Combining Visual and Auditory Scanning for Children with CVI and Complex Communication Needs

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Gayle Porter is the developer of PODD and receives royalties from sales of PODD template resources. Gayle Porter and Linda Burkhart are paid honorariums for delivery of PODD and other trainings. Both Linda and Gayle consulted with Mayer-Johnson to advise them in the development of high contrast PCS on a voluntary basis.

Cortical / Cerebral Visual Impairment

• Visual challenges caused by damage to the brain

• Vision skills fluctuate - often inconsistent and changeable - especially in relation to environmental conditions

CVI May or May Not Occur with Ocular Disabilities

CVI Frequently Occurs with Other Neurological Damage

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

Different parts of the brain
Sometimes, the neural pathways can be “rewired” around damaged areas of the brain to make new cortical connections.

Strategies and Accommodations for Cortical Visual Impairment and AAC

Effective Intervention Strategies

- Customized environmental adaptations to the child’s natural routine
- Modifications to presentation of materials in every day environments to support the best visual functioning
- Not “vision therapy”

Dr. Christine Roman-Lantzy
Characteristics of Children with Cortical Visual Impairment
www.afb.org/store
www.aph.org/cvi

Difficulty with Visual Novelty

- Lack of visual curiosity
- Brain is more likely to have built neurological connections for recognition for familiar items
- Children with CVI do see better at home and in familiar settings

Communication Displays should make use of familiar vocabulary location, pattern and sequence
**Communication Displays** should make use of familiar vocabulary, location, pattern, and sequence.

PODD Communication Books Provide Consistency of Presentation

**Difficulty with Distance Viewing**

- Child may view items at close distance to reduce complexity
- Child may have difficulty coordinating eyes for depth perception

**Bring Pictures Close then Move Back for Focus**

**Pull-Off Symbols**

- Present a column of symbols at a time
  - Visually simpler for the child
  - More complex for the partner
  - May take more time
  - Results in a much thicker book

**Pull-Off Columns**
Issues of Complexity

Complexity

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

Complexity

- Visual complexity compounds visual difficulties
- Other sensory input can compound visual complexity

Visual complexity can impact what the child can process and understand

Visual complexity & AAC

- Number of items on the display
- Spacing (crowding) of items on the display

Visual Complexity of Symbols

eat

eat

eat
Problems with Photographs

- clap
- car
- eat
- done playing

Black lines in Symbols

- playground
- CD player
- play

Complexity - Multiple Colors and Details

- playground
- Do you believe me?
- elementary school
- change

High-lighted backgrounds were a good alternative for activity specific displays to highlight parts of speech and break up a larger activity specific display.

(Goossens', Crain & Elder, 1992)

Complexity - Multiple Colors and Details

- playground
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High-lighted background may not be as useful for other vocabulary organizational systems.
Child with CVI may be more attracted to the color of the background than the shape of the symbol

Guidelines for Creating and Modifying Symbols for CVI

Increase visual contrast:
- Black background with light or bright contrasting colors
- Red and Yellow are good for many children with CVI
- Other bright colors
- Simple solid shapes

New Mayer-Johnson PCS High Contrast Symbols

Reduce visual complexity of each symbol:
- Less number of colors - try to keep to one or two colors per symbol
- Simpler forms/lines
- Use of color to support discrimination between similar shapes
- Possibly bold the main element instead of using an arrow to show emphasis
Reduce visual complexity of each symbol

- Use of egghead people instead of adding hair
- Fewer internal lines of detail the better
- Solid shapes rather than lines

Discrimination between similar symbols

- Use of varied solid shape for similar symbols - not just varied internal detail
- Use of color to support discrimination between similar shapes (ie: similar shape heads maybe colored different)

Color Can Assist with Discrimination of Symbols

dollar store  grocery store  shoe store

Additional Considerations

- One option per word such as "play" - not all the variations
- Still need large number of vocabulary items for specificity
- When possible - similarities to existing symbols is desirable

Color May Assist with Discrimination of Symbols

Alternative auditory / visual presentation
PODDs

- High contrast – direct access
- Auditory plus visual scanning
  - Regular symbols
  - High-contrast symbols
- Auditory scanning
Auditory plus Visual Scanning

Social speech versus operational speech

- Partner’s speech is part of the selection set
- Need to help partners learn to use operational speech for the auditory scan
  - Scanning is not a series of questions

Scan vs. Series of Questions

- Something’s wrong
- Is something wrong?
- Do you want something?
- Do you want to go somewhere?

Scanning operational speech (like the device would scan)

Consider Starting With a One Per Page PODD

• Include instructions to help partners use operational speech in the scan
Reduce visual complexity for child
Sequentially present one symbol at a time
Assist partner to learn to perform auditory plus visual scanning

Have a Pull-Off Companion Version for Direct Modeling
-Some of the Time

Decide if some items will just be presented auditorally in a list format

Column-item visual plus auditory scanning

Pull Off Symbols or Columns
- Visually simpler for the child
- More complex for the partner
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Flap - “More to Say”
Once the child has selected a word from the scan - that does not branch, the communication partner scans the flap. This allows the child to combine multiple words to create his message.
One / a few at a time auditory plus visual scanning

- Is partial, transient and temporal
- Cannot look around whole page opening and see what other words are on this page
- Need to hear/see every option before deciding if can change page—Unless learned the page

When Symbols are Presented One or a Few at a Time:
- Turn the page Last (or first and last)

Vocabulary with possible semantic associations are grouped together in columns to help manage the difficulties of transience

Increased use of subcategories
Increased use of lists

- Auditory scan some predictably associated vocabulary
  - Sentence starters
  - Topic action words
  - Topic descriptions words
Auditory scanning

- Recognition of spoken words
- Temporal presentation
- Limited selection set presented at one time (auditory memory)
- Selection set is transient

Auditory Only Page Layout

- More portable/manageable book
  - Less partner skill / time / effort presenting symbols one at a time
  - ? Time required to look
- No Point of Focus for Joint Attention
- Spaces between groups of words - instead of columns
- One page general interaction / early functions
General interaction / early functions

When to use what?
- Primary purpose is to support communication throughout the day
- Some vision strategies can be used some of the time, but for practicality reasons, you may not be using them all the time.
- Emphasis should be on frequent communicative interactions with supports for vision use when reasonable
- Don’t hold the child back in the area of communication development because of vision deficits

Remember
The primary purpose of an AAC system is to enable the child to most effectively meet their communication requirements as
- intelligibly
- specifically
- efficiently
- independently
- in as socially valued a manner
- as possible

To understand others and to be understood.