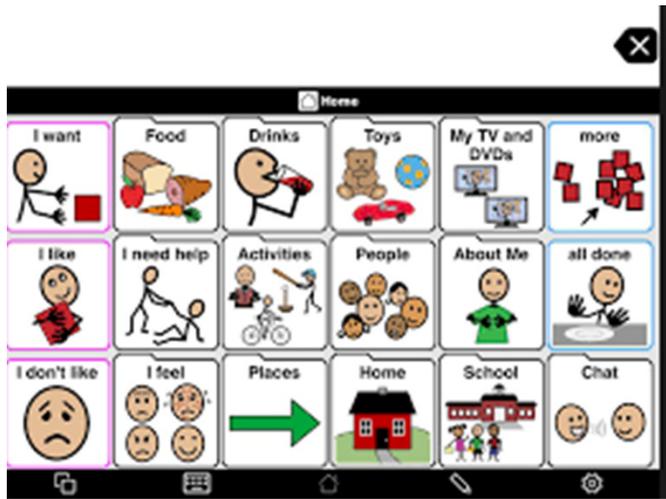
- Definition:
 - Protest: behavior that expresses objection or disapproval of an activity, event, or person.
 - Refusal: behavior that expresses rejection of an object, activity, or event suggested or initiated by another person.



Considerations

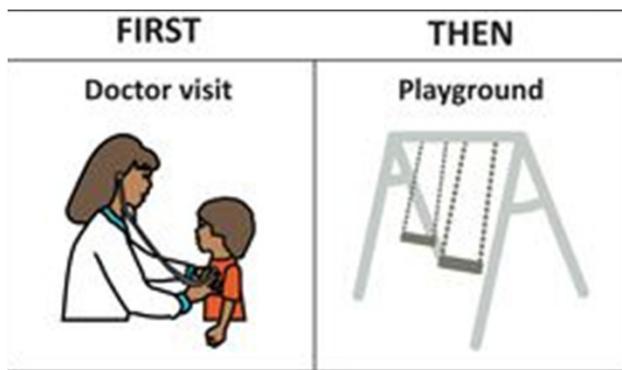
- Is your student able to appropriately protest when they are not escalated?
- Has your student generalized the ability to protest?
- What does their protest look like (verbal, visual, gestural)?

Supports for Protesting



Organization and Transitions

- Definition:
 - Organization: arranging elements (e.g., tasks, events) into an orderly, functional, structured whole
 - Transition: the process of changing from one state, stage, or activity/environment to another.



Considerations

- Is the student able to sustain participation?
- Are they able to participate in a variety of settings?
- How tolerant of change is your student?

Supports for Organization and Transition

Xai's Schedule

8:45	Meeting Meeting
9:00	[Photo]
9:30	[Photo]
10:00	[Photo]
10:30	[Photo]
11:00	[Photo]
11:30	[Photo]
12:00	Lunch
12:30	[Photo]
1:00	Speech group
1:30	[Photo]
2:00	Current Events
2:30	Current Events

Courtney's Schedule

8:45	Hom. Mtg.
9:00	Lauren
9:30	Ronnell
10:00	Alyssa
10:30	J. B.
11:00	Jackie
11:30	Art
12:00	Lunch
12:30	Ronnell
1:00	Speech group
1:30	Leisure Skill
2:00	Current Events
2:40	Class Store

First	Then
	
	

First	Next	Then												
<p>Math</p>  <p>10 Trials</p> <table border="1"> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>									<p>Basketball</p>  <p>5 Baskets</p> <table border="1"> <tr><td></td><td></td><td></td><td></td></tr> </table>					<p>Videos</p>  <p>15 minutes</p> 

