Supporting Language and Cognition for Adults with Chronic Aphasia through Pictures: What we know and what we don't

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Supports for Individuals with Aphasia

- *What do we know?*
  - How do images help? What types of images are there?
  - What can people with aphasia gain?
- *Images used as:*
  - Cognitive cues
  - Auditory and reading comprehension supports
  - Oral expression supports
- *Perceptions and preferences of individuals with aphasia*
- *What don't we know?*
  - What is the best image to use?
  - How important is personalization really?
- *Recommendations for selection and implementation of images*

CURRENT KNOWLEDGE

What do we know?

- 25 - 40% of people with aphasia experience chronic impairments
- Impairments limit communication
- Reliance on AAC to meet life participation needs
- Because of the “symbolic processing” deficits, images may be a good option (also may be the best or only option)

What do we know?

Challenges:

- Images must be transparent and meaningful
- We must find ways to depict abstract ideas
- Clinicians rely mainly on experience when selecting images to use as supports
- Clinicians don’t have a great deal of time to manipulate and create supports

What do we know?

Challenges:

- Training caregivers to provide the support
- Finding already made materials appropriate for the language levels of adults with aphasia
- Teaching clients the benefit of accessing and using images during conversations
- Teaching clients how to create their own images for later use

IMAGE OPTIONS

What do we know?

What are our image options?

- Inclusion of people or animals – vs. – a plain scene
- Camera engaged – vs. – camera disengaged
- Task engaged – vs. – task disengaged
- Image type
- Amount of content/context
- Layout

What do we know?

People/animals vs. Blank scene

What do we know?

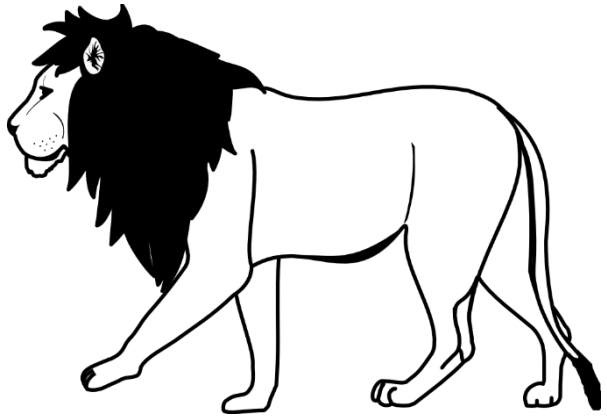
Camera engaged vs. camera disengaged

What do we know?

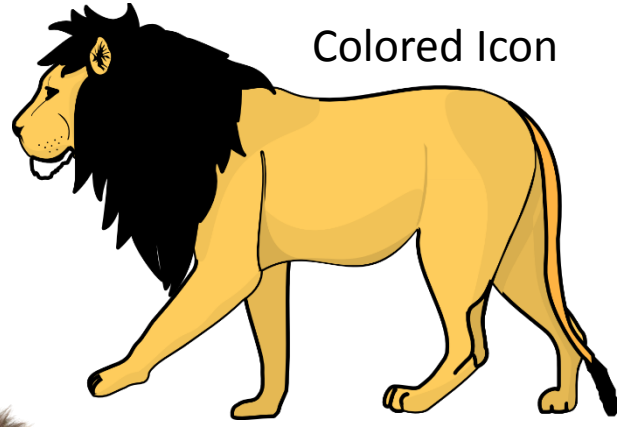
Task engaged vs. Task disengaged

What do we know?

Image Type



Line drawing



Colored Icon

Isolated Image

Contextually Rich Image

What do we know?

