

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

Linda Burkhart & Gayle Porter

[www.LBurkhart.com](http://www.LBurkhart.com)

Gayle Porter is the developer of PDD and receives royalties from sales of PDD template resources. Gayle Porter and Linda Burkhart are paid honorariums for delivery of PDD 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

- 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 - Screening Tool (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**

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](http://www.afb.org/store)

[www.aph.org/cvi](http://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

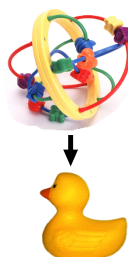


- Communication Displays should make use of familiar vocabulary location, pattern and sequence





## 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

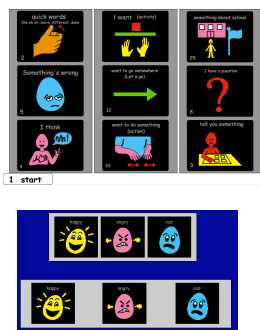


Visual complexity can impact what the child can process and understand



## Visual complexity & AAC

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



## Visual Complexity of Symbols

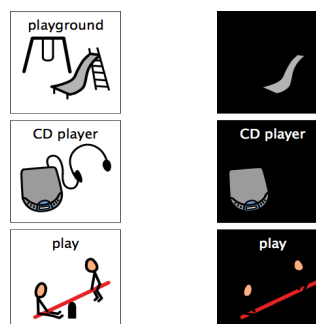




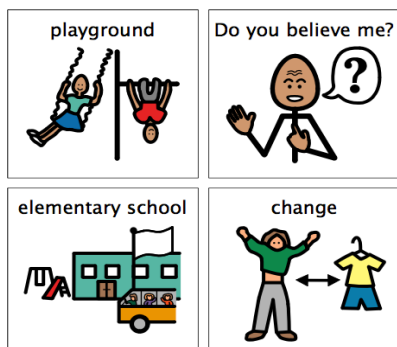
## Problems with Photographs



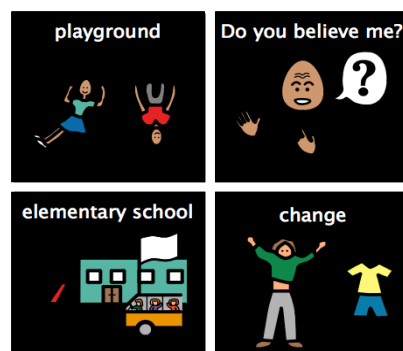
## Black lines in Symbols



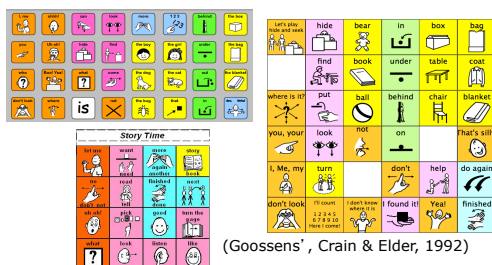
## Complexity - Multiple Colors and Details



## Complexity - Multiple Colors and Details

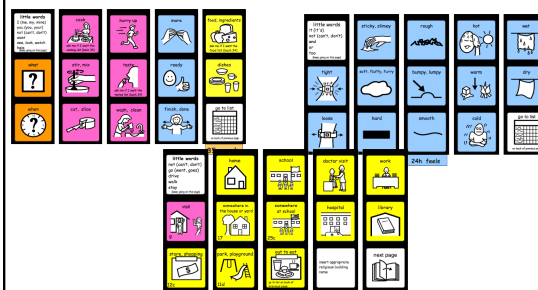


High-lighted backgrounds were a good alternative for activity specific displays to highlight parts of speech and break up a larger activity specific display



(Goossens', Crain & Elder, 1992)

