Experimental evaluation of the training structure of the Picture Exchange Communication System (PECS)☆

Anne R. Cummings a,*, James E. Carr b, Linda A. LeBlanc b

a Kinark Child and Family Services, 600 Alden Road, Suite 200, Markham, Ontario, Canada L3R 0E7
b Auburn University, United States

A R T I C L E   I N F O

Article history:
Received 25 August 2011
Accepted 31 August 2011
Available online 1 October 2011

Keywords:
Alternative and augmentative communication
Autism
Picture Exchange Communication System

A B S T R A C T

The Picture Exchange Communication System (PECS) is a picture-based alternative communication method that is widely accepted and utilized with individuals with disabilities. Although prior studies have examined the clinical efficacy of PECS, none have experimentally evaluated its manualized training structure. We experimentally evaluated the effects of training during each of the 6 phases of PECS with 7 children with developmental or language disorders. For all 7 participants, PECS responses consistently increased only after training was completed for each of the first 4 phases, but increases in PECS responses occurred during tests of Phases 5 and 6 as soon as training was completed in Phase 4. Consistent with prior research, PECS was taught in a short period of time and required few prerequisite skills. However, 3 of the 7 participants had difficulty with some aspects of training and were able to acquire the targeted skills only after procedural modifications were made.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

The Picture Exchange Communication System (PECS) is a behavior-analytic alternative communication intervention originally developed for children with autism (Bondy & Frost, 1994). PECS was designed to teach individuals with little to no spoken language how to exchange picture cards for preferred items and activities. Thus, the primary, though not only, communication function taught with PECS is the request (or mand). The purported benefits of PECS include the following: (a) it requires few prerequisite skills of the learner, (b) it is relatively easy to use and inexpensive, (c) it includes strategies for generalization, and (d) it may facilitate spoken language (Bondy & Frost, 1994). Although the first article on PECS was published less than 20 years ago (Bondy & Frost, 1993), the system has since become one of the most commonly used interventions for children with autism (Green et al., 2006).

The apparent simplicity of a picture exchange belies the fact that PECS is a manualized intervention that includes a specific training structure and teaching procedures (Frost & Bondy, 1994). PECS includes six different mastery-based training phases, each with a different purpose and slightly different target behavior. Phase 1 teaches the learner to exchange a single picture of a preferred item/activity to a communicative partner in return for the item/activity. Phase 2 teaches the learner to do the same under increasingly effortful conditions (e.g., the distance between the learner and partner is increased). Phase 3 teaches discrimination of pictures of preferred from pictures of nonpreferred items/activities. By the end of Phase 3, a learner

☆ This article is based on a thesis submitted by the first author, under the supervision of the second author, in partial fulfillment of the requirements for the MA degree in psychology at Western Michigan University. We thank Jack Michael for his helpful comments on the thesis. We also thank Laura DiMichele, Lalanya Gawne, Brent James, and Michael Kopka for their assistance with data collection.

* Corresponding author.
E-mail address: anne.cummings@kinark.on.ca (A.R. Cummings).
has a binder containing multiple pictures of preferred items/activities and can independently exchange them with a partner. Phase 4 teaches the learner to create a sentence strip comprised of an “I want” card and a picture prior to the exchange. Phases 5 and 6 teach the learner to answer the questions “What do you want?” (a request or mand) and “What do you see?” (a label or tact), respectively, using PECS materials. Studies that have reported the total trials to mastery of all phases indicate that use of PECS can be mastered in a relatively short period of time (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Ganz & Simpson, 2004).

The empirical literature on PECS has recently been synthesized in four literature reviews (Flippin, Reszka, & Watson, 2010; Hart & Banda, 2010; Preston & Carter, 2009; Sulzer-Azaroff, Hoffman, Horton, Bondy, & Frost, 2009). All of the reviews similarly identified a number of interesting findings. First, PECS is a remarkably general intervention, having been successfully used with children and adults with varied diagnostic conditions including autism spectrum disorders, intellectual disabilities, cerebral palsy, and attention-deficit/hyperactivity disorder. Second, PECS is as or more efficient than other communication modalities such as signs or voice-output communication devices. Finally, PECS sometimes results in concomitant increases in spoken language and other social behavior and reductions in problem behavior, although the conditions under which these effects occur have not yet been identified.

