

# Multi-Modal Communication and Learning Strategies for Children who face Significant Challenges

## Why Use Multi-Modality Communication and Adaptations for Young Children and Children Functioning at Young Levels? (Note: Use the term:

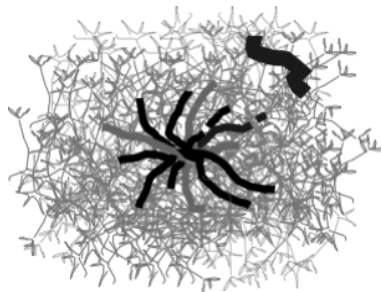
Complex Communication Needs, which puts the emphasis on needs vs. non, for example: non-verbal, non-speaking)

- Means of expressive language
- Means of improving receptive language skills for those children with auditory processing difficulties
- Provides a means for self-talk and cognitive processing
- Improves self-concept and self-esteem - Gives the child a sense of competence - which in turn, improves a child's ability to learn
- Facilitates speech for children who would be considered pre-verbal (We now have research and clinical evidence that shows multi-modal communication does not hinder speech development and in some cases it enhances speech development)
- Facilitates functional and appropriate use of speech
- Reduce frustration and behavior problems
- Makes language more concrete and less transient
- Provides multi-sensory input, and levels the playing field for children who are developmentally delayed
- Increases participation in daily life
- Means of interacting with Peers and provides a vehicle for developing social skills
- Means of manipulating play materials to learn cognitive concepts
- Provides support for emerging literacy and emerging mathematical concepts

## How Do All Children Learn? How Can Adaptations Help?

- Learning is Connecting Intent with Movement: Physical, Emotional and/or Cognitive Movement
- Learning is Enhanced by Attention to Relevant Components
- Children are born with billions of neurons and trillions of neurological connections
- Through experience, children learn by creating/building/expanding sets of neurological connections known as a neural network or cognitive schema and they use these cognitive schema as the basis for understanding new experiences.
- "What Fires together, Wires Together"
- Learning is the process of strengthening connections, adding connections and discarding connections based on experience (The child's cognitive schema for a particular concept is strengthened, expanded and refined)

- "Use it or Loose it!"
- Neural Networks or Cognitive Schema represent understanding about a concept that is processed in many areas of the brain to give a rich representation of all the aspects of that concept. For example, neurological connections related to one concept may extend to areas of the brain that process: visual, auditory, tactile, kinesthetic, olfactory, gustatory, vestibular, proprioception, function, cultural considerations, context and other associated concepts.
- Teaching needs to focus on helping children build more robust neurological connections and cognitive schema
- Once a neural network or cognitive schema is in place it operates unconsciously in the background until there is a reason to pay attention to it
- Attention to any aspect of that cognitive schema immediately gives the person access to everything connected to that concept
- Interaction is Critical for Learning Language - *Second Language Infant Studies* (Patricia Kuhl 2003)
- It is critical to teach concepts within natural contexts so that neurological connections for a given concept will be "wired" together for access later
- Learning and memory are contingent on being able to retrieve the information when needed for function
- Children who have normal processing build a complex network that encompasses many parts of the brain
- Children with abnormal processing or less connections to start with, may only build limited connections with fewer associations to a wide range of understandings
- Too much information coming in that doesn't make sense results in over-stimulation and that results in either: 'shutting down' or 'acting out'
- Shutting down can be a compensatory strategy to overload
- Frequently fear response is activated in the amygdala when there is too much unknown - resulting in fight or flight reaction. (acting out) This can prevent much of the information from reaching the frontal cortex for rational processing. Learning cannot occur.



Schematic Drawing of Neurological Cognitive Schema vs. Isolated Connections

## How Can You Help Children Develop x Neural Networks and Cognitive Schemas?

- The brain is not a video recorder of every detail
- The brain looks for patterns and changes in patterns
  - Memory is stored as patterns, not details
- Routines become patterns
- Patterns can be: Visual, Spatial, Auditory, Tactile, Kinesthetic, Temporal, Procedural, Cognitive, Linguistic, Multi-Modal, etc.
  - Patterns are learned through experience - not isolated drills
- When we "See" a Difference in an Expected Pattern, We are Compelled to Attend to it and Process it!
- Learning Occurs When the Brain Compares an Incoming Pattern with an Expected Pattern and Detects a Difference
- Music, Rhythm, and Rhyme can be used to Emphasize Patterns
  - Rhythmical Intention for teaching voluntary intent to move
  - Technology Can Emphasize Patterns and Comparisons
- Very Young Children Can Understand Abstract Symbols As Long as they are Presented in a Consistent, Meaningful Pattern- **Speech is Abstract**
  - We need to choose appropriate symbols based upon a child's individual requirements
  - Then, we need to present them in natural contexts with a consistent, meaningful pattern
  - Language is a Pattern - Our Task is to:
    - Use Appropriate Modalities
    - Emphasize and Clarify the Patterns
    - Model Patterns in Context
    - Engineer Ways the Child can Actively Engage and Experiment
    - Provide Strategic, Clear Feedback

The brain is pre-wired to look for patterns and make comparisons to what is known



## Representational Hierarchy

- True for easier recognition of nouns without any prior learning
- Has nothing to do with language development - We learn language, not recognize language
- Words are abstract concepts that are learned by how they are used, not by how concrete or abstract they are.
- Cannot represent the early core language concepts that are not nouns: more, done, help, me, stop, uh oh, etc.

- The field of AAC historically looked at the representational hierarchy as a process to teach language, however, there is no evidence that this led to long term outcomes in language development
- More info at: [lindaburkhart.com](http://lindaburkhart.com) - click 'handouts' and scroll down to: Limitations with Using a Representational Hierarchy

### **Historical Strategies in AAC: What were we missing?**

- Neurologically, the brain needs a large enough set of experiences with meaningful use of language to recognize patterns and create meaning
- Historically, we offer children a limited set of choices - According to our agenda of what we think or want the child to say. This is actually harder for the child to learn that communication is about her own message and not just about making a choice from what is offered by others.
- Children begin using language based upon their own agendas, long before they can talk about what we want them to talk about, so others providing options is not how language is learned
- We need to provide enough language for the child to say what she wants to say
- Children are often asked direct questions with a right or wrong answer or given limited choices that don't go anywhere
- There is a need for children to initiate and carry-on a conversation
- Historically, vocabulary flies in out of thin air and then poofs back into oblivion at the end of the activity. Activity specific vocabulary is great, but it needs to become a part of the child's larger system
- We need to be presenting vocabulary that doesn't disappear and can be built upon, instead of replaced.
- The brain builds understanding based upon patterns
- PECs: The Picture Exchange Communication System
  - Designed to teach initiation (functional communication) using picture exchange - beginning with requesting tangible objects (For individuals who are not demonstrating communicative intent - Autism Spectrum)
  - No verbal prompts -Structured procedure for fading prompts
  - Great tool for what it is designed for!
  - Often used beyond original scope and applied to a larger range of children who already have communicative intent
  - Not a whole language system
- Historical strategy: "20 Questions"
- Need a way to systematize vocabulary so the child can begin to recognize a pattern in how vocabulary is presented

- Select and customize communication displays: 'light tech' or 'high tech' that systematically arrange vocabulary, so the child can take advantage of the pattern and focus on the conversation, instead of searching for vocabulary
- Use a language system that can provide a large robust vocabulary that is organized into a systematic pattern for children to learn - For example PODD (Pragmatic Organization Dynamic Display - Gayle Porter, Melbourne, Australia)
- Features of PODD (Pragmatic Organization Dynamic Display - Gayle Porter) that reduce load on working memory
  - Systematizes presentation of vocabulary
  - One less thing to juggle
  - Requires less sophisticated motor skill
  - Reduces random presentation of symbols that have to be consciously processed as new, each time
  - Uses recognition memory - reducing load on recall memory
  - Natural branching - eliminates meta cognitive process of planning what link to follow
  - Patterns that continue and build across increasing levels of language and access methods
- By Systematizing How Vocabulary is Presented, the Child Can Recognize a Pattern and Focus on Communicating Instead of Searching

### **Patterns are learned through experience, not drills**

- Children need to develop cognitive schema and broad understandings that can be generalized and built upon later.
- Problem Solving clarifies patterns. Getting it Wrong is as Important as Getting it Right
  - Allow for cognitive processing time with anticipatory pauses
  - Set up Problem Solving Opportunities
  - Mistakes are an Important Part of Learning
  - Help children recognize a pattern and then change it moderately to maintain attention and encourage curiosity
  - Engineer and scaffold 'failure free' learning experiences with clear feedback
- Using the AAC System to talk to the child teaches patterns
- Relate all activities to the child's experience, knowledge base and relevance
- Make the neurological connections!

### **Multiple Modalities**

- Some children have weaknesses in one or more areas of sensory processing. We need to make use of the child strengths at the same time we help the child make sense of their weaker senses.

- Not being able to move their bodies into position to see, hear or feel what they would like, complicates this problem.
- Processing information is often easier and more effective when presented through a variety of modalities such as sight, sound, smell, taste, touch and movement.
- When communication is difficult, it is especially important to enhance the auditory component of language with other modalities such as visual and tactile/kinesthetic.
- Sometimes this input needs to be presented simultaneously and sometimes sequentially. (See cortical visual impairment considerations below)
- It is important for children to experience language receptively that utilizes multiple modalities.
- Using picture communication symbols, voice-output and sign language as input can provide multi-sensory information for cognitive processing.
- Modeling the use of multiple systems, teaches subtle nuances and differences of using these systems, which become natural components of communicating
- By providing multiple modalities, the teacher/therapist/parent can observe, over time, what strategies are most meaningful to the child

## Natural Contexts

- Learning takes place most effectively within the context of a meaningful event and not in an isolated drill and practice session.
- It is critical to teach concepts within natural contexts so that neurological connections for a given concept will be "wired" together for access later
- This helps children relate what they already know to the new information - thus increasing motivation and retention.
- Provides meaningful opportunities for practice with natural variability to maintain interest.
- When learning is presented in an isolated situation, out of the natural context, there is less for the child to associate with and fewer opportunities for practice.
- In the infant/toddler program, parents need models of how to use these strategies in daily routines, because sitting down and "playing" with the child is only one small part of a very busy daily routine. Often time parents don't have the time to just play
- Aided Language Stimulation (Goossens', Crain and Elder) makes augmentative communication a natural language context
- Augmentative systems need to be seen by the child as a natural means for communication. This is another reason that the systems must be used by others, while communicating to the child.
- A variety of communicative functions need to be modeled in appropriate pragmatic contexts.

- Children's attempts to communicate also need to be responded to and expanded upon using the same systems that the child is using.
- What is the Cue? Because I actually want to do something for a genuine purpose within a natural context or because I recognized an artificial prompt?
- Natural environments teach natural cues.

## **Current Understandings about Autism Spectrum Disorders**

- There is a vast amount of research being done in the area of autism
- Autism is no longer considered a static brain disorder, it is now recognized as a dynamic disorder that progresses through different "wiring" of neurological connections in the brain
- Children on the Autism Spectrum's brains are different, and that difference is not static overtime
- Birth - brains are the same or a little smaller
- 6-8 months - rapid brain growth, then some time later, growth is arrested
- Mirror neuron networks deficient / different
  - Mirror Neurons enable a person to feel what someone else is feeling and interpret gestures they observe in others
  - Feel sad when people around you are sad
  - Feel afraid at a scary movie
  - Feel you own body react when watching sports
  - Intrinsically know what another person intends when they move their body in a particular manner - such as reaching to pick something up vs. moving their arm out to hit someone
  - Children on the Autism Spectrum feel sad, afraid, mad, happy, etc. But they aren't very good at knowing how someone else is feeling
- Children on the Autism Spectrum may have reduced ability to filter out what isn't important, and they don't always understand what is important or what they should pay attention to
  - may hear everything with the same volume
  - All these things pull their attention and they are Not sure what is important to attend to
  - This makes them fearful - they can't predict what will happen
  - They may need extra time to sort out and process information
- Picture symbols stay around longer than a spoken word, which gives the child more time to process
  - Many children on the Autism Spectrum understand better with visual supports such as:
    - demonstration or showing them something
    - picture schedule

- sequence of pictures showing the steps in a task
- Augmentative Communication Systems such as PODD
- Picture symbols should be used in context, so the context is stored in their brain along with the symbol for the language.
- In the same or similar situation, it may be easier for the child to remember the language that goes with that context.
- Some children on the Autism Spectrum learn language in chunks - instead of understanding how individual words can be combined to generate ideas
  - Using a word based robust language system to model language to the child may help them see how sentences are actually made up of individual words.
- Many children on the Autism Spectrum understand better with visual supports such as:
  - demonstration or showing them something
  - picture schedule
  - sequence of pictures showing the steps in a task
  - Augmentative Communication Systems
- Many children on the Autism Spectrum have differences in how they process sensory information
  - May be less sensitive or more sensitive
  - May be: hearing, vision, touch, smell, taste, movement
  - May not be able to feel where their body is in space
  - Similar to when your foot falls asleep
  - You stamp your foot to get more input and feel it
  - As it is waking up, it may hurt - "pins and needles"
  - It is hard to learn new movements when you don't get good feedback through your body
  - May take time to learn how to point accurately for communication and understand how language works
- When Children are Not Processing Much Speech,
  - They need:
    - More receptive models will be required before expressive use
    - They cannot "map" the symbols onto an existing language
    - They may learn AAC as their first language
    - More vocabulary is needed in the AAC system
- How is the Brain Wired?
  - Experience strengthens existing connections and makes new connections
  - Experiences that are perceived by the child to be reinforcing and relevant to know information get firmly wired
  - Strong emotional experiences get wired, (but with less detail)
- Researchers are Still Exploring - What goes wrong or is different and why



- Probably a combination of genetic tendencies that are expressed through environmental factors
  - Possibly an inflammatory process
- These children often have numerous associated challenges, such as sensory processing differences, gastrointestinal problems, sleep problems, food and chemical sensitivities, and undiagnosed medical issues related to the inability of these children to communicate what is wrong along with difficulty localizing pain and sensation in their bodies.
- May start before birth or happen around 12- 18 months - different types, but often there are some subtle signs earlier
- Multiple areas of the brain are affected
- Overgrowth: Amygdala, cerebellum, temporal lobes, prefrontal cortex, among others
- Overgrowth of local connections but limited growth in connections that connect one part of the brain to other parts of the brain
- Typical children: Social wiring comes early and forms a basis for developing language and communication skills
- Language development is built upon social interaction (Patricia Kuhl study)
- Autism: Faces, speech sounds and social interaction are not often intrinsically interesting, and may be overwhelming to one or more sense. Therefore, the child may have no internal reason to attend to that type of incoming stimulation
- A number of researchers such as Geraldine Dawson and Stanley Greenspan, (from very different perspectives) among others, are looking into the idea and suggesting that intervention that targets early social interaction might actually help to "re-wire the brain"

