# Vision, Language, Learning Communication, Participation: An Approach to AAC for Students with CVI

Christine Roman-Lantzy, Ph.D.

Sarah W. Blackstone, Ph.D., CCC-SP

# Children with CVI and CCN

- At high risk: cognitive, sensori-motor, social, language, literacy, communication, participation.

**Access to vision, language, learning communication, participation**

- Need targeted interventions to develop functional vision, engage in meaningful interactions, & have consistent opportunities for learning.

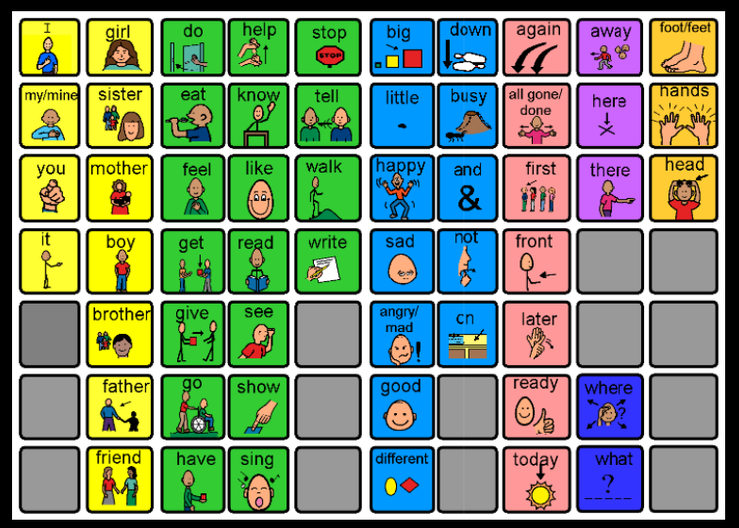
- Need access to a range of assistive/AAC strategies, tools and technologies to participate actively in family, school and community and communicate effectively.

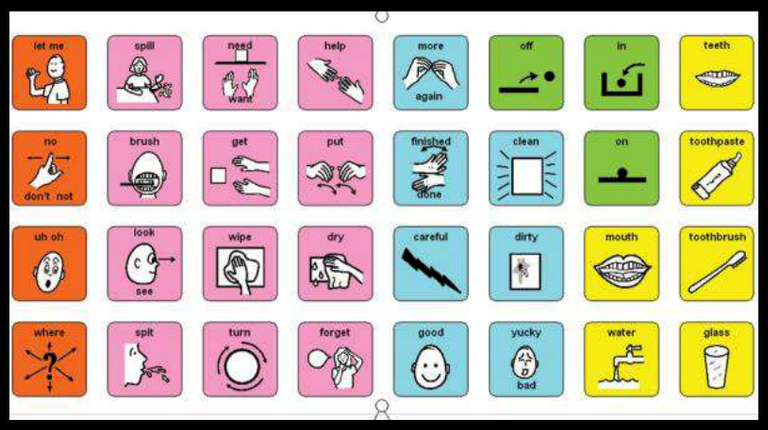
# Challenges

- Are vision educators required & willing to meet the unique needs of students with CVI?
- Are communication specialists willing to make accommodations for students with CVI?
- If vision, communication professionals & teachers do not collaborate, how does the student with CVI who uses AAC gain access to language, communication and their education?
- Attention! There are likely many students with CVI in classrooms  who are not diagnosed


ABC
DEF
GHI
JKL
MESSAGE
PQR
STU
VWX
SPACE
YZ


Page 2


I
girl
do
help
stop
big
down
again
away
foot/feet
my/mine
sister
eat
know
tell
little
busy
all gone/ done
here
hands
you
mother
feel
like
walk
happy
and
first
there
head
it
boy
get
read
write
sad
not
front
brother
give
see
angry/ mad
cn
later
father
go
show
good
ready
where
friend
have
sing
different
today
what


let me
spill
need
want
help
more
again
off
in
teeth
no
don't not
brush
get
put
finished
done
clean
on
toothpaste
uh oh
look
see
wipe
dry
careful
dirty
mouth
toothbrush
where
spit
turn
forget
good
yucky
bad
water
glass

# What we Know: Research

- "Traditional" AAC displays (symbols in grids) place significant visual & cognitive demands on young, "typically developing" children with normal vision
  - difficulty identifying, learning, using even a small number of pictographic symbols arranged on a grid display.
  - children with and without disabilities find it easier to learn and use personalized photographs of familiar people, events and locations ("visual scenes") than pictographic symbols in grids, especially before the age of 4-5 years.
- Children (and adults) seem to prefer looking at human/animal figures in photographs than other images
- "How" graphic symbols are arranged on a traditional grid display affects how fast and accurately children (with and without intellectual disabilities) can locate the target.
- Background color either has effect, or may even interfere with search
- Even small changes to physical features on AAC display can impact speech and accuracy

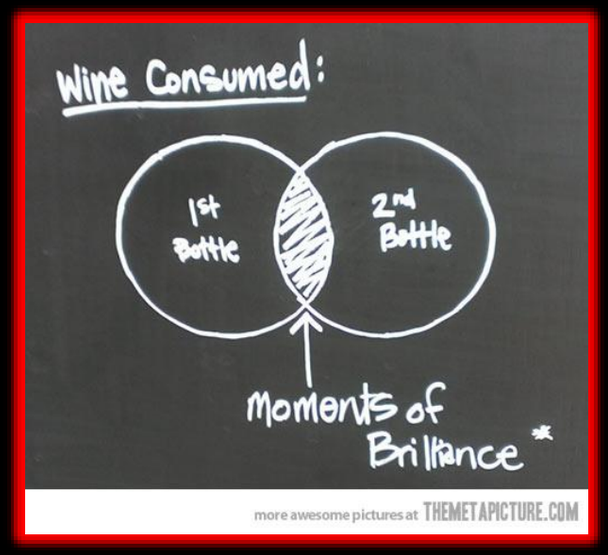
(Drager, Light, Carlson, DSilva, Larsson, Pitkin & Stopper, 2004; Light, Drager, McCarthy, Mellott, Parrish, Parsons, Rhoads, Ward & Welliver, 2004; Drager, Light, Curran-Speltz, Fallon & Jeffries, 2003; Light & Drager, 2002; Thistle & Wilkinson, 2012; Wilkinson, Broch, & Clarke, 2011; Wilkinson & Light, 2011; Wilkinson & Light, 2012; Wilkinson, Carlin & Thistle, 2008; Wilkinson, Light & Drager, 2012, Wilkinson & McIlvane, 2013; Wilkinson & Snell, 2011.

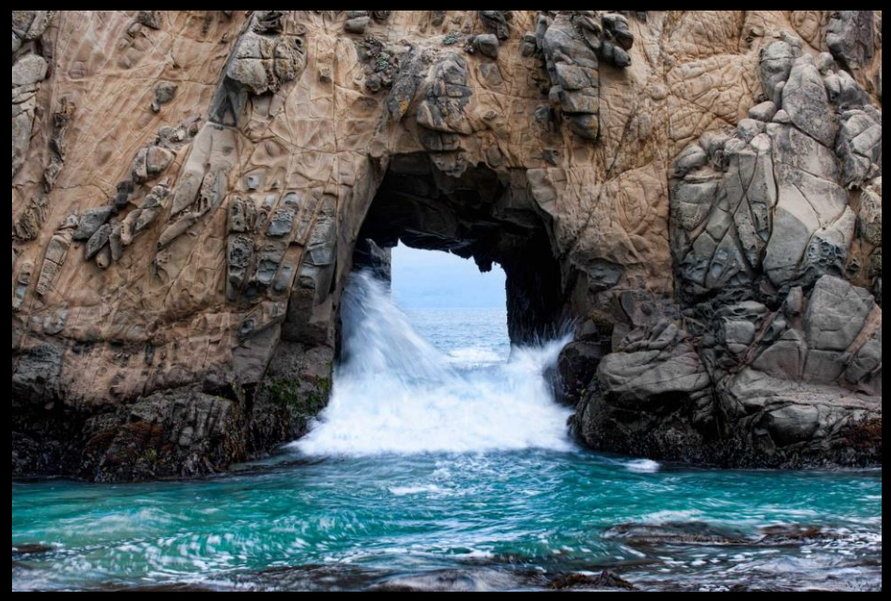
# What we Don’t Know?

