Evidence for AAC treatment in nonfluent progressive aphasia

Abstract for Biennial Conference of the International Society on Augmentative and Alternative Communication
ISAAC 2010 Conference, Barcelona, Spain

M. Fried-Oken, C. Rowland, C. Gibbons, C. Mills, G. Noethe, D. Daniels
Oregon Health & Science University
Oregon Institute on Disability & Development
Portland, OR USA

Most AAC specialists who work with adults with neurologic communication disorders are now treating persons with primary progressive aphasia (PPA) in their practices. AAC principles and communication strategies should be central to intervention for this relatively new clinical group. In the presentation, we propose to describe PPA, present video clips that show a longitudinal disintegration of expressive language skills, and show the effect of AAC intervention.

Primary progressive aphasia is a degenerative language disorder that does not fit easily into the classical aphasia typology (Duffy and Peterson, 1992). Mesulam (2001) describes the symptom complex: insidious onset and gradual loss of word finding, object-naming or word-comprehension skills in spontaneous conversation; all major limitations to activities of daily living are attributable to language impairment for at least two years after onset; intact premorbid language skills; absence of symptoms within initial two years of language impairment that would fulfill diagnostic criteria for other dementia syndromes and, finally, an absence of specific causes (i.e., stroke, tumor, infection, metabolic disorder) on neuroimaging. PPA has been described with three variants (Gorno-Tempini, et al., 2004). The most common variant is nonfluent progressive aphasia (NFPA) or PPA with agrammatism. Semantic dementia (resembling a fluent progressive aphasia) and logopenic progressive aphasia (also referred to as PPA with comprehension deficits) are the other variants. In this article, we will address treatment for adults with NFPA.

Language intervention for adults with NFPA has been reported during the past 15 years (Murray, 1998; Cress & King, 1999; Rogers & Alarcon, 1998; Rogers, King, & Alarcon, 2000; King, Alarcon, & Rogers, 2007; Fried-Oken, Rowland & Gibbons, in press). The case studies can be set within an AAC framework where we are faced with two treatment challenges for the adult with NFPA: to provide residual lexica visually for patients so that they can participate in daily activities as their language skills decline, and to engineer the environment to support successful communication.

Operationally, these two challenges are expressed as three treatment goals: to compensate for progressive language loss (*not* to stimulate the language system to regain skills); to start early so that the person with NFPA can learn to use communication strategies and tools as soon as possible; to include primary communication partners in all aspects of training, with outreach to multiple partners. Fried-Oken (2008) framed these goals within a five stage treatment model.

At Oregon Health & Science University, we are presently conducting a three phase investigation into the use of low-tech communication systems for persons with NFPA to provide experimental data on the value of AAC for functional conversation. Study I includes up to 50 individuals with NFPA, recruited with stringent inclusion and exclusion criteria. A communication board is designed for each participant based on a conversational topic of a past event that is chosen by the participant and his/her care providers or family members, and includes 16 photographs and labels (24 font) placed above each picture. Six highly scripted, personalized, 20-minute conversations are held between the participant with NFPA and a researcher. Three conversations are supported with the customized communication board, as well as pencil and paper. The other three conversations occur without AAC supports. The order of these conversations is systematically alternated between subjects. Importantly, the interactions are not open ended. Ten identical questions are embedded in experimental (with AAC) and control (without AAC) conversations in an effort to elicit specific target words represented on the communication board. The questions appear in the same order during each of the six conversations. Each question may be followed by up to two related probes or comments if the subject does not respond accurately to the initial query. This downshifting or repair strategy is included to further stimulate lexical access (Light, Beesley & Collier, 1988).

In the experimental condition, any combination of verbal response or pointing to the symbol on the board is accepted as correct as long as the specific target word or its synonym has been communicated clearly. In the control condition, a response is scored as correct if the subject can verbally produce the target response or its synonym. In both conditions, responses are scored immediately after the initial question or follow-up probes if needed. A weighted "conversation score" for responses to the 10 questions is derived from this coding. Three points are awarded for correct answers to the initial question, two points for correct answers to the first follow-up probe, and one point for correct response to the final probe. This composite score indicates a subject's level of lexical accuracy and the amount of repair needed to elicit the correct responses. The total score for each conversation may range from 0 to 30, with higher numbers reflecting greater participant independence and accuracy. We hypothesize that in controlled settings, AAC-supported conversations, in comparison to unsupported conversations, will yield greater numbers of target responses and more successful nonverbal communication resulting in less downshifting.

Study II is designed to assess the effects of AAC in more natural settings where conversations about daily activities are guided by primary communication partners with and without AAC supports. A second communication board is constructed that includes personalized pictures and labels selected by the user and partner about their daily schedule and needs. Partners receive standardized training on device use, identification of breakdowns and repair strategies. The role of primary communication partners should not be underestimated for the person with NFPA. As an individual loses skills, the partner assumes more responsibility for the interaction and message co-construction. The level of familiarity between the person with NFPA and the partner provides crucial leverage for successful conversation. Study III is a generalization phase, where partners are taught to track use of AAC supports during conversations over a six month period.

