Increasing Opportunities for Requesting in Children with Developmental Disabilities Residing in Group Homes through Pyramidal Training

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Abstract: This study evaluated the effectiveness of pyramidal training with direct care staff in group homes. Training focused on teaching staff how to provide opportunities for communication to non-speaking children with developmental disabilities to communicate. Staff were taught through a combination of a workshop, and nondirective consultation following an adult education model. A multiple-probe design across three cohorts of direct care staff was used to evaluate the effectiveness of the training in terms of the number of opportunities provided by staff and the percentage of requests emitted by participating children. Results showed that pyramidal training resulted in more opportunities provided to the children and concurrent increases in children’s requesting. Results are discussed in terms of the suitability of pyramidal training for group home settings, and implications for future research.

Children with developmental disabilities and severe communication impairments frequently rely on augmentative and alternative communication (AAC) systems such as manual signs and/or aided systems such as communication boards and voice output communication aids to communicate (Beukelman & Mirenda, 1998; Lloyd, Fuller, & Arvidson, 1997; Reichle, York, & Sigafoos, 1991). Communication is considered a transactional process where partners influence each other in the course of the exchange (Light, Datillo, English, Gutierez, & Hartz, 1992). Studies examining the interaction patterns between persons with developmental disabilities and communication partners in a variety of settings, however, indicate that partners exhibit high rates of directives while individuals with developmental disabilities are provided with relatively few opportunities for communication (Blindert, 1975; Houghton, Bronicki, & Guess, 1987; Sigafoos, Roberts, Kerr, Couzens, & Baglioni, 1994). In light of these interaction patterns, several authors have advocated that AAC intervention should be dual pronged, involving intervention with the individual using AAC and instruction of communication partners (Beukelman & Mirenda; Calculator & Luchko, 1983; Culp & Carlisle, 1988; Cumley & Beukelman, 1992; Naughton & Light, 1989; Walker & Antonius, 1995). A few controlled studies have begun to evaluate the efficacy of communication partner instruction in promoting increased communication by AAC users with developmental disabilities (Light et al.; Sack, McLean, McLean, & Spradlin, 1992; Sigafoos, Kerr, Roberts, & Couzens, 1994). For example, Light et al. successfully instructed three partners of two young adults with developmental disabilities who use AAC to decrease rates of turn-taking and initiations and to increase rates of turns that were responsive. As a result, the two adults increased the frequency of their initiations.

The need to provide instructions to partners is particularly evident in teaching an initial request repertoire to the learner (Sack et al., 1992; Sigafoos, Roberts et al., 1994). An initial requesting repertoire provides a direct
benefit to the learner by allowing access to preferred objects and activities which require the mediation of another person (Sigafoos & Reichle, 1992; Skinner, 1957). This mediation of another person (i.e., the partner) requires the provision of opportunities so that the child can learn to request spontaneously instead of only when prompted. In a study by Sack et al., staff in a residential setting were taught to follow a scripted routine in order to provide specific requesting opportunities for five adolescent learners with severe mental retardation in a snack activity and an art activity. Results revealed that staff provided more opportunities and the learners increased their requests within the scripted routine context.

In another relevant study, Sigafoos, Kerr et al. (1994) taught five teachers serving 26 children with moderate to severe mental retardation to increase requesting opportunities. Due to this instruction, the opportunities provided by teachers and the requesting behavior of the children increased during intervention, and was maintained during follow-up.

A number of strategies are available for communication partners in order to create opportunities for requesting among persons with developmental disabilities (for a detailed review see Sigafoos, Roberts et al., 1994). The missing-item format, for example, involves withholding a needed object until the child requests it or attempts to request it independently or with prompting by the partner (Cipani, 1988). In the study by Sack et al. (1992) staff were taught to use the missing-item format. The interrupted-chain strategy represents another procedure (Goetz, Gee, & Sailor, 1985; Hunt, Goetz, Alwell, & Sailor, 1986). Here, an activity is interrupted to create an opportunity for the child to request, independently or with prompting, the continuation of the activity. Delayed assistance may be used as yet another strategy to create opportunities for requesting (Reichle, Anderson, & Schermer, 1986). When a child is noticed to struggle completing an activity, the partner may approach, but wait until the child requests “help” either independently or prompted by the partner. Sigafoos, Kerr and colleagues (1994) taught each of these three strategies to their participating partners.