## **Current Understandings about Children who have Angelman Syndrome**

- Attention issues
  - Fleeting glances instead of sustained visual interest
  - Difficulty filtering out irrelevant input (everything pulls their attention)
  - Dyspraxia and Apraxia impact child's ability to attend on demand
  - Difficulty controlling impulses
- Strategies to Encourage Attention
  - Encourage attention, but don't demand it
  - Bring AAC closer - in the child's view
  - Flashlight - highlight what you model
  - Pull-off symbols (not as effective with Angelman Syndrome)
  - Keep modeling - even if child does not appear to be attending
- Sensory processing challenges (Varies by child)

- Dyspraxia and Apraxia
- Motor planning challenges
- Fine motor control (range)
- Some have auditory processing challenges and may need visual supports to augment understanding of speech
  - Need to move
  - Sensory seeking
  - Need to touch and explore their world
  - Some have difficulty looking and listening at the same time
  - Some have difficulty looking and touching at the same time
- Need for repetition for memory and retrieval (Video modeling with pragmatic context)
- Sometimes dual diagnosis / autism
- Anxiety (Need to trust communication partners and understand what is happening)
- Affect regulation (need to learn words to express mood)
- Some have a range of Cortical Visual Impairment (CVI)
  - More difficulty in handling the visual complexity of the display
  - Space between symbols reduces complexity
  - Visual latency may be a concern
  - Higher contrast symbols with solid shapes may be easier to see with a quick glance
  - Possibly getting some information peripherally
- Medical complications and seizures
- Children with Angelman Syndrome are now demonstrating ability to use robust AAC systems to communicate a full range of communicative functions

### **Understanding the Learner with Significant Physical and multiple Challenges:**

- Motor disabilities disrupt the child's natural ability to explore the world on her own and learn through experimentation
- Access to Learning Patterns may be more limited
- Frequently motor issues can occur with other multiple disabilities: sensory processing challenges, cortical visual impairment, ocular visual impairment, cognitive challenges, learning disabilities, auditory processing difficulties, hearing impairment, etc.
- Increased Passivity, agitation, sensory overload, and frustration are possible - Due to limited experiences of success
  - This may lead to less availability to take in information and learn
- Expectations are often set too low
- Since assessment requires a "motor response to a sensory input" (Gayle Porter), it is very difficult to determine cognitive abilities for children who have severe physical and multiple learning challenges:

- Testing only tells us something if the child responds correctly
- When child doesn't respond correctly, we can not know if the problem is due to motor, sensory, cognitive, or language challenges
- Cannot assume that the motor response is the same as the cognitive understanding
- we cannot assume that the motor response is the same as the cognitive understanding - especially at a young age
- It is usually very difficult to get a good measure of a child's cognitive abilities at young ages, because these children have trouble using typical non-verbal, pre-verbal and verbal communication
- These children often have trouble with typical skills that we classify as early communicative behaviors
  - Early communicative gestures such as reaching and pointing
  - Directed or coordinated eye-gaze for joint attention
  - Non-verbal signals
- Lack of early communicative gestures often cue caretakers to continue treating the child as if a much younger child, than chronological age
- "Catch 22" - We can't assess where the child is functioning due to lack of effective communication skills, but we don't know what communication systems to put in place, since we can't assess functioning.... round and round - often resulting in inappropriate teaching practices
- May take many many years to develop and refine their motor skills to be effective communicators
- Lack of motor success and problems with interpretation of feedback from their environment, can derail the development of the child's self-concept as a learner
- Development of passivity and learned helplessness is common
- Need to develop an active learning self-image instead of passivity (orthofunctional personality - András Pető)
- These children require activities where they can experience control and adaptations that enable them to learn through problem solving with exaggerated and clear feedback for their efforts
- Children need to learn more effective ways to move and manage their physical challenges - to prevent future orthopedic deformities and contractures
- Adults and adaptations need to provide a scaffold for learning - at just the right level of challenge for each child, so they can experience success

## **Understanding the learner with Rett Syndrome and Apraxia/Dyspraxia:**

### **General Characteristics of Rett Syndrome that Impact Learning**

- Rett Syndrome is a neuro-developmental, genetic disorder found mostly in girls -  
There is a phase of degeneration, but over-all it is not a degenerative disease.  
Children do make progress and learn.
- One of their greatest challenges is Apraxia/Dyspraxia.
  - Apraxia is the inability to reliably connect thought to action
  - Dyspraxia: the signal gets through some of the time, but may be delayed or misdirected
  - Neurological connections are formed, but not as strongly
  - Compare to using the back roads instead of the main highway
  - Getting from intent to action takes more time!
- Breathing and Alerting Abnormalities Affect Ability to Move as Intended
  - Difficulties with autonomic nervous system controlled by the brain stem
  - Breathing dysrhythmias
  - Weak parasympathetic (automatic calming) response
  - May get too much or too little oxygen and/or carbon dioxide due to breathing
- Difficulty Regulating the Autonomic Nervous system
  - Fatigue
  - Temperature regulation
  - Circulation (sometimes to one extremity randomly)
  - Sleep cycle disruptions
  - Swallowing
  - Gastro-intestinal movements
  - Anxiety
  - Agitation
- Observe for Sensory Regulation and Readiness for Learning
  - Identify signals of dysregulation and regulation for each child
  - Work with OT, family and others to make a list of strategies that help with regulation - Apply as needed
  - Take advantage of teachable moments when child is regulated
- Inability to Move Increases with Demand
  - The harder the child tries, the harder it is for her to perform it on demand.
  - May need to move away before moving toward what she intends
- Some motor skills remain intact - but only when triggered with an automatic event that doesn't require forethought or cortical intent. This can be confusing and may be interpreted by others as stubbornness, because it seems that the child can perform a task some of the time. However, the harder the child tries, the harder it is for her to perform it on demand.
- Sometimes the child seems to need to move away before moving toward what she intends. If you don't wait for the child to finish the intent, it may appear that she

is rejecting or responding incorrectly, when in reality she hasn't finished her movement yet

- Neurological Stereotypies
  - Neurologically caused - child does not intend to make these movements
  - Varies with day, stress, anxiety, pain, fatigue and other unexplained reasons
  - Masks intelligence
  - Often confused with sensory integration problems
  - The Child Must Over-Ride the Stereotypies to Perform a Motor Task for Communication
  - Wait for a response beyond the stereotypy with patient anticipation
  - Splinting
  - Music / Rhythm
  - Intention/Interest
- Masks intelligence
- May be interpreted by others as severe intellectual challenges
- Dyspraxia/Apraxia also affects movements that control speech
- Dyspraxia/Apraxia Affects Movements that control non-verbal communication
  - Difficulty moving as intended affects other communication skills - non-verbal social signals and sustained eye contact (She may appear disinterested)
  - May make it difficult to maintain eye gaze and move eyes efficiently (even though eye-gaze may be a strength)
- Significantly Increased Time to Initiate Movement
- Need attentive wait time from partners
  - Interact and then wait with attention
  - Sometimes look away to free gaze
  - Don't keep "re-booting" the system
- Verbal prompting may be less effective - especially if it is perceived as an instruction, which increases the dyspraxia
- Attentive / Respectful Wait time: Waiting for a response with patient anticipation is critical to success. The child learns which people will likely take the time to wait for her, so she can decide if it is worth her effort

**Note:** When the child produces spontaneous movement, no one can see the time it took between initiation and movement, which makes it challenging to know how long to wait. When in doubt, wait longer

- Sometimes, you can facilitate faster attention to you or materials: Movement, Proximity and Moving Your Face or Materials into the Child's View
- Sometimes talking the girl through the motor movements and /or modeling them may be helpful.

- Pressure to respond to a direct question or demand only increases the difficulty of being able to perform.
- Strategic Feedback and a little Assistance when Stuck
  - Move a little - at pelvis, trunk or shoulders
  - Separate hands
  - Only help once child shows intent
  - Allow child to complete movement on her own
- Motivated by Connection with Others:
  - They learn well from watching peers
  - Work with peer next to them
  - Be interactive - socially engaging
  - Take turns, laugh, tease and share pleasure in little things
  - Makes movement easier
- Model everything! Help child see the big picture
- Use peers for social motivation
- As with other children with motor challenges, these children often have trouble with typical skills that we classify as early communicative behaviors
  - Early communicative gestures
  - Directed or coordinated eye-gaze for joint attention
  - Non-verbal signals
  - Therefore, they may get incorrectly labeled as "pre-intentional" or "low functioning" and not provided with appropriate Augmentative and Alternative Communication Systems, supports, and strategic learning environments
  - We cannot see intention, so for children older than the age where typically developing children show intention we cannot use the term "pre"
- It is Easy to Make the Wrong Assumptions about Cognitive and Language Potential for Children with Rett Syndrome
- Children with Rett Syndrome are Often Underestimated
  - Severe difficulties in letting us know what they know
  - Behaviors (stereotypies) beyond their control make them appear cognitively younger
  - Limited expectations can impact their learning opportunities
- Children with Rett Syndrome are Reading and Participating in Academic Learning
  - Many do best in inclusive environments
  - Modifications include adjustments for
    - Quantity
    - Time allowed
    - Working with peers in group projects
- Keep your Expectations Open about Cognitive and Language Potential for Children with Rett Syndrome!

## Motivation for Learning

- Motivation is **more than enjoyment**. It comes from an inborn drive to explore the world: 3 drives
  - Drive for Cognitive Curiosity and Intrigue "The Need to Know"
  - Drive for Autonomy and Sense of Self
  - Drive for Social Connection

## Motivational Drive 1: Cognitive curiosity "The Need to Know"

- Babies are Motivated to Learn Through Problem Solving
- Cause and effect learning - baby scientists - Hanus Papousek (1969)
- Problem of habituation (Boredom develops with too much repetition that is not child-directed)
- Repetition is necessary for learning.
- Too much repetition can cause habituation
- Balance of Novel and Known
  - Children learn by a process of gradually adding to what is known through comparisons and patterns.
  - Start with Known Information and Build Systematically
  - Help the child build associations and comparisons to known information
- Start with what the child understands. Patterns that make sense, and then provide **repetition with moderate difference**
  - This taps intrinsic motivation and assists learning
  - Helps the child relate new information to familiar information and build associations
- Meaningful repetition within natural meaningful contexts provides active practice for developing skills. The use of natural motivation that includes variation (moderate differences) holds interest and helps child internalize a broader understanding of concepts.
- Personalize materials and use preferred/familiar items
- Use Multiple Modalities for better processing Set up activities for the child to use a combination of previous knowledge and trial and error to achieve success.
- Battery operated toys - give them a mission: deliver snack to a friend across the table, kick a ball, knock down blocks, act out a part of a story, etc.
- Repeated Readings with Moderate Differences:
  - Research shows that repeated readings of a favorite book is an important early literacy skill
  - Typical children naturally add moderate differences with each reading

- Children who don't have a means to interact with the book, may get bored with the book being read the same way over and over
- Read the same story on multiple occasions with moderate changes each time
- Begin with real life experiences that include multi-modal communication and create or select books related to those experiences. The book then becomes a moderate difference to what the child has experienced and will thus facilitate associations
- Read with multiple modalities - emphasizing one over others at a given time: sign language, picture symbols voice-output overlay
- One option is to add more pages to the book each day for sequential stories
- Add the voice-output device for sound effects or repeated lines (time dependent and non-time dependent - Goossens')
- Incorporate a song, or chant into the reading
- Use a robust AAC system to talk about book, pictures, events, characters, feelings, problems, solutions
- Reread versions of the story on computer: PowerPoint, IntelliPics Studio, etc.
- Have students act out the story - use props, signs for costumes and visual, tactile and positional stage settings
- Re-read the same stories with different purposes for listening/reading
- Write about it with alternative pencils (Center for Literacy and Disability Studies UNC) and robust aided-language system
- Write your own books with the student based upon their experiences
- Theme based learning provides multiple experiences with a concentrated set of vocabulary and concepts without being monotonous. The theme provides a context
  - Consider language themes that can be built upon throughout the year such as shopping or food preparation as opposed to seasonal or holiday themes
  - Help students see connections of concepts in a variety of activities within a theme
- Provide multi-modality experiences in natural contexts instead of teaching isolated tasks that are unrelated to what the child already understands
- Engineer the environment to prevent sensory and information overload, so the child will be more likely to be in a receptive state for learning
- Provide computer activities that allow the child to read with different voices to encourage repetition with variety
- Teach language in natural contexts throughout the day - not just in isolated activities
  - Natural contexts provide opportunities for repetition with variation
  - Emphasize communicative functions in a variety of natural contexts



## Work towards Mastery Motivation:

Mastery Motivation: "a psychological force that originates without the need for extrinsic reward and leads an infant or young child to attempt to master tasks for the intrinsic feeling of efficacy rather than because of recurrent reward"

(Morgan, MacTurk, & Hrnccir, 1995, p.6)

- Mastery Motivation is internally driven motivation - Active engagement with the internal desire and external supports to "figure it out"
- Children Need to See a Reason for Doing Something
- Problem solving is critical - Getting wrong is as important as getting it right
- Children will be motivated to only do what they know they can do or assume they can do successfully - This is often interpreted by others to mean: "She only does what she wants to do."
- Withdrawal or passivity may be the child's way of protecting themselves from further failure
- When a child wants to do something, her brain actually acts more efficiently and that task becomes easier for the child



**Summary of Cognitive Drive:** All people have an inborn need to figure things out and to understand what is happening. We foster this in children by:

- Following their interests
- Setting up the world for them to figure things out
- Explaining or showing (at whatever cognitive level possible) why they might want to try something
- Explaining or showing (at whatever cognitive level possible) why things are happening when they feel confused, frustrated or are in "lymbic mode" or emotional distress.
- By helping them understand patterns of how the world works to reduce their anxiety and increase their curiosity about the world. Provide repetition with moderate differences

## **Motivational Drive 2: Drive for Autonomy and Sense of Self**

"Have a say" and experience some control

### **Active Learning:**

- Active learning is vastly more effective for learning than passive participation.

