



# Evidence for AAC treatment in Nonfluent Progressive Aphasia

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There are a group  
of older adults who  
cannot participate  
in conversations  
successfully because  
they are slowly  
losing their language.

They have

***primary progressive  
aphasia (PPA).***



# *Types of primary progressive aphasia*

- Nonfluent progressive aphasia (NFPA)
  - Resembles a degenerative Broca's or expressive aphasia
- Semantic dementia
  - Resembles a degenerative Wernicke's or receptive aphasia
- Logopenic progressive aphasia

# Characteristics

- Age of onset 55-65 years old
- Preponderance of males
- In the community, they are still being diagnosed with Alzheimer's disease, but their non-verbal memory is intact.



# Progression of symptoms

- *Anomia* or trouble thinking of or remembering specific words when talking or writing;
- Slow, hesitant speech frequently punctuated by long pauses and filler words;
- Marked increase in speech errors (substitutions or distortions);
- Struggle for speech sounds, initial apraxia of speech.
- Yes/No confusion for responses;
- Can lead to mutism;
- Written language generation often mimics spoken language generation.

# *The research challenge*

**There is no empirical evidence that AAC helps people with NFPA with their daily expression. We only have case studies and clinical descriptions.**

# *Our purpose*

To provide evidence that simple AAC systems (communication boards) support adults with PPA during conversations.



To provide AAC to support lexical access so that individuals can participate in daily activities as language skills decline.

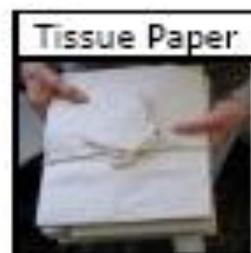


# Method\*

1. Make 16-item personalized boards (based on autobiographical memory) with photo + label.
2. Train individuals how to use boards during conversation in their residences.
3. In 6 VERY controlled conversations with 10 scripted questions compare language use with and without system.

\*Input from participant with PPA who was an SLP & now attends staff meetings.

# Board topic: Garage Sales



# Participants

- Primary Progressive Aphasia: N=11  
(66 conversations)
- 4 additional participants in data collection process.



# Demographics on 11 Participants

- **Gender:** 6 males and 5 females
- **Age:** Mean age of 72.9 years (range = 65 to 78)
- **Educational background:** 12-24 years of schooling (mean 15.4)
- **Living environment:** single family households (urban, suburban, rural farm), and assisted living facilities
- **Length of relationship between participants and communication partner:** 1.5 to 60 years (mean 35.25)
- **Partners:** 8 spouses, 1 friend and 1 paid caregiver.

# Mr. Ryderwood's board

Frankfurt  
Germany



Cheese Sandwich



Troop Transport



Soviet Union



Traffic Cop



Secret Mission



Monterey CA



Listening Post



Llama Kiss



Ship Going Down



Turn Signal



Lightning



Crackers



Army Language School



Country Road



Seasick



# *Sample of scripted questions*

1. You had an old Volkswagen in the Army, what was particularly unique about this car? [Turn signal]
2. Who broke off one of these turn signals while you were in Germany? [Traffic Cop]

# *Mr. Ryderwood's control conversation*



# *Mr. Ryderwood's experimental conversation*



# *Outcome measure: What is a correct response?*

- **In experimental condition:** Any combination of verbal response or pointing to the symbol on the board as long as the specific target word or its synonym has been communicated clearly.
- **In control condition:** Any verbal production of the target or its synonym.

# Weighted conversation score

Responses are scored immediately after the 10 questions or follow-up probes:

- **3 points** - correct answers to the initial question
- **2 points** - correct answers to the first follow-up probe
- **1 point** - correct response to the final probe
- **Total raw score** – range from 0 to 30, with higher numbers -> greater participant independence and accuracy.
- **Percentage score** – The % of total points possible.
- Indicates S's level of lexical accuracy and the amount of repair needed to elicit the correct responses.

# *Hypothesis with weighted scores*

- AAC-supported conversations, in comparison to unsupported conversations, will yield a greater weighted conversation score.
- *This indicates more success with verbal and nonverbal communication resulting in less downshifting by partner.*

# Establishing Inter-Rater Reliability

- Independent researcher coded 2 conversations/participant

	Control	Experimental	Total
Trial Agreement	93%	92%	93%
Verbal Agreement	95%	94%	94%

# Statistical results

- Weighted conversation scores in the experimental condition are significantly higher,
  - Mean experimental: 72%
  - *Mean Control: 42%*
  - $F(1, 58) = 14.804, p < 0.0001$ .
- ☺ With AAC, the participant with NFPA requires fewer cues before providing correct responses to questions.

# Number of Verbal Responses

- Responses to questions was higher in the experimental condition (with the boards) than in the control condition (without AAC).
  - Mean Control: 4.03
  - Mean Experimental: 5.58
  - $F(1,64) = 3.910, p=.052$
- ☺ With AAC support, participants with NFPA are more successful at retrieving the correct responses to questions.

# *Interpretation of results*

- AAC provides meaningful lexical support during conversation for people with PPA.
- AAC significantly reduces the degree of lexical scaffolding required by the conversation partner, leading to greater conversational contributions by participants.
- This approach should be part of a PPA treatment protocol.



## *Study 2: Conversations with natural partners*

- Does AAC support conversation when held between participants with PPA and their spouses, family members, care providers?
  - Designed new communication boards with 4 pictures each for 4 functional daily activities.
  - Trained partners how to converse using communication boards.
  - Videotaped and transcribed 3 conversations with the board (AAC-supported) and 3 conversational without the boards.