The aforementioned literature reviews revealed that researchers have typically evaluated PECS training in one of two ways. First, the PECS protocol is implemented and then pretraining (baseline) and posttraining periods are compared across a number of measures (e.g., independent exchanges, spoken behavior) without an experimental evaluation of the activity within each PECS phase (e.g., Charlop-Christy et al., 2002). Such comparisons are typically accomplished using multiple-baseline designs across individuals and between-subjects group designs. Although this strategy is fully capable of demonstrating a causal relation between the entire PECS protocol experience and certain outcomes, it does not do so for each of the different target behaviors (e.g., a simple exchange in Phase 1, a discrimination and exchange in Phase 3) taught during PECS.

The second evaluative strategy involves the depiction of data from each PECS phase in a sequential manner. This approach has been employed in both nonexperimental designs (e.g., Ganz & Simpson, 2004) and experimental designs such as the reversal design (e.g., Stoner et al., 2006) and the multiple-baseline design across individuals (e.g., Ganz, Simpson, & Corbin-Newsome, 2008). Because this strategy involves the depiction of data from each training phase, one can determine acquisition rates of each phase’s target behavior and also correlate other dependent measures with specific phases. To date, however, no study has employed this strategy to demonstrate experimental control over the independent variables in each PECS phase over its respective target behaviors. Such an evaluation would be useful for experimentally determining the adequacy and necessity of the six-phase PECS training structure.

The purpose of the present study was to demonstrate experimental control of each PECS training condition over its respective target behavior. This was accomplished using a multiple-baseline design across the target behaviors in each of the six PECS training phases for seven children with developmental or language disorders.

2. Method

2.1. Participants, settings, and materials

Seven male children with developmental or language disorders participated in the study. Prior to the PECS evaluation, each participant’s language, 2D–3D matching, and auditory–visual discrimination abilities were assessed. Language skills were assessed using the Behavioral Language Assessment Form (BLAF; Sundberg & Partington, 1998), an indirect assessment of 12 language–related skill areas (e.g., motor imitation, labeling, conversation), each of which is scored from 1 (minimal) to 5 (well developed). Matching skills were directly assessed through a series of discrete trials. Discrimination skills were assessed using the Assessment of Basic Learning Abilities (ABLA; Martin & Yu, 2000), a brief direct assessment of six hierarchical levels of visual and auditory discriminations.

Bob was 8-years old and was diagnosed with autism. He had limited vocal skills (primarily echolalia) and a mean BLAF score of 3.6. Bob was able to match 2D to 3D stimuli and the ALBA indicated that he could perform auditory–visual conditional discriminations (Level 6). Alex was 4-years old and was diagnosed with cerebral palsy and moderate/severe intellectual disability. He had no vocal repertoire and a mean BLAF score of 1.5. Alex was unable to match 2D to 3D stimuli and the ALBA indicated that he could perform conditional visual–visual identity matching (Level 4). Sam was 4-years old and was diagnosed with Down Syndrome. He had limited vocal skills and a mean BLAF score of 2.4. Sam was able to match 2D to 3D stimuli and the ALBA indicated that he could perform conditional visual–visual identity matching (Level 4). Russell was 4-years old and was diagnosed with Down Syndrome. He had limited vocal skills and a mean BLAF score of 2.3. Russell was able to match 2D to 3D stimuli and the ALBA indicated that he could perform auditory–visual conditional discriminations (Level 6). Dan was 11-years old and was diagnosed with autism. He had no vocal skills and a mean BLAF score of 2.1. Dan was unable to match 2D to 3D stimuli and the ALBA indicated that he could perform simple visual discriminations (Level 2). David was 10-years old and was diagnosed with autism. He had no vocal skills and a mean BLAF score of 2.3. David was able to match 2D to 3D stimuli and the ALBA indicated that he could perform auditory–visual conditional discriminations (Level 6). Jeff was 8-years old and was diagnosed with severe apraxia. Although he had advanced language skills (a mean BLAF score of 4.8), he had significant speech difficulties and spoke mainly in vowels. Jeff was able to match 2D to 3D stimuli and the ALBA indicated that he could perform auditory–visual conditional discriminations (Level 6).
All training sessions were conducted at each participant’s school, typically in existing therapy rooms. Each room was approximately 3.0 by 3.7 m and contained a table, chairs, the PECS binder, picture cards, and preferred stimuli that remained in plastic containers out of reach of the participant. A video camera was located in the room for videotaping sessions. All testing sessions were conducted in a separate room containing similar furniture and materials. An experimenter (the first author) and an undergraduate research assistant were present during all sessions. Sessions were conducted approximately 2–4 times per day, 2–3 days per week.

