Major findings from:
AAC Rehabilitation for Conversation in Dementia
Grant # HD04775401
Dates: 4/01/05 – 3/31/07
Rehabilitation of Communication Skills in Dementia through AAC
Grant # H133G040176
Dates: 12/01/02 – 11/31/07
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Study I: Effect of Voice Output

The question

What, we wondered, could we do to help people with dementia associated with Alzheimer's disease (AD) carry on satisfying conversations as their illness progressed? Were there tools out there that could help? Where should we start?

What did we think might help and why?

In dementia and AD people begin to have difficulty carrying on conversations because their memory doesn't work as well as it used to. The ability to remember words decreases. Eventually even events of importance may fade from memory. People with AD begin to talk less and have more difficulty maintaining a conversation at length.

We found that there was surprisingly little research in this area. But we discovered that people who live or work with people with dementia and AD had turned to pictures, lists of words, and other tangible visual aids to provide help for the memory of everyday things. Tools had been developed to help people with dementia or AD move through their day more easily. Examples include calendars that people could use to remember upcoming events, notebooks to remind them how to do things, or labels on cupboards to help them find things. We wondered whether some of these techniques might also improve conversational skills.

A small study (Bourgeois, 1993) suggested that using pictures of personal interest might improve the quality and quantity of conversations for people with AD. In this study they provided elders with personally relevant pictures, such as pictures of family members on a fondly remembered outing that were labeled with printed comments.   They found that these "memory aids" were helpful. But there was no large-scale research that explored what specific tools might be best to improve conversation. Was it printed words? The use of pictures and words together? Would meaningful objects that inspired memories of certain events work better than pictures or words? Would a "high tech" tool that "spoke" the needed words be

helpful? These options had not been explored in any systematic way. We decided that we would investigate which kinds of communication tools were most helpful for people with AD who were having difficulty conversing.

What is AAC?

We decided to take a look at Augmentative and Alternative Communication (AAC) tools to see if they could improve conversation for people with dementia and AD. AAC includes a wide variety of tools used to replace speech (for people who cannot speak) or to supplement speech. An AAC device can be many things; basically it is anything that supports communication by reducing the demands on the speaker. For a person with speech difficulties it may be an electronic keyboard that the person can activate to "speak" recorded words or phrases. People with AD can usually speak perfectly well, but they may have difficulty finding the words they need to express themselves clearly. For a person with AD, an AAC device might be something that reduces the demands on memory, since it is the loss of memory for words and events that interferes with the ability to communicate satisfactorily.   Possibilities include devices with pictures, objects or printed labels that remind a speaker of the words needed to discuss a favorite topic.

Our Study

Our study involved 30 people who had moderate to severe dementia and AD. For each of the participants we made a communication board (an AAC tool) that had either 16 photographs with a printed title, 16 objects with a printed title or just 16 printed words. We randomly determined which kind of board to make for each participant.

Communication Board

The topic is pets and animals

The words, pictures and objects on the boards were selected after talking at length with each participant and family to discover what might be a topic of great interest to the participant. With some people the conversation might be gardening, while for others it might be travelling, music, or being in the military: there were many topics.

Half of the participants' boards also included "voice output". This means that if you touched a picture, object or word on the board, a recorded voice "said" the name of what you touched; for example if you touched the picture of a lilac bush it would say "lilac".

Research assistants conducted 10 conversations with each participant in their homes. Half of the conversations simply involved talking about the topic, while the other half involved talking about the topic while the communication board was on the table between the research assistant and the participant.

We began this study with the expectation that the words, pictures or objects on communication boards would increase the quality of the participants' conversations. We weren't sure whether voice output would help or not.

This topic was gardening

What Evidence Did We Collect?

We videotaped the 10 conversations conducted with each participant and analyzed the speech they used during the last 5 minutes of each conversation. Research assistants noted:

- When the participant made a clear statement with content, for example "I like to garden."
- When the participant had trouble conversing but tried to correct it; for example "I can't remember what it was called."
- When the participant had trouble conversing but didn't attempt to fix the problem; for example, "I, I, I, it was, then, they…."
- When the participant spoke in one-word statements such as "yes," or "uhuh."
- When the participant used the communication board, for example by pointing to a word, picture or object on it.

We assumed that clear statements and attempts to repair difficulties reflected more competent conversations; while statements with unrepaired difficulties and one-word responses reflected less competent conversations. Noting how often participants made references to the communication board enabled us to track its importance and effect on the conversation. We compared all of these aspects of the participants' conversations with and without the communication board to see if the boards improved the quality of conversations.

What Did We Discover?

The results were not quite what we had expected. We had expected to find that the communication boards improved the participants' conversations; instead, we found that the boards didn't make much difference to the conversations. The evidence we collected didn't show significant differences in frequency related to whether the communication board was present or not. Furthermore, the evidence showed that the participants rarely referred to the AAC board during the conversations in which they were present. In fact, in half of the 300 conversations they never referred to the communication board at all. Eight of the 30 participants never referred to the board in any of their conversations. Although we didn't have any expectations about the usefulness of voice output, what we found surprised us. We discovered that voice output appeared to distract the participants, resulting in more one-word statements and fewer statements overall.

So What Does This Mean?

Finding that our hypotheses were not supported was disappointing because we had hoped to begin pin-pointing effective supports for supporting conversations in people with dementia and AD. However, the study still provided some important information. We were left with two major conclusions. First, it is not helpful to include voice output in an AAC device for this population. Second, we now know that for this group of people, simply providing AAC tools doesn't mean that they will use them. The fact is that providing AAC without training isn't assistive at all. This is a lesson that has been learned in many other studies of the usefulness of AAC for various groups of people.

What's Next?

The results of this study convinced us that we should explore the use of AAC tools further using different methods that included training of the participants. The next study (Study 2) yielded more information about the usefulness of AAC for people with AD.