- No studies have included  children with CVI
- Limited evidence. Awareness growing.
- Few case examples that provide guidance re: children with CVI who use AAC
  - No longitudinal documentation
  - Increased attention (& frustration/angst) from professionals and parents

# OUR JOURNEY:
# From Pittsburgh to Mexico City


# …to Big Sur, CA


Wine Consumed:
1st Bottle
2nd Bottle
Moments of Brilliance*
more awesome pictures at THEMETAPICTURE.COM



# Vision, Language, Learning, Communication, Participation: A Synergistic Framework

Children are WHOLE beings,
NOT a sum of their parts

# Assessment and Intervention

- Removing professional silos
- Focus on each individual and his/her ability to function: vision, learning, language, communication, mobility, participation

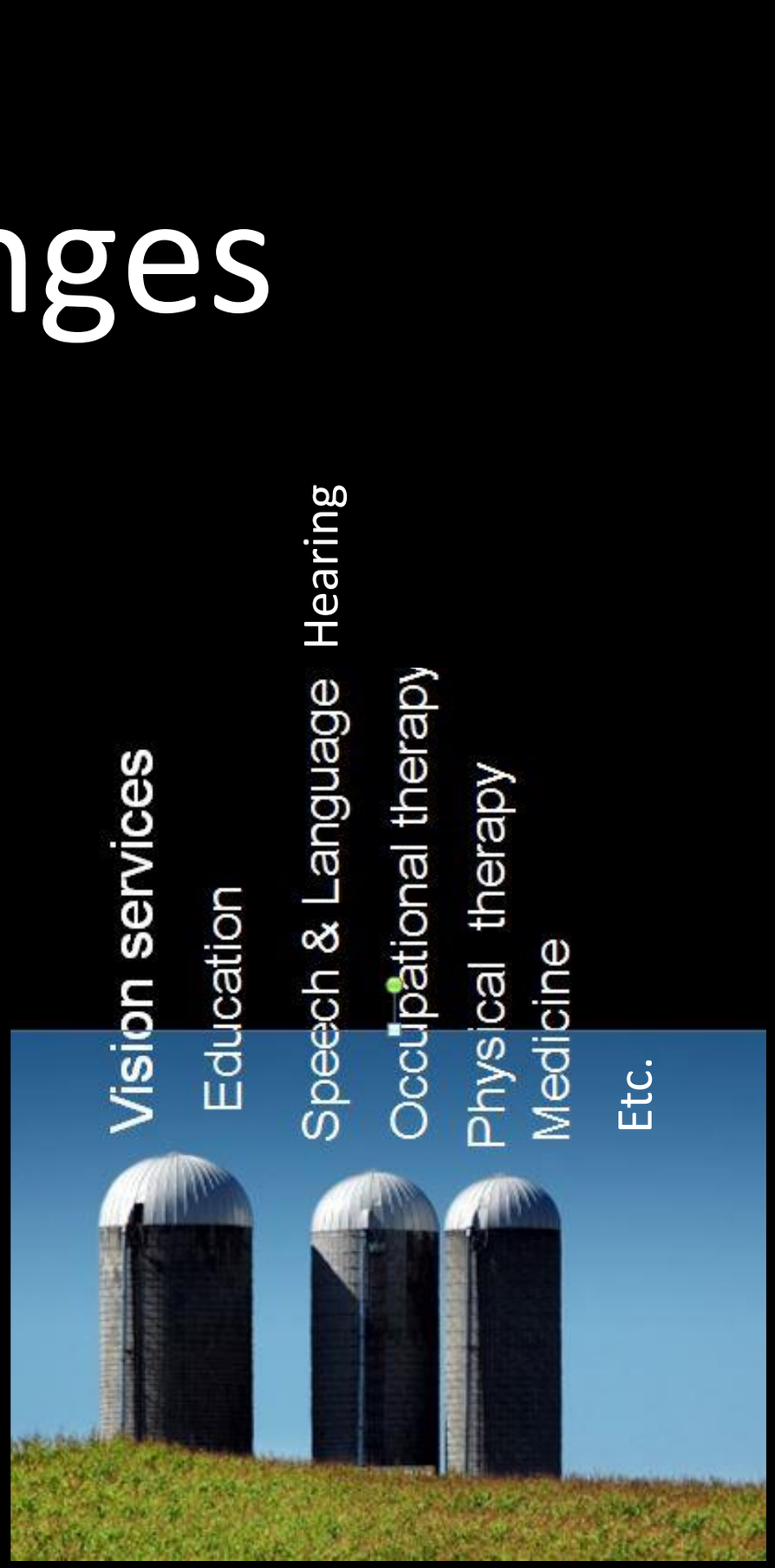
# A “Synergistic” approach

*Working together in a creative, innovative and productive manner*

# Challenges

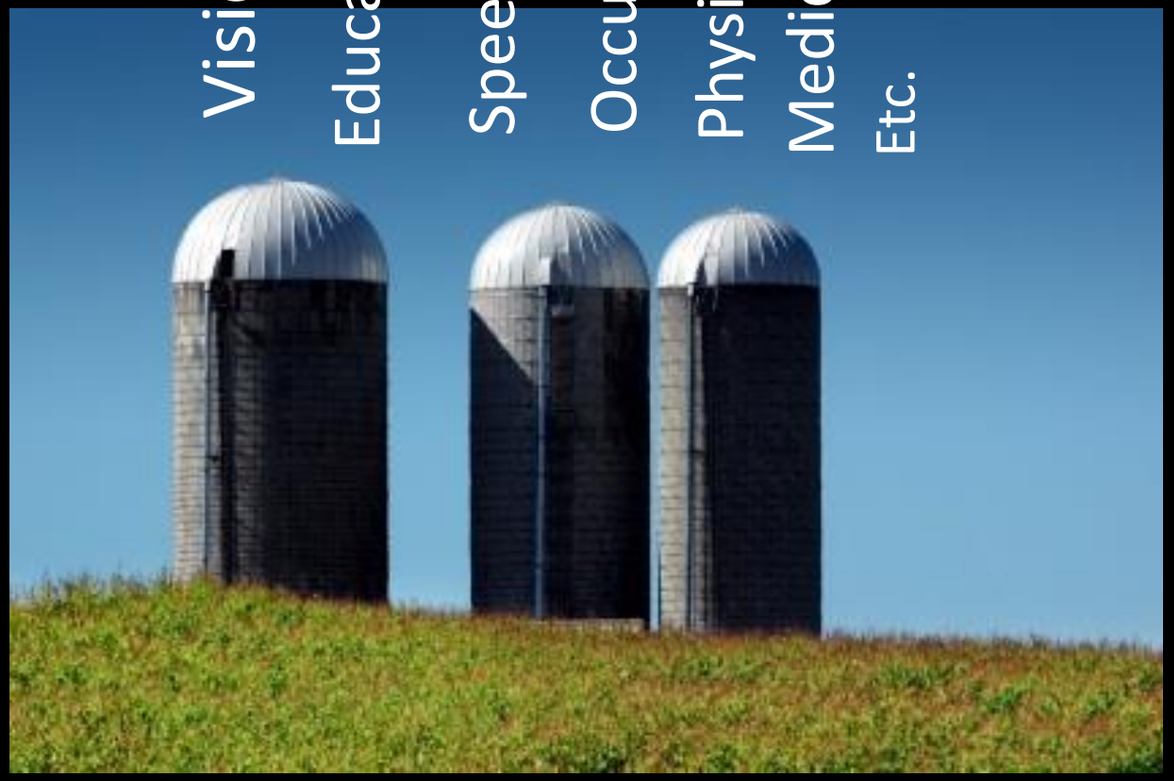
Educational & medical “systems” continue to support us “practicing” in silos