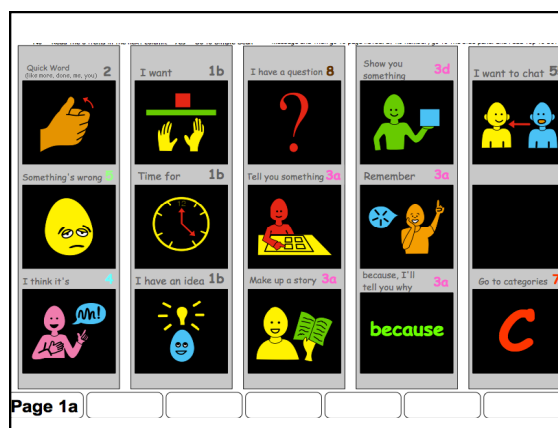
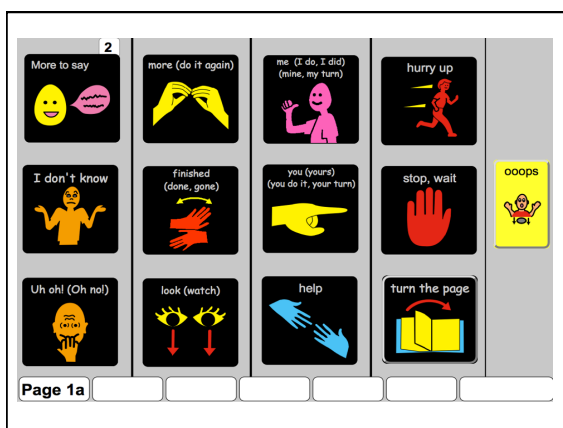
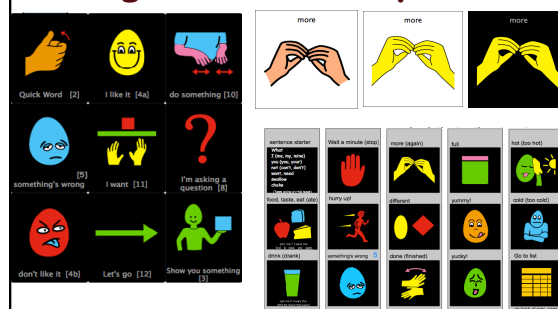
High-lighted background may not be as useful for other vocabulary organizational systems



Child with CVI may be more attracted to the color of the background than the shape of the symbol



## New Mayer-Johnson PCS High Contrast Symbols



## 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



### 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

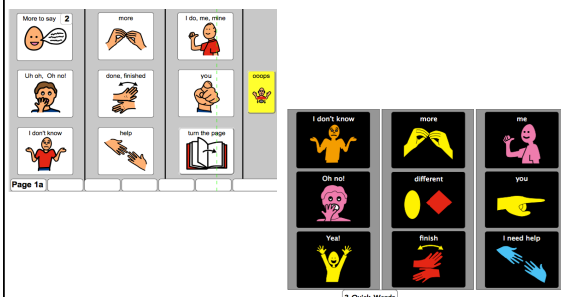


## Additional Considerations

- 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

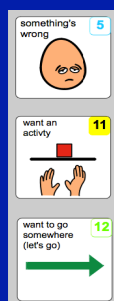
- Partner's speech is part of the selection set
- Need to help partners learn to use operational speech for the auditory scan
  - Scanning is not a series of questions

## Scan vs. Series of Questions

something's wrong

want something

go somewhere



Is something wrong?

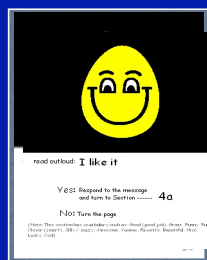
Do you want something?

Do you want to go somewhere?

## Scanning operational speech (like the device would scan)



- Include instructions to help partners use operational speech in the scan



## Consider Starting With a One Per Page PODD





One / a few at a time auditory plus visual scanning

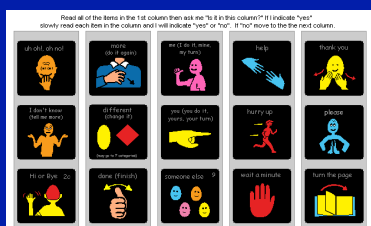
- Is partial, transient and temporal
- Cannot look around whole page opening and see what other words are on this page
- Need to hear/see every option before deciding if can change page  
–Unless learned the page

- Page #1 is branches
- Link to chat words page 2



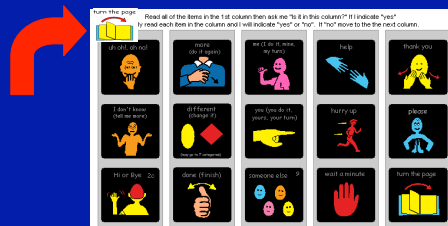
When Symbols are Presented One or a Few at a Time:

- Turn the page Last (or first and last)



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- 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

204 animals list back of 206						
animal body part:	wild animals			water animals	animal list	
	reptiles	wild	zee	fish		
tail	snake	bear	monkey	shark		
wings	frog, toad	squirrel	gorilla	whale		
fin	lizard	skunk	lion	dolphin		
scales	turtle	raccoon	tiger	seal		
back	alligator	chipmunk	elephant	walrus		
bill	bat	beaver	hippo	penguin		
horn	dinosaur	deer	giraffe	octopus		
hoof		reindeer	zebra	jellyfish		
		wolf	koala	shell		
		bobcat	kangaroo	lobster		
		porcupine		crab		
		buffalo		oyster		
		moose		turtle		
put it on the list	put it on the list	put it on the list	put it on the list	put it on the list	put it on the list	
none of those	none of those	none of those	none of those	none of those	none of those	

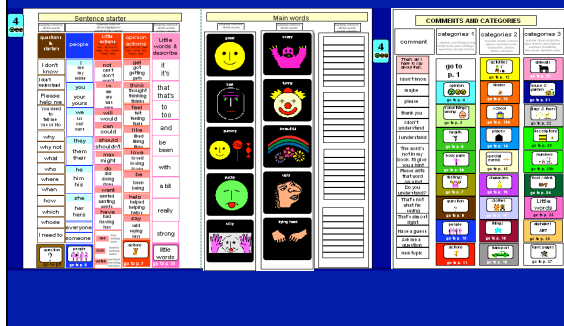
Read all of the items in the 1st column then ask me "Is it in this column?" If I indicate "yes" slowly read each item in the column and I will indicate "yes" or "no". If "no" move to the next column.

- » Sentence starters
- » Topic action words
- » Topic descriptions words

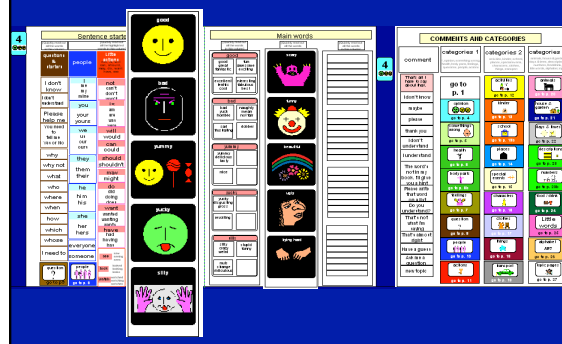
[illegible]



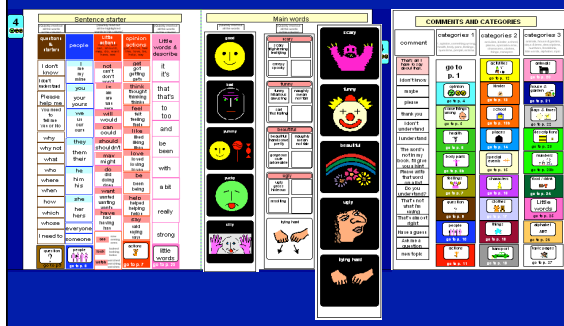
## Auditory plus visual scan with some just auditory



## Auditory plus visual scan with some just auditory



## Auditory plus visual scan with some just auditory

Auditory only  
partner-assisted scanning

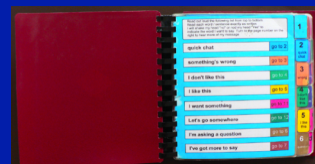
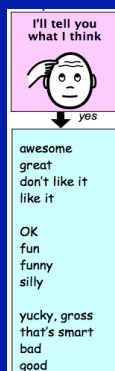
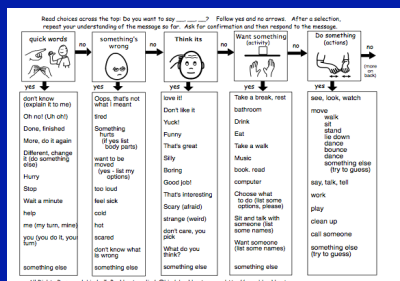
## Auditory scanning

- 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.