Requesting

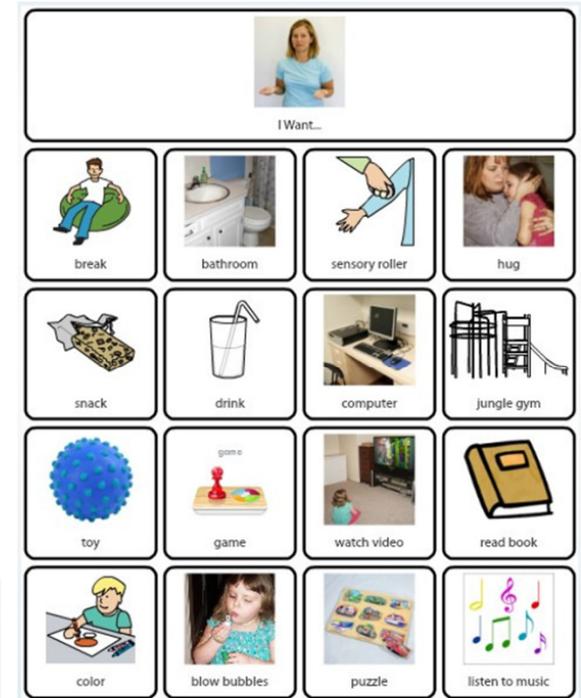
- Definition:
 - Request: expressing a desire for preferred objects (e.g., toys, food) and activities.



Considerations

- Have you conducted a preference assessment?

Supports for Requesting



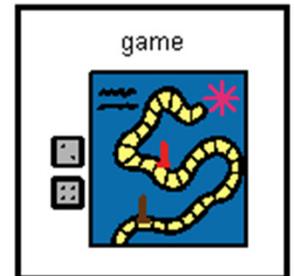
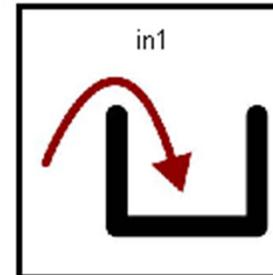
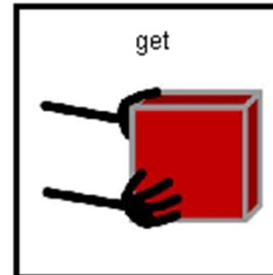
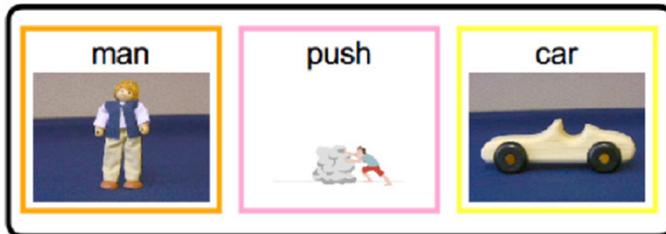
Directives

- Definition:
 - Directive: language used to control the behavior of another.
 - ~Instructional: (e.g. cut, point, circle)
 - ~Control: regulate learner's behavior (e.g. sit down, quiet, etc)
 - ~Routine-based: actions pertaining to participation in routines (e.g. get, open)
 - ~Play-based: (e.g. roll, throw, blow)

Considerations

- *What type of direction are you presenting?*
- *What part of the directive is your student cueing into?*
- *Do you have students who can follow familiar directions, but struggle with novel directions?*
- Students being corrected causing escalation?
- Over prompting verbally to aid student in following directives?
- Student is unable to control their environment beyond requesting for tangible items

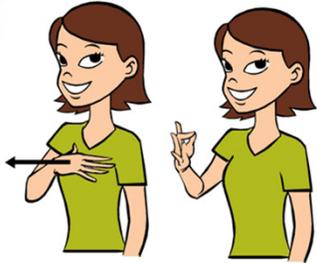
Supports for Directives



Commenting

- Expressive in nature-intended to entice a 2-way conversational exchange
- Some degree of *motivation* is required to make a comment
- Comments: a **behavior, gesture, vocalization, or other modality** that conveys information about observations, experiences, knowledge, opinions, emotions, and reactions.



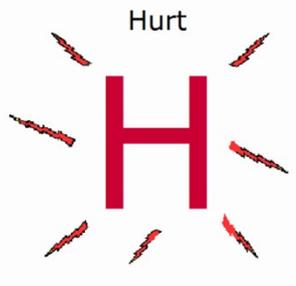
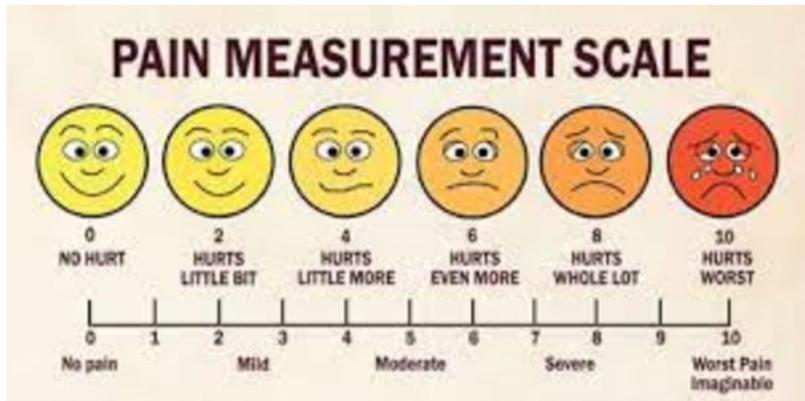