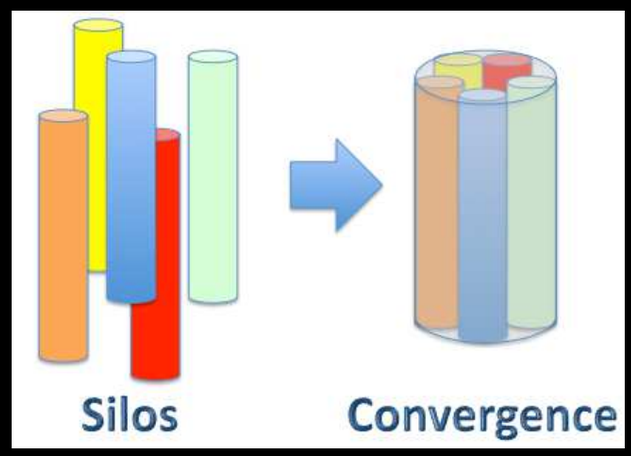
Children with CVI and CCN deserve access to the accommodations, over time, that reflect a convergence of our collective knowledge and skills



# Breaking down Professional Silos

Vision services
Education
Speech, Language, Hearing
Occupational therapy
Physical therapy
Medicine
Etc.






Children benefit

**Vision educators AND SLPs, OTs, teachers, family members need to understand**

- How CVI impacts development, learning, cmmunication and participation across domains
- What accommodations /strategies to make/use that are based on
  - Valid/reliable assessment data
  - Longitudinal measures of outcomes/ intervention strategies that support children with CVI who use AAC

# Interprofessional teams can

Track changes, make adjustments, and measure the impact of interventions on individual children longitudinally, across domains

- Vision
- Language
- Learning
- Communication
- Participation

# NOT EASY

# Guiding principles

## Vision- Learning-Language-Communication-Participation: A FRAMEWORK

- No child with CVI and CCN should be denied access to language, learning, communication and full participation.
- Vision, language, learning, mobility, and communication are developmentally intertwined.
- Improvement in functional vision for children with CVI and CCN should be expected and can result in improvement across other developmental domains.
- If you can’t talk and have CVI, incidental learning, joint attention are limited. If vision improves, other areas can be positively impacted.
- The nature of the language input children with CVI receive may actually assist them to interpret what they are seeing and should be approached mindfully.

- Access to language (and sufficiently large vocabularies) is essential to the long-term cognitive, educational, social and communication development and participation of children with CCN.
- Children with CVI and CCN require an integrated, dynamic, early intervention approach that specifically addresses their development across domains and their participation and ability to function in the world.
- Vision, language, communication and participation goals must be considered concurrently, however, they are NOT always be addressed simultaneously.

# SUPPORTING CHILDREN WITH CVI AND CCN

**GOALS**

**VLLCP**

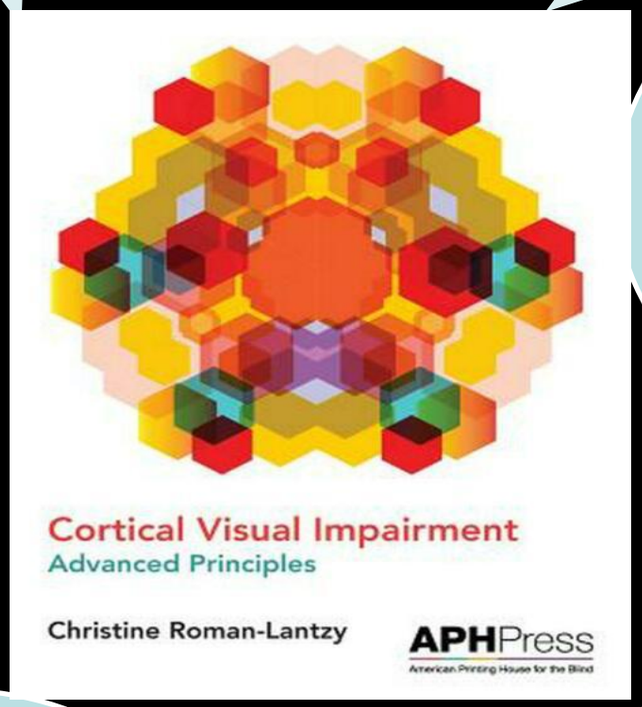
**CHARACTERISTICS OF CHILD**

**ENVIRONMENT**

**COMMUNICATION PARTNERS**

**SYNERGISTIC STRATEGIES**

**Phase I,II,III**



# Where to begin?

- Children with CVI and CCN: Asynchronous development across domains.
- Limited incidental learning opportunities; difficulty establishing joint attention
- Age, language skills, preferences, tasks, contexts social networks…often call for very different accommodations to environment, materials, methods/strategies
- Myths and misinformation abound in clinics, educational settings and homes

# BEGIN WITH ASSESSMENT

## GOALS

## CHARACTERISTICS OF CHILD

DX

Disabilities

Health/Medical status

Interests

Social networks

## ENVIRONMENT

Accommodations to Contexts

Activities

Materials

## COMMUNICATION PARTNERS

Trained/untrained

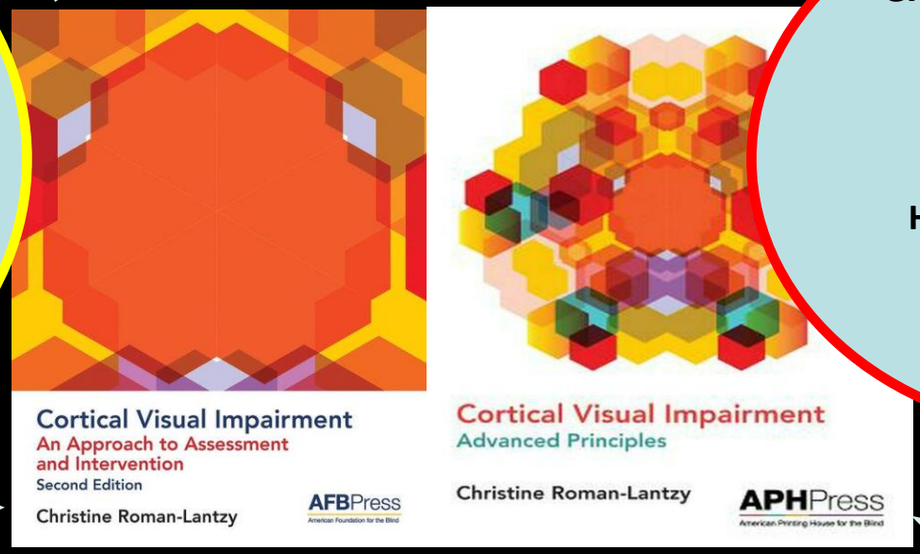
Mindfulness

Use of AAC/AT

## STRATEGIES/ METHODS

Phases I,II,III

## Collaborative team with training




(Roman-Lantzy, 2018; Newcomb, 2010).