Content AND Context = no, low, high

No context

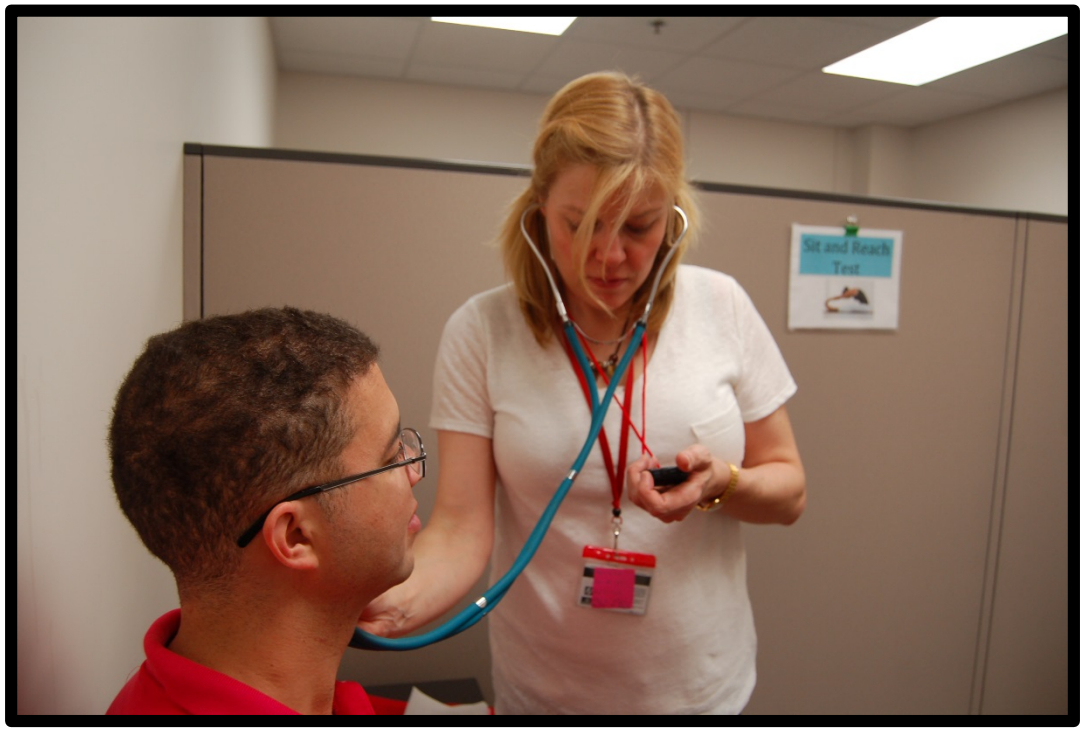
- White or plain background
- No identifying information
- No idea about location
- No pieces of content
- Very little information

What do we know?

Content AND Context = no, low, high

Low context

- A few pieces of background information
- Some identifying information
- Some idea relating to location
- Less than five pieces of content
- A little more information overall…



What do we know?