These strategies are often combined with delayed prompting; a technique that provides guidelines for the use of successively more and more intrusive partner prompts (Halle, Baer, & Spradlin, 1981; Halle, Marshall, & Spradlin, 1979). The partners in the Sack et al. and the Sigafoos, Kerr et al. study were also taught to use delayed prompting to solicit requests.

In addition to the content of partner instruction, instructors must also consider the effectiveness and suitability of available instructional formats to deliver this content. Sack et al. (1992) used an overview session, a video-taped demonstration of delayed prompting, followed by actual practice, supervised application in the activities targeted for training, and a review session. Sigafoos, Kerr et al. (1994) successfully employed a nondirective consultation format (Peck, Killen, & Baumgart, 1989) to instruct the teachers. This included an overview session, a session to generate ideas on how to use the strategies taught in the overview session, and feedback following each application. Nondirective consultation may represent an effective and acceptable form of teacher-directed intervention because it involves teachers in the training process and because it exploits the teacher’s greater familiarity with the children and existing routines (Sigafoos, Kerr et al.). In absence of any research on the comparative effectiveness of these instructional formats, it is important to choose a training format that seems at least conceptually appropriate to the targeted partners. Because many communication partners in AAC are adults, efforts to prepare these adults should consider the characteristics of adult learners and models of adult learning (Cumley & Beukelman, 1992).

With the exception of the use of nondirective consultation as a format of partner-directed intervention (Sigafoos, Kerr et al., 1994), there has been little emphasis in partner instruction research regarding the appropriateness of the training formats selected for targeted partner groups. The literature on adult education suggests that the following format best supports the learning styles of adult learners and yields the most effective training impact: a combination of (a) workshops, (b) modeling, (c) practice in simulated and real settings, (d) feedback about performance, and (e) coaching during actual practice (Joyce & Showers, 1980; Korinek, Schmid, & McAdams, 1985; Sparks, 1983; Wade, 1984).
Workshops are useful for presenting theories, skills, and strategies. Information and demonstration through modeling are needed to teach the basic content and convince participants of its importance. Practice is needed to develop fluency of the necessary skills. Guided practice in simulated or real settings will help to overcome the common problem of being unable to implement a strategy that appeared easy when first presented. And finally, one especially important component, essential for behavior change and maintenance, is feedback (Joyce & Showers; Sparks; Stevens & Driscoll, 1987).

The organization of the instructional strategy must also be suitable to the setting. Pyramidal training has been found an effective training strategy to train parents (Neef, 1995a) and multiple groups of staff including group home supervisors (Parsons & Reid, 1995), direct care staff (Shore, Iwata, Vollmer, Lerman, & Zarcone, 1995), and teachers (McGimsey, 1995). In a typical pyramid, a cohort of staff is trained by “experts.” Once trained, this cohort trains a second cohort, and the second cohort trains a third cohort, and so forth. Pyramidal training is therefore extremely appealing for group home settings where staff turnover is usually high and it may not be efficient to have each new staff trained by an “expert” (Larson, Lakin, & Bruininks, 1998). To date, pyramidal training has not been used for training group home staff how to provide opportunities for communication to non-speaking children with developmental disabilities. The purpose of this study, therefore, was to determine the effectiveness of pyramidal training, using nondirective consultation combined with adult education formats, in instructing direct care staff to provide requesting opportunities to children with developmental disabilities and little or no functional speech.

