Increasing Functional Communication in Non-speaking Preschool Children: Comparison of PECS and VOCA

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Abstract: For individuals who have complex communication needs and for the interventionists who work with them, the collection of empirically derived data that support the use of an intervention approach is critical. The purposes of this study were to continue building an empirically derived base of support for, and to compare the relative effectiveness of two communication intervention strategies (i.e., PECS and the use of VOCA) with preschool children who have complex communication needs. Specific research questions were (a) Which communication strategy, PECS or VOCA, results in a more rapid rate of acquisition of requesting skills for preschool children?, and (b) To what extent do communication behaviors utilizing PECS and VOCA generalize from a pull-out setting to the classroom setting? Results are discussed and clinical implications given.

According to Bedrosian (2003) only limited research exists to establish the efficacy of interventions in the field of augmentative and alternative communication (AAC). For individuals who have complex communication needs and for the interventionists who work with them, the collection of empirically derived data that support the use of an intervention approach is critical. As Hegde (1993) indicates "clinicians need procedures that. . .are experimentally demonstrated to be effective" (p.10). If this is not the case, then interventionists might be utilizing procedures that are not effective, or that might indeed be harmful to their client’s communicative success.

The Picture Exchange Communication System (PECS) is an intervention approach that has been supported by a large body of anecdotal literature (Mirenda, 2001) as well as by several controlled, empirical investigations (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Hanley, 2003). PECS was developed by Bondy and Frost (1994) to teach self-initiated communication to children with autism. Liddell (2001) and Schwartz, Garfinkle, and Bauer (1998) also reported that PECS was effective with children who were not diagnosed with autism but had similar complex communication needs. PECS consists of six training phases that begin with training a child to exchange a picture for a tangible positive reinforcer and then progressively move through requiring the child to travel some limited distance to get the picture to exchange, to discriminate between two or more pictures, to use a sentence strip beginning with “I want,” to respond to direct questioning, and to comment.

Other approaches to interventions for individuals with complex communication needs involve the use of voice output communication aids (VOCAs). As with PECS, interventions using VOCAs with individuals with complex communication needs are described in clinically oriented literature (e.g., Burkhart, 1993; Goossens’, Crain, & Elder, 1992) and have been supported by empirically controlled investigations. For example, Romski and Sevcik (1992, 1993, 1996) conducted a longitudinal study that documented primary and secondary school-aged individuals with moderate to severe intellectual disabilities were able to learn functional communication using VOCAs. Schlosser, Belfiore, Nigam, Bilchak, and Hetzroni (1995) also taught three individuals with severe to profound levels of intellectual disabilities to communicate with arbitrary graphic symbols presented on a
VOCA. In one condition, the VOCA was turned off so that no voice output was available, and in the other condition, the VOCA was turned on so that voice output was available. Their results indicated that the addition of voice output facilitated their participants’ learning of symbols. Schepis, Reid, Behrmann, and Sutton (1998) conducted a single-subject study in which they evaluated the effects of a VOCA on the communicative behaviors of young children with autism. Their results indicated that the use of a VOCA was effective in increasing communicative interactions for the children in their study. These authors indicated, however, that continued study into the use of VOCAs with children with complex communication needs is warranted.

Thus, both PECS and the use of VOCAs have been documented as being useful with individuals who are candidates for AAC interventions. Additional controlled investigations that supply empirically derived data supporting the use of these interventions remain important because replicated results both extend external validity and serve as substantiation and verification of previous findings (Muma, 1993). Given the fact that many individuals who use AAC have difficulty generalizing new skills (Schlosser & Lee, 2003), it is important to document the efficacy of a treatment approach and it is vitally important to determine whether children will generalize behaviors learned with that approach to other settings, partners, and behaviors.

Furthermore, while interventionists should have several options from which to choose for various children, Schlosser (2003) indicates that “once it has been demonstrated that individual interventions are efficacious in their own right, practitioners are often interested in knowing whether another approach might be even more efficacious” (p. 554). Several investigations have compared the use of PECS to the use of American Sign Language for teaching requesting to a child with complex communication needs (Adkins & Axelrod, 2001; Tincani, 2004), but, to date, the relative efficiency of teaching PECS versus using VOCAs for increasing spontaneous requesting skills in children has not been studied. Therefore, the purposes of this study were to continue building an empirically derived base of support for, and to compare the relative effectiveness of two communication intervention strategies (i.e., PECS and the use of VOCA) with preschool children who have complex communication needs. The specific research questions were (a) Which communication strategy, PECS or VOCA, results in a more rapid rate of acquisition of requesting skills for preschool children? and (b) To what extent do communication behaviors utilizing PECS and VOCA generalize from a pull-out setting to the classroom setting?