# Integrated Goals

1. Build stable visual responses
2. Provide multiple learning opportunities for children to
   - use their vision
   - learn – explore, develop concepts, language/ communication and other skills across domains
   - participate in meaningful ways in activities throughout the day (people, activities, objects, contexts, routines)

# Characteristics of Children with CVI and CCN

- Interests/Preferences
- Scores on CVI Range: Phases I, II, III
- Language comprehension/ expression, cognition
- Mobility & stability
- Sensory/motor issues
- Medical Issues - Health, medications
- Social Networks (family friends, etc.)
- Settings: school, home, community
- Communication challenges
- Learning challenges
- Participation challenges
- Access to AAC/AT

# Environment

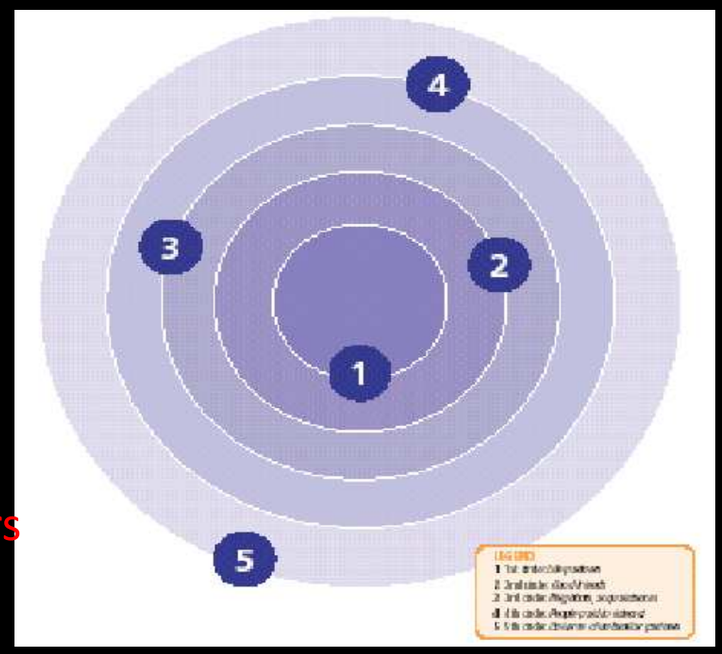
- Objects
- People
- Routines
- Visual complexity
- Accommodations to Environment/Context
- Adaptations to materials, activities, tasks
- Sensory input (auditory, smell, taste, touch, lighting, clutter, ambient noise)
- Positioning
- Mobility
- Language used by partners and in environment

# Communication Partners

- Trained vs. untrained
- Expectations
- Ability to read child's signals
- Ability to provide accommodations on the spot
- Mindfulness!
- Language use during interactions with child
- Language use with others when child is present
- Expectations for language use

Social networks

1. Family
2. Friends
3. Acquaintances
4. Paid Workers
5. Unfamiliar partners



# Strategies

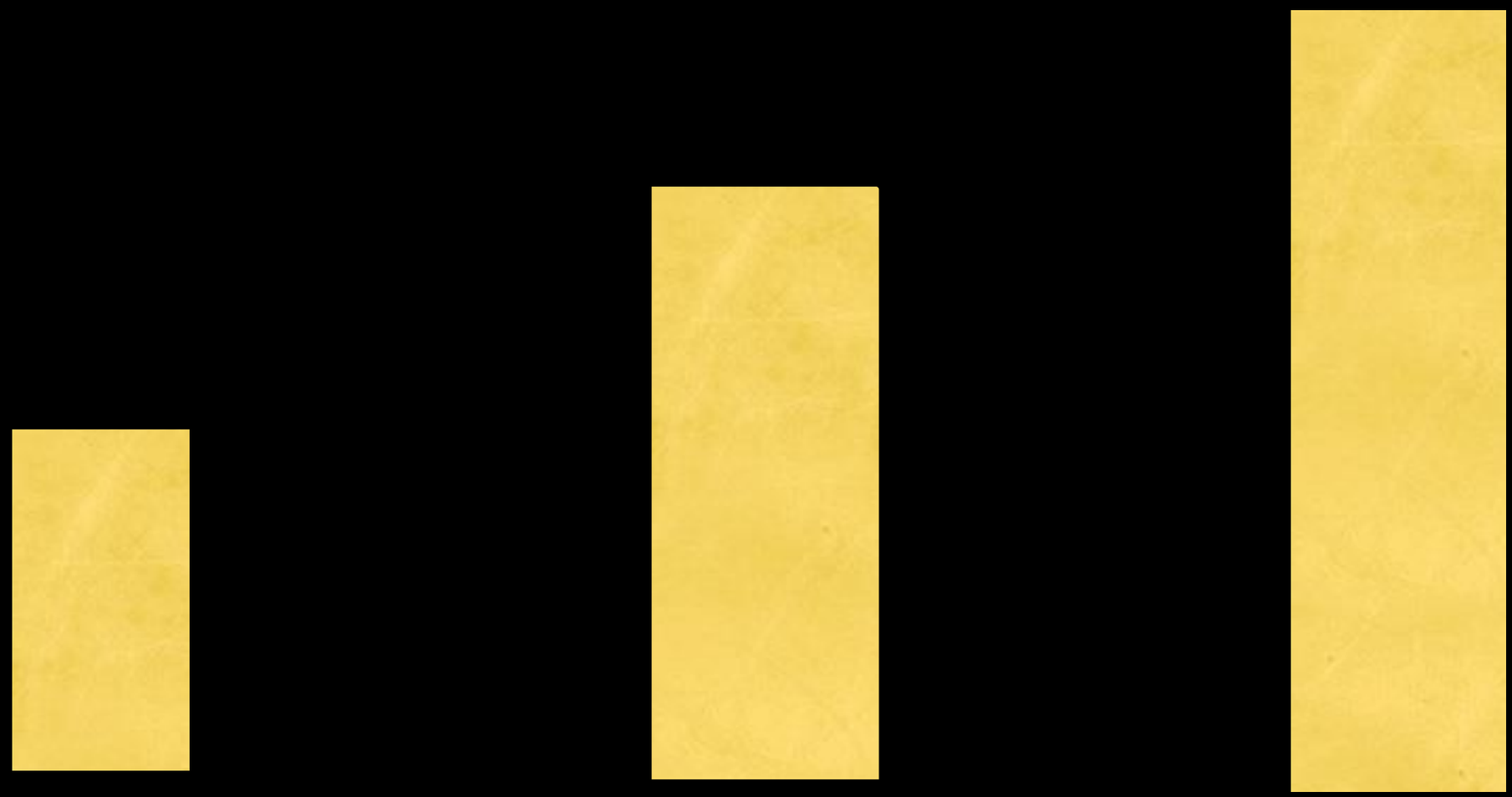
- Vision
- Learning
- Language
- Communication
- Participation