Method

Participants and Settings

Participants included children with developmental disabilities residing in group homes and their assigned direct care staff partners. Three male children with developmental disabilities participated in the study. Children ranged in age from 7 to 10 years. One of the children, Steve, was diagnosed with pervasive developmental delay and autism, and Joe and Paul were diagnosed with developmental delay and autistic-like features. Information obtained by interviewing staff with the Communication Interview (Schuler, Peck, Willard, & Theimer, 1989), revealed that each of the children had no formal (i.e., symbolic) means of requesting. They tended to communicate their requests by touching items within reach or leading someone to a desired item. Even though the participants had been provided with communication displays their assigned direct care staff indicated that the participants did not use these displays to request preferred objects or activities. Each of the three children resided in a different group home, operated by the same private agency, where the study was implemented. The children functioned in the moderate to severe range of mental retardation in terms of IQ and adaptive behavior.

Seven adult direct care staff, who usually worked with the three children, participated in this study. These adult participants were selected because they were the most regular (albeit paid) communication partners of the participating children. Participants were all female and had worked in group home settings anywhere from a minimum of one year up to five years (mean = 3 years). They knew the particular child participant with whom they worked anywhere from one year up to four years and six months (mean = 2 years). All of the staff had at least a high school diploma with one of the staff holding an undergraduate college degree. None of the staff who served as communication partners had received formal instruction in AAC techniques prior to this study.

Definitions of Dependent Measures

Staff were observed to determine the number of requesting opportunities that each staff person provided using the missing-item, interrupted-chain, or delayed-assistance strategy. Operational definitions for counting a staff behavior as an opportunity were specific to each strategy and consistent with those developed by Sigafoos, Kerr et al. (1994). To be counted as an opportunity with the missing-item strategy, the staff not only had to engi-
neer the situation to create a missing item, but also had to wait at least 3 s before providing the missing item, as if waiting for the child to make a request. To be counted as an opportunity with the interrupted-chain strategy, the staff had to prevent the child from engaging, continuing, or completing an activity followed by at least a 3 s wait before allowing the activity to proceed. Finally, to be counted as an opportunity with the delayed-assistance strategy, the staff needed to approach a child who was clearly having difficulties completing a particular task and then wait for at least 3 s before providing the required assistance. It was not necessary for the child to make the request in order to be counted as an opportunity with any of the three strategies. When an opportunity was provided through any of the above strategies, the child’s response to the opportunity was recorded as an “unprompted request,” a “prompted request,” or “no response.” Operational definitions for prompted and unprompted requests were also taken from Sigafoos et al. (1994). The response was considered unprompted when the child provided a response within 10 s of the staff approaching the child and before being provided some type of verbal, gestured, model, or physical prompt after the 3 s required delay. However, if the staff provided some type of verbal, gestured, model, or physical prompt after the required delay (i.e., 3 s), but before the child responded independently, then the child’s request was recorded as a prompted request.

The following dependent measures were used to evaluate the effectiveness of direct care staff instruction during baseline probes and intervention probes: (a) number of opportunities provided, (b) number of unprompted requests, and (d) number of prompted requests. Number of requesting opportunities provided was obtained by simply adding the number of opportunities provided using any of the three strategies. Number of unprompted requests and the number of prompted requests were obtained by adding the number of occasions when the child produced a communicative response that was accepted by the staff (as indicated by her reinforcement of that response).

Observation and Videotaping Procedures
Observations were conducted via a video camera to record the number and type of requesting opportunities provided and the number of prompted and unprompted requests. For each staff-child pair, 15 min observation sessions per activity were conducted approximately bi-weekly. The activities selected were recurring as part of the group home routine at approximately the same time on the days of data collection. For the first cohort, the activities for Steve, Joe, and Paul involved chair wiping, water play, and preparing lunch, respectively. For the second cohort, activities for Steve, Joe, and Paul included preparing lunch, mealtime, and bedtime routine, respectively. And the activities for the third cohort involved laundry for Steve and Chores/Table setting for Joe.

Sessions were videotaped by a research assistant (RA) with extensive experience in videotaping interactions. The RA positioned herself away from the staff and the child and remained as unobtrusive as possible to minimize observer effects. The video camera was mounted on a tripod and remained stationary.
during videotaping unless the staff and child moved out of the camera’s range, in which case adjustments were made to the camera’s position. Profiles of the staff and the child were made to allow a clear view of both.

