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Initiating Requests During Community-Based Vocational Training by Students With Mental Retardation and Sensory Impairments

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Students with mental retardation and deafness or deaf-blindness often need some type of communication system to communicate effectively with communication partners during community-based vocational training. However, students may need specific training to learn how to initiate requests for items or assistance, a skill identified as critical for job success. Students were taught to initiate requests using dual communication boards and gestures. Data were recorded on student performance using a multiple-baseline probe design in which data were collected during baseline, intervention, and generalization phases. Students were

> *able to initiate requests with 80% to 100% accuracy with the communication*
> *system at vocational sites. Training students to initiate requests may need to be*
> *targeted when students are first learning a job, as this is when most naturally*
> *occurring opportunities exist.*

An integral part of community-based vocational instruction is the development and expansion of communication systems for students who cannot effectively communicate verbally. Promoting an effective means of communication is crucial, as research has suggested that it is the inability to interact effectively with persons in the community and on vocational sites that often significantly contributes to individuals with disabilities losing their jobs (Hanely-Maxwell, Rusch, Chadsey-Rush, & Renzaglia, 1986; Moon, Inge, Wehman, Brooke, & Barcus, 1990). Therefore, investigations of methods have started to determine effective training in socially appropriate communication skills necessary for individuals with disabilities to attain and maintain jobs and become integrated into the social network of the workplace (Chadsey-Rusch, 1990). Two primary considerations in training effective communication skills in vocational sites are (a) teaching types of communication systems that are easy for communication partners to understand and (b) teaching appropriate communication targets.

Students with mental retardation and deafness or deaf-blindness who are unable to communicate using spoken language often use various forms of communication. Unlike systems in most other disability areas, the communication system must provide not only expressive communication, but receptive communication as well, due to the hearing impairment. Manual sign language, communication boards (using graphic, tactile, or object symbols), and gestures are a few communication systems commonly used (Heller, Alberto, & Bowdin, 1995; Rowland & Stremel-Campbell, 1987). Since the student with mental retardation and deafness or deaf-blindness must communicate with supervisors, coworkers, and customers at job settings, the communication system must be "partner-friendly" (requiring little specific knowledge of its use) (Heller et al., 1995). Very few communication partners in the community have knowledge of manual sign language to effectively interact with a student, whereas communication boards have been found to be easily understood (Rotholz, Berdowitz, & Burberry, 1989). The use of dual communication boards, one for the student and an identical board for the communication partner, has been found to promote effective communication and to be preferred by communication partners at community-based vocational sites (Heller, Allgood, Ware, & Castelle, in press; Heller, Ware, Allgood, & Castelle, 1994).

The second consideration is teaching appropriate communication targets. Often communication systems are taught emphasizing the student's following the supervisor's directions or responding to information and criticism the supervisor provides about the job. Although these are crucial skills, one of the most frequent behaviors indicated by employers to be critical for job success is

initiating requests for assistance (Chadsey-Rusch, 1990; Salzberg, Agran, & Lignugaris/Kraft, 1986; Salzberg, McConaughy, Lignugaris/Kraft, Agran, & Stowitschek, 1987). This may not be targeted during community-based vocational training when acquisition of the task becomes the overriding focus.

Initiating requests for assistance may be difficult for some students since individuals who are lacking competent language skills often do not typically demonstrate the ability to initiate in their conversational skill repertoire (Downing, 1987). For individuals with mental retardation, various systematic instructional strategies are needed to teach requesting behavior (Kaiser, Ostrosky, & Alpert, 1993; McCook, Cipani, Madigan, & LaCampagne, 1988; Reichle & Sigafoos, 1991; Romer, Cullinan, & Schoenberg, 1994). Requests for assistance at job sites often are due to missing items (e.g., missing a rake to do yardwork), inadequate portions of items (e.g., not enough bags at a dry cleaners), or assistance performing task (e.g., unable to locate area to shelve items in a drugstore). Environmental arrangement makes use of missing items, inadequate portions, or tasks requiring assistance as a strategy to promote requesting (Kaiser et al., 1993). This strategy closely aligns with what actually occurs on community-based vocational sites.