- Children with significant challenges, may become passive learners when they have difficulty communicating, interacting and/or understanding what is going on around them.
- Sometimes these children cruise through the day as a passive passenger, never needing to pay attention to the road or even helping with navigation of where they are headed. (Guided Tour vs. Following a Map)
  - They are cared for and entertained regardless of their participation level.
  - The problem is that learning is less likely to take place when the child is in a passive role. This can lead to "Learned Helplessness"
  - Neurological connections are formed through active experience - not isolated drills
  - Children need to be actively engaged in learning - correct level of challenge and worth the effort
- Teachers and therapists need to think outside the box and create participation opportunities within activities.
- What Takes the Child from Passive to Active? Engage the Child's Brain and enable the child to experience a sense of control
- The child's perception of control is what matters - it must feel real to them. If the child feels competent, then he will be more likely to engage his brain in the task at hand.
  - Teachers, therapists and parents can engineer opportunities for children to feel competent, by creating activities in which the child can easily relate his efforts to the success of the task.
  - Active participation is increased by providing opportunities for control and having a say that will affect the child's experiences
- Continually provide opportunities to "having a say" throughout the day during all activities
  - Opportunities for Control
    - Need to matter to the child
    - Need to make sense
    - Need to be understood and discriminated from each other
  - Provide opportunities for control, by setting up child-directed activities and following the child's lead
- While children cannot often have control about the sequence of the daily routine, there can be opportunities within routines that affect them. (For example, deciding who will be their peer buddy for an activity, selecting the book for story time, or competing with friends in an adapted game that reinforces concepts just learned in a lesson.)
  - Offer control beyond tangible objects
  - Who?
  - What?

- When?
- How?
- Where?
- How Many?
- Control needs to be balanced with limits.
  - Cultural and routine limits provide security and reliability that gives the child a known base of structure in which choices can then build the child's sense of self
  - Too many options without that structure can also be detrimental to learning.
  - The balance is what feels safe to the child and communicates respect for them as individuals.
- Prompting too much and being too helpful or rewarding dependency behaviors can reduce mastery motivation and lead to learned helplessness
- External rewards and reinforcers can reduce mastery motivation and shift child's attention away from task toward the reinforcer. It is more effective for the activity to have relevance and intrinsic motivation.
- Empty praise is NOT helpful. Praise a child for specific and active efforts. Constant cheer-leading, when the child hasn't done anything, can be confusing to the child and will make praise less effective. Well targeted praise, with clear feedback, helps the child recognize her own accomplishments. Praise effort
- Limit telling the child what to do. Instead, provide strategic feedback on what they did (strategic feedback)
- Select and customize technology to enable exploration and then provide strategic feedback
- Getting past learned helplessness and passivity requires multiple success with active participation
- Scaffold a discovery learning environment to allow for problem solving
- Role of teachers, therapists and para-professionals is to facilitate independence, active engagement, and support for problem solving - NOT just "help" the child complete a task
  - Doing one problem with active engagement is better than finishing a whole page of assignments without engagement - just to get it done
- Encouraging expectant wait time, without pressure, can allow the child time to process and respond with her own motivation. (Keep extraneous verbal clutter to a minimum)
- Avoid telling children it is "hard" (Ok to say, I can see you are working hard at this - in a positive encouraging tone)
- Modeling, especially by peers is a very powerful means of motivation
- Vygotsky (1978) "zone of proximal development" (ZPD) Challenge child just above what he can do independently and provide a scaffold of supports

- Reducing the pressure of testing situation and using an engaging, interactive experience instead, can help the child make use of more skills and be more likely to practice them on his own
- Recognize the difference between Testing and Teaching
- Children learn by doing
- Emphasize and focus on instruction and experience - not drills
- Assume that the child is strategic and there is a reason for their behavior - even if it is not immediately apparent
  - Every behavior has a reason - look for and respond to the reason
  - Behaviors often demonstrate the strategic competence to avoid, change or achieve something
- Look for and respond to any subtle communicative signals the child uses
- Language is multi-modal - Accept any attempts at communication as valid and respond to them - Presume competence
- Work Towards Clearer and More Reliable Signals
  - Move towards more independence
  - Support the child's Intent
  - Provide Strategic Feedback, instead of prompting
- Support the child's Intent
- Only help once child shows intent
- Allow child to complete movement on her own
- Scaffold success by assisting the child meet his goal
- Move towards more independence over time
- Backward chaining
- Limit or eliminate hand-over-hand assistance - try to support movement initiated by the child, instead of moving their hand for them

### **Adapting Materials to Increase Active Learning:**

- A range of assistive Technology from Velcro™ to computers can provide a means for children to accomplish physical tasks
- Two switches two functions for exploratory play
- Cookie sheet and bolt switch - emerging writing
- Adapted handles for grasping: PVC pipe, hot glue sticks, shower curtain rings, dowels, Velcro, stick tac, etc.
- Stabilizing toys: carpet squares, Velcro, shoe strings, clamps, slanted surface for better forearm support and better viewing
- Touch screen, tablet, iPad, eye-gaze, IntelliKeys overlays or two switches connected to the computer to do different actions on the screen
- Simulating fine motor experiences on the computer for children who face physical challenges - developing the cognitive concepts related to fine motor skills

- Indoor/outdoor Carpet playboards with Velcro
- PVC eye-gaze frame to hold props and direct action
- Magnetic dry-erase boards, colored magnets and magnet strips - math activities

### **Active Learning is not Just Answering Questions:**

- Reduce direct questions, because direct questions:
  - Limit control
  - Encourage passivity
  - Reduce initiation
- Active Learning is not Just Answering Questions
  - Student's robust AAC system must always be available
  - Add "My Work" phrases for quick control during schoolwork
    - Read it again
    - Explain it to me
    - Give me a minute to think
    - Help me brainstorm some ideas
    - Please get my communication book
- Foster and wait for initiation
- Prompt least to most - pause, environmental cue, expectant delay, gesture or point, model, indirect verbal, direct verbal, partial physical, full physical
- Summary of Drive for Sense of Self (Autonomy): Children gain a sense of self through being able to do things themselves
  - Scaffold learning opportunities that include options and opportunities for the child to try out different possibilities without a right or wrong answer
  - Adapt materials so child feels a sense of independence to do something themselves
  - Value their participation

### **Motivational Drive 3: Drive for Social Connection**

"Valued as a member of the community"

- Social interaction and a sense of belonging are powerful motivators for learning
- Connection with others is a basic human need
- What is the worse punishment for humans? Isolation, Solitary Confinement - people need to interact with other people
- Respect:
  - Communicate a feeling of value or worth as a human being
  - Care but don't pity
  - Communicate pleasure in being with them
- Teach Peers to be Friends
  - Teachers and other adults often set the tone of the classroom

- Discourage "helping"
- Encourage "doing things together"
- Friendships are formed through common interests, not forced
- Utilize peers to customize activities and play games
- Practice Academic Skills through playing games

### **Co-Planned Sequenced Social Scripts** (Musselwhite, Burkhart)

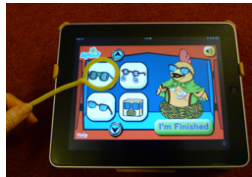
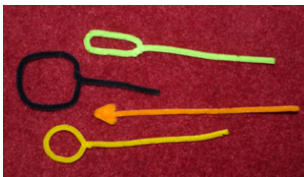
- Use of sequential message devices for a series of communicative turns
- Provide frequent opportunities for social interaction and connection with other people to increase motivation
- Access challenges for children who face severe physical challenges, often hold them back from participating in effective communication
- Provides practice for access with intent, purpose, motivation
- Co-plan with child's robust communication system if possible
- Touch Point cues (2 and 4 point) - using the child's body (Dale Gardner-Fox)
- Remember that no response is a response
- Do not give the child options to say that don't make sense or follow the flow of the conversation
- If the child doesn't choose one of your suggestions, change your suggestions
- Creating Co-Planned Sequenced Social Scripts (Burkhart and Musselwhite)
  - Action Scripts: Book reading to a peer, songs, everybody do this, putting on lotion, directing actions of others
  - Class/Work Participation Scripts: Studying for a test, engaging in a cooperative learning activity, be a song leader, story leader, or transition leader
  - Conversational Scripts: Guess what happened?, Who's cute, The gym last night, pranks, or an interview
- Anatomy of a Conversation
  - Attention Getters - and/or Greetings
  - Starters / Context Setters (Generic)
  - Starters / Context Setters (Specific)
  - Descriptive or Event Statements
  - Maintainers, Holders and Interjections
  - Turn Transfer Questions
  - Closures and Transitions to Other Topics
- Allow the child to initiate, don't say "press your switch" Approach the child with a look of interest on your face and wait. You can try a natural verbal prompt if necessary such as "So, what's up?" or "How's it going?"
- Provide frequent opportunities to co-plan and use scripts within natural contexts
- Co-planning is crucial!

**Summary of Drive for Social Connection:** Everyone needs to be connected to others and feel a sense of belonging

- Communicate to the child that you enjoy them
- Build a relationship with the child
- Model and use peer models
- Include them as a member of the group

## **Learning Access of Partner-Assisted Scanning as an Alternative to Pointing and Access to AAC**

- Within appropriate natural contexts, list at least 3 items and look for a signal from the child
- Always include "none of those" or "something else"
- Adding technology to the listing strategy: "that's the one I want" - be careful to balance new difficulty of using a device with a simpler cognitive task
- Yes and no movements are even better:
  - Child controls the speed of scan and allows for processing time
  - Partners are more confident in child's message
  - Plan to teach 2 movements over time, while accepting what the child can do now
- Use monotone, rhythmical voice for scan and social voice for interaction
- List toys, objects, things written on a series of dry-erase boards, song verses, class jobs, iPad apps with a pipe cleaner pointer, etc.



- Use partner-assisted scanning with a robust and organized language system such as PODD (Pragmatic Organization Dynamic Display) Communication books (Gayle Porter, Melbourne, Australia)
- Developing Access Skills for Partner-Assisted Scanning with AAC
- Partner-assisted scanning may be:
  - Visual
  - Auditory
  - Visual plus auditory
- Remember that scanning is giving the child an alternative means to point
- Visual partner-assisted scanning:
  - (this section) this column, this one
  - First choice if child has good vision for seeing the whole display
  - Faster, more efficient, less load on working memory

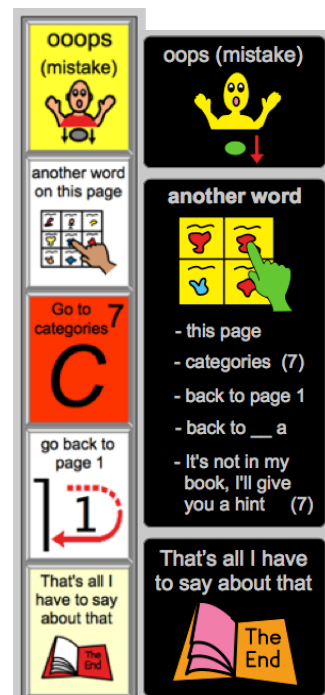
- Student learns the symbols and then can progress more quickly to other access methods, increased vocabulary, and high tech eye-gaze
- PODD navigational side panel: oops, another word on this page, go to categories, back to 1, that's all I have to say about that
- Visual plus auditory partner-assisted scanning: Name each item in the column and then individually if column is selected
  - For children who have vision challenges that prevent them from looking across the whole display and need auditory support
  - Can start as one-per-page item by item (with matching companion pull-off book for direct modeling) and then move to pull-off columns
  - Eventually, combine visual plus auditory with some items just auditory only scanning as vocabulary increases beyond the potential benefit of visual support.
  - PODD navigational side panel: oops, another word, (if yes: this page/go to categories/ back to 1/back to \_\_a/its not in my book, I'll give you a hint) that's all I have to say about that

- Auditory only
  - Partner's voice is part of the selection set
  - Selection set is transient and temporary
  - Only part of the selection set can be presented at one time
  - Hardest form of scanning
  - Start simple and build knowledge of patterns over time

- Scanning is Not a Series of Questions

- How do you model partner-assisted scanning?

- Start with Direct Selection Modeling
- Use a Direct Model for More Vocabulary and Speed of Conversational Flow
- The pattern that you are modeling is the key word on each page that the child will eventually scan to communicate (PODD)
- Powerful way to highlight and emphasize the path for each step of the message
- Reduces excess verbal clutter of the scan for the child - between targeted items
- Different from what the child will use to express herself
- The 'Full Model' will need to be introduced, in addition to the 'Direct Model' once the new partners are ready, in order to model how the child will use the system, but this can wait in the beginning



visual      Auditory  
Side Panels for Scanners  
(PODD)



- Use the Full Scanning Model - Some of the time
- Use the Full Scanning Model
- when there is someone else to chat with, so the child can watch
- Modeling Auditory Scan - sometimes just what child would say yes to - direct model, and sometimes the full model. Use full model more in the beginning with auditory scan for child who understands speech

## **"But he doesn't have a reliable "Yes and No" so how can we use Partner-Assisted Scanning?"**

- Model "Yes" and "No"...as you go... Let the child watch and listen to how no, no, no, yes can be used instead of pointing
- Look for Subtle Non-Verbal Communicative Intents, Confirmations, and Negations to let child babble with selecting from a list
- Work Towards Clearer and More Reliable Signals over time
  - Increase Clarity of Feedback for the child and for the Communication Partner
  - Reduces guessing
  - Provides more success for the child
- Stop the YES / No Hunt! - teach typical gestures and sounds if at all possible
- Why is Yes / No So Hard and Often Seen as Inconsistent?
  - Many questions are not easily answered with yes or no... may need to clarify what is being asked
  - Depends upon understanding the language used in the question
  - Doesn't allow for other options
- **Never Teach Yes / No with Random Questions**
  - Understanding the language of the question has to come first
  - Developmentally, expressing yes and no appropriately comes after the child has developed some expressive vocabulary
  - Yes/No for confirm and reject is an earlier skill than answering questions - this is what is used for Partner-Assisted Scanning
- Learn Yes/No as an **Alternative to Pointing** - **NOT** for Responding to Random Questions
- A list should be at least 3 items
- Present all options including: "none of those or something else" and then repeat one at a time
- Testing and Direct Questions - the last item always: "I don't know" and "please get my communication book/talker" (Encourage the teachable moment and control to ask for more information)
- Ideas to List for options:
  - Verses of a song

- o Flavors of ice cream
- o Books at the library
- o Items to click on an iPad
- o Dress-up clothes to wear
- o Anything and everything as long as it is a natural part of life, all day long
- A smile does not work for all meanings of YES ! (Does your head hurt?)
  - o Be aware that a smile may mean:
    - o "I like it", "funny", "silly", "Great", "Yeah", "Something on the other side of the room is funny", "I accept", "I'm nervous", "That reminds me of something funny", etc.
    - o Spontaneous smiling can cause confusion during scanning
- A Smile Doesn't Work for "yes" Long Term
  - o Ok to start as a subtle signal
  - o When trying to communicate something, What if it isn't something you are happy about - something's wrong / sick
  - o Need to keep a poker face during the whole conversation or you accidentally say something you didn't mean
  - o What if you hear or think something that is funny in the middle of your message?
- Problems with "look at me for yes"
  - o May work for a quick shared thought, but breaks down with longer autonomous communicative messages
  - o Apraxia / Dyspraxia increase with any timing demand
  - o How long do you wait for "no response"?
  - o Many children show great variability in time required to initiate movement
  - o Eye contact and smiles are social connection and may get misinterpreted as "yes" when used to engage
  - o Not responding takes effort and child must inhibit looking during a scan or list
  - o Some children begin to look more autistic, because they actively inhibit eye-contact to prevent accidentally saying "yes"

## Teaching "Yes" and "No"

- For children with Rett Syndrome and Dyspraxia, try talking switches for a target and clear concrete feedback (Personal Talkers from Attainment Co.)
  - o Hold "Yes" under child's chin and "No" next to child's left cheek and move back as a target (Move in after item is scanned - do not mount them)
  - o Activate for any head movement to the side or down
  - o Fade the use of Switches and move to head movements for Yes/No
- Teach Movements for "yes" and "no"

- Practice Yes/No in Fun Ways
- Work to get good positioning and then explain to the child what they could do for yes and no
- Children with significant CVI may not have observed that people use head nods and shakes to indicate yes and no
- Don't Forget Speech as an Option for "Yes" and "No"
- When a child signals yes or no with a movement of some type, let them know what you are responding to. For example, I see you looking up for yes.
- No response may be the response when your only options are YES or NO!