The picture cards used in the current study were based on Mayer-Johnson (Johnson, 1994) symbols obtained from the Boardmaker® software program and photographs constructed to the specifications of Frost and Bondy (1994). All picture cards were placed in hard-plastic protective sleeves with Velcro attached to the back. A 15.2 by 22.9 cm 3-ring binder was used as the PECS communication board. The binder contained three strips of Velcro on the cover and on each page to secure the “I want” and “I see” sentence strips.

2.2. Response measurement and interobserver agreement

The dependent measure for PECS training was the percentage of correct independent exchanges per 10-trial session. The dependent measures for composite testing sessions were the frequency of correct independent exchanges during tests for Phases 1 through 4 and the percentage of correct independent exchanges for Phases 5 and 6. A correct exchange was defined for each phase as follows. In Phase 1, the participant needed to independently release the picture into the experimenter’s hand. In Phases 2 and 3, the participant needed to remove only the picture for the desired item from the communication binder and hand it to the experimenter. In Phase 4, the participant needed to place the “I want” card and a picture onto the sentence strip and hand the entire strip to the experimenter. In Phase 5, the participant needed to respond to the experimenter’s question, “What do you want?” by placing the “I want” card and a picture onto the sentence strip with the “I want” card located on the left of the picture and release the sentence strip into the experimenter’s hand. In Phase 6, the participant needed to respond to the experimenter’s question of either “What do you want?” or “What do you see?” by placing the corresponding card and a picture onto the sentence strip with the text card located on the left of the picture and release the sentence strip into the experimenter’s hand.

Interobserver agreement (IOA) was assessed for 68% of all testing sessions for all dependent variables. Point-by-point IOA was calculated by dividing the number of agreements by the number of agreements plus disagreements and converting the ratio to a percentage. An agreement was defined as both observers identically recording a participant’s response during a trial. Bob’s mean IOA score was 96% (range, 88–100%). Alex, Russell, and David’s IOA scores were 100%. Sam’s mean IOA score was 99% (range, 96–100). Dan’s mean IOA score was 92% (range, 88–100%). Jeff’s mean IOA score was 98% (range, 94–100%).

2.3. Experimental design

A multiple-baseline design across behaviors was used to demonstrate experimental control over the PECS training phases. The different tiers of the design represented a participant’s performance during performance tests for each of the six PECS phases (see Section 2.4.2 below). Experimental control was demonstrated when a specific phase’s target performance increased in the test sessions only after it had been taught in the corresponding training session.

2.4. Procedures

2.4.1. Stimulus preference assessment

The experimenter conducted a single-array multiple-stimulus (without replacement) (MSWO) preference assessment at the beginning of each phase of PECS training. An array of eight toys and foods was placed equidistantly spaced on a table in front of the participant. The first item pointed to or touched by the participant was selected as the “preferred item” for that training phase. The item was removed and the remaining items were shuffled to identify second and third ranked items to use if interest in the first selection appeared to wane. A brief MSWO assessment was also conducted before each PECS testing session as described below.

2.4.2. PECS testing

At least three baseline composite testing sessions were conducted for each participant before PECS training was implemented. Each testing session included a 2-min period designed to assess the highest level of responding for each PECS phase. Thus, the initial testing sessions lasted for 12 min (i.e., a composite of 6, 2-min periods). Testing sessions were conducted throughout the study after every two training sessions. After a reliable increase in exchanges was demonstrated after a specific phase was trained, that specific 2-min period was removed from subsequent composite test sessions resulting in progressively shorter testing sessions throughout the study. All testing sessions were conducted under extinction conditions (i.e., no programmed consequences were provided for exchanges).

The Phase-1 test period began with a brief MSWO assessment, after which the preferred item and its corresponding picture card were placed on the table between the experimenter and the participant. If the participant independently
handed the picture to the experimenter, she would take it and replace it on the table without exchanging the picture for the item.

The Phase-2 test period began with a brief MSWO assessment as described for Phase 1. The experimenter then placed the picture of the preferred item on the communication binder (only this picture was placed on the binder). If the participant independently removed the picture from the binder and handed it to the experimenter, she would take it and replace it on the binder without exchanging the picture for the item.

The Phase-3 test period began with a brief MSWO assessment that was conducted to identify five preferred items. The experimenter then placed 2–5 pictures on the communication binder. If the participant independently removed the picture from the binder and handed it to the experimenter, she would take it and replace it on the binder without exchanging the picture for the item.