When teaching a student to initiate requests when assistance is needed at a vocational training site, symbols need to be in place that indicate the function of the communication (a request) and the specific item or action being requested. If the student merely indicates he needs something without indicating what the something is, the communication partner will not understand the communication. If the student only points to an item, the communication partner may confuse the purpose of the communication. To avoid this confusion, the student needs to point to an "I need" symbol (indicating function) and the symbol of the specific item needed.

One difficulty in using dual communication boards is that they may not have the full range of possible items or situations the student may need to request. This may be due to the time it takes to learn the symbol, the ability of the student to learn a large number of symbols on the communication board, or limitations of the communication board itself. In these instances, the student needs to point to the "I need" symbol and then gesture to the specific item or situation that requires some type of assistance on the part of the coworker or supervisor. The coworker or supervisor can then answer by using his communication board or by fulfilling the request.

Although teaching students to initiate requests has been addressed in the literature, there have been no studies examining this issue of teaching students to initiate requests for assistance using dual communication boards at community-based vocational training sites with students with mental retardation and deafness or deaf-blindness. The purpose of this investigation was to examine the effectiveness of teaching students to request assistance with the use of a general "I need" symbol on dual communication boards combined with a specific item requested (either on the board or by gesture) using environmental arrangement.

In particular, it was asked whether systematically teaching requesting behavior using dual communication boards or dual communication boards and gestures would (a) increase the occurrence of initiating requests and (b) provide an understandable form of communication for the communication partner.

METHOD

Participants

Four high school students participated in this study (see Table 1). Scores on intelligence tests and adapted behavior tests indicated that the students were functioning in the range of mild to severe mental retardation. All four students had moderate to profound hearing loss and three of the students had concomitant visual impairments. All students used sign language as their primary form of communication, but effectively followed directions and understood comments from coworkers and supervisors using dual communication boards during vocational training. The students were selected upon meeting the following criteria: (a) students used dual communication boards for receptive and expressive communication at community-based vocational sites, (b) students did not initiate requests for assistance, (c) students participated in community-based vocational training, and (d) students were between 17 and 21 years old with sensory and cognitive impairments.

Pilot Data of Initiating Requests

Prior to the study, teachers and vocational trainers were observed as to their behavior teaching students during community-based vocational instruction. Anecdotal records indicated that as the students were being taught new job skills, vocational trainers anticipated problems and provided students with missing items or assistance without requiring students to initiate requests. Students were also considered able to communicate well on the job due to their ability to follow directions given on dual communication boards and to answer questions using the dual communication board systems.

Due to the concern that students had not learned to initiate communication, data were collected on the ability of the students to initiate five different communications. These were: "What job now?", "Is this O.K.?", "I need," "Help," "What do I do with ?", and "How are you?". Data indicated a low level of correct initiations (0% to 20%) across all students with all initiations, except for using the "How are you?" symbol, which had been previously taught.

To determine which types of initiations were most important, questionnaires were distributed to five job sites where the students were placed (students trained at two job sites for a total of five different sites for four students.) Supervisors at the job sites were asked to rate from 1 (*least important*) to 5 (*most important*) four categories of questions: requests for assistance (I need, help, what do I do with), direction questions (What job now?), evaluation questions (Is this OK?),

TABLE 1
Student Characteristics

Student	CA	IQ[a]	MA[b]	Sensory Loss	Additional Impairment	Communication
1	18.9	63		Profound sensorineural hearing loss Myopia Optic nerve atrophy Nystagmus Exotropia	Spastic cerebral palsy	Dual communication boards Manual sign
2	19.2		7.6	Severe sensorineural hearing loss Myopia Glaucoma Aphakia Exotropia Corneal opacities	Ataxia	Dual communication boards Manual sign language
3	18.3	36		Moderate to severe sensorineural hearing loss	Down syndrome	Dual communication boards Manual sign
4	19.1	45		Profound sensorineural hearing loss Myopia Amblyopia	Seizures	Dual communication boards Manual sign language

[a]IQ measured by the Wechsler Intelligence Scale for Children-Revised(WISC-R) for students 1 and 4; Stanford Binet for Student 3.
[b]MA measured by Hiskey-Nebraska Test of Learning Aptitude.

and social of questions (How are you?). Rating was done on a Likert scale with a rating of 1 being *least important* and a rating of 5 being *most important*. The highest ranking category was initiating requests for assistance (mean of 4.8). This coincided with findings in the literature, which found this type of skill to be critical to job success (Chadsey-Rusch, 1990; Salzberg et al., 1986). Based upon these data, initiating requests that required some type of assistance was targeted.