# Use of Functional Vision Across the Day

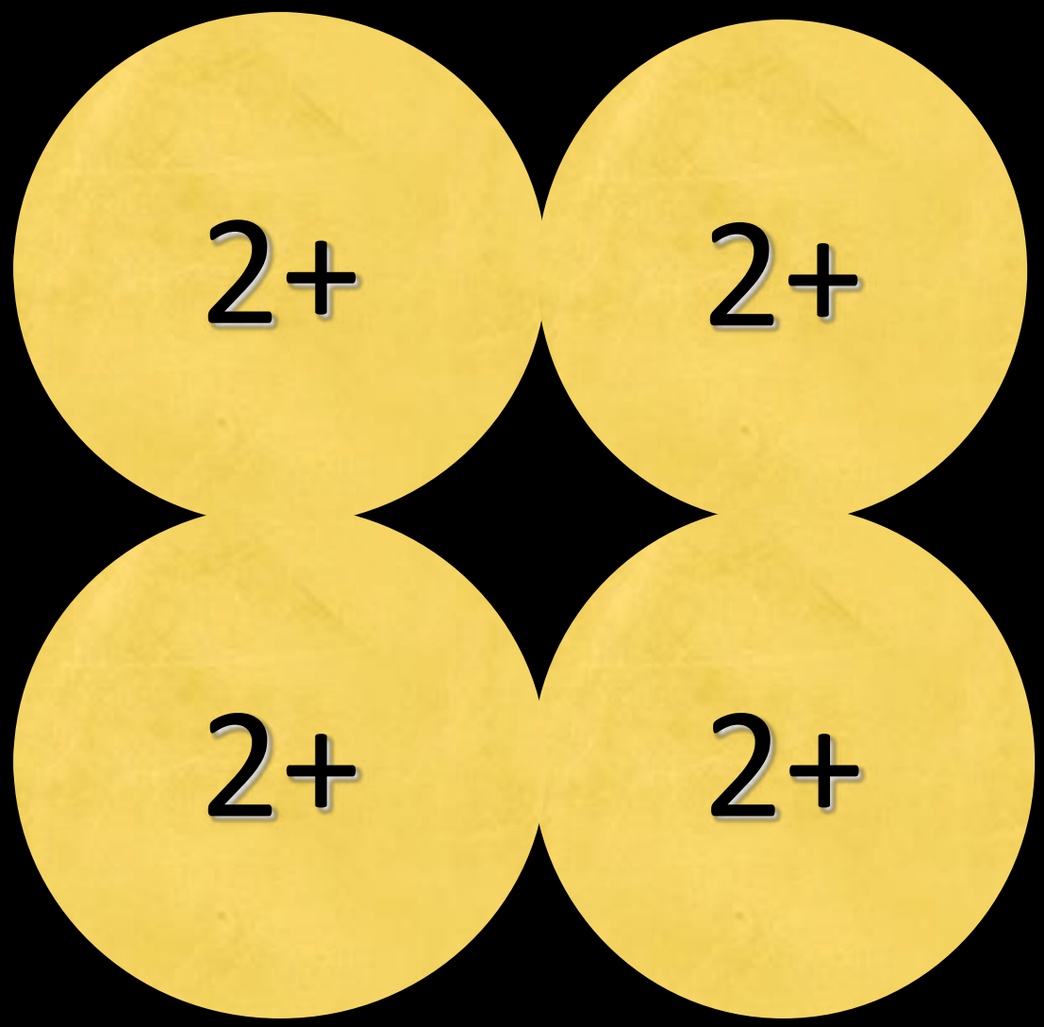
Phase I

Phase II

Phase III



Identify at least 2 opportunities in each quarter of the day to focus on supporting use of functional vision




Frequency is important

# We should expect improvement across domains when . . .

Multiple partners use appropriate language input

Signals are recognized and acknowledged during activities

Social interactions are supported

Targeted contexts are made accessible for learning

Access to growing vocabularies

Child can participate in target activities/tasks across contexts

Appropriate use of AT/AAC to support learning, language access, communication, participation across contexts

# We need Research!

Can teams implement strategies that can support vision, language, learning, participation/social intraction in a classroom setting?

- What we know
- What we don't know

# Improving Outcomes for Children with CCVI who rely on AAC

Grant awarded to The Bridge School, Hillsborough, CA by the Disability Communications Fund in California

- Retrospective Longitudinal study (2012-2019)
- Scoping study: Gap analysis (schools, university/college training programs, community clinics/agencies)

# The Brdige School Project will

- **Document longitudinal associations between students' functional vision, uptake of AAC technology/tools and strategies**
- **N=13; 2012-2019**
- **Investigate relationships among improvement in functional vision & student outcomes across domains**
- **Will identify intervention strategies that support positive outcomes**
- **AND….we will quantify unmet training needs (gap analysis)**
- **AND ….Identify collaborative partners.**

# Team

## THE BRIDGE SCHOOL

- Sarah Blackstone, PI
- Fei Luo, Research Assoc
- Aileen Arai, Director of Education
- Vickie Casella, Executive Director
- Professional Staff

## RESEARCH COUNCIL

- Christine Roman-Lantzy, Ph.D.
- Mary Ann Romski, Ph.D.
- Rose Sevcik, Ph.D.
- Frank DeRuyter, Ph.D.
- Jill King, M.S.
- Jesse Conchola, Statistician

# A FRAMEWORK
## SUPPORTING CHILDREN WITH CVI AND CCN

**GOALS**

**VLLCP**

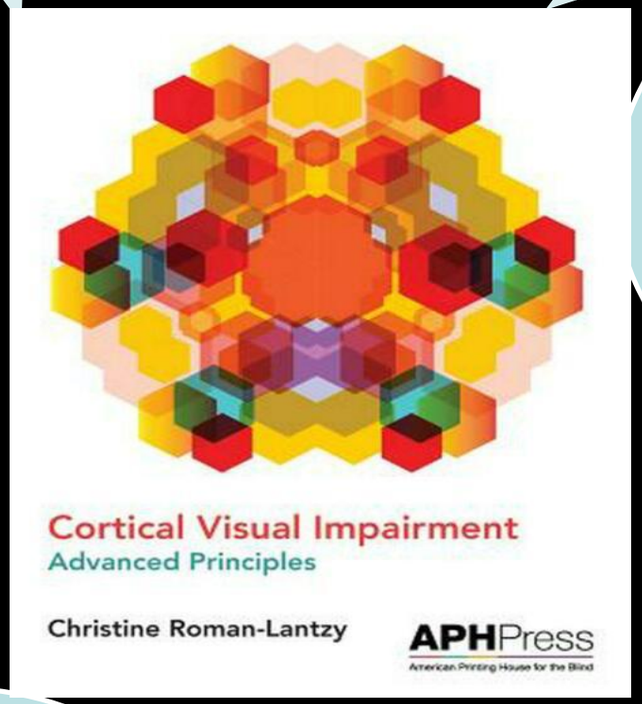
**CHARACTERISTICS OF CHILD**

**ENVIRONMENT**

**COMMUNICATION PARTNERS**

**SYNERGISTIC STRATEGIES**

**Phase I,II,III**



# Integrated Goals for Phase I

## CVI Range

1. Build stable visual responses

Phase I

2. Provide multiple learning opportunities throughout day to use vision

3. Attach meaning to familiar/preferred objects/activities/people in environment

4. Develop concepts for objects, actions, locations, etc.

5. Enable child to produce language and communicate with familiar partners

# Characteristics of children

## Phase I

Do not look at people

Do not establish joint attention

Eye to object contact rare

Visual responses intermittent/ rare

May turn to target using peripheral vision. All dorsal stream

May need physical supports to maintain position

Parents may report

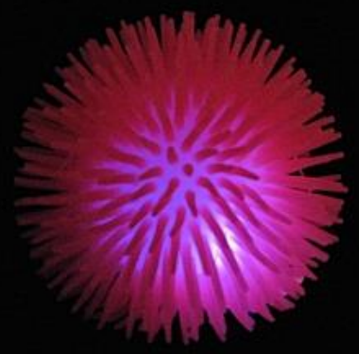
- Children attend mostly to auditory information
- Child may have a “favorite” color (often red or yellow).

Children who can talk: When vision is engaged, children may label familiar objects. Echolalia. Concrete (“I see it” / “I want that”).

3-dimensional objects

Movement

Familiar, shiny, favorite colored objects



# Phase I – Environment & Materials

Short frequent sessions

Light box, tablet with apps, flashlight to draw attention

Minimize sensory input

Stable positioning for seeing and communicating

Use limited, targeted vocabulary (label objects, actions, attributes)

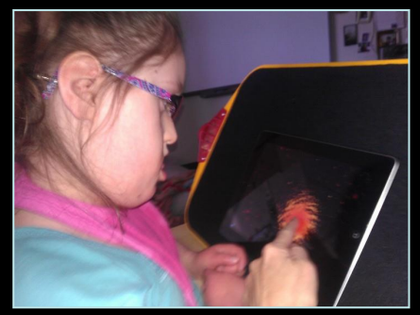
Language OUTPUT MULTI-MODAL

Use partner assisted auditory scanning

# Phase I

# Communication Partners

Use AT backlit technologies



Select activities and materials that match language comprehension abilities

Acknowledge use of signals

Use language mindfully to support vision, learning, communication, participation

# Sample Script – Phase I

1

**Partner sets up activity**

2

**Partner presents favorite, bright colored, shiny object.**
Uses light (backlit device, lite box, spotlight) and movement to highlight object.

3

**Partner waits.**
Latency can be quite prolonged.

**Partner is silent.**

4

**Child responds.**

5

**Partner labels, confirms/ expands.**
Key to building concepts, attaching meaning to language, and learning about world

# AAC/AT tools and strategies

## PHASE I

| PHASE I | | |
|---|---|---|
| **NO TECH (body-based)** | **Non-Electronic** | **Electronic** |
| Encourage<br>• Reliable yes/no signals<br>• Speech (approximations)<br>• Gestures/signs<br>Skilled partners use of *Partner Assisted Auditory Scanning* (with branching if possible) | • Highlight objects<br>• *Partner Assisted Auditory Scanning* card to help partner(s) present vocabulary | • Tablet (without sound/voice)<br>• Simple voice output messages to accompany familiar routines |
| | | |

# Integrated Goals for Phase II - CVI Range

**Phase # II**

Requires ongoing adjustments

1.Improve use of vision with intent (functional vision)

2.Increase ability to have impact on objects, events, activities, interactions with partners

3.Develop concepts by identifying salient features. Encourage comparative thought….“it’s got a handle, like your cup”

5.Provide access to increasing complex language, both expressive and receptive

6. Support participation in academic/ pre-academic activities by modifying materials anmd the environment

# Characteristics of child

## Phase II

Has begun to use vision functionally (reaches, moves toward).