### **Control is Important But there is More to Learning Language and Communication**

- Having a say helps to increase cognitive engagement and reduce passivity
- Choices Help Provide a Means of Active Participation - But
- Just Indicating a Choice that Someone Else Selects - Isn't Enough to Develop Language
- A robust aided-language system is needed to provide a basis for learning language for those children with complex communication needs.

### **Multi-Modal Communication - Creating an Aided-Language Learning Environment**

#### **Adopt and Share Beliefs for the Multi-Modal Language Learning Environment:**

- Not having speech is not the same as not understanding
- Everyone Communicates
- Communication is multi-modal - depends upon situation and communication partner - Is the message understood?
- Assume the Child has Something to Say - See your role as the person discovering what the child wants to say
- Respond to all communication as intent - build a sense of competence
- AAC is the individual's voice
  - Aided Language needs to be within arms reach at all times
  - Others need to take the responsibility for having the AAC available in the beginning
  - Children will take their cues from others
    - modeling kid talk
    - talking to others around the child
    - Valuing AAC
- Communication happens all the time it is NOT just an activity

- Communication is about something we don't already know
- Communication is Messy
  - Dynamic and Raw - Not Edited and Polished
  - Not Sterile Like Performing a Script
  - Not a One Way Process - Dependent Upon the Communication Partner's Responses - Not All Thought Out Ahead of Time
  - When the Goal is Communication, We Need to Accept and Expand Upon Whatever the Child Does
- Autonomy of Message is Critical: **Autonomous communication** (Gayle Porter)
  - Refers to where messages originate
  - Able to express self in accordance with own intentions - not just a response to the options provided by others
  - Few restrictions on what they can say
  - Autonomous communication is not the necessarily sophisticated or complex language
  - Autonomous communication is not the necessarily independent
  - Another person may have a role in operating the system to enable an individual to "say what they want to say".
  - Communication can be autonomous but not independent and communication can be independent but not autonomous
  - Autonomy must be the first goal, with independence coming over time
- Communication Begins with Intent
- Getting from Intent to Action is What is Difficult for many children who have multiple disabilities. The result of the effort, must be worth the effort
- Keep your expectations **open**

### **What Does Successful Communication Look Like?**

- Long term destination: (Gayle Porter)
  - Being able to say:
  - What I want to say,
  - to whoever I want to say it to,
  - whenever I want to say it
  - however I choose to say it
- Autonomous communication
- Will she take it to a Party?

### **What is Language? (Not just speech)**

- An agreed upon set up symbols and rules that enables a community of people to interact and communicate with each other
  - Spoken - verbal communication

- Unaided - using body - including sign
- Aided language - use a communication aid of some type

## What is Communication? (verbal and non-verbal)

- Connection
- Interaction
- Understanding
- A relationship with another person

"Communication is the Engine that Drives Language" Martine Smith

## Varied communication functions

greet	manipulate	relate information	agree / disagree
answer	ask questions	instruct others	ask for things
express an opinion	share information		joke
express feelings	protest	describe	
discuss interest	"make social contact"	bargain	
comment	request / attract attention	complain	

## **Typical Language Development - How many words do children express?**

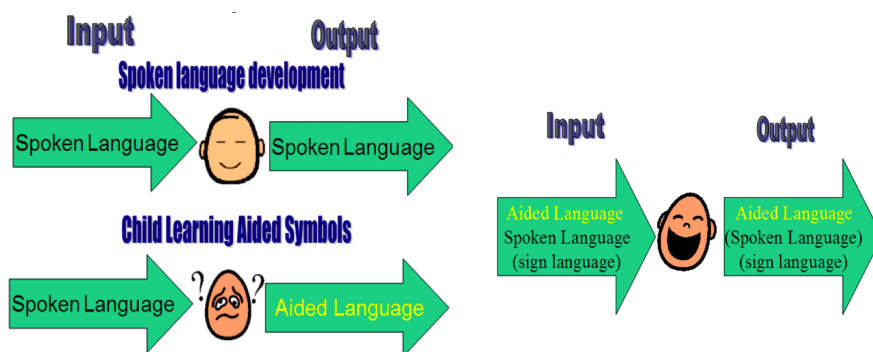
- 1 year old? - about 1-3 words
- 18 month old? - about 20 words
- 2 year old? - about 275 words
- 3 year old? - about 900 words
- 4 year old? - about 1,500 words
- 5 year old? - more than 2,000

Based on Smith (1926) as cited by Dale (1976) & Retherford (1996)

## How Do Children Learn Language?

- Typical children learn language by being immersed in a native language learning environment, where they can freely interact with, and try out their developing skills
- Language is not learned by straight imitation, it is learned through broad experiences that provide multiple repetitions of concepts, vocabulary and conventions. This provides a scaffold from which children can construct language
- All Theories of language development imply the existence of an environment of language users necessary to support the child's development of communication and language - Children acquiring spoken language are surrounded by a community of speakers
- Influences are usually not planned

- Input before Output - Receptive language input is necessary for developing language expression



Gayle Porter, 2004

- Analogy to Foreign Language Immersion
- Children who will need to use AAC systems have very limited opportunities to observe others using similar systems to communicate - especially those who use alternative means to access their systems
- Aided Language Stimulation (Goosens', Crain and Elder, 1992) - Multi-Modal Language Stimulation - information needs to go in before it comes back out
- System for Augmenting Language (Ronski & Sevcik, 1992)
- Natural Aided Language (Cafiero, 1998)
- Modeling general receptive input with no expectation that the child will say anything particular at that time. Model ideas of what to say - kid talk. This is very different from a Mand Model

### Create an Aided Language Learning Environment

- Children most effectively learn to use augmentative communication through the same methods that they learn to use verbal communication - through modeling in natural and functional contexts
- When in doubt of what or how to model - look to what we say to typically developing children and what the research says helps them learn language
- Model in natural, everyday situations as part of typical conversation and interaction
- Children will learn to use their system in the way partners model it
- Early vocabulary must be first introduced receptively in natural contexts
- Children who will need to use scanning systems have very limited opportunities to observe others using similar systems to communicate
- Talking to the Child with his system:
  - Validates the child's means of communication
  - Acknowledges that children learn to communicate in the way they have

experienced communication

- Gives the partner a good perspective on what the child is facing
- Teaching AAC requires the teacher/therapists/families to be more fluent in the child's language system than the child
- Utilize the child's AAC System to point to or indicate communication symbols receptively throughout the day. This is important even when child may need to use a different access strategy - such as scanning or eye-gaze. Model the child's access strategy at least some of the time.
- Drill and practice, rote learning is not very effective for learning language
  - Language concepts need an emotional, meaningful connection to be stored in memory
  - Learning language in functional situations facilitates generalization
  - Anything that has some intrinsic motivation for the child is more likely to be practiced in different settings and used by the child.
- Expand upon any efforts by the child to communicate, using vocabulary, communicative functions, and longer utterances just above what the child is able to express. This helps guide the child and provide a model for higher levels of language usage
- Use a Robust Language System
  - A wide variety of communicative functions need to be represented.
  - Core words by themselves are not enough to represent a full language. Core words do not allow the child to set topic or talk out of context. Core must be integrated with content, in any robust language system
  - Robust language systems must contain consistent meaningful patterns for organizing vocabulary to represent a full range of pragmatic functions
  - All children need a robust language system modeled to them in order to learn patterns of how language works

## **Strategies for Enhancing Attention to Communication and Interaction and Receptive Language Development**

### **Joint Attention and Shared Interaction**

- Much is learned receptively at this developmental level, through modeling language and play, but this natural function only works if the child is interested and attending
- Joint attention is especially difficult for many children on the autism Spectrum
- Begin with building relationships

- Help children develop intrinsic motivation (see a reason) to attend to people, language, and interaction
- Proximal Communication: Burst/Pause (Potter and Whittaker)
- Floor Time: open and close circles of communication (Greenspan and Wieder)
- SCERTS (Wetherby and Prizant) activate social interest first
- Think about facilitating attention, instead of prompting compliance
- Respond to child's signals and respect sensory responses
- Mirror/imitate the child's actions, affect, sounds or words, and then pause - you become a moderate difference to the neurological pattern firing in the child's brain and enhance the chance that the child will be intrigued to attend to you and compare incoming with internal patterns
- Expand upon the child's attempts at imitation
- Use visual supports, and exaggerated gestures, to increase joint attention
- Move visuals and objects close to the expression on your face
- Try pull-off symbols that you can move into the child's field of vision
- Tap object/symbol, move object/symbol, shine a flashlight on object/symbol
- Try using visual only cues, first to get attention and processing, before adding auditory or tactile information (or use whatever modality to which the child responds, before adding others)
- Allow for delayed processing
- Increase or decrease your affect, movements and loudness according to the child's individual reaction and attention (some children who use mono processing, perceive intonation and speech as two separate channels)
- Synchronize your language to the child's attention and activities (Michael Siller and Marian Sigman 2002-04)
- Provide strategic feedback instead of directing and prompting
- Start with a known activity and add a moderate difference to intrigue and engage the child's curiosity
- Start simple and build over time
- The objective is shared enjoyment - make up simple reciprocal games based on the child's pleasure, and activities within the child's repertoire
- Use a motivating toy as focus of attention and interaction
- Try giving directions through a video camera connected to a screen in front of the child

## **Considerations for Children who have Cortical Visual Impairment in Addition to Significant Motor Challenges**

### **Vision Challenges:**

- Types of visual issues - Ocular vs. CVI (cortical or cerebral visual impairment)



- Ocular
  - Typically static (unless caused by something degenerative)
  - If the child only has an ocular visual issues, then it is appropriate to figure out the specific accommodations required to enable the child to maximally use-their vision For example:
    - Specific accommodations required
    - Glasses
    - Large text, magnification
    - Special lighting
    - Compensatory strategies to compensate for blind spots
    - A child who has a visual field loss may require materials always presented in a certain field.
    - A child who has an acuity problem will need attention paid to contrast, size, distance of viewing, and corrective glasses
    - Surgery
- Cortical / Cerebral Visual Impairment
  - Visual challenges caused by damage to the brain
  - Vision skills can appear inconsistent, in relation to environmental conditions, but major changes to visual skills occurs gradually
  - Vision often Differs from What is Found in an Eye Exam done by an Eye Doctor (unless that doctor has had additional training in CVI)
  - CVI Frequently Occurs with Other Neurological Damage
- CVI may or may not occur with ocular visual disabilities
- Ocular vision impairment that occurs with CVI should be addressed immediately, in addition to dealing with CVI.
- Possibly normal eye report
- CVI can be a hidden component of other ocular problems and may not be easily diagnosed - Consult vision specialists for functional visual evaluation
- The key is: if the child's functional vision disabilities cannot be explained by the ocular condition, then CVI should be suspected
- If CVI is the main problem with a child's vision, then accommodations to the environment and materials will be made to systematically increase the child's use of vision and develop the neurological the connections to help the child make sense of what she sees.

