

# Mands Across the Water: A Report on the Application of the Picture-Exchange Communication System in Peru

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This report describes the introduction of the Picture-Exchange Communication System (PECS) to the Ann Sullivan Center, a program for developmentally disabled children and adults in Lima, Peru. PECS was developed in the Delaware Autistic Program, a public school program in the United States with a strong behavior-analytic orientation for children with autism. We will briefly describe PECS, its advantages with people with language disabilities, and our efforts to work with the staff of the Ann Sullivan Center to implement the system.

## PECS

PECS was developed as a communication system that could be taught very rapidly to children with autism who have no functional communication skills (Bondy, 1989; Bondy & Frost, in press; Ryan, Bondy, & Finnegan, 1990). Many language training programs, both vocal (Guess, Sailor, & Baer, 1976; Kozloff, 1974; Lovaas, 1977) and nonvocal (Carr, Binkoff, Kologinsky, & Eddy, 1978), place

an early emphasis upon developing appropriate orientation skills (e.g., eye contact) and imitation (vocal and motoric). However, because these behaviors are maintained by socially mediated reinforcers with normal children, they are very difficult to teach to children with autism, who display a relative insensitivity to socially based reinforcers (Bondy, 1988a). Other communication training programs that have relied upon pictures (or other nonvocal or nongestural symbol systems) have relied upon teaching children to point to (or touch) pictures that correspond to objects or events. Such pointing is not always directed toward a communicative partner and, especially with autistic children, may be difficult to distinguish from noncommunicative acts (i.e., self-stimulation). Given these limitations and the lengthy acquisition time even when such approaches are successful (Carr, 1982), an alternative communication system, PECS, was developed in the Delaware Autistic Program.

The first goal of PECS is to identify objects that may function as reinforcers for the actions of each child. When a child reliably reaches for a particular object (e.g., a snack food, a toy or trinket, etc.), a picture of that object is provided to the child. The first training step involves physically guiding the child to put the picture of the desired object into the open hand of an adult who holds that object. The child is then given the object while the adult says "Oh. You want a cookie!" (or some such equivalent statement). As rapidly as possible, the physical prompts are faded until the child picks up the picture, gives it to the partner, and receives the requested item. This training se-

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quence establishes a mand repertoire. A critical aspect of the establishing operation for this type of verbal operant is for teachers to remain silent and avoid providing verbal prompts. This strategy increases the probability that the child will initiate the interaction rather than respond only after a prompt from the teacher. The trainer then systematically eliminates the more subtle nonvocal prompts (e.g., showing an open hand in anticipation of receiving a picture, gesturing toward the picture board, etc.).

Once the student is able to complete the exchange without prompts, discrimination between various pictures is taught. As much as is possible, a variety of pictures is taught. For example, the student is taught to request a variety of food items, toys, and eventually social routines. When the student has 15 to 20 pictures on the communication board, training begins on the use of the phrase "I want \_\_\_\_." A single picture or symbol of "I want" (not two separate pictures) is used. Simultaneously, a "sentence strip" is added to the communication board, on which the student can place a picture, or a picture-based sentence, and remove the entire strip. The child can put a picture-card with "I want" and a separate picture of a cookie on the sentence strip and hand it to a teacher. This arrangement forms the basis for the development of new and more complex verbal operants while maintaining the exchange to highlight the social initiation required of the student.

Subsequent phases of PECS teach children to respond to simple questions (e.g., "What do you want?") and respond with multipicture responses (e.g., "I want juice," etc.). Other phases introduce responding to "What do you see?" and similar simple questions, and ultimately teach the child to tact (initially impure tacts under partial intraverbal control) as well as mand. Each phase carefully identifies the initial stimulus control for specified responses and how such control is shifted within a phase (e.g., saying "leaf" in response to being asked "What is it?" involves different stimulus control than saying "leaf" upon seeing a leaf falling).

Outcome studies with over 85 children

in Delaware (Frost & Bondy, 1992) have indicated the rapid acquisition of this system with children 5 years old and younger. Virtually all of these children have learned at least one exchange within 1 month of training. A high proportion of these children learn the basic exchange within a single day of training. An important additional outcome of PECS training is that most of these children have learned to speak, the great majority without any augmentative use of pictures. In particular, 66 students in Delaware have used PECS for at least 1 year. Of this group, 41 now use only speech as their communication modality, and an additional 13 children use speech augmented by a symbol system based on either pictures or writing (Bondy & Peterson, 1990). In summary, although the system is purely picture-based at first, most children begin speaking within 1 year and stop using their pictures to communicate effectively.

#### THE ANN SULLIVAN CENTER

Liliana Mayo Ortega is the director and founder of the Ann Sullivan Center. She began the school in her own home and now leads a program serving almost 250 children and adults with autism and other severe developmental disabilities in Lima, Peru. The program is privately funded and depends upon a small tuition base and the donations of supporters. From the start, Dr. Mayo used a behavioral approach to working with the children she served. The behavioral orientation of the school has been substantially bolstered and supported by the efforts of Judith LeBlanc from the University of Kansas. She has worked directly with the staff and parents of the school for 10 years, and a large degree of their staff training and research skills, as well as their strong organizational skills, is a reflection of her ability to provide leadership in these areas.