Considerations

- Comments are NOT necessarily **verbal**
- Earliest form of commenting is object labels
- Comments vary in complexity (i.e. “Doggy!” to “Look at that big hairy slobbery dog drooling on that boy!”)
- This first comments develop from **observing** the world around us and mapping language to it
 - “Look, I see a doggy!”
- **Internal** commenting is a later developing skills, but just as important
 - “I feel sick today.”
 - “I feel so worn out.”



Supports for Commenting

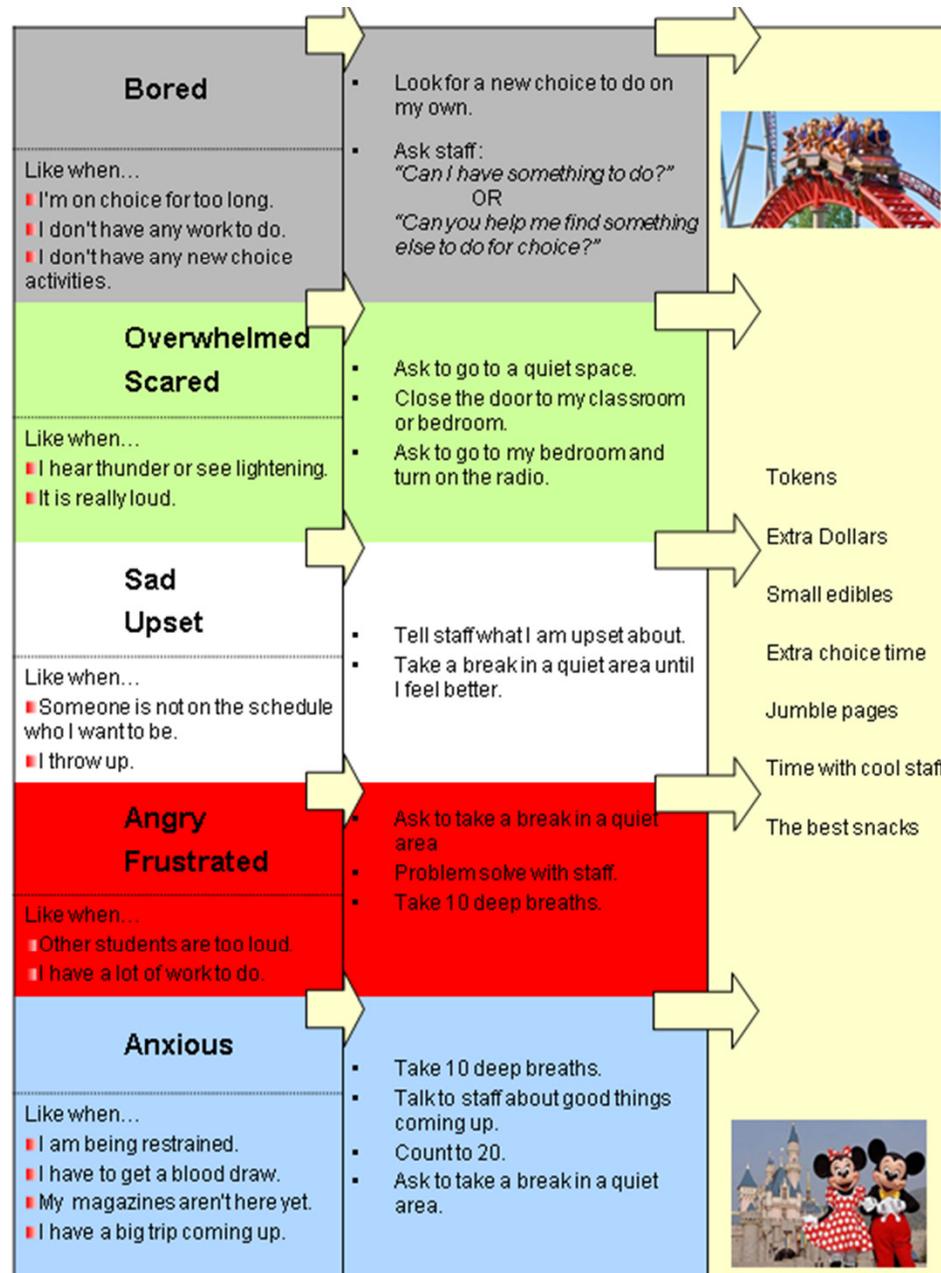




Four empty white rectangular boxes with black outlines, arranged horizontally on a grey background.

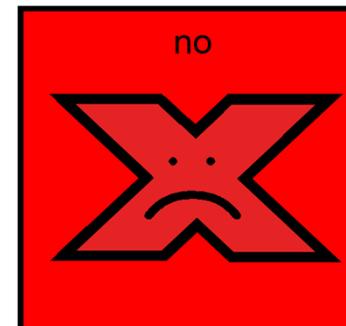
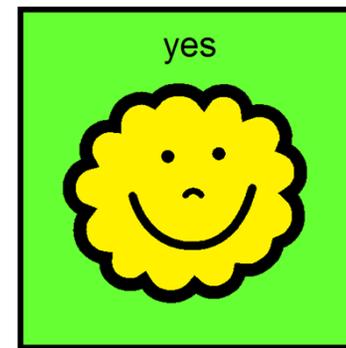


Agents	Actions	Adjectives	Objects
 The girl	 pulls	 a black	 suitcase
 The boy	 gives	 a pink	 soccer ball
 I	 kicks	 a green	 cup



Questions

- Two types:
 - 1. Wh-questions (e.g. Which (choice making), When, Who, What, Where)
 - 2. Yes-No questions
 - -Is this a _____?
 - -Do you want a _____?



Considerations

- Is our student answering accurately?
- Do they understand all of their options?
- Can they discriminate questions? (e.g. “Where do you want to go?” vs. “What do you want?”)
- Is your student understanding their options?