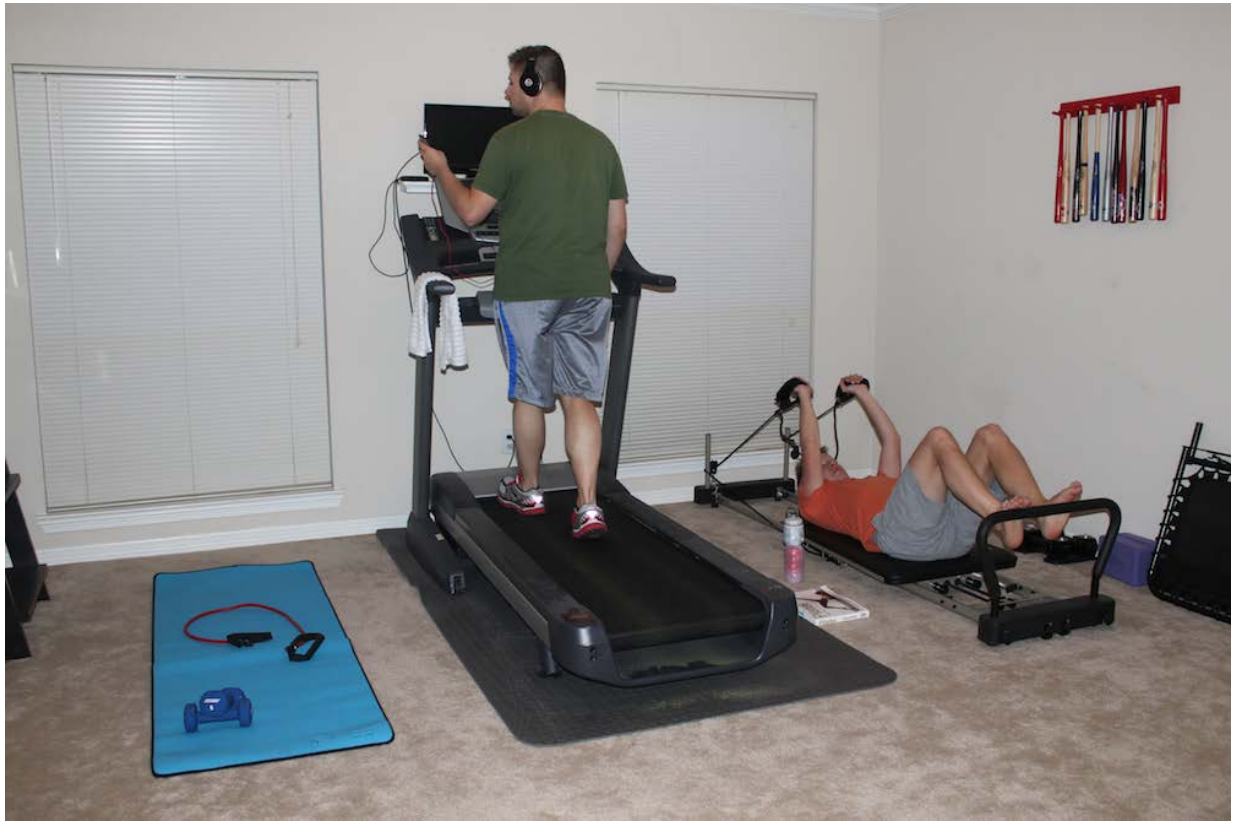
Content AND Context = no, low, high

High context

- Multiple objects in the background
- Information comes together to build a scene/location
- Greater than 5 pieces of content
- Overall, more information to learn from and use

What do we know?

Image layout options – Visual Scenes vs. Grids



What do we know?

Images – the wave of the future

- Easy and accessible way to capture, store, and share life events
- Advancements in computer graphics, memory, and processing capabilities
- In the past,
  - photographs recorded major life events (e.g., weddings)
  - Were put into albums for future generations
- NOW….
  - Capture major and minor life events
  - Can be shared instantly
  - Used in face-to-face and online environments

What do we know?

How do images help?

- Relative benefit varies with image type
- Potential to provide support for main concepts or details when reading or participating in conversations
- Potential to convey information about situations, activities, experiences, relationships that the person with aphasia cannot
- May be ideal for communicating large amounts of information

What do we know?

What can people with aphasia gain from images?

The same information as adults without aphasia!!!

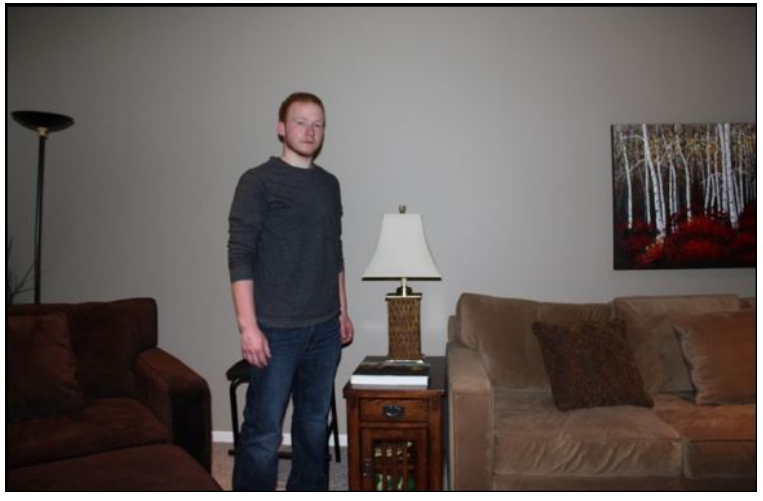
NOTE: Be careful of this interpretation – aphasia at its core is a "symbolic" processing disorder

HOW ARE IMAGES HELPFUL?

Images used as…

Cognitive Cues

- Engagement in visual scenes can result in a guiding effect to areas of interest that may not be focused upon without the cue
- Without engagement, people tend to focus heavily on human figures and just search the background with limited purpose to their search



Camera-engaged

Task-engaged

Thiessen, A., Beukelman, D., Ullman, C., & Longenecker, M. (2014). Measurement of the visual attention patterns of people with aphasia: A preliminary investigation of two types of human engagement in photographic images. *Augmentative and Alternative Communication*, *30*, 120-129.

Images used as….

