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Continuing Education Questions

- 1. The visual Instruction mode refers to the use of visual supports for purposes of
 - a. expressive communication.
 - b. language comprehension.
 - c. organizing daily events.
 - d. showing sign language.
- 2. PECS is an example of a a. Visual Scene Display.

Visual Scene Displays (VSD): New AAC Interfaces for Persons With Aphasia

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Why was the VSD project initiated? Aphasia is a language impairment resulting from damage to the language centers and their connections in the brain. The lives of persons with chronic aphasia are profoundly changed by this condition, as are the lives of their significant others, including family members, friends, colleagues, and caregivers. Typically, initial intervention for persons with aphasia is designed to restore comprehension and expression by reducing the extent of the language impairment. During this phase of intervention, frequent communication partners usually receive instruction and guidance to facilitate communication interaction. For those with severe, chronic aphasia, there usually is a need to supplement and augment natural speech and language capabilities in order to enhance communication effectiveness. It is beyond the scope of this brief article to review AAC intervention for persons with severe aphasia, so readers are referred to several excellent resources (Garrett & Lasker, 2005; Kagan, 1998; Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001; Lyon, 1995).

A review of the literature reveals that some persons with severe, chronic aphasia make use of AAC strategies. Often they

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- b. systematic use of symbols for requesting.
- c. language set.
- d. low tech device.
- 3. Count down displays, visual timers and first—then boards are all examples of instructional materials that would be considered within the
 - a. Visual Instruction Mode.
 - b. Visual Expressive Mode.

- c. Visual Organization Mode.
- d. FC teaching mode.
- Instructional material that uses symbols to designate an impending activity is generally referred to as a
 - a. PECS display.
 - b. Grid Display.
 - c. Visual Schedule.
 - d. Visual Scene Display.

VSDs Continued from page 13

use speech generating devices to accomplish specific communication tasks such as answering the phone, giving speeches, calling for assistance, ordering in stores or restaurants, telling stories, or saying prayers (Garrett & Lasker, 2005). Low-tech communication books, residual writing, and drawing are used to supplement their residual speech by assisting with word finding and recall of specific information, using rating scales to communicate attitudes and preferences or making choices among written options. However, language limitations in symbolizing meaning using printed messages or icons (representation), spelling, combining words into messages (formulation), and locating information in a book or electronic device (navigation), often limit the ability of individuals with severe chronic aphasia to use AAC strategies to meet their diverse communication needs.

Although language is impaired in severe aphasia, visuo-spatial capability is typically preserved. The purpose of the Visual Scene Display project is to develop a new type of interface that uses contextually rich visual images to represent meaning and to support navigation within a high technology AAC device (See Figure 1 for an example of a visual scene display). Although the cerebrovascular accident (CVA) that causes aphasia also often limits the use of one arm and hand (usually the right), control of the other hand allows for relatively efficient control of touch screen technology provided that vision is relatively well preserved.

During the past 24 months, a research team from the University of Nebraska, Lincoln has collaborated with colleagues from Penn State University and with engineers from DynaVox Technologies to develop a prototype visual scenes dis-

play interface for a speech generating AAC device. Five individuals with severe, chronic aphasia have used this interface during the past 12 months. In the remainder of this article, the use of visual scenes strategies in high technology AAC interventions is described. For further information, readers are referred to a Web cast about the VSD project (Beukelman, Hux, McKelvey, Dietz & Weissling, 2005), available at the AAC-RERC Web site. This Web cast also describes the use of visual scene strategies in traditional aphasia intervention and low-tech AAC strategies. Readers are also referred to the presentations by Dietz, McKelvey, Beukelman, Weissling, and Hux (2005) and by McKelvey, Dietz, Hux, Weissling, and Beukelman (2005) for further information.