**Coding Procedures**

Two research assistants (RAs) were trained to code the videotapes. One RA served as the primary rater while the second RA served as the independent observer to obtain interobserver agreement data (see Interobserver Agreement). The second RA was blind to the purpose of the study. Both observers were trained to follow the target behaviors (see above) prior to baseline by coding 15 min segments of two activities involving a staff-child pair that was not part of the research project. Both observers coded the videotapes in the presence of an author until a standard was established. Instruction continued until both observers achieved an agreement of at least 90% with the standard.

**Procedure**

**Baseline probes.** Baseline sessions were observed for one targeted activity for each staff-child dyad. The observer entered the room at the time when each activity was about to be conducted, located the staff and the child, and videotaped the activities. Each session lasted 15 minutes per activity. During baseline, the staff was informed that the observer was present to observe the children’s existing communicative behavior.

**Pyramidal instruction.** Between the last baseline session and the first intervention session, the staff from the first cohort participated in an instructional program, consisting of (a) the presentation of theory, skills, and strategies, (b) modeling, (c) practice of modeled skills in simulated environments, (d) generating others ways that the strategies could be used in targeted activities, (e) practice in real environments, (f) coaching during actual practice (i.e., steps c–e), and feedback about performance (i.e., during steps c–e). Components a through c were implemented as part of a one-day workshop involving first cohort staff and the authors.

The overview of theories, skills and strategies lasted approximately three hours and involved the following topics: the importance of the partner in promoting communication (Light et al., 1992), identifying communication environments, selecting vocabulary and symbols for different activities, strategies for creating opportunities for requesting (i.e., missing-item, interrupted-chain, and delayed assistance), and the techniques involved in using delayed prompting. As part of the presentation of strategies, the staff received a one-page description of the missing-item, interrupted chain, and delayed-assistance strategies developed by Sigafoos, Kerr et al. (1994). Following the presentation of strategies, the instructors modeled them. Modeling included the demonstration of each strategy for creating requesting opportunities along with delayed prompting through role-play using several hypothetical activities. Each strategy was modeled with each activity to instill that the strategies are flexible and not limited to only one particular activity. Staff was then asked to practice the strategies through role-playing using the same hypothetical examples while the instructor provided coaching and ongoing feedback.

In individual consultation sessions, the staff was then asked to generate ways these strategies could be used with their child in the activity targeted for intervention. Occasionally, instructors had to facilitate this process through guiding questions (e.g., how might the missing-item format be used with Steve?). Consultation sessions were also used for creating topic-specific communication displays for each activity. Using the ideas and displays generated, the staff practiced the use of the strategies in the targeted activity with their child in one 20-minute session. Instructors provided coaching and feedback throughout and following this session. Where appropriate, the list of ideas generated during consultation was revised utilizing this feedback.

Staff of the second and third cohort was trained by the first cohort staff using individual consultation sessions and a one 20 min practice session. In order to maintain efficiency, the staff from these cohorts did not partake in a workshop.

**Intervention probes.** Observations during intervention were identical to baseline sessions involving the target activity. Five minutes be-
Before each session, however, the observer and staff reviewed the one-page description of the three strategies and the accompanying list of ideas for using the strategies that had been generated through the consultation process and revised following practice in real environments. Using these ideas and strategy descriptions as a guide, staff was asked to provide as many opportunities for requesting as possible during the upcoming 15 min session. During the 15 min probe session staff was provided with no feedback because these probes constituted the basis for evaluating the effectiveness of intervention. After each session, however, the observer provided feedback to staff on the number and types of opportunities they had actually provided and the delayed prompting techniques used during the preceding session. Additional ways for using the strategies were then discussed.

**Interobserver Agreement**

Interobserver agreement checks were conducted by the second RA for dependent measures equally across baseline and intervention probes (25%) and across all staff-child pairs. After receiving instruction (see coding procedures), the RA recorded the target behaviors during all phases of the study. An agreement was scored when the primary rater and the second RA had recorded the same type of opportunity and the same type of request at the same clock time (to the nearest minute). Interobserver agreement was calculated by taking number of agreements divided by number of agreements plus disagreements and multiplying by 100%.