**Cortical Visual Impairment:**

- A vision specialist in conjunction with a specially trained pediatric ophthalmologist and the family, should work together to determine the presence of CVI
  - CVI Range : Dr. Christine Roman-Lantzy
  - Functional Vision Assessment

- CVI is a Continuum (Range) of Characteristic that Must be Evaluated Individually for Each Child
- CVI Occurs within a Wide Range of Cognitive Abilities and Cognitive Potential
- It is Easy to Make the Wrong Assumptions about Cognitive and Language Potential for Children with Complex Sensory and Motor Challenges
- CVI is not a static condition.
- Functional vision can change with visual learning, meaningful use, fatigue, environmental conditions, and material design.
- Sometimes, the neural pathways can be "rewired" around damaged areas of the brain to make new neurological connections
- The younger the child, the better chance of improvement and the increased importance of working to increase visual skills - but still possible with older children
- Strategies and Accommodations for Cortical Visual Impairment and AAC:
  - Effective intervention strategies typically focus on customized environmental adaptations to the child's natural routine and modifications to presentation of materials in every day environments to support the best visual functioning - Not isolated visual training exercises or vision therapy
  - New connections are formed when the child uses her eyes and meaning can be attached to what she is looking at
  - The goal is create/find materials that the child will look at and then present them in a way that is meaningful to the child

## **Characteristics of Cortical Vision Impairment with Suggested**

**Communication Strategies:** (Characteristics adapted from Dr. Christine Roman- Lantzy's Screening tool) (Roman-Lantzy, C. A. (2007). Cortical Visual Impairment: An Approach to Assessment and Intervention. New York: AFB Press) [www.afb.org/store](http://www.afb.org/store)

Free Webinars: Cortical Visual Impairment: Special Topics, West Virginia Department of Education  
<http://wvde.state.wv.us/osp/vi/cvi/cvi-special-topics.html>

### **Light Gazing, Non-Purposeful Gaze or Light Sensitivity**

- Some children stare at lights and lit objects
- Others drop their heads, close eyes, or turn away from lights
- Adjust lighting conditions as needed, attend to child's position in relation to light from a window or other sources
- Use matte lamination instead of glossy for picture symbols to avoid glare
- Use lit objects or a lit computer monitor to attract attention
- Flashlight highlighting on objects or pictures to help focus attention
- Light box or background illumination

### **Reduced Visual Reflexive Responses**

- With severe CVI, visual reflexes may be absent
- Blink and visual threat reflexes
- As vision is resolving, reflexes may become present but delayed at first

### **Color Preference**

- Many children with CVI show a color preference
- Often red or yellow
- May be any color, especially a familiar color
- Use preferred color to facilitate looking and then add moderate differences to expand interest

### **Movement Attracts and Assists Vision**

- Vision for movement travels a neurological pathway to the primitive, subconscious part of the brain before going to the cortex. This area is deeper in the brain and may or may not be damaged
- Rapid movement often attracts vision - may trigger a primitive "fight or flight" response
- Shake materials peripherally and move toward center - hold still for inspection if possible according to child's response
- Infants develop the ability to see an object as separate from the background as it moves in front of a background (Big Bird Infant Study)
- Some children may see better when they are moving, rocking, or in a powered wheelchair
- Utilize movement on the computer screen
- Consider magnification scanning for visual display (see below - visual/motor)
- A small number of children with CVI have the opposite problem and may lack the ability to see things when they are moving - depending upon the location of brain damage

### **Latency of Visual Gaze**

- Frequently there is a delay in visual gaze
- Latency varies in different situations, with increased practice and use of vision, with fatigue, environment, or other issues such as health and arousal state.
- Always allow plenty of time for child to respond visually
- Pause with anticipation and without adding distractions
- Cue the child's attention and then wait quietly with anticipation
- Be aware that the child may need more time to use vision when physical position changes (sit to stand to lie down, etc.)
- Provide strategic feedback once looking has occurred - "Oh there it is, its a red ball."

### **Visual Field Differences**

- These children show a variety of differences in visual fields
- May change - improve and worsen
- May change over time as child uses vision more effectively and learns to scan an area visually
- Child may need to hold head at an odd angle to see more effectively
- Pay attention to where a child will attend to objects and pictures at any given time and make appropriate adjustments
- Watch for cues from the child that items have been seen before asking him/her to interact with, or choose from them

### **Difficulty with Visual Novelty**

- Lack of visual curiosity for visual novelty
- For items that have been viewed frequently, the brain is more likely to have built neurological connections for recognition
- Build vision by adding small changes to what the child will already look at
- Children with CVI do see better at home and in familiar settings
- Repetition of viewing in favorable conditions promotes familiarity - incorporate communicative opportunities to use AAC into the child's routine
- Create familiarity with location, color, and natural context
- Communication Displays should make use of familiar vocabulary location, pattern and sequence
- PODDs (Pragmatically Organized Dynamic Displays - Gayle Porter)

### **Difficulty with Distance Viewing**

- Child notices things close up, but not things at a distance
- Child may view items at close distance to reduce complexity - item fills up more of the child's visual field and reduces amount of background clutter
- Child may have difficulty coordinating eyes for depth perception
- Bring pictures close and then move back to clear focus distance
- Use pull-off symbols
- Place pull-off symbols on black backgrounds that can be moved to a good viewing location

**Issue of Complexity: One of the hardest characteristics to resolve, but one that can be dealt with by type and presentation of materials**

### **Complexity of Visual Plus Auditory -Looking and Listening**

- Neurologically, it may be difficult for some children to coordinate attention to listening and attention to vision at the same time Because vision takes a great deal of

conscious effort and focus for these children, they may not be able to continue looking when they are focusing on listening.

- Background noise - environmental considerations
- Some children drop their heads, avert gaze, close eyes or roll eyes up to block vision when listening intently
- Separate looking and listening and reward looking with sound e.g. using a PODD
- Sequential presentation: visual then auditory. Present visual items silently or with attention getting sound or movement and then silence to allow the child time to process the visual. Speak the label only after the child has processed the information, visually. (**Note:** Some children do better when visual and auditory input is presented at the same time, so observe each child individually to determine appropriate strategies.)
- Attract attention (sound, light, movement) and then wait quietly with anticipation
- Use switch toys and activities that don't make sounds
- Encourage looking toward faces by movement without sound at first

### **Complexity of Visual Plus Motor**

- Difficulty coordinating reach and/or grasp with visual gaze - children may look then reach
- Difficult for some children to attend to looking and moving at the same time, because both require conscious effort and attention - neither is automatic - This varies according to the degree of CVI and resolution of vision challenges and complexity of physical challenges with position and movement.
- May be affected by motor reflexes as well
- Reducing complexity can assist with motor targeting - some children who would not be able to directly point to symbol on a typical display, may be able to directly select symbols if the symbols and layout of the display are optimized to reduce complexity.
- Consider visual complexity of switch placement
- Try a black towel or fabric draped over other non-relevant, distracting elements to help the child focus on the target
- Work with occupational and physical therapists to adapt seating systems and adjust the child's position for the best possible use and coordination of vision and motor skills.
- Also need to plan for how the child can communicate /will be able to access the PODD, or other communication system, when they are not in an ideal position that maximizes their use of vision i.e. communication happens all the time - may rely more on visual strategies, such as in some positions and auditory alone in other positions. the bath tub or lying on the floor.
- Following a Visual Scan May be Difficult Unless it is perceived as Movement

- Provide activities where the child uses one switch to move something across the screen and a second switch to activate it once it reaches the other side (Two Switches to Success - Burkhart 06)
- Try scanning magnification when it is an option
- Two Switch Step Scanning Allows Child to Pace his Own Processing Time

### **Environmental Visual Complexity**

- Background environment - clothing, clutter, surface color and pattern can significantly affect the child's ability to see something familiar
- Amount of detail and clutter on a page of a book
- Black fabric can be placed over the surface
- Black screens can be used to reduce environmental clutter
- Lighting, windows, glare, (reflection simulates movement)
  - Matte vs glossy
  - Light box or flashlight illumination (maybe use some of time due to practicality)

### **Visual Presentation of Communication Symbols and PODDs**

- Consider presentation of one symbol at a time: One per page PODD
- Limit the number of symbols to be viewed at one time
- Spacing of symbols can affect complexity
  - Highlight pictures / objects with a flashlight
- Cover some symbols to draw focus to others
- Present one column of symbols at a time
- Folding the grid of symbols to show just one at a time
- Pull off symbols that can be moved into the child's visual field
- Using a one symbol per page - flip book
- Consider how these adaptations will be managed by the partner and make compromises to ensure that the system will be used (ideal vs practical- but understand the ramifications of your decision)
- Decide if some items will just be presented auditorally in a list format
- Repetition of viewing in favorable conditions promotes familiarity
- Create familiarity with location, color, and natural context
- Communication Displays should make use of familiar vocabulary location, pattern and sequence
- Consistency - Look and Placement of Symbols on a display or device
- PODDs (see below) Provide Consistency of Presentation

### **Visual Complexity of Symbols**

- Take your cues from the child. Different visuals work better for different children. The key is to find what the child will be mostly likely to look at - do some exploring to see what the child will look at.
  - The number of colors on a symbol increases the complexity. Use of a single color on a contrasting background may be needed.
    - Black background
    - Highlighting white symbols with colored backgrounds (Goossens', Crain, & Elder)
  - Amount of detail increases complexity - shape is simpler
  - Size - larger is not always better as these children may have limited visual fields and not be able to take in the whole image if it is too large. Start with 3, 4 or 5 inch symbols.
  - Problems with photographs
    - Complexity
    - Busy backgrounds - cut around object or person, but still can be complex
    - Difficult to identify action from person who is performing the action (verbs)
    - Difficult to use photos to represent a wide variety of communicative functions - such as more, done, different, uh oh, help, wait, great!, Don't like, hurt, silly, etc.
  - Words/text on Symbols - this presents a problem and must be considered by the team to make the best decision for a child. Issues to be considered:
    - Text is needed so that the partner to know what to speak consistently when the symbol is presented
    - Text may add complexity - write text in a smaller font with less contrast for partner
    - It Is Not Necessary for Children to Learn the Label for Each Picture, Before Using then for Communication
    - Meaning does not have to be in the Symbol. The Meaning is in its use as is for Speech
    - More important for symbols to be different from each other
    - Symbols are Effectively Learned within the Context of Receptive Language Development - As People Talk to the Child with the Symbols in daily routines and natural contexts
    - Some children with CVI develop the ability to read text

**Complexity of faces may effect use of vision for non-verbal aspects of communication**

- Faces are visually complex, with lots of detail. They often, move and make sound all at the same time

- Communication relies a great deal on non-verbal aspects for timing, intent, context, clarification and elaboration of meaning (humor, sarcasm, teasing) It also signals joint attention, conversational discourse and turn taking.
- Child may not pick up subtle facial expressions, eye gaze, orientation and other body gestures from the people that she is interacting with
  - Allow time for the child to focus on symbol and then readjust to focusing on your face
  - You may need to move your face to a position where the child has a better chance of regarding it
  - Once the child is looking toward your face, try using facial expressions - quietly, without talking or making a sound. This may facilitate looking. Exaggerate your facial expressions and move your head
  - Exaggerate you head nod and head shake for yes and no.
  - Consider nodding or shaking your head first and then saying yes or no (so visual and auditory is separate but sequential)
  - If the child won't look toward your face at all, try communicating nonverbal states with an auditory component. Use sounds, vocal expressions, or words to emphasize what we are communicating non-verbally

#### **Auditory Monitoring of the Environment and Working Memory:**

- Children who have significant visual challenges, will need to constantly monitor their environment through the auditory channel instead of the usual visual channel
- This will impact what they can hold in their working memory at any given time
- Sounds may Trigger a Primitive "Fight or Flight" Response - Demanding Attention
- Instead of being able to look over and confirm what caused a sound, they will need more cognitive energy and attention to identify it and decide if it needs attending to or not
- Attending to that Sound - Pushes Something Else Out of Working Memory - especially when working memory is already mostly auditory
- The more the child develops automaticity of skills, the less working memory is used for motor, cognition and communication. Repeated practice in natural contexts develops automaticity

**Dealing with distractions** - When child is obviously distracted by a noise or movement unrelated to the current interaction:

- First try regaining attention with strategies discussed above
- Help child identify - at least auditorally, what is causing the noise/ movement etc. If needed, use picture symbols from the communication book to explain the distraction.
- Finally, recap what you were discussing prior to the distraction and where you were in the conversation when the distraction happened. Use the picture symbols if



needed to recap what has been communicated and check with the child for confirmation that she still means what you have summarized.

### **Recap and provide auditory feedback to keep the child's focus on the communicative interaction**

- Working memory is limited in duration and amount
- Thinking about what to say, how to say, how to move your body to say it, etc, all require conscious working memory
- Working memory may run out before the message is completely communicated
- Balance how much feedback and reminders of the message you give the child
  - Reminders of what she is trying to do, like you said something hurts... now we are on the body part page, etc. can be helpful to extend working memory and help the child stay on task
  - However, reminders or prompts can also interrupt the child's thinking process and then she may forget what she was focusing on, such as how to move her body
  - Dynamic observation of both your part and the child's reaction will help you achieve the right balance.
  - Be very careful not to talk about things unrelated to the current focus. When a child is slow to respond, we often talk to fill in the time, because of our needs, not the child's. It may feel unnatural to wait quietly, but this may be the best strategy for the child.
- Children will quickly figure out which communication partners are going to take the time to wait for them to respond, and will simply choose not to make the effort with some people. It takes a great deal of effort for these children to coordinate the communication process and the result has to be worth their effort

### **Sometimes, Communication and Language Needs May Have to Move Ahead of Developing Visual Skills Due to Conversational Flow and Efficiency**

- Continue to attend to environmental strategies to encourage visual / social orienting towards communication partner and possibly the display
- Consider focusing on auditory strengths for communication strategies, while continuing to work on visual skills at other times - auditory scanning/listing for communication
- Include visual feedback that may become familiar, and thus paid attention to, at a later time - light tech and high tech when possible - unless it significantly slows down the communication exchange to a point that isn't functional
- Light Tech: Partner assisted scanning strategies can allow for a smart partner who pays attention to the child's delayed responses and allows time for thinking and self talk to occur within the process.

- High Tech: Try Two switch step scanning - to increase cognitive engagement and enable the child to control the time needed to process information visually and/or auditorally before moving on
- With communication, some things are non-negotiable, and communication must be the priority with vision taking a back seat

## **Motor / Cognitive Learning for Access**

### **What does Research Say About What is Most Effective in Learning a Motor Task?** (Adapted by Burkhart and Hanser)

- Initiation of intent from within the child - often generated in response to the environment or social context. (This is not passive participation or hand-over-hand.)
- Problem solving opportunities for trial and error and child-initiated correction or adjustment to errors.
- Practice and repetition with a purpose. (Studies show increased motor accuracy and ease when there is a purpose)
- Thousands of repetitions with variation (moderate differences)

### **Developing Automaticity**

- Developing Automaticity takes practice: Thousands of Repetitions with Intent, Purpose, and Variation
  - Motivation Provides Intent
  - Natural Context Provides Purpose and Variation
- Working memory can only deal with a limited amount of information at a time
- Automaticity is a level of skill where you no longer Have to Consciously Think About Performing that Skill
- If something is not automatic yet, it will occupy the child's working memory instead of operating in the background
- Developing automaticity is getting to a point where cognitive efforts can be redirected from the motor skill to the content of the task
- Always attend to where the child is spending their cognitive currency: motor, cognitive, linguistic, emotional, efforts

### **The Juggling Act and Working Memory**

- Cognitive attention is needed to focus on anything that is not automatic. When someone is first learning a task it requires conscious effort, then with repeated use and practice the brain learns to control the task automatically without much conscious thought. For example: what do you do if someone suddenly throws a ball at you? What would a baby do?