- Do they understand their role in question/answer?
- Is there the potential for an increase in communication breakdowns?

Supports for Questions

who 	what 	where 
girl 	swinging 	swing 

what		
		
	WHAT Use to ask about a thing	
If someone asks a question that starts with the word WHAT, your answer is an object or some thing		
	What is your favorite toy? What did you eat? What do you write with?	

Who?

Where?



What?

Conversation Questions	Who?	Where?
	Who went with you?	Where is _____?
	What?	When?
	What did you eat?	When did you go?
	What did you watch?	How?
	What did you do?	How did it happen?
	What did you see?	Did?
	What did you buy?	Did you like it?
What else _____?	Why?	

Social Pragmatics

- Definition:
 - Social Pragmatics: Use of verbal and nonverbal language as a means of engaging communication partners in an exchange to initiate, maintain, and terminate interactions.



Considerations

- What does your student's behavior look like as means to engage in/ end an interaction?

Supports for Social Pragmatics

First...

Talk about trains for 10 minutes



Then pick something new to talk about...

baseball



American Idol



homework



movies



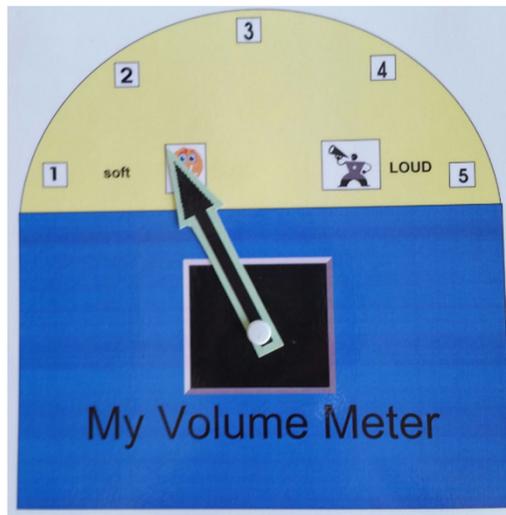
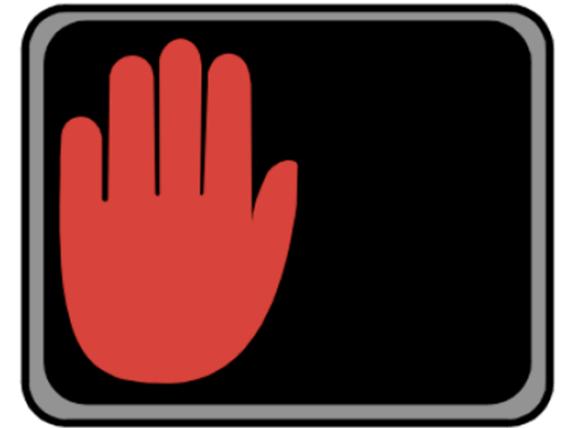
vacation