Method

Participants

Participants were six 4 year old boys diagnosed with developmental delay who were non-speaking and who did not use an AAC system to communicate functionally. Children were drawn from two self-contained preschools in central Illinois. School A was located in a city with a population of approximately 150,000 and school B was located in a small city with a population of approximately 15,000. After obtaining permission from school administrators, researchers contacted preschool teachers in each of the schools who then identified specific children who met selection criteria. All six children were selected for the study based on three criteria: (a) they were currently educated in a preschool setting, (b) they could physically manipulate and visually locate a laminated 2 in. x 2 in. picture, and (c) they were non-speaking and did not use a formal, functional means of communication. Parents were subsequently contacted and signed an informed consent letter.

Materials

The VOCA intervention utilized the GoTalk, a lightweight, digitized AAC device with a built-in handle and nine static locations separated by a keyguard. Velcro was attached to each of the location sites on the GoTalk. Both the VOCA and PECS interventions utilized 2 in. x 2 in. laminated colored pictures with the label of the picture printed above the word. Pictures were produced with Boardmaker Version 5.1.8 software. Velcro was attached to the back of the pictures. Both interventions used the concrete referents to which the pictures corresponded (e.g., a picture of a cookie and an actual cookie). The PECS intervention also...
included the use of a 1 in. three-ring binder with a Velcro strip attached to the front.

**Dependent Measure**

The dependent measure was the correct response. The correct response was operationally defined as exchanging a picture for a desired item without a gestural or verbal prompt when implementing the PECS intervention. During the VOCA intervention a correct response was operationally defined as independently (i.e., without a gestural or verbal prompt) positioning the VOCA correctly and accessing a picture to produce digitized speech in exchange for a desired item. Coded data sheets with a prepared format were designed for each phase of the treatment for both PECS and VOCA and were used to assess correct responses per session (Alberto & Troutman, 2003). For example, the data sheet for PECS Phase I included the correct response as to whether the child independently exchanged the icon for the desired object whereas the data sheet prepared for PECS Phase II indicated the correct response for the independent exchange of the icon and the persistence component. Prepared format sheets were also provided to assess inter-rater reliability, and procedural fidelity.

**Data Collectors**

At each school setting there were three investigators present during all intervention sessions. Each team of investigators included a lead person who was a certified SLP and/or a doctoral level faculty member in either speech language pathology or special education. The other team members included master or bachelor degree candidates in speech language pathology. All investigators were trained in the interventions, data collection procedures, and procedures to evaluate procedural reliability.

**Inter-rater Agreement**

Inter-rater agreement was assessed during baseline, intervention, and generalization probes by having two individuals independently score the child’s responses for all sessions. The number of agreements was tallied and divided by the number of agreements + disagreements. Inter-rater agreement was 100%.

**Experimental Design**

An alternating treatment single subject design was implemented (Tawny & Gast, 1984; Zhan & Ottenbacher, 2001). Intervention procedures were operationally defined and a schedule for counterbalancing the presentation of interventions across time and children was established. That is, the researchers predeterminded that in each session a child would have 10 opportunities or 15 min, whichever came first, to request items or activities using VOCA and 10 opportunities or 15 min, whichever came first, to request items or activities using PECS. If a child started with PECS followed by VOCA on day 1, then the order was reversed on day 2 and so on, counterbalancing the order of intervention procedure used across children. A minimum of a 15 min break was provided between the interventions for each child. Additionally, half the children were randomly selected to follow the intervention order VOCA/PECS and the other half followed the order PECS/VOCA.