Still requires significant accommodations

Still may be necessary to control sensory input

Can introduce 2-dimensional materials…need to teach meaning

Need multiple opportunities to USE vision functionally each day and across environments

Parents may report

- Children recognizes  more colors and familiar objects and may begin to look at faces
- Begins to understand that what child can see can impact what happens.

Children who talks may label, describe, request, questions, etc.

Variability: Early-late.
Across environments/tasks.
Increased complexity.

Can introduce 2-D photos
Add colors on object surfaces

# Phase II
## Environment & Materials

LANGUAGE can support vision. Ask child to sort (e.g., red things;
Find more cups;
This is your doggy, here's a picture of it.

Early->late phase II.
Able to function with increase in sensory input

**POSITION so can use vision and interact with objects and participate in activities.**

**Increasing INDEPENDENCE. Exploring environment**

**Use TECHNOLOGY to make something happen**

# Phase II
# Environment & Materials



**Increase COMPLEXITY while maintaining visual attention**

**Use LANGUAGE to support learning (concepts and language)**

**Language Input** (objects, actions, descriptors, etc). Describe salient features

**Support active engagement in routines**

**Make small group activities accessible in familiar environments**

# Phase II
# Communication Partners

**Help mediate new or more complex settings**

**Support communication access across contexts (multiple modes & methods)**

# Sample Script – Phase 2

1

**Partner sets up activity**

**Can present objects more towards midline**

May say,
"See if you can find…look at..
when you look at…we'll begin, etc."

May introduce 2 – dimensional photographic images

2

**Label object and describe 2 to 3 features.** "Here's your red cup. It's got a handle so you can hold it."

**Incorporate comparative language.** "This cup is like your yellow cup except it is a small."

3

**Partner waits.**
Latency is decreasing

4

**Looking precedes action**

May reach/ swat, say something

Eye-to-object contact

Makes choices

Begins to sort

5

**Partner confirms/ expands**

"You found all the pictures of ducks"

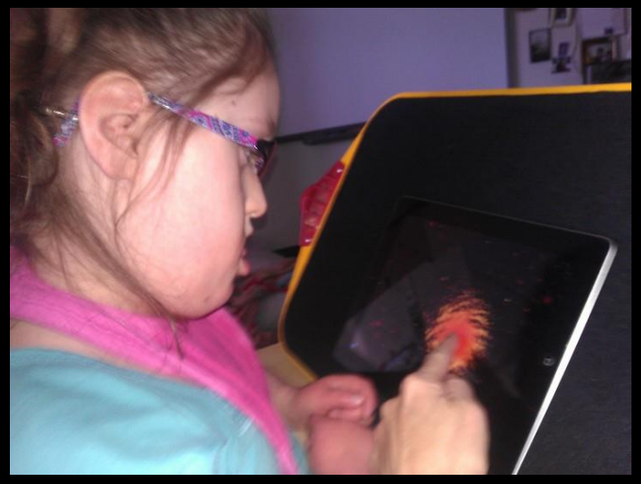
"You put all the blue blocks in the box."

"You found the dog in the picture of room."

"You found the switch and told me what you wanted."

# SUGGESTIONS FOR AAC TOOLS AND STRATEGIES – PHASE II

| PHASE II | | |
|---|---|---|
| **NO TECH (body-based)** | **NON-ELECTRONIC** | **ELECTRONIC** |
| • Skilled partners. Access to vocabulary beyond objects & actions.<br>• Partner assisted auditory scanning with branching<br>• Uses recognizable signals/ language (gestures, signs, head shakes, etc).<br>• Makes choices, etc. using a few objects/photos | • Objects<br>• 2-dimensional materials with meaning established<br>• Communication display/book<br>• Simple visual scanning system<br>• Simple Etran system<br>• Card for partner(s) with vocabulary for PAAS with branching | • Tablet (with sound) and Apps<br>• Switches that activate toys or speech output<br>• Computer with software (photos and other meaningful graphics)<br>• Communication devices<br>• Access (direct select, switches, eye gaze)? |



**PARTNER ASSISTED AUDITORY SCANNING – enables access to larger vocabulary -**

**TABLET**

**Monitor whether can visually attend while sound is present**

**AAC STRATEGIES: body based, non-electronic, electronic**

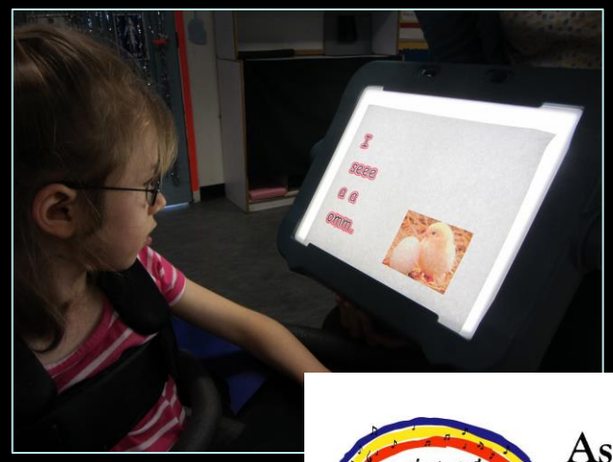
**Partner input:**
**Consider when and how to provide language input. WAIT TIME**

**LANGUAGE REPRESENTATION**
**Objects - Making Meaning Accessible.**

# CHALLENGES AND OPPORTUNITIES IN PHASE II

| PHASE II | | |
|---|---|---|
| **LOW TECH (non-electronic)** | **HIGH TECH (electronic)** | **Being Mindful to** |
| • **Objects**<br>• **2-dimensional materials with meaning established**<br>• **Communication display/book**<br>• **Simple visual scanning system**<br>• **Simple Etran system**<br>• **Card for partner(s) with vocabulary for PAAS with branching** | • Tablet (with sound) with aApps<br>• Switches that activate toys, speech output<br>• Computer with software (photos and other meaningful graphics)<br>• Communication devices | • **Value ALL communication modes**<br>• **Select representations (graphic, object, verbal) that are meaningful to child**<br>• **Use displays/tools that child can easily ACCESS** (vision, motor, linguistic, frequency, preferences, ease of use).<br>• **Consider how to arrange display, navigation based on individual child and usability across contexts** |
| | | |

# ABIGAIL: Preparing a project
# Partner assisted auditory scanning




# Assessment to Success: Integrating CVI Interventions, Strategies, and Accommodations into the Instructional Program at The Bridge School

Aileen Arai, M.A., Special Educator; Janelle Moynihan, M.S., CCC-SLP; Caitlin Sale, M.A., Special Educator; Sarah Blackstone, Ph.D, CCC-SLP

## What we've learned:

- Results from The CVI Range determine interventions within classroom instruction.
- When students use vision consistently with appropriate CVI accommodations:
  - overall participation increases
  - communication opportunities increase
  - curricular engagement increases

## Background

- The Bridge School serves students with severe speech and physical impairments (SSPI) and complex communication needs (CCN), aged 3-14 years. Most of our student have severe cerebral palsy.
- At least 50% of our student body at any time has diagnosed CVI.
- In 2012, The Bridge School began consulting with Christine Roman-Lantzy.
- Special education teachers and speech-language pathologists learned to administer The CVI Range, and implement accommodations and interventions based on assessment results.


Students with SSPI and CCN have complex needs and abilities. Vision is one piece of the pie which makes up a whole person. These factors influence one another and impact development and learning.