Visual Scenes

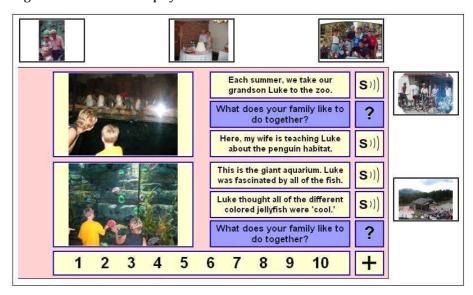
The VSD is designed to provide persons with aphasia (and apraxia) with visual-contextual support to facilitate navigation of a dynamic display AAC system, and thus, successfully communicate messages/intent. A visual scene is a picture, photograph, or virtual environment that depicts and represents a situation, place, or experience. Typically, a visual scene is contextualized, meaning that the elements in the

scene are depicted in relationship to the natural environment (picture of a wedding or child's soccer game). Such a scene establishes the context for a conversational interaction and provides the person with aphasia and their communication partner(s) with information to support multiple communication exchanges. By contrast, a portrait contains limited, usually decontextualized information (picture of a person or two with a plain background). Any additional information about the person(s) or object in a portrait must be generated by the person with aphasia or speculated on by the communication partner. It is this spontaneous generation of information that is difficult for persons with severe aphasia.

VSDs vs. Grid Displays

Historically, most AAC systems have been organized in grids in which symbols/pictures/icons occupy individual spaces at regular intervals. The demarcation of the individual squares isolates each symbol, thus requiring individuals to process individual symbols and combine them to formulate messages. Consequently, persons with aphasia and their communication partner(s) are required to formulate messages using iconic information

Figure 1. Visual Scene Display



that is decontextualized and has little implied relation between symbols. In contrast, each element in a visual scene is pictured in its natural relationship and position to all other elements in the scene. The person with aphasia and the communication partner co-construct "the gist" of the visual scene. The meaning of all elements and semantic associations are integrally tied together, creating a holistic context. In addition, contextualized pictures can be paired with text and voice output to communicate specific messages, ask questions, and/or provide support for the listener.

Case History

The experiences of two women with severe, chronic aphasia are described below. Rita's VSD system is discussed in some detail, while Pat's experiences in selecting and programming content are highlighted. Rita is an 84-year-old woman and has had aphasia for 3 years. She lives at home with her husband and, since her CVA, has experienced a severely limited social network. Prior to her involvement in the VSD project, she communicated using vocalizations, a few gestures, and, to some extent, a communication book. If given phonemic cues, Rita could occasionally produce single words and had some spontaneous use of familiar phrases (e.g., How are you?). She did not use these spoken messages to communicate with a partner. She had no consistent means to solve communication breakdowns and usually abandoned her attempts after a few tries. Rita began using a VSD device 11 months ago.

Rita's VSD has numerous themes that are represented by signature photos located around the edge of the screen. By touching these photos or images, she navigates to retrieve information about a programmed theme. These theme images (photos) and their locations do not change as she uses her VSD, so

they are available at all times to support navigation among different themes. Her themes include her husband and their experiences together, her dog, phone communication messages, her Red Hat Club, the communication group at the University of Nebraska-Kearney, her life-long flower hobby, her medications and care, her four children and their families, additional content about each child, and her house (with extensive information to communicate with her house cleaner a social role she reclaimed after learning to use the VSD).

The (+) buttons that appear on most screens are used to navigate deeper into a given content or topic area, rather than to move to new themes. For example, the (+) buttons for the family theme in Rita's system are associated with a photo of each of her children and their spouses, thus providing more and more information about each child's family. While she is retrieving more and more information about her children, the signature theme pictures located on the edges of the VSD remain constant. Therefore, she can navigate deep within a theme (family) and immediately move to any other theme by touching the signature image for that theme.