- Children with significant physical challenges, have not yet developed reliable control of movements at an automatic level, and therefore, even simple movements can be unreliable and require a great deal of cognitive energy to perform.
- When child needs to focus on movement, then there is very little working memory left for attention to the play, language or cognitive task.
- Children with Rett Syndrome may not have reached, or may have lost, automaticity with many skills, especially those with a motor response, and thus need to focus attention on each component to be successful. In addition, adding cognitive intent to movement often increases the difficulty - due to apraxia.
- Children on the severe end of the Autism Spectrum may lack initiation of movement and/or motor planning and may not be able to focus on more than one sense at a time
- To be able to communicate effectively, many individual components must be coordinated. For example:
  - **Sensory-motor demands:** motivation, strength, motor planning, endurance, motor automaticity, auditory filtering, reaction time, visual discrimination, visual scanning/memory, visual tracking
  - **Cognitive demands:** motivation, cause/effect, initiating, discriminating purpose and function, developing cognitive schemas, making active choices, trial and error, problem solving, memory
  - **Language components:** motivation, processing of language in activity, pragmatics, processing of questions, auditory filtering, processing of symbol set, syntax/grammar, attention to task, memory
- Juggling means that the child may only have some of the 'components in the air' at any given time, and having all the 'components in the air' will be rare. **This explains why performance is so inconsistent and can not always be predictably repeated**
- We need to take successes and move on, as opposed to requiring repetition of the task over a given number of trials - Meaningless repetition produces boredom and habituation and thus produces inconsistent test results



## **Parallel Programming**

- If we wait for everything to develop in a coordinated fashion, you will be waiting forever
- We don't want to hold the child back in one area because of deficits or difficulties in other areas
- We need to be careful that we continue to develop rich cognitive schemas and not just splinter skills

- The answer to this problem is to work on individual components in parallel. Use functional and natural contexts to give the child opportunities to develop skills, where only one component is cognitively challenging them at a time. Provide a variety of these types of activities that challenge the child in all areas of development, but mainly just one at a time. Help the child make associations see the relationships between skills that she is developing. Agree as a team on long term direction
  - Focus on one component or skill with each activity
  - Reduce motor load for difficult cognitive or language tasks
  - Reduce cognitive load for motor learning tasks
  - Teach access as a separate but parallel skill: Stepping Stones to Switch Access (Linda J. Burkhart- see handouts at [www.Lindaburkhart.com](http://www.Lindaburkhart.com))
- Team Planning and coordination is necessary for consistency and to allow for development of automatic skills
- "Light Tech" Communication Book for Language development with reduced motor load
  - Smart partner operating "Light-tech" system
  - Sufficient vocabulary
  - Genuine communication
  - Language development
  - Need a Robust Language Organizational System that Has Clear Patterns of Organization
- Switch Play to Develop Motor Skills for Switch Access
- Fun Play Activities to Develop Pointing Skills
- Play to Develop Eye-Gaze Motor Skills
- Eventually: Combine Motor and Language Skills to Operate a Communication Device

### **Motor / Cognitive Learning for Switch Access**

- We need to stop looking for the perfect switch placement
- We need to begin teaching children to use switch access
- Myth: "We just have to find the perfect switch placement."
- Its Not About Finding the "Perfect Switch Site"
- Its About Finding the Best Switch Sites to Learn to Use
- No One Starts with Automaticity of Movement
- Stability and Active Position Still Important Components
  - Weight bearing on pelvis
  - Upright in an active position, moving forward slightly if possible
  - Able to rotate and shift weight - even if only slightly
  - Grasp bar for stability
  - Control often begins at the head when body is active engaged with gravity

## **Stepping Stones to Switch Access**

[http://lindaburkhart.com/wp-content/uploads/2016/06/stepping\\_stones\\_chart\\_10\\_12.pdf](http://lindaburkhart.com/wp-content/uploads/2016/06/stepping_stones_chart_10_12.pdf)

- Sequence of skills - fluid not rigid
- Child may use several steps during one activity: starting at one level to warm up and get oriented to location of switch(es) then moving to a higher level for practice at current learning level, but also explore some higher levels when doing well and within the context of some extra modeling, then move back down to a comfort level when fatigue starts to set in, so the child can end on a feeling of success and accomplishment.
- The higher cognitive demands of an activity the lower the stepping stone may need to be for that activity
- The lower cognitive demands in combination with increased motivation of an activity, may allow the child to work on a higher stepping stone.
- **Step 1: Single Switch - Cause and Effect**
- **Step 2: Single Switch - Multiple Locations and Multiple Functions**
- **Step 3: Two Switches - Two Functions**
- **Step 4: Learning to Two Switch Step Scan** (For children who don't understand Two Switch Step Scanning)
- **Step 5: Two Switch Step Scan Failure Free Learning with Feedback**
- **Step 6: Two Switch Step Scan to a Target - Activities for Increasing Accuracy and Cognitive Engagement**
- **Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning**
- **Step 8: Two Switch Step Scan - Reducing Time for Success and Demonstrating Knowledge**

**Anat Baniel -9 Essentials:** <http://www.anatbanielmethod.com/> (Kids Beyond Limits by Anat Baniel, 2012)

- Essential 1—Movement with Attention
  - Learning is determined by where the brain is focused
  - The brain only attends to a small amount of stimuli at one time
  - Movements done automatically do not create new connections in the brain
  - High levels of activity in prefrontal cortex (Jueptner, Stephan, Frith, et al. 1997)
    - During new learning
    - But Not when performing something that has become automatic
    - Learning requires active involvement of prefrontal cortex
- Essential 2—The Learning Switch
  - At any given time, the brain is open for learning or not

- Anxiety and fear turn off the ability to learn
- Motivation organizes the brain
- Essential 3—Subtlety
  - Less is more
  - Difficult to discriminate differences when there is too much competing input
- Essential 4—Variation
  - Variation is required for a brain to recognize patterns
- Essential 5—Slow
  - We can only do something fast that we already know how to do automatically
  - Learning occurs when we slow down and add intention
- Essential 6—Enthusiasm
- Essential 7—Flexible Goals
- Essential 8—Imagination & Dreams
- Essential 9—Awareness

### **Step 1: Single Switch - Cause and Effect**

- Child begins to associate an intentional movement with the ability to cause something to happen
- Children often have difficulty learning cause and effect through prompting.
- Cause and effect is learned through experience, not teaching, so our job is to create adapted meaningful experiences for them to learn cause and effect.
- Begin with accidental switch activation using an existing motor pattern
- Place switch in a location where the child can independently experiment with the concept of cause and effect using existing motor patterns
- Learning a new motor pattern and learning cause and effect at the same time is often too much new
- Once the child understands cause and effect, new motor patterns can be shaped and facilitated - using the cognitive understanding of "why move" as a motivator
- Use momentary/direct activation to get started so the child can easily learn to associate her movements with the effect (Switch Accessible Boombox - Judy Lynn, Rad Sounds - RJ Cooper, Everybody Has Feet - Marblesoft / Simtech) (None currently through a switch on the iPad - but some work that way by holding hand on the surface of the iPad)
- Do not use a delay-timer until it is clear that the child understands the cause and effect of the switch. Then, use a delay timer if needed to make the results worth the effort. (You may want to begin sessions with a few minutes of direct activation and then moved to timed activation)
- Short activations
  - Small parts of songs

- Short segments of video
  - RJ Cooper - Application Clicker
  - Tarheelgameplay.org
- Don't stay in this step longer than needed (Children will habituate to the activity and loose interest. This can be misinterpreted as not understanding cause and effect)

## **Step 2: Single Switch - Multiple Locations and Multiple Functions**

- At this step, child understands simple cause and effect but needs practice intending and executing a movement for different purposes or with different body parts, or when a switch is moved to a new location or used for a new function.
- Practice activating switch using engaging motivating activities, in multiple locations with a variety of body parts
- Develop some motor control and beginning motor automaticity, through repetition with moderate differences - without the stress of timing
- Use a switch for multiple clear intents
- Give battery operated toys a mission - Help the child see a meaningful purpose in activating a switch
  - Battery powered doll pushing a push toy to deliver snack
  - Battery powered pig knocking over blocks
  - Battery powered penguin kicking a ball to a friend
- Operate a battery powered spinner to play a game
- Spinners high tech / iPad
- Practice with variation, control and intent in natural contexts
- Create and use co-planned sequenced social scripts with the child, for switch
- Focus on general social and pragmatic timing - instead of motor timing: reduce pressure for timed control - allowing problem solving to occur in the motor learning of switch activation

**Note:** Strive to achieve a balance between leaving a switch in one place long enough for the child to accommodate to it, and experimenting with moving the switch to alternate places for the child to learn to use.

## **Step 3: Two Switches - Two Functions**

- At this level the child is learning to understand that two switches do two different things. (developing cognitive skills of discrimination and memory)
- Increase motivation by increasing cognitive engagement and control
- Two switches introduces the element of meaningful choices instead of 'do it or don't'

- Two switches positionally related to function - Object Permanence (Left Right Switch Activities on Two Switches to Success CD)
- Encourage attention to both switches, with emphasizing feedback from side that may be ignored more than the other (light, sound, use of motivational drives)
- Two switches trial and error (One works, one doesn't) (Inclusive TLC Software and Apps) also used for two switches social turn talking
- Two switches / two functions (See Stepping Stone 3: Early Songs and Play CD)
- Two switches for related objects or two functions on one object (Switch Skills for Two - Inclusive TLC, and Learning to Two switch step scan - Judy Lynn)
- Two voice-output messages: appropriate pragmatic use of each function
- One switch activating toy, computer story, or song and one making social comments
- One switch toy and one voice-output device (single message or step by step) (pig knocks down blocks - voice output: "build it up!")
- Game spinner switch and voice output comments
- Two voice-output devices with different functions
- One switch computer, one switch related toy or voice-output device
- Classroom Suite - two switches two functions from IntelliKeys or IntelliSwitch
- Newer version of Mind Express will have this function with any switch interface
- iPad Apps, Classroom Suite, PowerPoint, or other digital story with one switch, and the other switch can be a voice-output device for repeated line, sound effect, or to comment about the story.
- Two separate but related activities on the screen in a computer activity (Switch Skills for Two - Inclusive TLC; Learning to Two switch step scan - Judy Lynn; Two Switches to Success & Early Songs and Play - Burkhart)
- Two switches - powered mobility - one turns right and one left to explore and look around the room

### **Proximity Switches**

- Mechanical vs. Proximity switches (Karen Kangas)
  - Mechanical
    - Move toward
    - Push to activate
    - (Sometimes hold on)
    - Release
    - Move away
  - Proximity
    - locating is activation
    - Only need to move toward - no extra effort to push and release
- Less overflow of whole body movement patterns when not having to exert effort to push



- More ability to isolate the movement needed and disassociate one movement, such as head movement from the rest of the body
- **Adapted Switch Labs** - proximity sensors with USB power and two switch jacks
  - Designed to use for powered mobility
  - Durable
  - Some are adjustable
  - May be embedded in head rest or under tray

### **Spashtop**

- Designed to show computer screen on an iPad - app for iPad and software loaded on computer
- On same wifi network - no cost.
- Over distance - small subscription fee
- Classroom teachers can mirror what is projected on Smart Board onto iPad that they can move closer to the child for better view and interaction

### **Types of Scanning - to increase choices and control**

- Automatic Scanning
- Inverse Scanning
- Step Scanning with a Delay
- 2 Switch Step Scanning
- Morse Code

### **Why Two Switch Step Scanning?**

- Eliminate need for Timing
- Requires less Concentration / Allows for more Distraction
- Allows Time for Cognitive Processing
- Allows for more appropriate social skills and pragmatics
- Active vs. Passive Control
- Separate Function for Each Switch: Simple Cognitive Map
- One switch advances scan with each activation, the second switch selects the item.
- Very few options are available for a single switch user beyond cause and effect that don't require some type of timing

### **Different Cognitive Levels:**

- Some children have difficulty moving to two switch step scanning because they do not yet understand the cognitive task. The goal for these students is to provide them with graduated experiences so they can experience success in learning the task of two switch step scanning. These students will go on to Stepping Stone 4.

- Some Children will understand the concept of 2 Switch Step Scanning, as soon as they are shown how it works. They may require additional practice to develop the automaticity of motor skills. These students will go on to Stepping Stone 5.
- Some children have difficulty moving to two switch step scanning because of the motor component, even though they cognitively understand the task. The goal for these students is developing and refining the motor skills while maintaining motivation for continued success, so they can use two switch step scanning to learn a variety of curricular content. Go to Step 5 or 6.
- Some children have difficulty moving to two switch step scanning because of passivity and learned helplessness. For these students it is especially important to provide purposeful activities with which they can experience control and success. Refer to motivational factors discussed earlier in this handout.
- Some children have a combination of motor and cognitive challenges and it may be difficult to know if they understand the task or if the motor component is too difficult. The goal is to find motivating activities, tied to what they do understand and relate to, and then add moderate challenges to gradually increase their skills. These children may benefit from working on Stepping Stone 4 activities.

