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EFFECTS OF A VOICE OUTPUT COMMUNICATION AID ON INTERACTIONS BETWEEN SUPPORT PERSONNEL AND AN INDIVIDUAL WITH MULTIPLE DISABILITIES

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We evaluated a means of increasing staff members' interactions with an individual with multiple disabilities through use of a voice output communication aid (VOCA). When activated, the VOCA allowed the individual to communicate through synthesized speech. Results indicated that staff members interacted with the individual more frequently when she had access to the VOCA, suggesting that VOCAs may represent an alternative to more traditional staff management programs for increasing interactions.

DESCRIPTORS: communication, augmentative communication, staff management, assistive technology, multiple disabilities

Considerable research attention has focused on supervisory procedures for increasing interactions between support personnel and people with severe disabilities. An alternative approach for increasing these interactions may be to enhance communication skills of individuals with disabilities. Due to lack of speech and otherwise ineffective communication systems, people with severe disabilities often have difficulty initiating interactions. Such difficulty may relate to the pervasive lack of interactions between people with severe disabilities and support staff members (Repp, Felce, & de Kock, 1987). One means of improving the communication skills of this population that is becoming increasingly popular is the use of augmentative communication strategies (see Mirenda, Iacono, & Williams, 1990, for a review). A specific type of augmentative communication that might be particularly advantageous for promoting interactions with staff members is the use of a voice output communication aid (VOCA). One advantage of a VOCA is the production of synthesized speech that can be readily understood by the general population, thereby potentially facilitating interactions with speaking individuals. This study examined the effects of VOCA use by an individual with severe disabilities on communicative interactions with support personnel.

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METHOD

Participants and Setting

The client participant, Megan, was 23 years of age and had a diagnosis of profound mental retardation, spastic quadriplegia, and visual impairment. She was nonambulatory and was dependent on support personnel for fulfillment of basic needs. Megan's primary communication mode consisted of brief vocalizations, involving nonword utterances that were very difficult to interpret. Staff participants were a teacher's aide and 3 residential direct service personnel. The study was conducted during a morning period in Megan's adult education classroom involving the teacher's aide and during two time periods in Megan's residence involving the direct service staff.

Behavior Definitions and Observation System

A *communicative interaction* was defined as a verbalization directed to or from the participant that conveyed meaning, such as requesting an item, asking a question, or providing a greeting or comment. For Megan, communication also included nonword vocalizations, gestures, and VOCA use, and included a subcategory of initiated communicative interaction. An initiated interaction was scored if there was no preceding interaction by support personnel within 5 s of Megan's communication. Communicative interactions were observed using a continuous 30-s partial-interval system. Each observation session continued for 10 consecutive minutes (20 intervals). Interval-by-interval interobserver agreement was assessed during 33% of the sessions, including all experimental conditions, and averaged 88% (range, 50% to 100%) for occurrence of interactions and 83% for initiations (range, 50% to 100%).

Experimental Conditions and Design

Prior to baseline, item and food preferences were assessed by conducting interviews with staff members familiar with Megan, along with a structured preference assessment (Pace, Ivancic, Edwards, Iwata, & Page, 1985). As a result of the assessment, four items were determined to be highly preferred (cookie, chocolate milk, keyboard, and magazine) and were selected for use with the VOCA. Megan was trained in a discrete-trial format to activate the VOCA (Mega Wolf[1]), which was preprogrammed to speak the request, "I want (item) please" for each of the four item choices, by pressing a photograph of the item on the template of the VOCA. Before beginning the study, several staff members listened to the voice output to determine the intelligibility of each VOCA activation. All personnel expressed no difficulty in understanding the VOCA-produced requests, although several individuals stated that the requests did not sound very natural, due to the synthesized nature of the voice output.

[1] Available from ADAMLAB, 33500 Van Born Road, Wayne, Michigan 48184.

During baseline, observations were conducted during routine morning activities in Megan's classroom at 10:00 a.m. and in her residence at 4:00 p.m. and 7:00 p.m. Two teacher's aides and eight other students were present in the classroom. During the classroom time, Megan was in her wheelchair and was typically engaged in leisure activities (e.g., looking at a magazine) while the teacher's aides conducted individualized training with other students. In Megan's residence, two staff members provided interactions and prompted engagement with leisure items (e.g., playing a keyboard, looking at a magazine) with Megan and 12 other people with multiple disabilities. The VOCA was not present during baseline. Observation sessions occurred for several days, with no more than one observation at each time period per day.