Dual Communication Boards

Each student carried a dual communication board system. Each communication board consisted of five to seven cards with approximately 10 to 15

high-contrast line drawings on each card. Upon approaching a communication partner, the student kept one communication board (the student communication board) and handed an identical communication board to the communication partner (the partner communication board). In responding to directions, the students had already learned that the communication partner would point to the partner board to say something to the student and the student would answer on the student board. The students had learned to initiate "How are you?" on the student board, and the communication partners answered on the partner board. The use of a dual board system has been found to be preferred by communication partners and also enhanced the turn-taking quality of communication (Heller, Allgood, Ware & Castelle, in press).

Each communication board consisted of core vocabulary and site-specific vocabulary. Core vocabulary was identified as that occurring frequently throughout all sites, such as "Watch," "Show you," "Go do," and "Try again." This vocabulary was often combined with site-specific vocabulary, which had pictures of items specific to the job site, such as "rake" in an outdoor job or "bag groceries" in a grocery store.

To promote initiating a request, an "I need" symbol was added to the core vocabulary. This was to be used in combination with the site-specific vocabulary. In certain instances it was anticipated that the specific vocabulary would not be on the communication board that the students needed to use due to the large vocabulary needed to cover all anticipated possible problems that could arise. In these instances, the student would gesture to the needed item or the problem that required assistance.

Instructional Procedure

In this study, students were taught to initiate requests with their dual communication board system using the technique of environmentally arranging situations to promote initiation, as well as during the naturally occurring situations when items were missing, portions were inadequate, or assistance with the task was needed. As seen in Table 2, specific jobs provided a variety of environmentally arranged and naturally occurring opportunities to promote communicating requests. Training occurred in the school setting (office tasks) as well as in a grocery store, a drugstore, a dry cleaners, and a tourist attraction.

Students were taught to point to the "I need" symbol to indicate the function of the communication. This was followed by gesturing the specific item or action needed or pointing to the specific symbol on the communication board indicating the needed item. For example, at the tourist attraction the student could point to "I need," then to the symbol for "rake" to request assistance in locating the rake. Difficulty opening a container required pointing to "I need" and gesturing "opening the container." Students often pointed to "I need" and gestured by showing a sample of the depleted item, such as the last twist tie used for bagging bread. All students had opportunities involving both a combi-

TABLE 2
Examples of Environmentally Arranged Opportunities to Initiate Requests

School	Office jobs	Run out of staples
		Run out of paper
		Three-hole punch set up incorrectly
		Run out of envelopes
Grocery store	Bagging bread	Run out of bags
	Baking	Twist ties missing
Drugstore	Open boxes	Unable to find tools to open boxes
	Shelve items	Unable to locate area to shelve items
Dry cleaners	Hanging up clothes	Run out of bags
	Tagging and bagging clothes	Tags missing from clothes
		Run out of tags
		Unable to locate trash can
Tourist attraction	Grounds keeping	Run out of trash bags
	Gardening	Unable to locate watering can
		Unable to locate rake
		Unable to open jar

nation of the communication board plus gesture and the communication board that contained the symbol needed for the specific request.

Students were taught to request assistance using the system of least prompts. Students received a correct score when they independently initiated pointing to "I need" and pointing to the specific item on the board or the actual material being used. If students did not respond, they were given directions in sign language as to what they needed to do and received an incorrect score. If this was unsuccessful, the correct response was modeled for the student on the student communication board and an incorrect response was scored, indicating that a model was provided.