music



wait



hi



goodbye



talk



listen

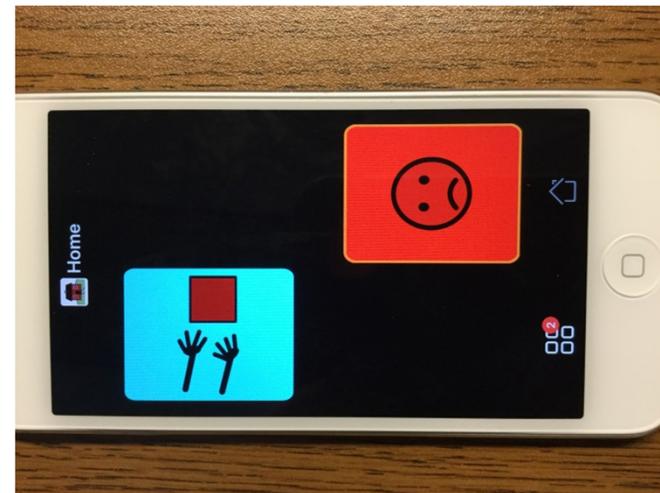


Collaboration Across Disciplines

- What can each discipline contribute to the generalization of replacement behavior?
 - OT
 - Behavior Analyst
 - SLP
 - Supervisor/Administration
 - Parent/Guardian
 - Physicians/Specialists

Case Study - Luka

- Replacement behavior identified as:



Step 4

- Design and develop data collection system
 - How will you track the success/failure of your replacement behavior?
 - When will the team decide whether the replacement behavior is successful?
 - Consider graphing and visual analysis

Monarch School
ABC Analysis

Student:

Date	Time / Subject	Staff Involved	Antecedent (what was occurring just before the behavior)include setting	Behavior (include frequency/duration)	Consequence (what occurred immediately after the behavior)