Many of the VSD screens contain spelled messages that are accompanied by a (S) speak button. When activated (touched), a spoken message identical or similar to that printed on the screen is produced through digitized or synthesized speech. We have learned that persons with aphasia are reluctant to use the speech output function if they are not reasonably confident about the content of the message that will be produced. Some printed messages are highlighted, or coded, in different colors. It was particularly important for Rita to have color codes to assist her. Speech buttons were coded with a red background and questions were coded with a blue background.

Programming VSD

The process of personalizing the content of the VSD is referred to as theme development. Essentially, there are three phases of the theme development procedure: (1) informant phase, (2) programming phase, and (3) validation phase. The Informant Phase involves session(s) with the AAC facilitator and a family member or caregiver. Depending upon the situation, or personal preferences, the person with aphasia is usually present during this session. Prior to the session, the family and the person with aphasia are asked to provide relevant photos. The AAC facilitator downloads or scans the digital pictures into a PC editor. Subsequently, the pictures are enlarged and individually discussed. The informant provides details regarding the names of the people, places, and activities in the images while the AAC facilitator re-names the photos in the image editor. This interaction can be recorded for later reference, or the facilitator may make notes as the informant talks. A 'theme' is realized from the informant's description of the contextual photos. At the end of the informant session, the AAC facilitator summarizes her understanding of the theme using the pictures as a guide. This provides the informant with an opportunity to correct any errors or miscommunications. Upon completion of this phase, the AAC facilitator begins the programming phase.

During the Programming Phase, the AAC facilitator assembles and programs the theme into the VSD. For example, photos are identified to support communication interaction. A "signature photo" is chosen to represent each overall theme; this signature photo is used for navigation to that theme. The signature photo is chosen based upon its saliency of the identified theme for the person with aphasia. The photos within a theme are then systemati-

cally programmed to correspond with the key ideas related to the theme that were expressed during the informant phase. The key ideas are provided as written text. Once the theme is programmed, it is downloaded to the user's device. The informant previews the content of the theme and any obvious errors are corrected, prior to sharing the new theme with the person with aphasia.

The person with aphasia is directly involved in the Validation Phase of theme development. The new theme is reviewed on the device, and the person with aphasia is provided time to explore the content. As the photos, text boxes, and speak buttons are reviewed, it is important to question the person with aphasia regarding the accuracy and acceptability of the theme content. The AAC facilitator works with the person with aphasia and the informant to further personalize the theme. The validation phase fosters ownership of the material included in the VSD and cultivates a sense of competency that is often lost in people with aphasia.

Case History

In 2001, at 52 years of age, Pat had a CVA that left her with severe aphasia and apraxia of speech characterized exclusively by stereotypies (repeated sound sequences or words). People with aphasia often experience limitations in their former social roles. Pat's social roles became restricted to those of wife, mother, and grandmother. Her social network was limited to her family, with the exception of the aphasia communication support group at a university speech-language clinic. Initially, Pat rejected the VSD. She insisted that she would regain functional speech and that her current low-tech AAC was sufficient for her communicative needs. Over time, her family's perseverance helped Pat realize that she was not going to regain functional speech and that her current low-tech AAC was not sufficient to meet her communication needs.

Once Pat agreed to use the VSD for a trial period, an AAC facilitator assisted in the identification of contextual photographs that could be successfully used in a theme. Initially, Pat and her family chose many portrait-type photos (e.g., static photos of people posed with limited background). These types of photos limit interactions significantly; partners tend to ask questions such as. "Who is that?" or discuss very basic need topics, such as washing the dishes and doing the laundry. Once the family began to understand the impact that contextual scenes could have on Pat's ability to interact with those outside of her family, they began to identify photos that were rich in context and represented important experiences in Pat's life (e.g., the Hawaii theme). The signature photo of the Hawaii theme was easily identified. One of Pat's most memorable lifetime events was meeting Don Ho, her favorite singer, on a cruise. She was able to easily associate the Hawaii vacation with this signature photo and excitedly told "everyone" she encountered about meeting Don Ho. Once Pat became comfortable using this theme to interact with others, she expressed a desire to expand the Hawaii theme and requested that additional photos and key ideas be added. These included a trip to the top of a volcano and exploration of pineapple gardens. Pat also identified and requested other themes to be included in her system. One theme was Family. She wanted to be able to talk about her daughter and son-in-law and to brag about her grandchildren. In fact, Pat requested a page describing her daughter's work be included, so that she could help recruit business for her. Pat uses the VSD to introduce and describe her daughter's company, then hands out company pens! Another theme that Pat included in her VSD was Hobbies.