The school espouses a functional approach to teaching critical life skills. Staff members systematically review not only the level of skill of each student but also the level of prompt support each student

requires on each particular lesson. Because of the large number of families served and the exceedingly limited resources upon which they can depend, the students attend for either a morning session or an afternoon session. The strong staff commitment to data analysis and the concomitant emphases on thorough lesson planning (both within and across lessons) has lead the staff to work 4 days a week with students and to spend each Friday on staff planning, preparation, and training. The parents have found this arrangement to be a beneficial one for themselves, given the strong progress that children make while at the school. Perhaps the key to the success of the school and its students is the commitment to teach these children's parents the necessary skills to maintain acquired skills and teach new skills in their homes and in the community. The parents observe and participate in lessons in the classroom and attend biweekly classes at the Parent's School that are organized and run by the Ann Sullivan staff. Staff members also provide extensive direct training in community activities.

In 1988, Dr. Mayo attended a presentation about PECS (Bondy, 1988b). Early in 1991, she asked us to come to her school and provide suggestions regarding the communication strategies staff members employed with students. We went to Lima for a week in November of 1991. According to staff members, traditional speech/language pathologists in Peru (and in many other South American countries) are not adequately trained to provide functional communication training to children with complex communicative and behavioral difficulties. The staff members of the Ann Sullivan school are well versed in the fundamentals of applied behavior analysis and are especially sensitive to identifying the three-term contingency in various functional routines. The staff members were particularly concerned with the difficulty they perceived the children demonstrated regarding the "spontaneous" use of their communicative repertoires. Our primary goal was to watch staff members work with children and make recommenda-

tions regarding their communication training techniques and appropriate communication objectives for individual children or classes of children.

### INTRODUCING PECS TO THE STAFF

On our 1st day at the school, we visited many classrooms. Classes typically had eight to ten children, with at least two teachers per class. Activities were functionally based. All activities, such as meal preparation and eating lunch or snacks, were developed into teaching situations. Teachers were warm and friendly with the students, and their overall positive orientation was punctuated by frequent comments "Tu puedes amigo!" ("You can, my friend!") Rewards were selected by their natural relationship to the activity—food and drink were used when it was time for a meal or a snack. Although the predominant format was group oriented, children had many opportunities to respond to individual prompts from teachers. We should point out that although we attempted to see as many different situations as possible, and initially to have as little impact as possible upon the classes, we have no doubt that we observed "biased" or "observer reactive" situations. However, through continued conversations with the staff members, we are confident that our basic comments about our observations are sound and relevant to the actual teaching practices of the staff.

Two important factors we observed were (a) a high proportion of verbal prompting, especially for verbal responses (e.g., "what do you want?," "do you want some?," "say . . .," or pure modeling of expected responses such as "give me . . .," "I want . . .," etc.) and (b) frequent provision of physical assistance without prior verbal responses by students. The latter situations occurred most often when teachers were training a sequence, such as opening a juice container or a package of cookies, or physically oriented tasks, such as spreading butter or operating a juicer. In conversations with staff members about the lat-

ter circumstance, it became clear that the teachers were focused upon the physical and manipulative aspects of activities and lessons and were not "helping" the child out of pity or an orientation of "we must take care of these children" as opposed to "we must teach these children."

The foundation for working with staff members and sharing our ideas centered upon working directly in classrooms while the children were in attendance and then talking to the entire group of teachers for several hours after the end of the student day. Staff members routinely stayed to 6:00 p.m. and beyond to work with us. An interpreter was constantly by our sides in each classroom, and Dr. Mayo served as the interpreter for our group presentations. On Friday, we led an all-day workshop.

With each pair of classroom teachers, we followed a similar routine. First, we asked the teachers to tell us about students who rarely or never initiated verbal requests. We then assessed whether a particular student wanted a particular reinforcer (usually drinks, snacks, part of their lunch, or a toy). We then either found a picture of the corresponding reward or the teacher quickly drew an appropriate representation. The two of us would then work directly with the child. One of us would manipulate the motivating object and attempt to have the child orient toward that object while the other would provide appropriate levels of physical prompts. These prompts directed the child to pick up the picture and place it in the open hand of the first trainer (the one with the reinforcer). When the exchange was made, the reward was immediately handed to the child with appropriate comments in Spanish (e.g., "Good!", "You want the cookie!", etc.). Over trials the degree of physical assistance was faded. After physical prompts to pick up the picture were dropped, the distance to the trainer with the reward was increased. Thus, over a few trials, the child would pick up the picture and walk over to the trainer holding the reward to initiate the exchange.