Case Study - Luka

Luka

Week of: _____

Monarch School
 Data Sheet: Frequency Recording

Target Behavior

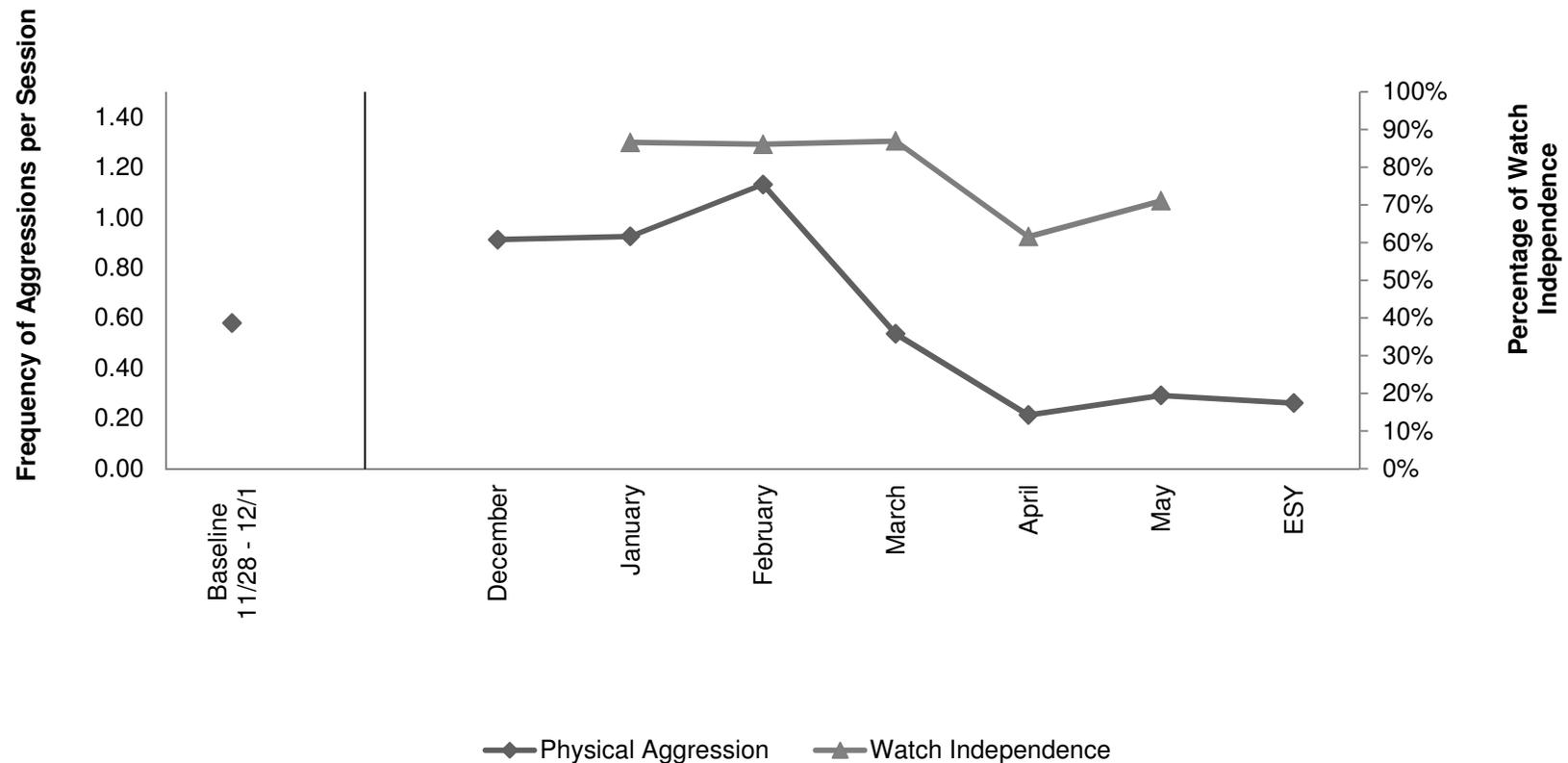
Aggression (A): Episodes of hitting, kicking, scratching, biting, pulling hair or grabbing, head-butting

- Staff will tally the # of episodes of target behavior per session. If there was no target behavior staff will mark 0.
- An episode is defined as the moment Luke makes contact and begins target behavior(s) and ends when contact is not maintained and target behavior is not occurring.

Monday		Tuesday		Wednesday		Thursday		Friday	
Date:		Date:		Date:		Date:		Date:	
Time	A	Time	A	Time	A	Time	A	Time	A
8:30		8:30		8:30		8:30		8:30	
9:00		9:00		9:00		9:00		9:00	
9:30		9:30		9:30		9:30		9:30	
10:00		10:00		10:00		10:00		10:00	
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12:30		12:30		12:30		12:30		12:30	
1:00		1:00		1:00		1:00		1:00	
1:30		1:30		1:30		1:30		1:30	
2:00		2:00		2:00		2:00		2:00	
2:30		2:30		2:30		2:30		2:30	

Replacement Behavior & Target Behavior

Luka: 2017-2018
Target and Replacement Behaviors



Step 5

- Manipulate environment to motivate the student to want the reinforcer (attention, escape, tangible, automatic) and then prompt the replacement behavior.
- Are you giving your student enough opportunities to engage in the replacement behaviors?



Prompt Reminder

- What is the least intrusive prompt that will allow for correct responding?
 - Verbal
 - Visual
 - Gestural
 - Partial physical
 - Full physical