## Assessment

- The CVI Range gives staff a snapshot of how the 10 CVI characteristics are uniquely expressed for the student.
- Annual re-assessment with The CVI Range to track progress and update intervention needs.
- The educational team keeps 10 characteristics in mind always and continually re-assesses the interventions that are in place, modifying as appropriate.

## Planning

- The educational team identifies intervention objectives for specific times of day, materials, prompting language, and environmental modifications.
- Strategies are shared with classroom staff, families, and IEP teams.
- **Targeted activities and materials match language comprehension abilities** (e.g., start by adding new visual demands to something the student already understands).

## A Case Study: Abigail

**Before systematic CVI interventions:** In preschool and Kindergarten (2009-2012) Abigail was very socially engaged with peers and adults, but showed little interest in classroom materials and limited understanding of common objects.

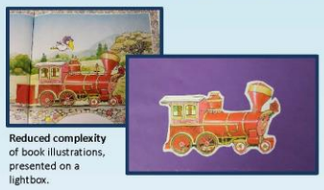


**2013 CVI Range Score = 4.75 (age 7, grade 1). Recommendations & Strategies:**

- Present 3-D objects when possible.
- **Reduce complexity** of 2-D objects, present with **backlighting or highlighting**.
- Present 1-2 items at a time on a **solid black background**.
- Reduce interfering sensory input (background noise).
- Modify visual targets with **saturated color**.
- Allow **extra viewing time**, describe visual salient features of targets.
- **Increased expectations for looking** at objects, classroom locations, and partners have increased. Gain Abigail's visual attention before interacting with objects and partners.

## Interventions: examples of modifications and accommodations designed for Abigail.

**Reduced environmental complexity** by adding black background to lap tray.



**Reduced complexity** of book illustrations, presented on a lightbox.

**Reduced background and desktop complexity** at work station, simplified word wall words with "glow" font.

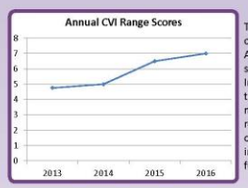
he visual lightbox, ointer.

**Literacy instruction:** teaching the visual salient features of letters within whole words, to support decoding skills.

Using a laser point to highlight salient features of 2-dimensional materials presented on a **lightbox**.

## Outcomes


**Educational Gains:** Abigail's ability to visually engage with educational materials increases her active participation in classroom




The CVI Range is completed each spring. Abigail's initial CVI Range score in 2013 was 4.75. In 2016 she scored XX on the CVI Range. Abigail's mom reported that at a recent check-up, her ophthalmologist noted improved visual functioning.

**Educational Gains:** Abigail accesses a more complicated visual display on her desktop computer for typing. She copies words from her sight word wall.

**Educational Gains:** Abigail's sight word vocabulary is growing, as well as her visual decoding skills. She no longer requires backlighting for viewing familiar literacy targets.


**Self-Determination:** Abigail is building stable visual representations of important objects in her environment, and learning how to impact her environment by then physically accessing/operating those objects.

**Communication and Social Engagement:** Abigail's communication device used to be mounted behind her, out of sight. She accessed it with a switch and only auditory prompting. Today, she is trialing a large-screen device and prefers to have it mounted in her best visual field. Abigail visually follows the magnification as picture symbols are highlighted (and she hears an auditory cue), and uses a switch to select her words and messages.


**Communication and Social Engagement :** Abigail is more socially engaged and demonstrates increased nonverbal communication skills by looking towards communication partners during interactions.

## Questions, Challenges, Next Steps

- Strategies for training team members outside of Bridge School: how to carry over interventions and accommodations to other settings (home, community, etc.)
- Changing and adapting interventions over time as vision improves, strategies to challenge students to use vision more and more.
- Teaching student to understand their own visual needs and self-advocate for appropriate accommodations.

**References**

Roman-Lantzy, C. (2007). *Cortical Visual Impairment: An Approach to Assessment and Intervention*. New York: AFB Press.

**Acknowledgements**

Thank you to:
Bridge School staff and administration
Bridge School students and families
Dr. Christine Roman-Lantzy

# Literacy skills

# Integrated Goals for Phase III - CVI Range

**Phase # 3**

1. Refine and integrate use of vision for increasingly visually complex tasks.
2. Distance vision increasing. Support attention to actions, locations & persons.
3. Increase access to incidental learning opportunities

5. Increase access to robust/ large vocabulary to support vision and learning
6. Support learning (academic/pre-academic), modifying instruction and materials as needed
7. Increase participation and independence during functional activities across familiar environments

# Characteristics of child

## Phase III

Can participate in activities, assignments, tasks

Continues to need accommodations to environment and materials

Contextual complexity interferes with performance across domains

Incidental learning occurs. May benefit from Orientation and Mobility services

Parents may report

- Child may appear curious in new environments, establish eye contact, engage with siblings, peers, adults/
- Contextual complexity matters

Children who can talk: May not have well-developed concepts. Children with CCN need access to large vocabularies and be able to access and use variety of AAC approaches to communicate with familiar (and unfamiliar) partners.

INCIDENTAL LEARNING. More independence. Rely on salient features in new or complex environments

**POSITION**
with back to complexity

# Phase III
# Environment & Materials

**Orientation and Mobility. Maps**

Highly complex and novel environments still difficult

# Moving to small group independently – Phase III

**2-D materials.** SPACE between elements of 2-D materials, images, symbols

**Construct environment to decrease** complexity, support instruction, incidental learning, relationships and use of language/communication tools

# Phase III
# Environment & Materials


COLOR HIGHLIGHTING of salient features.

Adaptations important. Consider complexity, novelty and visual fields


Use of **COMPARATIVE LANGUAGE**. Draw attention to the similarities/differences of classes of objects, actions, environments. Use consistent vocabulary

**Make sure attach meaning to 2-D representations**

# Phase III
## Communication Partners

**WAIT TIME**
Latency may still be present.

**AAC Strategies. Partner assisted scanning; Communication displays using 2-D representation; increase array, 4+**

**ACCESS TO LANGUAGE ESSENTIAL –** No, low, high tech. ALL environments

**Increasing independence**

# Phase III
# Participation

**Increasing access to instruction and materials throughout the day.**

**Expanding communication access across partners and environments**

**Increased use of technologies across** environments

# Sample Script – Phase III

1

**SET UP**

"Tell me what you see;"

"Show me how these things go together."

"You've seen things like this before." "Tell me what you notice while we are walking."

"Let me know when you see the__."

Which pictures are faces of girls"

2

**Incidental access**

Describe object, event, activity, people.
Use salient features and comparative language.

3

**Wait time**

More complex language (speech/AAC strategies/tools)

- Express personal contributions
- How objects, images, environments, people are alike/ different.

4

**Child output**

Acknowledge child's competence.

Build depth and breadth of existing schema:

Affirm ability to solve a problem

5

**Confirmation**

- Base (O&M) based on salient features of routes
- Flexibility in thinking
- Connect novel experiences to past visual information