**General Procedures**

After procedures were operationally defined and an order of presentation decided upon for each child, a reinforcement inventory was completed, baseline data were collected, intervention was implemented, and generalization probes in the classroom setting were conducted individually for each child. Due to school schedules, intervention was conducted three days a week for children in school A, and two days a week for children in school B. The criterion to move to a new phase during each treatment condition was established at 90% for 2 out of 3 consecutive days. Baseline data were collected in the first week and a half, intervention was conducted over the next 5½ weeks, the last week of which took place in the classroom setting. Generalization probes were taken one week after intervention was terminated. Each child’s school spring break occurred during the intervention period so that all children actually received intervention for 4½ weeks. As a part of the initial research design, no intervention training with either PECS or VOCA was provided past Phase III.
Reinforcement inventory. Prior to beginning any intervention with the children, a reinforcement inventory was conducted for each child. This consisted of placing two to three objects in front of the child and documenting which object was preferred per object grouping. Preference for the object was noted when the child either consumed an edible or manipulated an object or a toy. Using this procedure, approximately 10 reinforcing objects were identified for each child. These objects included food, toys, and activities (e.g., basketball and blowing bubbles). For each child, the reinforcers were randomly divided into two groups of equally desired objects and activities. One group of reinforcers was chosen randomly for use with the VOCA intervention and the other with the PECS intervention.

Baseline. The baseline phase, while not an absolute requirement in alternating treatment designs (Zhan & Ottenbacher, 2001), was conducted to strengthen the conclusions drawn from the results of the study. The protocol for the baseline phase consisted of placing 3-4 items, the corresponding PECS pictures, and the VOCA with the appropriate pictures attached within the child’s reach. The child was then observed for 10 min and number of times that the child either exchanged a picture with the observer or activated a location on the VOCA as a request for an item was recorded. The observer did not interact with the child unless the child engaged in one of the above behaviors or in a self-injurious behavior. Baseline data were collected over three consecutive baseline sessions conducted on separate days.

PECS Phase I – Picture exchange. Three researchers were involved in the PECS intervention during Phase I. One researcher was designated as the communication partner. This person sat across from the child and also scored the child’s responses. Another researcher was the prompter and sat behind the child. The third person observed and scored responses. The picture was placed in front of the child and the corresponding desired item was either placed on the table behind the picture or the communication partner held the desired item. No verbal prompting was provided to the child to exchange the picture for the object. If the child tried to pick up the item without exchanging a picture for it, his response was blocked and the prompter used a hand-over-hand to assist the child in accomplishing the exchange. During the time between the presentation of the stimuli and the child’s final response, the communication partner held out her open hand giving the child a gestural prompt to exchange the picture. Once the student placed the picture in the communication partner’s hand, the partner gave the child the desired item and reinforced the child verbally, stating, for example, “bubbles, you want bubbles!” All prompting was gradually faded until the child was independently able to exchange a picture for a desired object 90% of the time for two out of three consecutive days. Once this criterion was reached, PECS Phase II was begun.

PECS Phase II – Persistence of communication. The Phase II protocol for PECS consisted of placing one picture on the Velcro strip attached to the front of a 1 in. three-ring binder and placing the binder in front of the child with the corresponding object also in the child’s view. The communication partner did not prompt the child to exchange the picture for the object either verbally or gesturally. Physical assistance was only provided if the child tried to access the desired item without using the picture. Once the child handed the picture to the communication partner, the partner gave the child the desired object and also verbally reinforced the child as in Phase I. When the child was able to exchange the picture independently in Phase II, the communication partner gradually began to move away from the child until a distance of 6 ft was achieved. The communication partner also began to turn away from the child. In the final step of shaping persistence, the communication partner moved 6 ft away and turned her back to the child. This required the child to become more persistent in his attempts to communicate. The child had to pick up the picture, get up from his chair, move toward the communication partner, get the communication partner’s attention and then hand the picture to the communication partner. When the child did this successfully for 90% of the opportunities on 2 out of 3 consecutive days, PECS Phase III was initiated.

PECS Phase III – Picture discrimination. The Phase III protocol for the PECS intervention consisted of placing two pictures on the Velcro strip, one of a desired item and one of a neutral item (e.g., a piece of paper). The or-
der in which these pictures were placed on the strip was alternated on a random schedule. Again, the communication partner sat across from the child and did not prompt the child in any way to exchange a picture for the object. The desired object was placed in the child’s line of vision. The child had to look at the two pictures, discriminate between them to select the picture of the desired item, and then hand that picture to the communication partner in exchange for the desired item. If the child chose the picture of the neutral item to exchange, then the child received the neutral item. If the child rejected it, then the child was given another chance to choose between the pictures of the desired item and the neutral item. When the child was able to choose the desired item consistently, two equally desired items were placed on the board. Again, the order in which these pictures were placed on the strip was alternated on a random schedule. Correspondence checks were conducted every fifth trial. Correspondence checks consisted of offering the child two items after the picture exchange and noting if the child chose the item that corresponded with the selected icon. If the child did not, then an error correction sequence was performed. The error correction sequence consisted of prompting the child to choose the item that corresponded with the picture the child had handed the communication partner. After every successful exchange, the communication partner verbally reinforced the child in the same way she had in the previous Phases.