Following baseline and before the VOCA condition, staff members received a 15- to 30-min in-service session on Megan's use of the VOCA. They were given verbal and written information on how to put the VOCA on Megan's wheelchair tray top, turn the VOCA on and off, find the page containing the item requests, and store the device. Megan also demonstrated use of the device during this session. Staff members were then asked to ensure that Megan had access to the VOCA during the 10:00 a.m. and 4:00 p.m. time periods. They were not given any instructions regarding interactions with Megan or prompting her to use the device. After the in-service session, classroom and living unit procedures remained the same as in baseline except that the VOCA was present. A multiple probe design across two time periods (with the 7:00 p.m. period serving as a control) and settings was used to evaluate effects of the VOCA on staff members' interactions with Megan.

Following termination of the formal VOCA condition, support staff provided Megan with access to the VOCA at the designated time periods as part of her routine schedule. Follow-up observations were conducted (using the same observation system as during the study proper) after 98 days during the classroom period and after 83 days during the 4:00 p.m. period in the living unit.

RESULTS AND DISCUSSION

Support personnel increased their frequency of interactions with Megan in both settings when Megan had access to the VOCA (Figure 1). During baseline in the classroom and the 4:00 p.m. period in the residence, staff members' interactions with Megan occurred during an average of 21% (range, 10% to 42%) and 31% (range, 0% to 70%) of the observation intervals, respectively, whereas during the VOCA condition respective interactions increased to 63% (range, 40% to 94%) and 86% (range, 60% to 95%). Follow-up observations indicated that these increased interactions continued, averaging 85% in the classroom and 90% in the living unit. No changes in staff interactions were observed during the control period in the residence (7:00 p.m.). Observations also revealed that Megan activated the VOCA when it was available, averaging 22% of the intervals (range, 0% to 35%) in the classroom sessions and 24% (range, 10% to 35%) in her residence. Megan's VOCA activations accounted for 68% of all her communicative interactions during the classroom intervention sessions and 86% of her interactions during the living unit intervention sessions.

Follow-up data indicated that VOCA use accounted for 75% of her communicative behavior in the classroom and 60% of this behavior in the residence. During the classroom period, 87% of Megan's VOCA activations were initiated (i.e., not prompted by a staff member), and 72% of the VOCA activations in the living unit were initiated. During follow-up at both time periods, 100% of Megan's VOCA activations were initiated. Probe observations regarding the number of different items Megan requested in the VOCA condition occurred during 63% of the sessions in the classroom and 100% of the sessions in the residence. Results of the probes indicated that she requested at least two different items in 71% and 86% of the respective sessions. In both follow-up sessions, Megan requested at least two items.

Results suggest that interactions between support personnel and an individual with multiple disabilities and limited communication skills can be increased through use of a VOCA. This client-centered communication strategy represents an alternative approach to the more traditional use of staff management contingencies to increase interactions with people with disabilities. After Megan was trained to use the VOCA, she frequently used it to request an item during leisure periods in her classroom and residence. Staff members responded to the synthesized speech request by providing the desired item and simultaneously interacting with Megan. One likely reason that the use of the VOCA increased staff interactions is the synthesized speech provided a salient cue to staff to interact. Relatedly, VOCA speech output appeared to be much easier to understand than were Megan's typical communication attempts. For example, in baseline, all of Megan's communication attempts were either nonword vocalizations or gestures that were, for the most part, quite difficult to interpret. In contrast, when using the VOCA, Megan's requests were clearly understood and readily acknowledged by staff; thus, during the observed sessions, Megan received the item she requested using the VOCA on 100% of the requests. In addition, it appeared that staff interactions continued to be prompted and reinforced by the specificity of Megan's requests as reflected in the follow-up data, showing high percentages of intervals of interactions for periods ranging up to 14 weeks. As of this writing, Megan continues to use the VOCA successfully, as indicated by staff-reported data in her individual habilitation plan notes as well as by informal experimenter observations. Also, two additional requests have been added to the VOCA since completion of the study.