Auditory Comprehension Supports

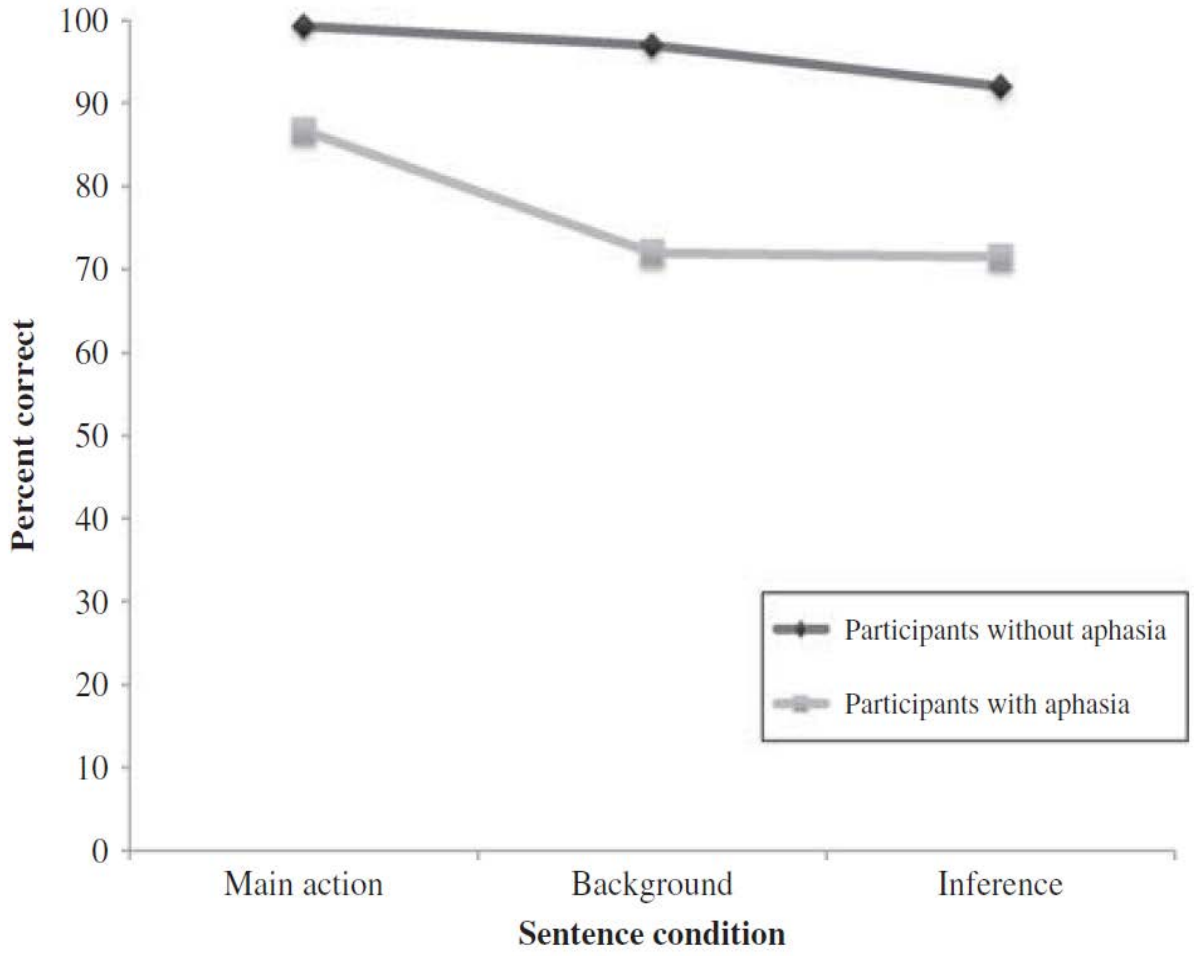
- What information can individuals with aphasia gain from high-context images?
- How accurate are individuals with aphasia at identifying main action, background details, and inferential information within images?

Wallace, S. E., Hux, K., Brown, J., & Knollman-Porter, K. (2014). High-context images: Comprehension of main, background, and inferential information by people with aphasia. *Aphasiology*, *28*, 713-730.

Images used as….