**VOCA Phase I – Activate picture location.** The protocol used for the intervention with the GoTalk was identical to that used for the PECS. The only difference was that the picture of the item was attached to one of the locations on the VOCA and the name of the picture (e.g. production of “cookie”) was programmed into the device. Instead of exchanging a picture as in PECS, the child had to grasp the handle on the upper edge of the GoTalk, lift the top edge off the table so that the bottom edge of the GoTalk was still supported on the table, and activate the location containing the picture. The child was required to lift the VOCA partially off the table in preparation for Phase II training.

**VOCA Phase II – Persistence of communication.** Again, the protocol used for the VOCA intervention in Phase II was identical to that of the protocol followed for the PECS Phase II intervention with the exception that the child had to pick the GoTalk up by the handle, carry it to where the communication partner was, get the communication partner’s attention, brace the GoTalk on his stomach or hip, and then activate the correct location as a request for the desired object or event.

**VOCA Phase III – Picture discrimination.** A protocol identical to the one used with PECS Phase III was utilized for the VOCA Phase III with the exception that the two pictures were attached to randomly alternated spots on the GoTalk and the child had to pick the GoTalk up as in Phase I and activate the location with the picture of the desired item.

**Classroom intervention.** Intervention in the classroom was completed for one week with all children with both PECS and VOCA. Classroom intervention simply moved the child and the communication partner into the classroom for the intervention session. The communication partners, the current phases, and the procedures remained the same as during individual intervention. For example, Corey’s intervention was at Phase III during individual sessions, it was then continued in the classroom at the same phase level with the communication partner from the research team. Intervention was conducted in the classroom to help the children generalize communication skills learned in the pull-out sessions and to model both interventions for the classroom staff.

**Generalization probes.** Generalization probes were conducted in the children’s classrooms. During these probes, the PECS and VOCA materials were placed together at one location in the classroom. The classroom teacher and the classroom aide interacted with the children in a typical manner and kept the children’s desired items within reach. The researchers remained in the environment only as data collectors and did not participate in the communication exchanges. Every instance of the child spontaneously selecting either the GoTalk or a PECS picture and using it to initiate a request with a member of the classroom staff was documented.
Data Analysis

Data on acquisition of spontaneous initiations with PECS and with VOCA were graphed and then visually inspected. Generalization of these behaviors in the classroom were averaged over sessions and put into table form for visual inspection. According to Alberto and Troutman (2003) graphic display of data should be simple, uncluttered and provide a picture of progress across the time of the intervention. With that in mind, the graphic display used for visual inspection departs from a tradition alternating treatments graph for two specific reasons: (a) both interventions consisted of three separate phases and the children progressed through the intervention phases (PECS and VOCA) at differing rates; thus, creating an inability to insert intervention lines between the phases; and (b) data were collected on each treatment (PECS and VOCA) each day resulting in multiple overlapping data points.

Procedural Fidelity

To ensure that procedures were correctly implemented, procedural fidelity measures were also assessed during the intervention procedures. On a schedule that was unknown to the person presenting intervention, a scorer documented procedural fidelity for at least one session in each phase of each intervention and during generalization probes for all children. Procedural reliability was documented on a form that was created for each phase for both PECS and VOCA. Procedural reliability was 100% across all phases of each intervention for each child.

Results

Acquisition of Use of PECS and VOCA During Individual Pull-Out Sessions

As shown in Figures 1-6, all children demonstrated stable baselines before intervention was initiated with both PECS and VOCA. No child utilized either PECS or the GoTalk to initiate a request during baseline. Within the 5 1/2 week time frame of the intervention, all children met the criterion in Phase I for advancement to Phase II with both the VOCA and PECS. Three children took notably longer to progress through Phase I of the VOCA intervention than they did to progress through Phase I of PECS. Five children met the criterion in Phase II to move to Phase III with PECS, but, although all children showed increased persistence when utilizing a VOCA for an initiation in Phase II, only two met criterion to move to Phase III of the VOCA intervention. Two children met the criterion for successful completion of Phase III of PECS intervention and only one for successful completion of Phase III of VOCA intervention.