In light of these preliminary results and the importance of frequent interactions between support staff and people with severe disabilities (Schepis & Reid, 1994), additional research seems warranted to explore further the benefits of VOCAs. Such research could evaluate the direct benefits to individuals with severe disabilities in terms of enhancing their communicative skills across a wider variety and type of communicative interactions. Research also seems warranted to evaluate more thoroughly the effects of VOCA use on the interactions of

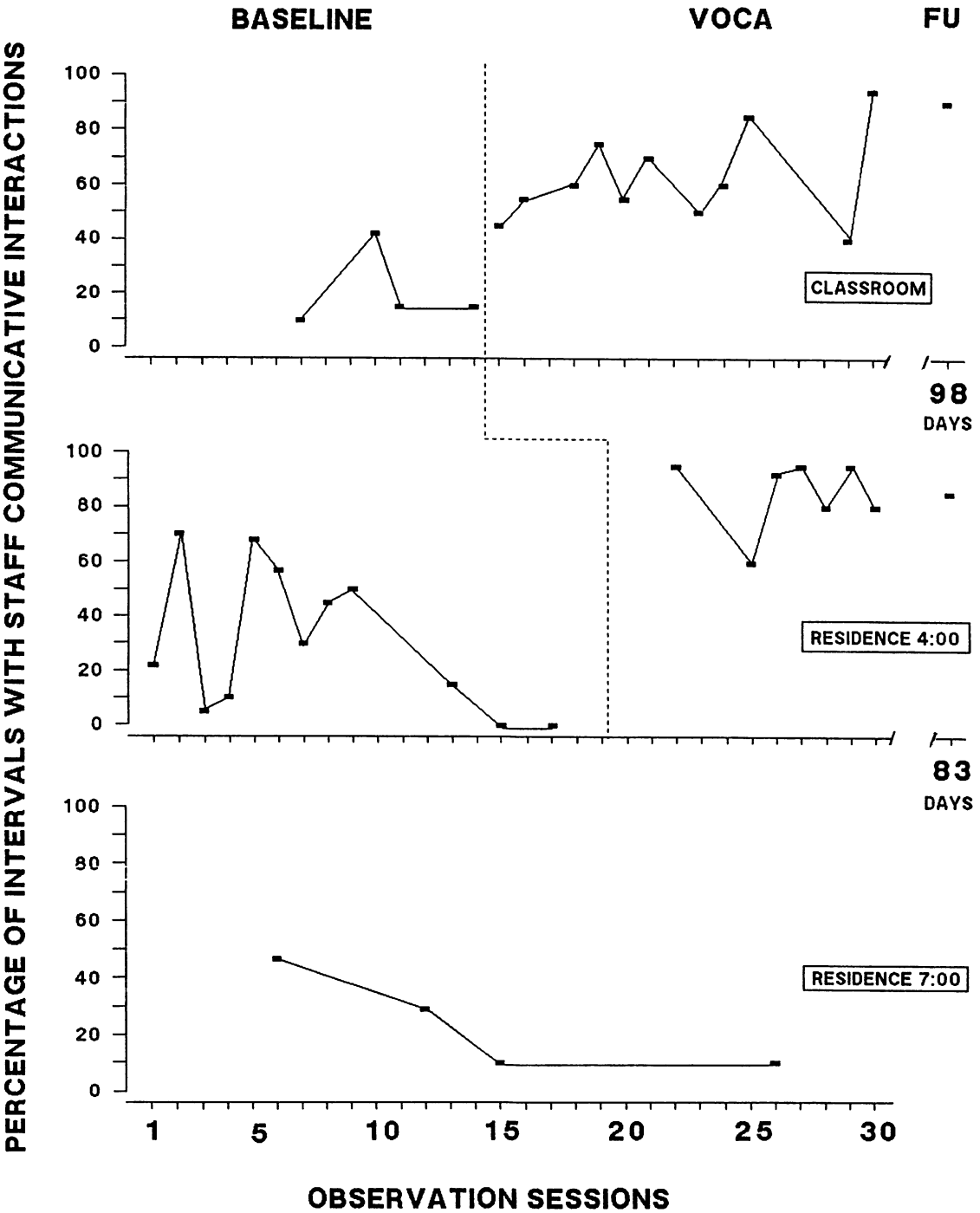

Figure 1. Percentage of observation intervals during which support personnel interacted with Megan for each observation session during each experimental condition and during follow-up (FU) in the classroom and residence.

potential communication partners without disabilities, including people who are unfamiliar with a given individual with disabilities and people in a variety of community settings.

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