#### **Step 4: Learning to Two Switch Step Scan (For children who don't understand Two Switch Step Scanning)**

- Move, move, move, get: The focus here is understanding that one switch moves something along a path (by repetitive activations) and the other switch selects or "gets it" based on the moved item arriving at a given destination. (Note: children who do cognitively understand this process, but simply need more practice to develop motor automaticity, should skip this step and move on to step 5.)
- Children who don't understand the concept of two switch step scanning, may need this intermediate step to experience one switch as the mover and one switch as the selector.
- These children may appear to activate the two switches randomly and without discrimination of function.
- One switch is the "mover" or "lister" and one switch is the "get it" or "selector" switch
- Requires Complex Integration of Cognitive, Motor and Language Skills
- This cannot be taught like a set of facts - It needs to be learned through scaffolded experience
- Learn to use a mover switch to reach a goal
- Use battery powered toys to move to a location for a play purpose. Use a delay timer that moves the toy a short distance for each activation. (rotating plate)
- Rotating plate toys with a delay timer to move a pointer to selection - then second voice-output switch for "that's the one I want"

- Provide experiences where one switch moves something on the computer screen and the second switch activates something in relation to where the item has moved. Allow only one switch to work at a time, so that if the child tries the other switch, the natural lack of feedback will direct her back to the first switch. This is in contrast to typical two switch step scanning where the movement on the screen or display is simulated by a light or highlight showing one item after the next. Some children may have trouble seeing this as movement.
- 'Move - Get' activities on the computer (Switch Skills for Two - Inclusive TLC; Learning to Two switch step scan - Judy Lynn; Two Switches to Success & Early Songs and Play - Burkhart, (working on newer activities for Mind Express)
- Learning to Follow a Visual Scan
  - Use above activities to teach that one switch moves something visually across the screen
  - Use magnification of scanned items to call attention to each item

#### **Step 4a: Side Step: Single Switch with Timing**

**Note:** Following this step may lead to variations of steps 5-8 for automatic scanning, inverse scanning or step scan with a delay

- Some children develop an ease of activating a switch that indicates they will be able to activate a switch in a timed mode. For these children, you may want to probe this ability by presenting simple single switch activities that require timing. Experiment with automatic scanning, inverse scanning and single switch step scanning with a delay
- As you are working with a child, periodically check to see if they have developed automaticity of switch activation. Specifically, the child quickly activates switch upon intent during an activity without having to think of shift focus to the motor skill of activating the switch. This is especially important to monitor as the cognitive demand of the task increases. If increase cognitive demand reduces automaticity of switch activation, it may be more appropriate to continue using 2 switch step scanning for a while
- Observe these children closely to make sure they are successful enough to stay actively involved. If they get discouraged, consider going back to two switch step scanning.
- Physical fatigue is a factor to consider with step scanning. However, consider that increased active involvement may outweigh the downside of physical fatigue.
- Automatic scanning may require less motor effort for some children, but is often cognitively more fatiguing because of higher demands on concentration, holding attention to task, and timing of motor movements
- Consult the child's OT and PT for help with positioning and switch placement that will reduce fatigue and work to build endurance over time

- If a child hasn't yet developed enough automaticity for switch activation, you will probably want to keep them on the path of two switch step scanning, until if and when, they can be more successful with timed activation.
- Children who have good timing skills may follow a similar sequence to steps 5-8, but with the access of single switch automatic scanning, inverse scanning or step scan with a delay.
- Other children may not be ready for a timed form of scanning until step 8, at which time, they may have developed enough motor automaticity with a switch to be successful with timed scanning.
- Some children may always be faster with two switch scanning and never use a timed scanning.
- At this step, it is helpful to be modeling actual step scanning when choosing an activity to use with the child. For example, use a launcher or a menu of games with the child's switches, to select one activity for the child to play with. The strategy of slow motion or pausing before the second switch is also effective here, to encourage active involvement during the modeling.
- \*Avoid direct verbal prompts such as "get this switch" and use more nonverbal, natural cues and slightly delayed feedback: "You moved it", "it is almost there", "it's there", "you got it!"

**Step 5: Two Switch Step Scan Failure Free Learning with Feedback** - any option works - and provides clear logical feedback for that choice.

**Note:** In the past, I have used the term: Errorless Learning for this stage. However, the term "Errorless Learning" has started to be used for a totally different meaning. Some vendors and developers are using the term to describe a teaching method that eliminates any problem solving or mistakes and only allows the child to indicate a correct answer. This is not what I am talking about here! Karen Erickson, used a better term for describing what I am trying to convey. She uses: "Failure Free with Feedback"

- At this level the child may be learning to understand how two switch step scanning works and/or if they may already know how it works, but they are continuing to work on automaticity for switch activation as well as develop automaticity for the motor coordination of the process of step scanning
- This type of activity offers the child a variety of choices through two switch step scanning, but any response is accepted as the child plays, selects a song or video, creates a story, rhyme or errorless letter. (IntelliTools Classroom Suite - a wide range of possible activities on the Activity Exchange; Two Switches to Success, Early Songs and Play - Burkhart; Inclusive TLC - Choose and Tell Nursery Rhymes, Legends, simple iPad apps: Clicker - Errorless writing with a closed set of whole words (sentence starters, etc.) - Clicker; Boardmaker Plus and Boardmaker Studio; Learning to Two Switch Step Scan, Pick and Choose, and Story Builder - Judy Lynn.

Many augmentative communication devices set up in step scan access mode for two switches - Grid, Compass, Communicator, Mind Express, etc.) (Many of the simple switch accessible iPad Apps that are currently available are at this level - if they are beyond cause and effect.)

- One step by step to list choices, one voice-output to say "That's it"
- Choose a song, story, rhyme, video, or any other activity
- Choose verses of a song to be sung in any order.
- Have the child can use a series of communication displays to direct the action of another person in a play activity script
- The child can "scribble" with a talking word processor with the whole alphabet
- The child can use different computer voices to listen to a selected tongue twister or silly saying.
- The child can use a communication device to direct action in a game such as follow the leader or draw a face, with options that all make sense
- Try adapting two switch step scanning access to commercially available mouse activated software games that respond to a child's choices. These are great for practice and motivation. For example iTunes. (some websites use tab and enter)
- Provide emerging literacy activities for creating stories, playing with sounds and letters, or constructing a rhyme or sentence. (Classroom Suite, Clicker, Clicker, Mind Express, Story Builder)
- Use popular, un-adapted software, Apps and websites: Give the child one switch connected to a voice-output device that says "next", and a second switch connected to a mouse click on the screen. A partner moves the mouse to the next item on the screen when directed by the child or moves a pipe cleaner wand over each item on the iPad screen. The child can use the second switch to select that item or direct the partner to move to the next item. Note: it may be helpful to use a large or fancy cursor, and name each item as an auditory cue as the mouse is placed on it.
- On the iPad, (or computer screen) The child can use a head shake or turn for "no" and a head nod for "yes" as the partner moves the pipe cleaner wand from item to item.
- iPad Switch Access: Still evolving and getting better, but currently requires specially designed apps or for full access of the iPad - good cognitive and good visual skills
  - Not all switch interfaces are created equal - some use keyboard equivalents and only work with specifically designed apps, others use built in ios switch access and do not work with specifically designed apps
    - Applicator (Inclusive TLC)
    - RJ Cooper - several versions
    - New Blue2 (Ablenet)
    - Hook+ (Ablenet)

- Tapio
- Tecla
- Pererro
- **Note:** If the child appears very unintentional after many, many experiences in step 5, move on to step 6.

### **Step 6: Two Switch Step Scan to a Target - Activities for Increasing Accuracy and Cognitive Engagement**

- This step is often used when the child appears to continue selecting items randomly and doesn't appear to be trying to select a specific item based upon their intent. (Note this is something that you have to observe by the child's attention, responses, interests, social reactions, and patterns of switch activation)
- Some children need practice with an array that has only one target to scan to and blanks that do nothing to learn this concept. Do not do this until the child has had a large range of opportunities to experience Stepping Stone 5: Failure Free with Feedback Step Scanning
- This step is often used when the child appears to continue selecting items randomly and doesn't appear to be trying to select a specific item based upon their intent. (Note this is something that you have to observe by the child's attention, responses, interests, social reactions, and patterns of switch activation)
- Child is now given one exciting or interesting target to aim for. All other items are neutral
- Insert some blanks in the array of choices with a communication display or software activity.
- Use a word like "click" or "nope" repeatedly and have the child listen/look for a target word such as: "read", "sing", or "show me!"
- Have at least 3 or 4 items in every list, and limit the target item from being the first in the list (two items is not a list, and may be confusing to the child)
- When the child selects one of these blank or neutral items, the feedback shows that it is somehow not logical or not reinforcing. Hopefully, the child will select those items less often over time, and pay more attention to selecting a fun or appropriate option.
- Try social interaction, sensory play or movement activities as motivating items to scan to in a list of blanks or nonsense sounds
- The number of blanks or clicks before a target item, should be varied to prevent the child from just learning a motor pattern, instead of staying cognitively engaged to make a clear selection.
- MODEL self-talk as you take your turn: "hmm, no, no, yes- that's it"
- Move-Get" activities on the computer (Switch Skills for Two - Set 2 ('move and get' - difficult level. For example, moving spotlight across stage to reveal musician or passing basket ball to the player who shoots the ball) Inclusive TLC, Learning to

Two Switch Step Scan Judy Lynn (level where you move to a target, but can also move past target and come around again) New features being added to Mind Express

### **Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning**

- At this step, the child is developing the ability to integrate the motor component of step scanning with the cognitive component of selecting an item for a particular reason or purpose. With more than one target in the array, the cognitive load to select desired targets requires more engagement of cognition as the child refines automaticity of the motor skill
- Use failure free with feedback activities, like step 5, however, now create them with options that allow the student to select options that are more logical, or show more personal opinion than others. At this step, the child will be putting more conscious effort into creating and generating his or her own ideas with these activities. Include the child in determining which items to include in these activities, such as errorless letters.
- Some activities have correct and incorrect options, but also have good feedback for incorrect items
- Keep motivation high and customized for the child.
- Simple Powerful PODD Page Set: A high tech page set that is organized in a similar way to the child's PODD communication book, with the same patterns, but contains less vocabulary - selected for the most powerful things to say out loud. Make sure there is an item to ask for the communication book to say more, and make sure in the book, there is a way to ask for the talker. (Simpler, because child is still developing access skills)
- With successful and motivating practice, the child will be developing more motor automaticity, and integration of cognitive and motor tasks.

### **Step 8: Two Switch Step Scan - Reducing Time for Success and Demonstrating Knowledge**

**Note:** This step is for children who Student has developed motor automaticity of switch activation and the step scanning process. Children can now use step scanning with more ease, can focus on cognitive content of the activity to both learn and demonstrate knowledge.

- Present a limited array at appropriate times to increase efficiency (combining letters with word endings) (full alphabet should be available as well)
- Provide practice for rehearsing or studying for a test in a child-controlled flash card format.
- Consider using word prediction or picture/word prediction.

- Any of the commercial software or Apps that have only correct and incorrect responses related to a variety of content are typically at this level

## **Tips for Literacy Learning: Switch Access and Vision Challenges**

### **High Cognitive and Motor Load**

- Severe physical challenges plus vision challenges
- Everything is more difficult
- Typically not yet automatic in switch access or vision

### **Don't Overload the Visual Channel**

- CVI range - determine how materials should be presented
- Reduce complexity (visual and auditory)
- Use auditory channel if vision requires too much effort or if it is not at a sufficient level on the range to introduce text

### **Auditory Channel May be the Best Possible Option Left for Input**

- May or may not be an innate strength of the child
- May or may not have additional auditory processing challenges
- May be able to get some input visually, but not as reliable as auditory
- Vision may actually add complexity for some children

### **When the main gateway to the brain will be Auditory, there will be a bottleneck of input to the brain**

- monitoring safety in the environment (fight or flight)
- Input needs to be auditory
- Communication system: auditory scan
- Access needs to be auditory
- Thought is probably auditory
- Holding a thought is challenging when needing to attend to everything through the same channel

### **Some Children will be Learning via a Dual Literacy Program**

- For children who have some visual abilities:
  - Visual reading and listening comprehension skills may be at very different levels
  - Can work on both at appropriate levels
- One should not hold back the other - some children can progress in both

### **Literacy Four Blocks** (Patricia Cunningham)



- Working with Words (phonics, letter names and sounds)
- Guided Reading (comprehension) (shared reading: enjoyment)
- Self-Selected Reading
- Writing

### **Working with Words** - emphasize auditory components

- Phonemic Awareness
- Rhyming
- Alliterations and tongue twisters
- Onsets and Rimes
- Making words
- Syllables
- 2 Switch Step Scanning Activities to Play with Sounds
- Letter names and Letter sounds - Challenge: to see and visually discriminate a letter to connect a letter sound to
- Provide: a personalized set of hook words for each letter of the alphabet\*
- "Light Tech" Working with Words
  - Black dry-erase with fluorescent markers
  - Velcro/magnet cards on black Velcro or magnet boards

\*Hook Words (Select one personally meaningful hook word for each letter)

**Apple**, ask

**Bye**, boy, bus, bed, bad, back, ball, bug, bat, bath, bell,

**Cold**, Cut, Cat, Cup, Calm, Come, car, cart, cover, carry,

**Dance**, Dog, Dad, day, dark, done, doctor, door, do

**End**, elevator, empty,

**Fun**, Fish, fast, feet, fix, fan, feel, fist, finger, family, full, farm

**Good**, gas, get, give, go, girl, game, gone, goofy,

**Hug**, hat, hand, hi, happy, hard, head, hello, help, hot, hair, hit,

house, hungry, hurt

**Itch**, in, ill, instruments, it

**Joke**, Jump, job, jar, jelly, jacket, jeans, jewelry, jingle, joy, juice

**Kiss**, kick, kid, key, kitchen,

**Love**, laugh, leg, lip, lick, lift, like, list, look, last, lazy, lap, loud

**Mad**, mom, mat, math, me, mess, miss, more, move, music, mud, mouth,  
money, milk

**No**, not, name, nap, need, new, nice, night, nose, nut, nurse, noisy, neck, nag

**Off**, on

**Pants**, Pain, pop, paw, part, pee, poop, pig, PODD, pet, pool

**Quiet**, quick, quarter, quit, queen

**Read**, race, rain, ramp, read, rest, ride, room, run, rap, rag, rip, ring, rub,  
 ready, right, rope, rack, race, roll, rug, rock

**Silly**, sock, sad, song, sun, Santa, see, sit, sick, sing, secret, soup, sand,  
 seat, safe, super, side, sink

**Teeth**, Tongue, toe, toy, talk, tummy, tickle, time, turn, tub, top, teeth,  
 teacher, today, tired, table, towel, touch

**Up**, underwear, under, uncomfortable

**Van**, video, visit, vest, vote

**Wet**, watch, wait, walk, want, water, wiggle, woman, worry, work, what, why,  
 where, word, wrong, wow, wild, wipe, wind, winter, watch, wash, wall, warm

**Xray**

**Yes**, yawn, yum, yell, yes, yuck, young, yogurt

**Zipper**, zoo, zero, zip

**Note:** When selecting key words for an individual child, use words with the short vowel sound in the beginning of the word. For example itch rather than Ice.

Stay away from food items for kids who don't eat much by mouth

Stay away from things that are mostly visual for kids who have vision challenges

Stay away from objects that don't have meaning for children who are not able to manipulate objects themselves

Stay away from blends and double consonants at the beginning of words.