To date, we have collected data on seven subjects in Study I. By July 2010, we will report data on ten subjects with NFPA for Study I and II. The seven subjects enrolled in our study present at different points in disease progression. Participants include three males and four females with an average age of 75 years (range = 71 to 78). Educational background ranges from 12-19 years of schooling, and living environment consists of single family households in a variety of environments (urban, suburban, rural farm), and assisted living facilities. The length of relationship between participants and their primary communication partner ranges from 1.5 to 60 years, and the partners include five spouses, one friend and one paid caregiver. Scores on the following clinical tests are reported in the table below: oral agility – subtest of *Boston Diagnostic Aphasia Examination-3*; auditory comprehension – subtest of *Western Aphasia Battery*; picture naming – *Boston Naming Test* from the *BDAE-3*; object naming – subtest of *Western Aphasia Battery*; functional reading – subtest of *The Reading Comprehension Battery for Aphasia;* matrix reasoning – subtest of *Wechsler Adult Intelligence Scale-IV*. Total points possible for each clinical assessment or subtest are noted in parenthesis.

Subject	Oral Agility (26)	Auditory Comprehension (60)	Picture Naming (60)	Object Naming (60)	Reading (10)	Reasoning (26)
01	7	48	4	4	2	1
02	10	57	23	41	8	12
03	26	60	21	51	6	8
04	20	51	20	46	5	11
05	7	48	4	9	1	0
06	14	54	2	1	5	1
07	7	57	42	46	8	6

An initial review of the weighted conversation scores indicates that, as predicted, the experimental condition results in significantly more correct responses, $F(1, 40) = 14.954$, $p<.0001$. The mean conversation score during AAC supported conversations (overall weighted score for correct response verbal and/or nonverbal) was 21 compared to 10 in the control condition (range = 0 to 30).

This preliminary result strongly suggests that AAC provides meaningful lexical support during conversation for people with NFPA. It further indicates that AAC significantly reduces the degree of lexical scaffolding required by the conversation partner, leading to greater conversational contributions by participants. The improved lexical access observed during AAC-supported conversations suggests that this approach should be part of an NFPA treatment protocol. Our initial results provide evidence that remediating language functions using impairment-based therapy approaches is not sufficient. As this project unfolds, we expect to further quantify the effect of AAC supports for persons with NFPA, to discover specific clinical characteristics that are related to successful use of AAC and to develop clinical guidelines to teach people with NFPA and their communication partners how to use AAC effectively.

References

Cress, C., & King, J. (1999). AAC Strategies for people with primary progressive aphasia without dementia. *Augmentative and Alternative Communication, 15*, 248-259.

Fried-Oken, M., Rowland, C., & Gibbons, C. (in press). Providing Augmentative and Alternative Communication Treatment to Persons with Nonfluent Progressive Aphasia. *SIG 3 Perspectives Newsletter*. Rockville, MD: American Speech-Language-Hearing Association.

Fried-Oken, M. (2008). Augmentative and alternative communication treatment for persons with

primary progressive aphasia. *Perspectives on Augmentative and Alternative Communication, 17,* 99-104.

Gorno-Tempini, M.L., Dronkers, N.F., Rankin, K.P., Ogar, J.M., Phenegrasamy, L., Rosen, H.J., Johnson, J.K., Weiner, M.W., & Miller, B.L. (2004). Cognition and anatomy in three variants of primary progressive aphasia. *Annals of Neurology* 55(3): 335-346.

King, J. M., Nancy Alarcon, N., & Rogers, M. A. (2007). Primary progressive aphasia. In D.R. Beukelman, K. Garrett, K. M. Yorkston (Eds.). *Augmentative Communication Strategies for Adults with Acute or Chronic Medical Conditions*. Baltimore: Paul H. Brookes.

Laurence, F., Manning, M. & Croot, K. (2002, July). *Impairment based interventions in primary progressive aphasia: Theoretical and clinical issues.* Poster presented at The 10th International Aphasia Rehabilitation Conference: Past, Present and Future. Brisbane, Australia.

Mesulam, M. M. (2001). Primary progressive aphasia. *Annals of Neurology*. *49*(4), 425-432.

Murray, L. (1998). Longitudinal treatment of primary progressive aphasia: a case study. *Aphasiology, 12*(7/8), 651-672.

Rogers, M. A., & Alarcon, N. B. (1998). Dissolution of spoken language in primary progressive aphasia. *Aphasiology, 12*(7/8), 635-650.

Rogers, M. A., King, J., & Alarcon, N. (2000). Proactive management of primary progressive aphasia. In D. Beukelman, K.M. Yorkston & J. Reichle (Eds.). *AAC for adults with acquired neurological disorders* (pp. 305-337). Baltimore, MD: Paul H Brookes Publishing.

This research is supported by grants #H133G080162 and #H133E080011 (Rehabilitation Engineering Research Center in Communication Enhancement) from the National Institute for Disability and Rehabilitation Research, U.S. Department of Education.