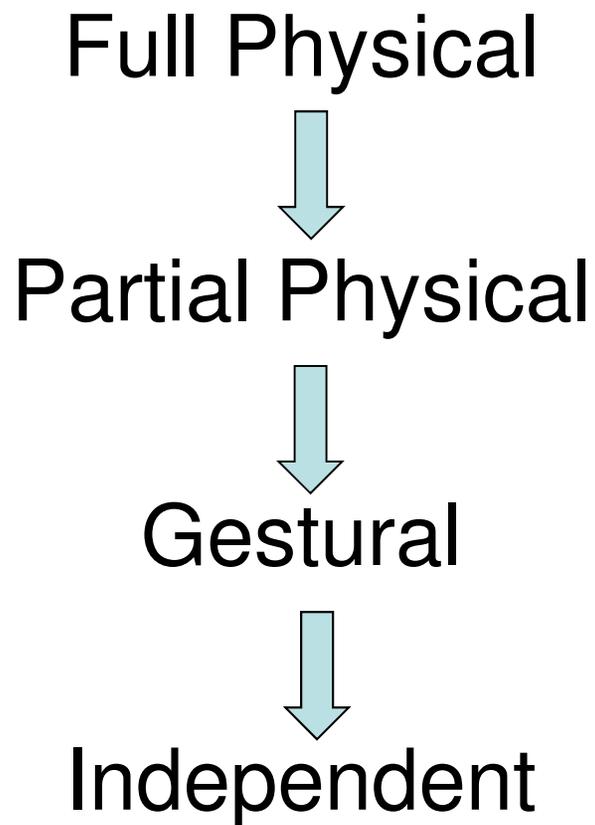
Case Study - Luka

- Staff limited attention to Luka to encourage the button-pressing behavior
- Staff would physically walk away from Luka's proximity (work table), to encourage button-pressing behavior
- Since both attention and access to items was provided quickly, staff would keep preferred items in view of Luka

Step 6

- Identify a planned prompting procedure and teach to staff
 - Think back to the prompting hierarchy
 - What type of prompt does your student respond to best? (i.e. doesn't like being touched)
 - What is the least restrictive prompt for your student?
 - Think about how to generalize

Case Study - Luka



Step 7

- Do not reinforce problem behavior
 - DRA procedure refers to how you reinforce the alternative behavior vs how you reinforce the problem behavior
 - When safe to do so, educators/parents should attempt to avoid providing reinforcement when problem behavior occurs
 - When safety is a concern, provide a lesser magnitude of the reinforcer when problem behavior occurs.

Case Study - Luka

Reactive Procedures (from BIP)

- *Extinction:* If Luka engages in aggressive behaviors, staff should not engage Luka in any type of attention to the behavior. Staff should place a mat between themselves and Luka and refrain from all verbal redirection to the behavior. Once Luka is refraining from physical aggression, staff should remove the mat and neutrally gesture Luka back to activity.

Step 8

- Reinforce replacement behaviors
 - All team members must consistently provide immediate reinforcement for replacement behaviors
 - Keep in mind:
 - Density
 - Satiation
 - Immediacy
 - Deprivation
 - When natural reinforcement is not enough....
 - if necessary complete a preference assessment



Preference Assessment

- Procedures used to determine:
 - a. The stimuli that the person prefers
 - b. The relative preference values of those stimuli (high vs low)
 - c. The conditions under which those preference values change when task demands, deprivation states, or schedules of reinforcement are modified

Cooper, J.O., Heron, T.E., Heward, W.L. (2007) *Applied behavior analysis*. Columbus, OH: Merrill Publishing Co.

Case Study - Luka

- Initially, each instance of button-pressing (whether prompted or independent) resulted in a continuous schedule of reinforcement (CRF) meaning that reinforcement was provided on a fixed schedule of one button press to one contact with reinforcement (in this case, attention and presentation of preferred items).

Step 9

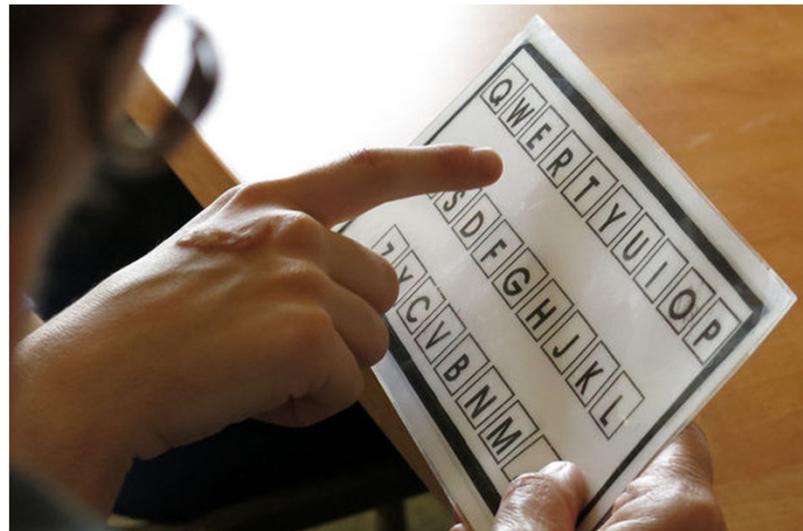
- Shape response
 - Educators initially accept any approximation of the replacement behavior
 - Slowly reinforce closer approximations of the replacement behavior until it more closely resembles the desired production