### **Writing:**

- Write for a purpose and for an audience
  - Sample purposes: email, text, cards, invitations, shopping list, sign, letters, story, journal, Facebook post, etc.
  - Remnant books for setting purposes
  - Robust AAC system to talk about writing
  - Share writing with others
- Forms of Writing
  - Scribbling / Writing with the Alphabet
  - Co-planning Errorless Writing
  - Predictable Charts and Sentence Starters for group writing
  - Writing with AAC - Robust Language System
  - Combination of AAC and alphabet at child's discretion
- Modeling Writing
  - Model writing for multiple purposes throughout the day
  - Use child's alternative pencil
  - Use child's AAC system
  - Don't worry about using full sentences for a child who is at a younger expressive language. Model slightly above the level they produce

- Use Self-Talk and Verbal Referencing
- Scribing for the Writer
  - Self-Talk while writing / typing
  - sounding out words
  - naming letters
  - calling attention to hook words
  - calling attention to word walls
- Spelling with rhythm - ear print for the spelling of words
- Scribe - Don't suggest edits during initial writing
- Revising, Editing, Publishing
  - Writing may span days or weeks instead of all in one session
  - Have others read and comment for revisions
  - Edit with assistance of a scribe at first
  - Publish/send and share with intended audience

**Guided and Shared Reading/Listening** means there is active participation

- Not just reading/listening to a story
- Set purpose for reading/listening (change with multiple readings on different days)
- Involve the child in discussion, opinions, comments
- Provide options for re-reading/listening to parts as needed
- Review purpose and discuss afterwards
- Auditory clutter from the environment and the auditory scan may mean that parts are missed with one reading
- Challenge to go back and "re-read" to find an answer
- Amount to hold in head with no visual hook
- Ways to remember the purpose of reading / listening
- Systematic Method for Multiple Choice answers
- High Tech templates for guided reading including feedback with options to go back and read/listen again

**Self-Selected Reading**

- Kid picks the book!
- List of 3 plus something else
- Electronic Launchers / Book Shelves
- Real books - Partner reading
- Recordings of real people reading
- Record teacher or peer reading the book
- Use Launchers and Book Shelves - allow child to select books

**Creating Books**

- Related to the child's experiences
- Emphasis on literacy level, for example: rhythm and rhyme
- Sound effects for turning pages forward and back
- Video clips
- Reduced complexity of visuals
- Large text, additional space between words and lines
- Digital Voice for fluency vs. Text to speech
- Control to do more than turn the page (read with different voices, "show me" animation or video, etc.)
- Apps and software: Classroom Suite, Mind Express, Clicker, Boardmaker Studio, Go Talk Now, Pictello, Tar Heel Reader (however, challenge to create/find books that have good auditory story)
- Study Guides for Older Students
  - Need launcher or light tech way to choose
  - Can be just text with limited or no pictures
  - May include video or sound effects

## **Motor / Cognitive Learning for High Tech Eye-Gaze Access**

### **Eye-gaze is a motor skill to learn**

- Looking to locate and looking to select are different
- Need to develop motor skill for selecting with increasing accuracy
- Follow a similar process as described above for switches when teaching eye-gaze access
  - Start simple
  - Start with play
  - Build access skills
  - Avoid high cognitive load when learning access
  - Focus learning based on child's intent, not following directions
  - Cannot use for testing until access is automatic
- Strategies for teaching eye-gaze - select or create software:
  - to enable children to Manipulate the Environment and use Pretend Play
  - personally relevant (topics, photos, videos)
  - Large Targets
  - Limited Number of Targets
  - Control to Choose, Change and Stop
  - Simple Powerful Pageset
    - Including the most powerful vocabulary and phrases to say out loud, but organized in similar patterns to communication book
    - Add a pause button to Model
    - Add a speak message window button

- Self-Talk Operational Commands
  - Speak message
  - Pause
  - Delete Word
  - Clear
  - Go back to Main
- A way to ask for her "talker" in her book and a way to ask for book from her talker

## Tips, Hints and Tricks for Getting Started

Establish the Habit that the communication system is always with the child

- If you carry the communication system with you and have it within arm's reach, you are much more likely to model with it and the child will begin to see it as his voice
- How will you carry the AAC?
- Can you use it with one hand?
- Do you need straps and stands
- Clear front cover?
- Develop Habits for Modeling Anytime, Anywhere

Modeling and expanding for autonomous communication Keep the long term goal in mind

- Our role is to provide ideas of possibilities (NO fixed agenda)
- Child's role is to select what they want according to their own agenda (intentions)
- It is not about work!

Use the system to "talk" to the child in typical every day contexts all day long, whenever possible

- Model the Whole Process
  - Model Initiating
  - Model Self-Talk:
  - Verbally Reference what you see and do - acknowledging what you see the child doing that may be used as intentional communication
  - Model a Range of Communicative Functions
  - Make sure to model messages children might like to say, not just adult instructions and questions
  - Encourage Others to Model
  - Model how the child will use the system some of the time (alternative access method)
- How to Spend your Modeling Currency
  - Immersion is our goal, but reality is that AAC takes more time than speech

- Look at what types of language input research shows impacts typically developing kids' language development and use that as a guide for what to model most
- Model what matters to the kid
- Model kid talk
- It's not about work!
- Limit Asking Questions
  - Only pragmatic function the child can use after a question is "answer"
  - Turn questions into statements: Instead of "Do you want more?" say "Looks like you want more"
  - Describe
  - Explain
  - Comment
  - Pause
- Relate Everything to the Child's Experiences
  - Help make the neurological connections by scaffolding experiences for child to discover associations
  - Share enjoyment of discovered associations with the child
  - Limit "teacher voice" and telling the child what to do
- Focus your modeling around what child is interested in and attending to
  - "Linguistically Map" aided language onto the child's behavior
  - Talk about what is going on around the child - make connections
- Build your fluency
  - Set manageable goals for yourself to build your fluency with AAC and help others build fluency, too!
  - Practice, Practice, Practice!
  - Teach everyone to model
- Set the stage for expressive use with no demands
  - Pause periodically and provide an opportunity for the child to communicate, without requiring her to do so
  - Recognize when a child may have something to say
  - Offer "Do you have something to say?" only at times when a message from the child is more likely in the situation / conversation
  - Focus on Interaction
  - Have Fun!
  - Build a relationship
- Have a Conversation
  - Whatever the Child Says is Correct! Respond with a comment that relates to the child's experience - Using their AAC System
  - Expand upon what the child says using his AAC system

- Use AAC to say something first, if the child doesn't have anything to say, and also say something after - keep the discourse going!
- It is Good to Make Mistakes - Shows Kids that it is OK to take a Risk
  - Communication Partners May Also Get "Stuck" - Use this as a "Teachable Moment" - with Self-Talk and Repair Strategies - often the flap or side panel of a PODD has "Oops" that can be used when you get to a page and realize that you didn't want to go there.
- Modeling Communication Books
  - Always follow the operational procedures that the child will need to use
  - Self-talk your thinking process
  - Speak out loud what you point to
  - Recap the message as you go
  - Speak the complete message at the end
- Modeling High Tech
  - Model on the child's device, or use a separate device, or a book
  - Model operational process - "Speak Message", "Clear", etc.
  - Self-talk your thinking process
  - Turn off 'Speak on Entry'
- Communication and interaction should be the primary goal
  - Communication provides the purpose and context for the development of language skills
  - Enjoy communicating with the child!!!

**Give Children Something to Do, Something to Think About,  
Something to Learn, and something to talk about!**

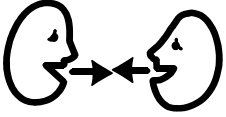

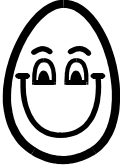

**Acknowledge that Communication is a priority for any child with  
Complex Communication needs!**

"Communication is the essence of human life" ASHA, 1991, p.9

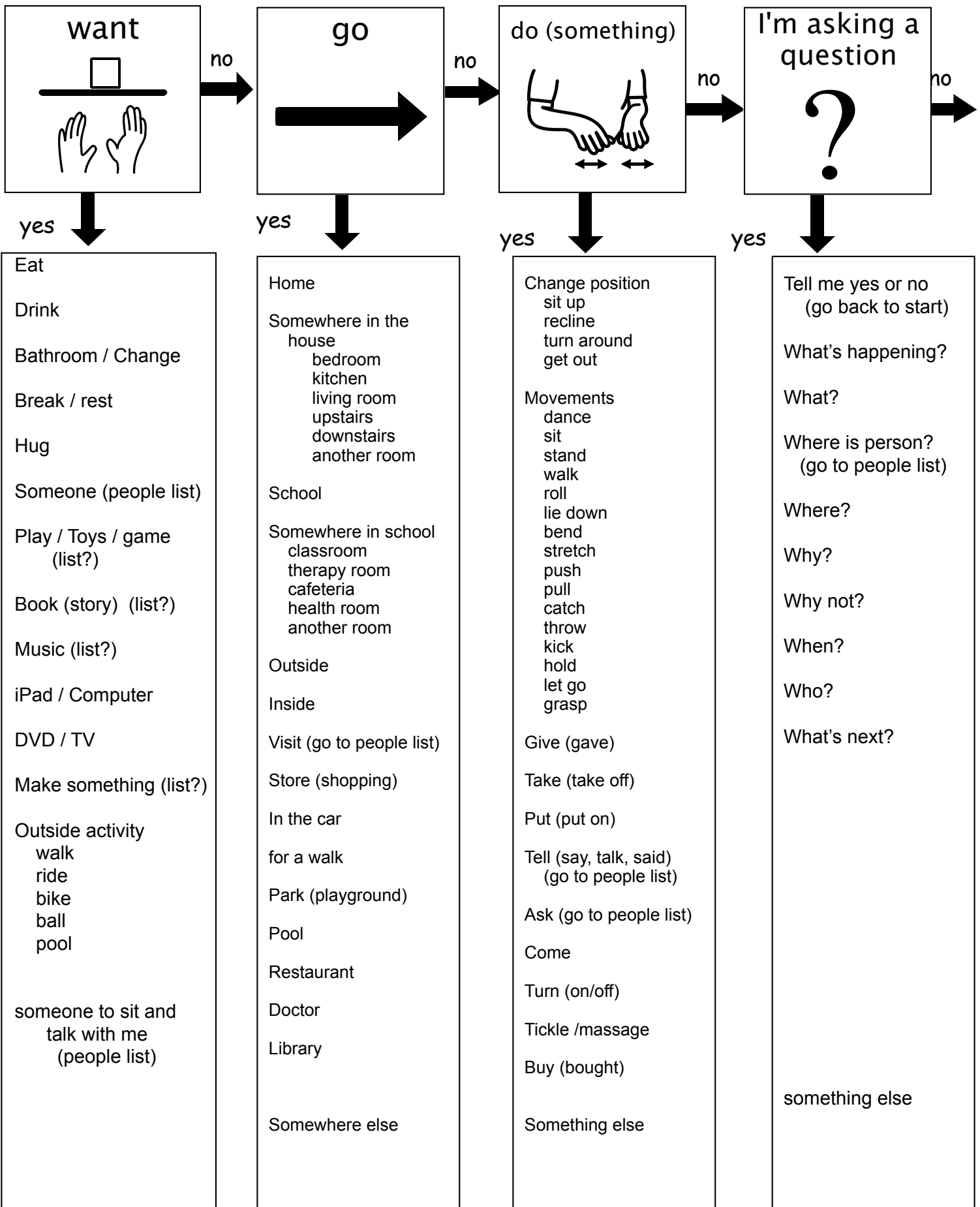
**Communication allows us to:** (Porter and Kirkland)

- Establish relationships
- Express our personality
- Demonstrate and share our knowledge
- Ensure that our needs are met and our wishes are considered

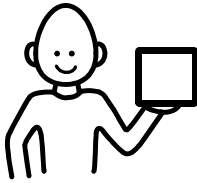
Read labels one at a time, across the top, and wait for the child to respond yes or no. If No, continue reading across. If Yes, read down the column. Once the child makes a selection, recap your understanding of the message and then respond to the message. Use a monotone voice for the scan, but use a social voice for responding to the message.

<p>chat words</p> 	<p>no</p> <p>something's wrong</p> 	<p>no</p> <p>like</p> 	<p>no</p> <p>don't like</p> 
<p>yes</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>I don't know</p> <p>More</p> <p>Done (finished)</p> <p>Help</p> <p>Uh oh (Oh no)</p> <p>Hurry up</p> <p>Stop / wait</p> <p>Me (I do, my, mine)</p> <p>You (your turn, yours)</p> <p>Listen</p> <p>Look</p> <p>Just kidding</p> <p>Leave me alone</p> <p>I love you</p> <p>Good bye</p> <p>Please</p> <p>Thank you</p> <p>Sorry</p> <p>do something else</p> <p>Something else</p>	<p>Tired</p> <p>Hurt</p> <p>Stomach</p> <p>Ear</p> <p>Head</p> <p>Neck / throat</p> <p>Leg / foot / toes</p> <p>Arm / fingers / hand</p> <p>Eyes</p> <p>Mouth / teeth</p> <p>Nose</p> <p>Back</p> <p>Bottom</p> <p>Somewhere else</p> <p>Uncomfortable</p> <p>wiggle (jiggle, move)</p> <p>change position</p> <p>too tight</p> <p>too loose</p> <p>Hot</p> <p>Cold</p> <p>Wet</p> <p>Sick</p> <p>runny nose</p> <p>cough</p> <p>cold</p> <p>Grumpy/upset (frustrated)</p> <p>I can't see it</p> <p>I don't know what's happening</p> <p>Hungry</p> <p>Thirsty</p> <p>Want or need someone (go to people list)</p> <p>Broken</p> <p>Lost</p> <p>Bathroom (change)</p> <p>Don't know what is wrong</p> <p>Something else</p>	<p>Great</p> <p>Good (good job)</p> <p>Funny</p> <p>Fun</p> <p>Clever (smart)</p> <p>Silly / crazy</p> <p>Awesome</p> <p>Yummy</p> <p>Favorite</p> <p>Beautiful</p> <p>Nice</p> <p>Lucky</p> <p>Cool</p> <p>love it</p> <p>something else</p>	<p>Yucky (Gross!)</p> <p>Boring</p> <p>Too noisy</p> <p>Scary</p> <p>Makes me mad</p> <p>Don't want to</p> <p>Can't do it</p> <p>Too hard</p> <p>Too easy</p> <p>Wrong</p> <p>Bad</p> <p>Something else</p>






show you something



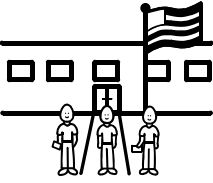
no

something special



no

school activity



yes

yes

yes

people list:

- In my bag
- something new
- Something I made
- Something I can do (watch me)
- I'll look at it (watch my eyes)
- I'll tell you where my room another room (list)
- Ask someone (go to people list)
- I have a note
- Something else

- Surprise
- Present
- Card
- Birthday
- Party
- Holiday
  - Christmas
  - Hanukah
  - Halloween
  - Thanksgiving
  - Easter
  - Vacation
- Sticker (prize)
- trophy (metal)
- Something else

- Circle (group)
- Work
- Play
- Book (Read story)
- Work with someone (go to people list)
- Therapy
- Centers
- Eat (snack, lunch)
- Drink
- Bathroom
- Rest
- Something else

- me
- Mom
- Dad
- someone here (list who is near)
- Someone else (use back of page for more people)