Auditory Comprehension Supports

- Comprehending inferential information is difficult for people with aphasia – even with the image
- But, they perform well above chance
- AND, understanding detailed information from images is possible
- Images support comprehension

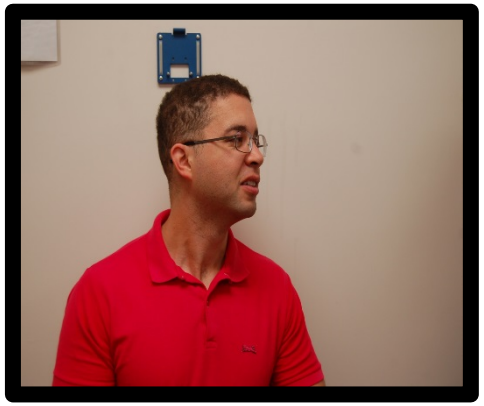


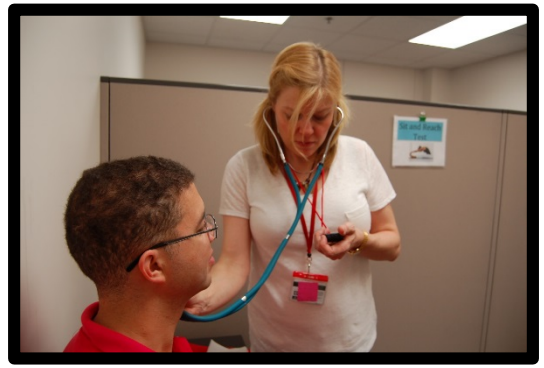
Wallace, S. E., Hux, K., Brown, J., & Knollman-Porter, K. (2014). High-context images: Comprehension of main, background, and inferential information by people with aphasia. *Aphasiology*, *28*, 713-730.

Images used as….

Reading Comprehension Supports

- Does the presence of an image enhance reading comprehension for adults with aphasia?
- Which type of image is most beneficial?





Dietz, A., Hux, K., McKelvey, M. L., Beukelman, D. R., & Weissling, K. (2009). Reading comprehension by people with chronic aphasia: A comparison of three levels of visuographic contextual support. *Aphasiology*,*23*, 1053-1064.

Images used as….

Reading Comprehension Supports

- Significantly increased reading comprehension when a visuographic support is available
- Image type didn't always matter
- All participants felt pictures were helpful
- All participants thought reading ease increased when pictures were present

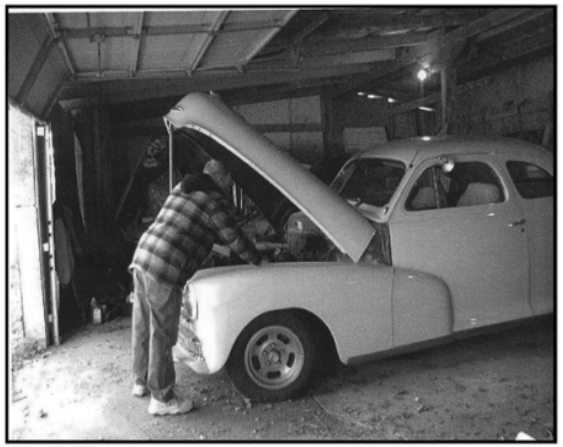
	Accuracy		
Participant	*High-context*	*Low-context*	*No-context*
1	5/9	3/9	3/9
2	5/9	4/9	4/9
3	2/9	2/9	3/9
4	7/9	4/9	5/9
5	9/9	7/9	7/9
6	8/9	7/9	8/9
7	3/9	3/9	2/9

Dietz, A., Hux, K., McKelvey, M. L., Beukelman, D. R., & Weissling, K. (2009). Reading comprehension by people with chronic aphasia: A comparison of three levels of visuographic contextual support. *Aphasiology*,*23*, 1053-1064.

Images used as….

Oral Expression Supports – Shared Communication

- Can the presence of a visual scene change the communication efficiency and content of a person with aphasia?
- How does the presence of a visual scene alter the quality of the communicative interaction?
- What are the perceptions of the person with aphasia and listener when a visual scene is present?



- 1948 Chevrolet Coupe
- Bought from Paul, $2500
- Light blue exterior, dark gray interior
- 283 horsepower
- 38,000 miles; 250,000 miles?
- Dick , friend, Bennett, helped fix, $3500

Hux, K., Buechter, M., Wallace, S., & Weissling, K. (2010). Using visual scene displays to create a shared communication space for a person with aphasia. *Aphasiology*, *24*, 643-660.

Images used as….

