A series of studies: 2004-2012

Do AAC tools improve the quality of conversation by individuals with degenerative language impairment associated with Alzheimer’s disease or Primary Progressive Aphasia?
Series of experiments: Methods

1. Consent participant and communication partner in their primary residence;
2. Determine participant’s preferred topic and vocabulary;
3. Develop communication board;
4. Conduct videotaped conversations with participant with and without communication support in scripted and naturalistic conditions.
Personalized communication board

- Oil Painting
- Hand Painted Pottery
- Rock Painting
- Birthday Cake
- Tomio
- Wedding Cranes
- Arts & Crafts
- Shell Art
- Watercolor
- Origami
- Hand Pottery
- Malheur County Fair
- Pottery
- Kuni
- Pin the Tail on the Donkey
- Ceramics
For people with AD and PPA:

- Low tech AAC provides meaningful language support during structured conversations for people with AD and PPA.
- Low tech AAC significantly reduces questions and prompts needed by the conversation partner.
- AAC balances the conversation more.
- This approach should be part of a treatment protocol for AD and PPA.
Next Steps

• Using mobile technology
• Compare vocabulary layouts during conversation (popular apps)
• In naturalistic settings
• Using personally relevant, contextualized photos
• With both PPA and AD participants
"I can understand what he is saying when I start the conversation. But when Jim comes up to me and wants to tell me something, and I don’t know the topic, I have no idea what he is talking about!"
PPA Pilot Research Questions

• Does the use of mobile technology for language support improve conversation in people with PPA?

• Do different vocabulary layouts (different apps) in mobile technology affect conversation in people with PPA?
A functional barrier task:
Novel activities and conversations

- Making a smoothie
- Potting a plant
- Making a sandwich for lunch
Method: Share new information

• Conduct an activity in the participant’s house when the spouse or daughter is NOT present.

• Ask the participant to describe the activity just accomplished to:
  – The RA without the iPad
  – The spouse/daughter with the iPad
Device

iPad (3\textsuperscript{rd} gen) with 16 GB memory and wifi capabilities
Method

- **Subjects** – 3 men, 1 woman; age: 69-75 yrs
- **Dx:** Primary Progressive Aphasia
- **Setting:** Home
- **Communication partners:** RA for control conversations; wife or daughter for AAC supported conversations
Assessment Summary: 4 participants with PPA

- Expressive language skills mild to severely impaired
- Limited to no presence of oral/verbal apraxia
- Moderate to severe impairment in sentence production
- Formal cognitive skills WNL to severely impaired
- CDR Scores low (.5 of 3): Functional in their day
Comparing 5 layouts: Does the presentation of language make a difference?
Visual Scene + speech (no label)

- One picture with 9 hot spots
- Started with Scene & Heard by TBoxApps
- Using GoTalk Now by Attainment Co.
Grid: 9 photo + label + speech

- Started with Talk ‘n Photos app
- Changed to GoTalk Now
Grid: 9 photos + speech (no label)

- Pictures obtained during real time activity
- Started with Talk ‘n Photos app
- Changed to GoTalk Now
Label + speech (no photo)

- Grid with 9 target words
- GoTalk Now by Attainment Co
3 level grids: Photo + label + speech

- 3 photos
- 1 operations button
- Started with PhotoVOCA app
- Using GoTalk Now
Levels 2 and 3: Photo + label + speech

JELLY

SANDWICH

KNIFE

NEXT PAGE

EATING

SINK

REFRIGERATOR

GO BACK

5 Mastery B

5 Mastery C
Comparing 5 vocabulary layouts

1. Visual scene- 9 hot spots + speech (no labels)
2. Grid- 9 buttons, photo + label + speech
3. Grid- 9 buttons photo + speech (no labels)
4. Grid – 9 label + speech (no photo)
5. Three level grids (nested screens)
   – 3 buttons: photo + label + speech
   – 1 operation button
Method: 6 visits and 3 activities

Visits 1 & 2
- Consenting
- Language/cognitive assessment

Visit 3
- Teach participant how to use the chosen 3 layouts (with mastery sandwich screens).
- Show participant and spouse how to use the iPad for a conversation.
Method: Visits 4 - 6

1. Conduct and photograph activity
2. Conduct baseline conversation with RA (no iPad)*
3. Create board layout with 9 messages in randomized condition
   - RA records her speech for the digitized output
   - Use humor and vocabulary of participant when possible “That smoothie is ugly.”
   - Each message includes activity name (in case it is the only message selected)
4. Review app for visit and repeat mastery task
5. Conduct iPad conversation with spouse or daughter*

* All conversations are videotaped.
The Conversations and Supports
Activity: Making a sandwich and lunch
Layout condition: Visual scene + 9 hot spots
Baseline: Sandwich making
Experimental: Visual scene for sandwich task
Activity: Making a sandwich and lunch
Layout condition: 9 grid photo + label + speech
Baseline: Making a sandwich and lunch
Experimental: 9 grid photo + label + speech; making a sandwich and lunch
Activity: Potting a plant
Layout condition: 9 grid photo + speech
Baseline: Potting a plant
Experimental: 9 grid photo + speech for planting
Activity: Making a smoothie
Layout condition: 9 grid label + speech

Smoothie          Blender          Apple
Pear              Water           Spinach
Ginger            Lemon           Kale
Baseline: Making a smoothie
Experimental: 9 grid label + speech, smoothie
Activity: Potting a plant
Layout condition: Nested 3 layers with photo + label + speech
Levels 2 + 3

Garden gloves

Miracle grow

Spade

NEXT PAGE

Clay pot

Plant

Water can

GO BACK
Baseline: Potting a plant
Experimental: 3 level grids photo + label + speech
Potting a plant
Impressions from pilot data

1. Mobile technology apps support conversation and sharing new information by people with PPA.
   - Each pair agreed that new information was presented with the iPad.
   - The iPad created a more fluent conversation.
   - All spouses reported that they got the gist of the story.
2. *Partner training* is imperative if people are to incorporate technology into conversation.

- Spouses did not know how to respond to iPad; need training to add technology to their conversational modes. (Perhaps add video review at each visit)

- Some participants with PPA did not know how to switch strategies between speech and iPad use.

- \( \frac{3}{4} \) of the participants do not use computers for communication now; adding this medium will require *training* (it’s NOT cheating to use the iPad!).
3. Different layouts facilitate lexical support
   - Layouts with written labels are most beneficial. (Reading single words or phrases is a strength for people with PPA.)
   - Users preferred large pictures.
   - The multi-level grids offer operational challenges to people who are not familiar with technology.
   - Layouts without labels may stimulate repetition and practice.
Next steps

• Continue with data collection and analysis
• Teach people with PPA to take photos and place them in apps
• Examine different word functions (nouns, verbs, adjectives)
• Add participants with AD
  – Require spaced retrieval training
  – No speech output condition
Webcast references

www.aac-rerc.com

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http://www.reknewprojects.org