Difference in Performance for Children Receiving Two Versus Three Sessions a Week

David, Jason, and Ryan all attended school A where intervention was conducted three days a week while Corey, Adam, and Nate all attended school B where intervention was conducted only two days a week. All the boys who attended school B progressed to Phase III of the PECS intervention and two of them also progressed to Phase III of VOCA intervention. Of the boys who attended school A, only one progressed to Phase III of PECS intervention and none met criterion to progress from Phase II to Phase III of VOCA intervention.

Acquisition of Use of PECS and VOCA During Classroom Sessions

For two children in School A (David and Jason), the move into the classroom resulted in a slight decrease in PECS behaviors and a more notable decrease in use of VOCA during the first classroom session. For both of these children, PECS behaviors came back to the level evidenced in the pull-out sessions by the end of the week. Jason’s use of VOCA also increased to a level higher than it had been during the final pull-out session. For David, however, use of VOCA decreased even more markedly as the week progressed. The performance of the third child in School A, Ryan, became variable when intervention was conducted in the classroom. With PECS his accuracy decreased markedly, then rose to 100%, then decreased to 0%. His performance with VOCA was the reverse, he maintained his previous level of accuracy on the first session, fell to 0% on the second, and rose again to 100% on the third session. Children in School B demon-
David

Generalization of PECS and VOCA

During generalization probes, five children used PECS and five used the Go-Talk to initiate spontaneous requests in the classroom setting. Three children (David, Corey, and Jason) appeared to have a slight preference for PECS, two (Ryan and Nate) appeared to pre-
fer the VOCA, and Adam did not demonstrate a clear preference for one method over another. Table 1 shows the average number of requests initiated with either the PECS or VOCA per child.

Discussion

Acquisition of Requesting Skills

A noticeable difference in the rate of acquisition between the two intervention methods was shown for three children (David, Jason, and Nate); PECS was acquired at a slightly higher rate than the VOCA. During Phase I of the intervention, the investigators noted that for these boys, the physical acts of picking the VOCA up, positioning it correctly on the table, and pushing the appropriate location hard enough to activate the voice output appeared to be more difficult and required more hand-over-hand guidance from the prompter than simply picking up a picture.

Figure 2. Jason’s acquisition of PECS and VOCA during pull-out and classroom sessions.
and handing it to the communication partner. Once the motoric aspects of the task were mastered, the children quickly learned to utilize the VOCA for a request in Phase I of intervention. All of these boys showed increased performance with the VOCA in Phase II, but did not meet criterion to move to Phase III because of the time frame of the study. That is, there was not time to extend training with the VOCA in Phase III. Two (David and Nate) were able, however, to acquire PECS behaviors through Phase II and to begin Phase III of PECS intervention.

For the other three children (Ryan, Adam, and Corey), acquisition of requesting skills utilizing PECS mirrored their acquisition of requesting skills utilizing VOCA. These results suggest that once these boys understood the concept of utilizing an aided form of AAC to request a desired object, they were able to take advantage of the different AAC systems that were offered to them.

**Difference in Performance for Children Receiving Two Versus Three Sessions a Week**

Children in School A, who received three intervention sessions a week, generally made
slower progress in both interventions than did children in School B, who received only two sessions per week. At first these results might appear to indicate that two intervention sessions are superior to three intervention sessions a week for teaching requesting behaviors to young children. This conclusion, however, is tempered by the fact that children at school A all had some problematic behavior issues, whereas children at school B did not. Each child at school A had several sessions where they were either lethargic, laid their head on the desk and did not participate independently in the interventions, or were so actively resistant to participating that the session had to discontinued. These behavior issues did not occur with the children at school B. Results of the current study therefore support the clini-

Figure 4. Corey’s acquisition of PECS and VOCA during pull-out and classroom sessions.
cally logical idea that the number of intervention sessions that need to be conducted each week should be determined by the individual child and his or her specific needs.

Acquisition of Requesting Skills in the Classroom

To facilitate generalization of the use of both PECS and VOCA to the classroom setting, the researchers conducted both interventions in the classroom for one week. This allowed the children to use both communication methods within the context of their classrooms and the classroom staff to see the intervention being modeled.