# Functional activities board for study 2

Costco



Target



Chinese



Happy Hour



Home Depot



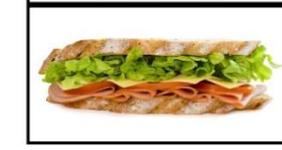
Safeway



Pizza



Sandwich



Papa Murphy's



Lee's Kitchen



John



Patty



Clancy's



Stock Pot



Myrna



Roger



# *AAC-supported conversation with spouse*



# *Preliminary data on 7 PPA participants*

- *NOTE: Conversations are not controlled; it is difficult to compare same responses across supported and unsupported sessions.*
- Partner behaviors
  - Supported conversations have fewer utterances and fewer questions than unsupported conversations.
- Participant behaviors
  - Supported conversations have fewer utterances; fewer abandoned responses.
- *There is an economy of language with the board because of shared reference and shared communication space.*

# Next Steps

- Increase number of participants in all studies.
- Compare conversations to data collected from control groups (AD and normal aging);
- Determine robust dependent variables for conversations with primary partners;
- Determine if AAC supports are generalized as part of daily communication (study 3).

# *ISAAC Handout*

- “Guidelines for communicating with persons who have language difficulties”
- “Helpful hints for conversation”
- Available at:

[www.reknewprojects.org](http://www.reknewprojects.org)

Primary Progressive Aphasia

Presentations: Training Handouts ISAAC 2010

## Guidelines for Communicating with People who have Communication Difficulties

### Remain Calm and Positive

- Smile and remain interested even when conversation strays.
- Keep a level head, a calm voice, remain as relaxed as possible.
- Focus on what the person *can* do, not what they can't do.
- Look for opportunities to support interaction.

### Keep it Simple

- Speak in short, concrete sentences.
- Rephrase to keep topic focused when person is confused.
- Respond immediately to communication attempts.
- Provide clear choices between no more than two possibilities.

### Be Polite

- Make sure the person is willing to have a conversation.
- Maintain eye contact (if culturally appropriate).
- Reassure and support the person if stuck or frustrated.
- Thank the person for having a conversation.

### Support All Forms of Communication

- Encourage and validate the use of *any* communication techniques.
- Use pictures or other aids to help with word finding difficulties.
- Encourage pointing and other gestures.
- Encourage facial expressions.
- Encourage writing and drawing.

### Reduce Frustration

- Request more information on a topic if unclear.
- Avoid quizzing just to get the "right" answer.
- Do not directly contradict the person even if they are wrong.
- Draw focus away from frustrating or embarrassing problems.

### Be Aware and Informed

- Monitor changing needs for communication support.
- Practice using all communication strategies yourself.
- Role play with friends, family and therapists to understand how to handle communication breakdowns.

## Helpful Hints for Conversation

Use the examples below to help you think about how to begin a conversation, keep a conversation going, redirect the conversation, or to expand the conversation beyond one topic.

### Request Details

- Can you give me a specific example?
- How did that happen?
- Why did you go?
- What were the names of the other people?

### Request More Information to Expand the Conversation

- Is there anything else you can think of?
- Tell me more about...
- Had you done similar things?

### Ask About Context

- Who else was there?
- What were you wearing?
- What color was it?
- Who did you travel with?
- What did you eat?
- How did the flowers smell?
- Had you ever been there before?

### Ask About Time/Sequence

- When did it happen?
- What day of the week was it?
- Was it dark or light?
- What time of year did it happen?
- How long did it last?
- What happened next?

### Ask About Place

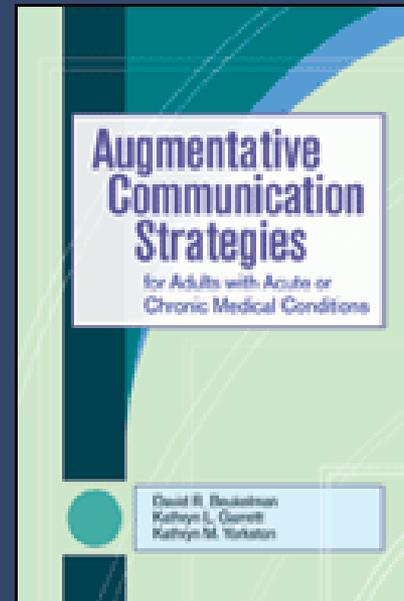
- Where did it happen?
- Were you inside or outside?
- What room were you in?
- Where were you sitting?
- What sorts of things were around you?
- Did you stay there or go somewhere else?

### Acknowledge Any Response

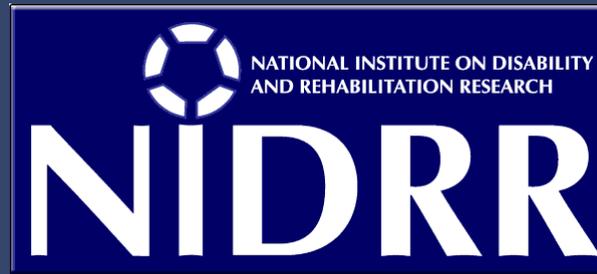
- Yeah, I like it there too.
- You're right, she is a wonderful friend.
- I remember doing that, and then we...
- That was a long time ago, but what I'm really asking is...
- I'd love to talk more about that.

# *Book and website references*

- [www.aac-lerc.com](http://www.aac-lerc.com) (AAC Rehabilitation Engineering Research Center)
- Beukelman, Garrett & Yorkston book
- Brookes Publishing



**[www.aac-rerc.com](http://www.aac-rerc.com)  
and  
[www.reknewprojects.org](http://www.reknewprojects.org)**



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