Design

Data were taken on student performance using a multiple-baseline probe design (Horner & Baer, 1978; Murphy & Bryan, 1980) in which data were collected during baseline, intervention, and generalization phases. Baseline was taken at the community-based vocational site where situations were arranged in which the students required assistance. Data were recorded as correct if the students indicated on their communication board or with a combination of communication board and gesture that assistance was needed. Each session consisted of five trials of pointing to the "I need" symbol and five corresponding trials of gesturing or pointing to the specific item or communication symbol. Correct responses consisted of

pointing to the "I need" symbol and pointing or gesturing to the specific item requested. The baseline data for Student 1 ended after five sessions (with a stable baseline). Baseline probe data were taken for the remaining students until the student prior to them reached criteria on the intervention phase.

During the intervention phase, students were taught to use the "I need" symbol in addition to gesturing to the problem or needed item or pointing to the item on the communication board using the system of least prompts. Data were taken for each student until the student reached 80% or greater for two consecutive trials by correctly initiating "I need" and item-specific request. Training occurred in the school setting with teachers.

The generalization phase consisted of training requesting behavior at community-based vocational sites with teachers, vocational trainers, coworkers, and supervisors. Data were to be collected until all students were responding with 80% or greater accuracy.

RESULTS

During baseline, all of the students scored at 0% for requesting assistance (see Figure 1). Anecdotal records showed that when they needed assistance, the students typically stopped what they were doing and did not continue working. On a few occasions the student looked for the missing item, then gave up without communicating a need for assistance.

During the intervention phase, all four students achieved 80% to 100% accuracy in requesting assistance in school-based tasks. Student 1 began with 0%, but reached 100% on the third and fourth trials in the phase. Student 2 reached 100% accuracy on the second and third sessions for this student. Student 3 reached 80% accuracy, and Student 4 reached 100% accuracy. All requests in this phase consisted of pointing to the "I need" and gesturing for what was needed.

During the generalization phase, three of the four students maintained a high rate of correct response. Student 1 maintained 80% to 100% accuracy on requesting assistance. Student 3 maintained an 80% accuracy rate. Student 4 had only one trial at 80% in this phase due to the onset of summer break. Student 2 dropped to 40% at the beginning of the phase, but reached 80% and 90% at the end of the phase.

Data were examined as to whether errors were made due to situations requiring a gesture or pointing to a specific symbol on the communication board after pointing to "I need." All four students had both types of situations. No discernable error pattern was found. The communication partner understood the student whether a gesture or specific symbol was used by the student after the student pointed to the "I need" symbol.

Interreliability checks occurred for a minimum of 25% of the total number of sessions for each student. Interobserver agreement was calculated by dividing the number of agreements of occurrence of the target behavior by the total number of agreements and disagreements and then multiplying by 100. The
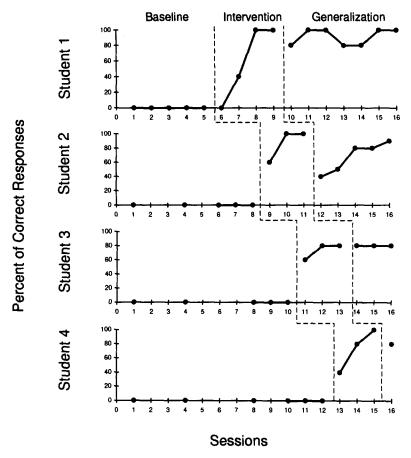
FIGURE 1. Percentage of correct responses of requesting assistance across baseline, intervention, and generalization phases for four students.

interobserver agreement checks resulted in a range of 90% to 100%, with a mean of 98.5% agreements.

DISCUSSION

Data indicated that students were able to increase their ability to initiate requests using a general "I need" symbol and a specific referent (either through gesture or communication board) within a dual communication board system. All four students reached criteria in the school setting and reached criteria using the targeted requesting behavior in community-based vocational sites. No confusion of understanding the student's form of communication occurred when the student pointed to both the "I need" symbol indicating the function of the communication and the specific item needed by symbol or gesture.