Oral Expression Supports – Shared Communication Space

- More conversational turns
- Higher complexity of utterances
- Greatest # content units shared
- Perceptions of person with aphasia and communication partner are high in shared condition

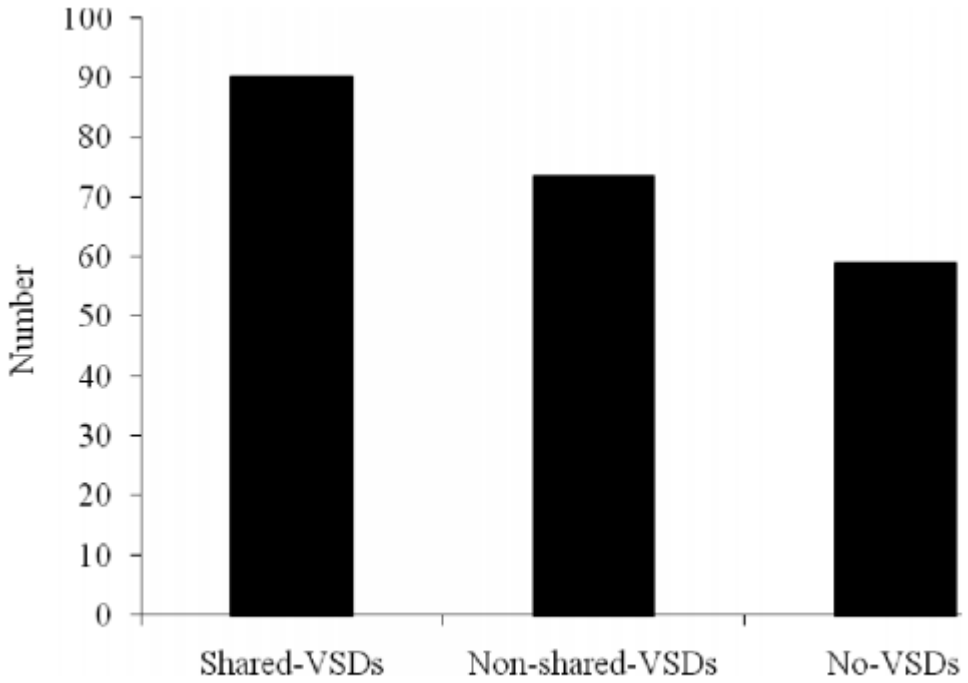


Figure 3. Mean number of conversational turns split by experimental condition.

Hux, K., Buechter, M., Wallace, S., & Weissling, K. (2010). Using visual scene displays to create a shared communication space for a person with aphasia. *Aphasiology*, *24*, 643-660.

Images used as….

Oral Expression Supports – Image Capture for Communication

- What types of images do adults with aphasia take to use for later conversation?
- How helpful are these images in aiding recall and expressive language effectiveness?

Ulmer, E., Hux, K., & Brown, J. – in progress

Images used as….

Oral Expression Supports – Image Capture for Communication

- Not all participants took pictures
- Not all participants referenced images
- Produced longer conversations with more complex content (nouns and verbs) when images were present

Ulmer, E., Hux, K., & Brown, J. – in progress

Images used as….

Oral Expression Supports – Image Capture for Communication

Researcher: **Tell me what you saw this morning.**

P1: **Ok. Two. One**. **Two**.

Researcher: **You saw two people.**

P1: **Yes**. **Oh**. **Look at this.**

Researcher: **She’s listening to his pulse.**

Images used as….

Researcher: **Tell me what you saw this morning.**

P1: [swipes iPad and points to two people in image] **Ok. Two. One** [points to first person]. **Two** [points to second person].

Researcher: **You saw two people.**

P1: **Yes** [swipes to next picture]. **Oh** [points to stethoscope in picture]. **Look at this** [traces stethoscope in picture from ears to neck of other person]

Researcher: **She's listening to his pulse.**

PREFERENCES AND TRAININGS

Perceptions and Preferences

What pictures do individuals with aphasia prefer?

- What type of image would participants with aphasia choose to support their reading?
- What is the rationale for this selection?