Using the VSD, Pat asks others what their hobbies are in hopes that they, in turn, ask her about her hobbies so she can show off (using the VSD) her cow collection. Pat's most recent request was to incorporate a theme specifically designed to facilitate interactions while at the university speech and hearing clinic. Since implementation of the VSD, Pat has befriended people she sees regularly at the clinic. Recently, Pat has resumed her participation in Women's Club meetings at her church.

Pat's gradual acceptance and increased use of the VSD illustrate an important point. The general purpose of the VSD Display is to support her participation in multiple communication roles. Oftentimes, this includes telling personal narratives, such as the Hawaii vacation experience. Many of Pat's themes do not adhere to a narrative framework. Her theme focusing on her miniature cow collection is a clear exception. Since realizing the potential of the VSD, Pat has slowly expanded her social roles and has accepted that she will never regain functional speech, but in the process, she has regained her "voice."

Comments From VSD Users

The following comments have been provided by Pat and Rita's daughters regarding their mothers' use of VSD:

- 1. (For her)...pictures mean a lot more than words do. So at least it is easy for her to find things...if she sees a picture she remembers what's behind (related to) that picture.
- 2. ...after she showed me (daughter)...it was just a touch screen type thing, I just knew it was going to work out for her.
- 3. Before she had this (speaking) computer...she couldn't tell the stories, but now...if she has new

- information in there (VSD), she loves to sit down and just go through each story and they'll (friends and family) sit there with her and they just love it. She may not be able to speak about it but she still has it...she can communicate it.
- 4. Now she's more apt to take people in and show them her computer and when they're in there she doesn't want them to leave. She wants to talk about everything.
- 5. I am really impressed with her wanting to learn it, wanting to use (it), and she's not too worried about getting around in it.
 - 6. ...(she) shows them (friends and relatives) what's new on her computer and how she gets around in it.
- 7. ...so he (husband) is not afraid of computers... he just isn't gonna work with her that way because he can communicate with her (without the VSD)
- 8. Now the grandkids, I think they understand.

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Continuing Education Questions

- 1. According to Garrett and Lasker (2005), some people with severe, chronic aphasia currently make use of AAC strategies to
 - a. complete specific tasks such as: answering the phone, telling stories, and ordering in stores.
 - b. expand their social roles.c. meet diverse communication needs.

- d. return to work.
- 2. A Visual Scene Display is best described as
 - a. a line drawing of a scene(i.e., a kitchen, living room).b. a portrait with peoplesmiling and "posing" for the
 - c. iconic symbols arranged to create a "scene" on the display.
 - d. a photograph that depicts and represents a situation, place or experience.
- 3. Navigation through the Visual Scene Display is accomplished through the use of
 - a. grids organized through categorization of topics using iconic symbols.
 - b. hot spots created within the photographs.
 - c. themes, color and contrast, and "link deeper" buttons.
 - d. grids organized through categorization of topics using text.
- 4. How are the themes developed and entered into the Visual Scenes Display?
 - a. The family/person with aphasia provides photos and the AAC facilitator creates a theme based on the pictures, and then programs the device.
 - b. The AAC facilitator, the family, and the person with aphasia jointly develop the themes during three phases: informant, programming, and validation.
 - c. The AAC facilitator works with the family to create the theme, then programs the device.
 - d. The AAC facilitator collects pictures from the internet, magazines, and newspapers, develops a theme and programs the device.