Case Study - Luka

- In the case of button-pressing behavior, the team did not need to shape the actual response. The team accepted all responses that activated the button.
- When the iPod was introduced with Proloquo2go, the behavior needed to be shaped to digit isolation in order to press the correct button to gain attention.

Step 10

- Fade prompts
 - fade the use of prompts so student can increase independence using replacement behaviors



Case Study - Luka

- Following the prompting hierarchy, as staff faded prompts, reinforcement followed closer approximations to the independent response. At first, FP prompt was accepted and met with reinforcement, shaped to PP prompt, to Gestural prompt, until an Independent Response was consistently emitted by the learner.

Step 11

- Increase time between replacement behavior and reinforcement
 - Discuss as a team when to start increasing time between replacement behavior and reinforcement
 - What is the end goal for the replacement behavior?

Case Study - Luka

- In this case, time between the replacement behavior and reinforcement was not increased due to the nature of the skill and our environmental set up.

Step 12

- **Maintain this skill!**



Case Study - Luka



Take-Aways

- Assessment of appropriate visual supports will help to implement the right visual language/communication for your student
- Provide visual supports and technology that will expand language functions and help reduce problem behaviors
- Provide each service provider/parent copies of the visual to support for generalization.
- Provide training regarding using visual communication and prompt hierarchy.
- Teach the skill while the student is receptive to learning.
- Finding the function of the behavior is the first step in reducing it.

Resources/Materials

Visual Language in Autism by Howard C. Shane and Sharon Weiss-Kapp (Nov 1, 2007)

- **Enhancing Communication for Individuals with Autism: A Guide to the Visual Immersion System** Oct 20, 2014 by Howard C. Shane Ph.D. and Emily Laubscher M.S. CCC-SLP

Use Of Augmented Input To Improve Understanding Of Spoken Directives

- By Children With Moderate To Severe Autism Spectrum Disorder
-
- Invited Paper to Appear in:
- *eHEARSAY*
- *Journal of the*
- Ohio Speech Language Hearing Association
-
-
- By
- Rebecca Remner M.S. CCC-SLP
- Melissa Baker M.S. CCC-SLP
- Christian Karter M.A.
- Kevin Kearns, Ph.D.
- Howard Shane, Ph.D

More resources

Preference assessment:

http://ttac.odu.edu/_public/file/ReinfAssessIndSevereDisab.pdf

- **Monarch friends and family:** Monthly newsletter that contains printable visual supports, upcoming webinars and trainings, app ideas, etc.

– <http://www.monarchcenterforautism.org/contact-us/join-our-email-list>

ViZZle: <http://www.monarchteachtech.com/try-vizzle-free/>. **ViZZle** is an all-in-one digital resource center for special educators. Played on any device or computer from any location, **ViZZle's** multipurpose software allows educators to: Search a peer-reviewed library of almost 15,000 interactive, visual PreK-12 lessons on any subject using state standards or keywords.

Resources/Materials

- **Functional Communication Training: Steps for Implementation** National Professional Development Center on ASD November, 2010
- http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/FCT_Steps_0.pdf

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Monarch Center for Autism

- ❖ **Preschool**
- ❖ **Day School**
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- ❖ **Extended School Year Program**
- ❖ **Boarding Academy**
- ❖ **Adult Autism Program**
- ❖ **Adult Autism Residence & Support Living Settings**
- ❖ **Free Webinar & e-newsletter Series**
- ❖ **Online Resource Center**

- ✦ **Web:** www.monarchcenterforautism.org
- ✦ **Telephone:** 216.320.8945 or 1-800-879-2522
- ✦ **Address:** 22001 Fairmount Boulevard, Shaker Heights, Ohio 44118
- ✦ **Join our e-newsletter mailing list:**
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