Knollman-Porter, K., Brown, J., Hux, K., & Wallace, S. (2016). Preferred Visuographic Images to Support Reading by People with Chronic Aphasia. *Topics in Stroke Rehabilitation*, DOI: 10.1080/10749357.2016.1155276

High Context, High Content

- “It says all it needs to say, it’s a medal for excellence and the flag represents America.”
- “…he’s…excited. He’s…feeling great…He’s the Olympics. He won…It has everything in this…He went to the USA.”
- “Right here [pointing to laughing face in picture]. I love that. That is very, very good. “

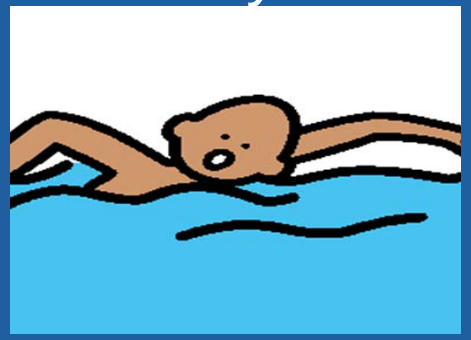
High Context, Low Content

- “He is so real - going places [arms in swimming stroke].”
- “Because it shows Phelps water…you know US [points to flag on swim cap].”

Portrait

- “I don’t like that one...It’s just a plain old picture.”
- “It doesn’t say anything.”
- “Nothing.”
- “This one is terrible.”

Iconic Symbol



- “That’s stupid.”
- “Cause I don’t know who it is…Is it a girl? Is it a boy? It doesn’t really tell what it is.”
- “Hard.”

Perceptions and Preferences

Can we train clients and family members?

- Ideally clients should select their own image supports
- It may be worthwhile to perform extensive training to clients and caregivers
- However, *MOST* (if not all) of their previously captured photos will break the “rules”
- Train to take <u>new</u> photographs for use in communication

Thiessen – in progress

Image Personalization

- Adults with aphasia prefer personally-relevant images to represent their intended words
- Adults with aphasia are more accurate at matching words to images when personally-relevant images are shown
- Individual may spend a great deal of time telling you how the generic image is different than their own story

McKelvey, M. L., Hux, K., Dietz, A., & Beukelman, D. R. (2010). Impact of personal relevance and contextualization on word-picture matching by people with aphasia. *American Journal of Speech-Language Pathology*, *19*, 22-33.

CLINICAL RECOMMENDATIONS

CLINICAL RECOMMENDATIONS

The reality…

- Clinicians in any setting have a short amount of time with a patient
- Pre-packaged generalized photos are easier to find
- Many devices or communication books are already programmed with images to select
- Anything will do

CLINICAL RECOMMENDATIONS

If I had to pick one…

- ✓High context, high content
- ✓Inclusion of people and animals
- ✓Person(s) task-engaged
- ✓Colored, photographic image
- ✓Personally-relevant
- ✓Addition of text if available (within an app, device, or handwritten)

CLINICAL RECOMMENDATIONS

What we can improve on clinically:

- Train rehab professionals
  - The image you use matters
- Utilize resources at our fingertips
  - Internet databases, cameras within devices, apps
- Train caregivers and patients from the start
  - This will be about creating NEW images rather than selecting from their old
- Think of images as your go-to support

CLINICAL RECOMMENDATIONS

What we still don't know …

- Best way to display images (study underway)
- We know images help, but to what extent?
- What are the "must haves" to include in an image
- Best ways to train caregivers and clients regarding image capture and use

Thank you!!!

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Resources

- Dietz, A., Hux, K., McKelvey, M. L., Beukelman, D. R., & Weissling, K. (2009). Reading comprehension by people with chronic aphasia: A comparison of three levels of visuographic contextual support. *Aphasiology*, *23*, 1053-1064.
- Hux, K., Buechter, M., Wallace, S., & Weissling, K. (2010). Using visual scene displays to create a shared communication space for a person with aphasia. *Aphasiology*, *24*, 643-660.
- Knollman-Porter, K., Brown, J., Hux, K., & Wallace, S. (2016). Preferred Visuographic Images to Support Reading by People with Chronic Aphasia. *Topics in Stroke Rehabilitation*, DOI: 10.1080/10749357.2016.1155276
- McKelvey, M. L., Hux, K., Dietz, A., & Beukelman, D. R. (2010). Impact of personal relevance and contextualization on word-picture matching by people with aphasia. *American Journal of Speech-Language Pathology*, *19*, 22-33.
- Thiessen, A., Beukelman, D., Ullman, C., & Longenecker, M. (2014). Measurement of the visual attention patterns of people with aphasia: A preliminary investigation of two types of human engagement in photographic images. *Augmentative and Alternative Communication*, *30*, 120-129.
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