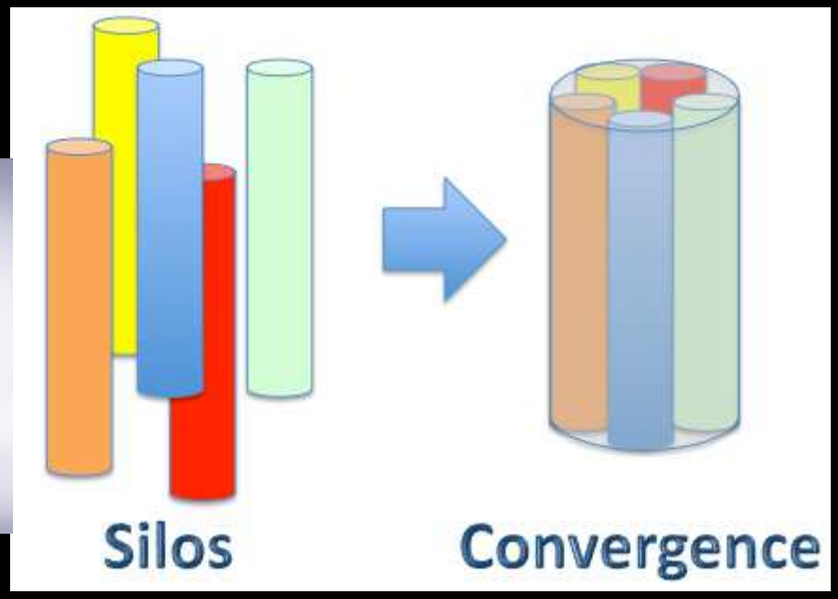
# SUGGESTIONS FOR AAC TOOLS AND STRATEGIES – PHASE III

| PHASE III | | |
|---|---|---|
| **NO TECH (body-based)** | **LOW TECH (non-electronic)** | **HIGH TECH (electronic)** |
| • Same strategies- more<br>• Skilled partners. Access to large vocabulary. Create many types of messages.<br>• Partner assisted auditory scanning<br>• Increased use of recognizable signals/<br>• Increase use of language across environments/ communication partners | • Same as Phase II with more vocabulary<br>• Possible use of coding (e.g., color/number) | • Tablet (with sound/ voice) and apps<br>• Computer with software (meaningful graphics).<br>• Highlighting letters/words possible<br>• Communication devices (direct select, switches for auditory scan)<br>• Access to vocabulary/ partners/throughout day.<br>• May be able to use eye gaze system or visual scan |

# VLLCP: A Framework for Synergistic Practice

Use your skills in ways that make a difference

# Structured observations, longitudinal case studies, integrated approaches & measurable outcomes


# REFERENCES AND RESOURCES

The Bridge School Website. https://www.bridgeschool.org

*Get To Know Me: A training video for family members and friends of children with cortical visual impairment and complex communication needs*. Featuring Diego, his family, friends, and CATIC professionals.


- Blackstone, S.W. & Hunt-Berg, M. (2012). Social Networks: A Communication Inventory for Children with Complex Communication Needs and Their Communication Partners. Wisconsin: Attainment Company
- Brady, N. C., Bruce, S., Goldman, A., Erickson, K., Mineo, B., Ogletree, B. T., Paul, D., Romski, M. A., Sevcik, R., Siegel, E., Schoonover, J., Snell, M., Sylvester, L., & Wilkinson, K. (2016). Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention. *American Journal on Intellectual and Developmental Disabilities.*
- Drager, K., Light, J., Curran-Speltz, J., Fallon, K., & Jeffries, L. (2003). The performance of typically developing 2 ½-year-olds on dynamic display AAC technologies with different system layouts and language organizations. Journal of Speech, Language and Hearing Research, 46, 298-312.
- Light, J. & Drager, K. (2002). Improving the design of augmentative and alternative communication technologies for young children. Assistive Technology, 14, 17-32.
- Drager, K., Light, J., Carlson, R., DSilva, K., Larsson, B., Pitkin, L., Stopper, G. (2004) Learning of dynamic display AAC technologies by typically developing 3-year-olds: Effect of different layouts and menu approaches. Journal of Speech Language Hearing Research, 47, 1133-1148.
- Good, W.V., Jan, J.E., de ST, L., Barkovich, A.J., Groenveld, M. & Hoyt, C.S., (1999). Cortical visual impairment in children: a major review. *Survey of Ophthalmology* 38: 351-64.
- Jacobson L, Ek U, Fernell E, Flodmark 0, Broberger U. (1996) Visual impairment in preterm children with periventricular leukomalacia: visual, cognitive and neuropaediatric characteristics related to cerebral imaging. *Developmental Medicine & Child Neurology* 88: 724-35.
- Light, J., Drager, K. McCarthy, J. Mellott, S., Parrish, C., Parsons, A., Rhoads, S., Ward, M., & Welliver, M. (2004). Performance of typically developing four and five year old children with AAC systems using different language organization techniques. Augmentative and Alternative Communication, 20, 63-88.
- Rogers M. (1996) Visual impairment in Liverpool: prevalence and morbidity. *Archives of the Disabled Child* 74: 299-303.
- Roman-Lantzy, C. (2007,2018 2nd Edition). *Cortical Visual Impairment: An Approach to Assessment and Intervention.* New York: APH Press.
- Roman-Lantzy, C. (2019). Cortical Visual Impairment: Advanced Principles. New York: APH Press. (all chapters)
- Soul, J. & Matsuba, C. (2010). Visual impairment in children due to brain damage. In G.N. Dutton, M. Bax (Eds). *Causes of Damage to the Visual Brian*. London, England: MacKeith Press, pp 20-26.
- Thistle, J., & Wilkinson, K. M. (2015). Building evidence-based practice in AAC display design: Current practices and future directions. *Augmentative and Alternative Communication*, 31, 124-136.
- Wilkinson, K. M., Dennis, N., Webb, C., Therrien, M., Stradtman, M., Hetzel, J., Leach, R., Warrenfeltz, M., & Zeuner, C. (2015). Neural activity associated with visual search for line drawings on AAC displays: An exploration of the use of fMRI. *Augmentative and Alternative Communication, 30,* 99-105.
- Wilkinson, K., & McIlvane, W. J. (2013). Perceptual factors influence visual search for meaningful symbols in individuals with intellectual disabilities and Down syndrome or autism spectrum disorders. *American Journal on Intellectual and Developmental Disabilities 1198,* 5: 353-364.

- Wilkinson, K., O'Neill, T., & McIlvane, W. J. (in press). Eye-tracking measures reveal how changes in the design of aided AAC displays influence the efficiency of locating symbols by school-aged children without disabilities. *JSLHR*.

- Wilkinson, K. M., & Light, J. (2014). Preliminary study of gaze toward humans in photographs by individuals with autism, Down syndrome, or other intellectual disability: Implications for design of Visual Scene Displays. *Augmentative and Alternative Communication, 30*, 130-146.

- Wilkinson, K. M., & Mitchell, T. (2014). Eye-tracking research for answering well-formed questions about augmentative and alternative communication assessment and intervention. *Augmentative and Alternative Communication, 30,* 106-119.

- Wilkinson, K. M., Light, J., Drager, K. (2012). Considerations for the composition of visual scene displays: potential contributions of information from visual and cognitive sciences. *Augmentative and Alternative Communication.* 28: 3, 137-47. doi: 10.3109/07434618.2012.704522.

- Wilkinson, K. M., & Light, J. (2011). Preliminary investigation of visual attention to human figures in photographs: Potential considerations for the design of aided AAC visual scene displays. *Journal of Speech-Language-Hearing Research*, *54*, 1644-1657.

- Wilkinson, K. M., Carlin, M., & Thistle, J. (2008). The role of color cues in facilitating accurate and rapid location of aided symbols by children with and without Down Syndrome. *American Journal of Speech-Language-Pathology, 17,* 179-193.



- Wilkinson, K. M., & Light, J. (2014). Preliminary study of gaze toward humans in photographs by individuals with autism, Down syndrome, or other intellectual disability: Implications for design of Visual Scene Displays. *Augmentative and Alternative Communication, 30,* 130-146.

- Wilkinson, K. M., & Mitchell, T. (2014). Eye-tracking research for answering well-formed questions about augmentative and alternative communication assessment and intervention. *Augmentative and Alternative Communication, 30,* 106-119.

- Wilkinson, K. M., Light, J., Drager, K. (2012). Considerations for the composition of visual scene displays: potential contributions of information from visual and cognitive sciences. *Augmentative and Alternative Communication* . 28: 3, 137-47. doi: 10.3109/07434618.2012.704522.

- Wilkinson, K. M., & Light, J. (2011). Preliminary investigation of visual attention to human figures in photographs: Potential considerations for the design of aided AAC visual scene displays. *Journal of Speech-Language-Hearing Research*, *54*, 1644-1657.

- Wilkinson, K. M., Carlin, M., & Thistle, J. (2008). The role of color cues in facilitating accurate and rapid location of aided symbols by children with and without Down Syndrome. *American Journal of Speech-Language-Pathology, 17,* 179-193.