After we were able to teach the first student in each classroom to pick up a picture, walk to one trainer, and make

the exchange, we asked one of the observing staff members to take the place of whomever had the role of "attractor." After this step proved successful, the other observing teacher took the place of the "prompter." In almost every classroom, we were able to achieve this step during the 1st day. During the subsequent classroom visits, the teacher began the entire sequence with a new student while we gave suggestions and feedback. As in our own program, the most difficult step for teachers was to remain silent while trying to gain the attention of the student to the reinforcer and the location of the picture. By the end of the 3rd day, all teachers were successful in implementing the first phase of PECS with at least one student. By the end of the week, several teachers had successfully taught the more complex phases of PECS, in which a student can discriminate between several available pictures for several available rewards.

At the end of the 1st school day, we met with the staff for several hours to discuss our views of the theory and application of traditional approaches to language intervention with autistic children. We discussed "spontaneous communication" and identified various stimulus factors associated with promoting and inhibiting spontaneous communication by children (and adults). Next, we introduced the first two phases of PECS. The group discussions were greatly helped by drawing upon classroom examples that we had experienced earlier in the day. We also took the opportunity to role play with certain teachers and encourage discussion from the entire group. The day ended with outlining plans for the 2nd day.

During the next 3 days, we worked with all staff members until each had practiced with PECS with at least one student. We introduced more complex phases of PECS, including the development and use of the "sentence strip." We found the staff to be remarkably adept at converting simple suggestions into practical materials. Overnight, some teachers had modified the pictures into a more three-dimensional card that was easier for some students with physical disabilities to pick up or push toward a teacher. We contin-

ued to meet with the staff as a whole after the children left each day, although one meeting was relatively short because we were the guest speakers for the biweekly parent meeting, held in a nearby high school. Over 150 parents and most of the staff attended the meeting, during which we described PECS and the advantages we have found with the system in Delaware.

On our last day, we worked all day with the staff, beginning at 8:30 a.m. and working until almost 6:00 p.m. In addition to lunch, there was a break for staff members to engage in various recreational activities, an event that we believe has helped to promote teamwork. During the workshop, we completed describing all of the phases of PECS. We also discussed how to incorporate picture and related systems into a schedule-following program for the students. We described how picture systems can be combined with time-based reward systems for productive performance and behavior management. We emphasized procedures to promote greater spontaneity within each classroom. The staff practiced identifying where in their current classroom schedules they could implement the various techniques. Our direct experience in the classrooms greatly helped us to understand the situations to which the teachers referred. We also were able to commend each staff member for his or her actual accomplishments with the students. The most theoretical discussion centered on Skinner's *Verbal Behavior* (1957) and how an understanding of verbal operants (especially cases of mixed control) can be beneficial in planning and implementing language development programs for severely handicapped and autistic children (cf. Bondy & Ryan, 1991). Their previous training in behavior analysis was very apparent during these conversations, and they were quick to raise various generalizations related to their everyday work.

#### FOLLOW-UP DATA FROM THE CENTER

Before we left Peru, we discussed with Drs. Mayo and LeBlanc and several staff members about how they could proceed

after their 2-month summer break. We talked about potential shared research projects and discussed evaluative criteria. In August 1992, one of their staff members, Oscar Solis, sent us a brief report on the results of PECS training at the center. Thus far, they have trained 74 students. Over a 3-month period, 28 students have learned to function within the first phase of PECS (exchange of a single picture without discrimination), 28 students are working within the second phase (which involves the use of several different pictures individually presented), and 18 children can make discriminations from a group of pictures. Of the total group, 35 are autistic. There are seven children under 6 years old and five individuals over 21 years old. The teachers are enthusiastic about the overall impact that implementation of PECS training has had on their students.

In summation, the staff of the Ann Sullivan Center were successful at introducing PECS to their students, resulting in a higher rate of communicative initiations by these students. We were very impressed by the speed at which the teachers were able to implement various aspects of PECS and astonished at the dedication and hard work we were fortunate to witness each day of our visit. Only time will tell how far they will go with PECS and how much generalization of the system they will be able to support. We are optimistic that they will begin to see the additional bonus of watching the younger children who adapt to PECS begin to develop speech. We look forward to returning to the Ann Sullivan program in the near future.<sup>1</sup>

#### CONCLUSION

PECS is a communication system in which very young autistic children are taught to mand for significant reinforcers

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<sup>1</sup> Following the completion of this manuscript, the first author returned to the Ann Sullivan program in November 1992. He worked with staff on their application of PECS in the classroom and the community. He also worked with many parents, focusing on introducing the initial phases of PECS into their homes. Subsequent reports will describe the long-term success of these efforts.

without substantial preliminary training (e.g., eye contact or other attending skills, vocal and nonvocal imitation skills, etc.). Use of PECS often has been associated with the acquisition of independent speech. This report supports the use of PECS with children and adults having diagnoses other than autism but who display impaired or restricted communication repertoires. This report also supports the international cooperation that exists within the field of applied behavior analysis. In the future, we hope to continue to expand demonstrations of successful implementation of PECS and to determine whether the children in the Ann Sullivan Center will develop speech, as have many of the children taught PECS in the United States.

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