During baseline probes, interobserver agreement on opportunities provided across staff yielded a mean of 100%. Interobserver agreement on the type of requests yielded a mean of 100% as well. During intervention probes, interobserver agreement on opportunities provided across staff yielded a mean of 91% (range: 85–95%). Interobserver agreement on the type of request yielded a mean of 90% (range: 83–94%).

**Results**

Results for opportunities provided and requests made by the children are displayed in Figure 1. Because only a total of three requests by the children were unprompted, we opted to combine prompted and unprompted requests with the understanding that the majority of requests were prompted.

**Baseline**

During baselines, including extended baselines of Cohort 2 and 3, staff provided no opportunities for requesting through the missing-item strategy, interrupted chain strategy, or delayed-assistance strategy. In turn, no requests were observed by any of the children across cohorts. These data were consistent with the agency’s reason for seeking consultation services from the authors; that is, the lack of formal requesting among participating children.

**Intervention Probes**

Staff in all three cohorts displayed marked improvements in providing opportunities for requesting only after training for a specific cohort was initiated. At the same time, the children across cohorts increased their number of requests made; each cohort did so only once training was initiated. Although the level of requesting indicates that the children failed to make use of all opportunities provided to them, a direct relationship between opportunities provided and requests made is clearly indicated.

**Discussion**

The purpose of this study was to determine the effectiveness of pyramidal training, using nondirective consultation combined with adult education formats, in instructing direct care staff to provide requesting opportunities to children with developmental disabilities. Results clearly demonstrate that the intervention resulted in increased opportunities provided by staff along with concomitant increases in children’s requesting. Thus, pyramidal training appears to be a viable option to train direct care staff in promoting communication of non-speaking children with developmental disabilities.

Previous studies had indicated that children’s request behavior could be increased...
Figure 1. Number of opportunities provided and requests made. Open squares indicate opportunities provided and closed circles indicate requests made.
through the training of partners in providing more opportunities (Sack et al., 1992; Sigafoos, Kerr et al., 1994). This study adds to this literature in that it demonstrates a viable approach for “expert” trainers to train only a segment of direct care staff who in turn provide training to their peers without further direct involvement of the experts. The knowledge that it is effective to train the trainer may assist group home supervisors in ensuring that new staff, arising due to often rapid turnover, is readily trained by their peers (see Larson et al., 1998). This study also extends previous work on the effectiveness of pyramidal training with group home staff (Parsons & Reid, 1995; Shore et al., 1995) to a different group of clients whose primary needs relate to the development of communication skills. It should be kept in mind, however, that the pyramidal approach used in this study was somewhat different from previous applications. In typical applications, the first cohort trains the second cohort, and the second cohort trains the third cohort. In this study, the first cohort trained each of the subsequent two cohorts. This was more consistent with the expressed expectations and needs of the supervisory staff in the group home agency. Future research needs to be directed into the relative effectiveness of these various approaches to pyramidal training.

The vast majority of requests emitted by participating children were prompted rather than unprompted. There are a number of plausible explanations for this somewhat disappointing finding. First, delayed prompting was addressed more with the first cohort as they received the workshop in addition to individual consultations, practice sessions, and feedback. This may explain why the only three unprompted requests were demonstrated during interactions with the first cohort.

It is important to note that the staff-training package included a number of components (e.g., in-service training, written guidelines, modeling, feedback). It is unclear to what extent each of these components was necessary and contributed to the outcomes obtained. Similar results may have been obtained by using only the in-service training component, for example. While in-service training alone might represent a more efficient training approach, the absolute savings in terms training time would not seem to be so great so as to recommend exclusion of the other components. Still, it would require additional component analysis to determine an optimal training package. The present results do however suggest that the current package was effective and the pyramidal approach would seem to have made it an efficient way of training staff. The lack of treatment integrity data is a limitation. Future research would be improved by monitoring the extent to which the pyramidal training program is delivered as specified.

References


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