Results for children in School A (David, Jason, and Ryan) when intervention was transitioned into the classroom indicated that this change was initially disruptive to their learning of either PECS or VOCA. Given that individuals with complex communication needs often don’t generalize behaviors learned in one setting to another without specific training (Calculator, 1988) these are not surprising
results. The fact that children in School B transitioned as easily as they did to the classroom is perhaps a more unexpected finding. Children in School B, however, did not have the behavioral issues that the other children had and so might have been better able than children in School A to focus their attention on the researchers and the tasks, regardless of setting. Nonetheless, two children in School B did have a slight decrease in performance for both PECS and VOCA in the first classroom session. The results of 5 of the 6 children then

![Figure 6. Nate's acquisition of PECS and VOCA during pull-out and classroom sessions.](image)

## Table 1

<table>
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<th>Child</th>
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<th>PECS</th>
<th>VOCA</th>
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</tr>
<tr>
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indicate that if training for either PECS or VOCA is initiated in pull-out sessions, it is necessary that further training be conducted in the environments in which those behaviors are expected to occur.

**Generalization**

For the more severely involved children in School A, results in the classroom phase predicted generalization results. David’s and Jason’s accuracy for PECS remained stable in the transition to classroom while their accuracy with VOCA fluctuated. Both of these children appeared to prefer PECS in generalization. Ryan’s classroom performance fluctuated for both PECS and VOCA interventions but ended higher for VOCA than PECS. Ryan preferred VOCA over PECS in generalization.

Unlike the classroom performance of the children in School A, performance of children in School B did not predict their generalization results. Despite the fact that Adam made rapid progress through Phases I and II and was performing at a high level of accuracy in Phase III for both interventions, he showed minimal evidence of generalizing behaviors from either intervention outside of the structured intervention sessions. While Nate took longer to progress through Phase I with VOCA than he did with PECS, he demonstrated a preference for VOCA over PECS in generalization. Corey progressed rapidly through Phases I and II with both PECS and VOCA and was using both with the same level of accuracy in the classroom sessions. He, however, showed a definite preference for PECS during generalization.

Taken together the results of the generalization probes support the efficacy of teaching children to initiate requests using the protocol suggested by Bondy and Frost (1994). That is, in a relatively short timeframe, all these children learned to initiate a request spontaneously when taught using an intervention approach that systematically applied the principles of positive reinforcement, backward chaining, shaping, anticipatory prompting, delayed prompting, and fading of physical prompts. Furthermore, all children showed some evidence of maintaining these behaviors during generalization probes. The unique finding from this study is that this protocol can be used to teach the use of a VOCA as well as the use of pictures for initiating communication. These results then are consistent with and expand on previous research that has validated the use of PECS and VOCAs as functional communication systems for non-speaking children (Charlop-Christy et al., 2002; Hanley, 2003; Romski & Sevcik, 1992 1993 1996; Schepis et al., 1998).

Furthermore, results of the generalization probe underscore the importance of considering the individual child. Five of the children appeared to have a preference for one type of communication modality over the other. Sometimes this preference could be predicted from intervention data, sometimes not. Children should not be taught only one method by which to communicate. The act of communication is multimodal; all communicators use more than one way to express themselves. Children should be taught and encouraged to use multiple means of communication. The results of this study indicate that children can learn at least two functional systems of communication at the same time. This then allows the child to select from an array of options when given the opportunity to choose how to express him or herself. It also allows interventionists to offer a child a means of communication that might be more advantageous than another in a specific situation.

**Limitations and Directions for Future Research**

One limitation is the short duration of this study. Only two children were able to reach criterion in Phase III of PECS, none reached criterion in Phase III for VOCA. If time had allowed children to progress through all phases of intervention, results might have been different. Future studies should be conducted that would allow for progression throughout all phases.

Another limitation is that the researchers did not audio or videotape sessions so that valuable information on verbalizations was not gathered. Given the reports of increased verbalizations after the use of PECS (Bondy & Frost, 1994; Hanley, 2003), future research should investigate if the use of a VOCA or PECS has a differential influence on development of verbalizations in children with complex communication needs.
Conclusion

Results of this study support use of a systematic, behaviorally-based program for teaching children to initiate communication utilizing either pictures, as in PECS, or a VOCA. Previous research has indicated that children who use AAC systems are primarily recipients of adult directed communication (e.g., Calculator 1997; Light, Binger, Agate, & Ramsay, 1999) and remain passive communicators. The protocol for teaching PECS and for teaching the use of a VOCA, as applied in the current study, reinforces children’s independent and spontaneous initiation of communication, which allows them to become active communicators. While the performance of children in the current study documents the importance of individualizing intervention programs, all children should be encouraged to develop their own active voice. Using Bondy and Frost’s (1994) protocol to teach initiations appears to be a step toward achieving this goal.

References