The use of dual communication boards has been found to be a more partner-friendly system. In this study, when the student pointed to "I need" and the specific needed item, the communication partner occasionally pointed to the second communication board to indicate the location of a missing item, but generally the communication partner needed to perform an action or obtain an item. A communication response was not needed by the communication partner. Although the dual communication boards were used for directive type of communicative exchanges with the student — which occurred during other parts of vocational training — typically only the student used the student communication board when requesting assistance. The communication partner did not typically need to respond on the communication-partner communication board, but instead took some action such as showing the student where to retrieve more items or assisting the student.

No particular error pattern was detected upon examining whether students were missing pointing to "I need" and a second symbol on the board or pointing to "I need" and using a gesture indicating the specific item or action required. However, the practice of teaching students a strategy to gesture to what is needed when the item is not on the communication board has not yet been learned. Two students relied on using the "I need" and a gesture. Without the training in using a gesture to request, the students would have been unable to communicate their request effectively. Since job-skill vocabulary typically changes frequently, due to addition of new vocabulary as new jobs are introduced or expanded, the student will not always be able to keep up with learning the symbols on the communication board, nor will vocabulary on the board be able to anticipate all possible items or situations in which the student needs assistance. This was demonstrated by a student who gestured to a sample item she needed rather than using the board when she had not yet learned the symbol for the item on the board. Gesturing to the problem, showing a sample, or gesturing the action of the item was understood by the communication partner when in combination with the "I need" request symbol. The combination of a functional request with a symbol of a specific item or gesture to an item, provides the student with a reliable means of requesting.

The inability to initiate requests effectively on the job may in part be perpetuated by how the vocational task is taught. When a student is learning a new job at a community-based vocational site, the need to request assistance can occur quite frequently due to the unfamiliarity of the task or the workplace. However, vocational trainers may anticipate the student's needs for assistance and provide the needed material or assist with the obstacles the student may encounter without the student's needing to ask for assistance. This was observed to occur during the pilot data, which solely target the performance of the job. In this instance, the teacher and vocational trainers additionally thought they focused on providing communication skills. However, the pilot study demonstrated that the students effectively used their dual communication boards primarily when responding to another's initiations, and not for initiation.

Unless initiating requests is systematically targeted, learned helplessness may occur. In these instances of learned helplessness, the student comes to rely on others to anticipate needs and provide assistance rather than the student's taking the initiative of requesting assistance. Upon moving to an employment setting, the same level of support may not be available, and the individual will not have the crucial skill of requesting assistance. This will become evident when a student is learning a new skill and there is a large number of naturally occurring opportunities in which the student would need to initiate requests for assistance.

Several issues arise regarding future research on the use of dual communication boards and initiating requests. Although arranging the environment is an effective strategy to promote teaching students to initiate communication, training may need to occur when requests occur most heavily, which is when a new task is being learned. In this study, this occurred primarily for the first two students, but the second two students had already been at their job site with the same job tasks, and arranging for items to be missing or problems to occur was not as natural as for the first two students. Further research is needed looking at the effects of training in initiating requests at job sites during the initial training on the task and the impact of effectively learning the job.

Another research question is that of the effectiveness of having initial training at the school. In this study, initial training at the school assisted three out of four students to generalize their training to the work site. Although this is a questionable practice when students have more severe cognitive impairments and subsequent difficulty generalizing, it appeared beneficial to most of the students in this study. The additional school training provided a greater amount of practice and did not interfere with the efficiency of their work. This may be important when the job site is new and vocational trainers are concerned with the appearance of their performance and are not as inclined to train communication strategies due the perception that they interfere with job performance. Further investigation is needed regarding students' acquisition of requesting behavior and the effect of training in this behavior on coworkers' perception of competency when training occurs solely at community-based vocational sites.

Further research is also needed regarding the use of dual communication boards while initiating requests. Although, in this study, communication partners rarely used the second communication board during the student's initiations of requests, communication partners heavily used the second communication board when providing directions and feedback. Further research is needed on whether it is more efficient to use single boards in certain situations instead of dual boards and whether communication partners have a preference in these specific situations.

In conclusion, students with mental retardation and sensory impairments were able to initiate requests successfully using an "I need" symbol on a dual communication board system and a second symbol or gesture. More research is needed regarding training in this skill, since requesting assistance has been identified as one of the most critical skills for job success.

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