The Phase-4 test period began with a brief MSWO assessment as described for Phase 3. A variety of preferred items were then placed on the table next to the experimenter. If the participant independently assembled and handed to the experimenter a complete sentence strip, she would take it and return its various components to their correct positions on the binder without exchanging the picture for the item.

The Phase-5 test period began with a brief MSWO assessment as described for Phase 3. One preferred item was then placed on the table next to the experimenter and the “I want” card and five pictures of preferred items were placed on the communication binder. The experimenter asked the participant “What do you want?” every 30 s. If the participant then independently assembled and handed a complete sentence strip to the experimenter, she would take it and return its various components to their correct positions on the binder without exchanging the picture for the item.

The Phase-6 test period began with a brief MSWO assessment as described for Phase 3. A variety of pictures of preferred and non-preferred items were then placed on the binder with the sentence strip, an “I want” card, and an “I see card.” Every 30 s, the experimenter would hold up an item and ask the participant either “What do you want?” or “What do you see?” Two trials of each question were assessed during each 2-min test period. If the participant then independently assembled and handed the experimenter a complete sentence strip appropriate to the question, she would take it and return its various components to their correct positions on the binder without exchanging the picture for the item.

2.4.3. PECS training

Training consisted of six phases and the mastery criterion for each phase was correct independent performance of the final target response for at least 80% of trials across two consecutive sessions. During Phase 1, participants were taught to exchange a picture card for its corresponding preferred item. The highest preference item from the preference assessment and its corresponding picture were placed on the table in front of the participant. When the participant reached for the item, the experimenter placed the corresponding picture into his hand and gently guided him to release it into her open hand. As soon as the picture was released, the experimenter said, “You want ____” showed the item, and gave the item to the participant. Over successive trials, the physical guidance was faded until the participant independently picked up the picture and placed it into the experimenter’s open hand.

During Phase 2, participants were taught to walk to the communication binder, select the picture of the preferred item, reach for the experimenter, and release the picture into the experimenter’s hand. The experimenter placed the picture of the preferred item on the communication binder (only this picture was located there). In the beginning, the participant was taught, with some assistance, to remove the picture from the binder, reach for the picture, and place it into the experimenter’s open hand to receive the corresponding item. In the next sub-phase, the distance between the experimenter and the child was gradually increased. Initially, the experimenter stepped three feet away from the participant, requiring him to walk towards her to hand over the picture. During the final sub-phase, the distance between the participant and the communication binder was increased by .91 m, requiring the participant to walk to the communication binder and then to the experimenter to complete the exchange.

During Phase 3, participants were taught to distinguish between different pictures. First, the experimenter placed two pictures on the communication binder: one of a preferred item and a blank card. If the participant removed the picture of the preferred item and handed it to the experimenter, the item was delivered. If the participant tried to remove the blank card, the experimenter redirected him to the picture of the preferred item by gently moving his arm to the picture. The next sub-phases included replacing the blank card with a picture of a less preferred item and gradually adding more pictures of items (up to five). Initially, these were pictures of non-preferred items. The pictures then increased in their degree of preference until all pictures were of comparable preference.

During Phase 4, participants were taught to request items by creating sentence strips. As the first step, the experimenter included a card with the phrase “I want” on the sentence strip, which was located on the top of the communication binder. A variety of preferred items were available on a table next to the experimenter. Whenever the participant attempted to remove one of the pictures from the communication binder, the experimenter physically guided him to place the picture on the sentence strip to the right of the “I want” card. The participant was then guided to hand the strip to the experimenter to receive the item. The next sub-phase included teaching the participant to place the “I want card” on the sentence strip and then place the picture of the preferred item next to the “I want” card prior to the exchange.

During Phase 5, participants were taught to construct a sentence strip to respond to the question “What do you want?” Training began with one preferred item located on a table next to the experimenter and the “I want” card plus five
pictures of preferred items on the communication binder. The experimenter simultaneously pointed to the “I want card” and said, “What do you want?” During the phase, the time between the question and pointing to the “I want” card was gradually increased until the participant was able to pick up the “I want” card before the experimenter pointed to it. The next sub-phase included opportunities to use the “I want” card when asked, “What do you want?” and to spontaneously request.

During Phase 6, participants were taught to construct a sentence strip to respond to the questions “What do you want?” and “What do you see?” During this phase, the communication binder included an “I see” card and pictures of various preferred items. The experimenter held up an item and asked the question “What do you see?” while pointing to the “I see” card. If necessary, the participant was guided to pick up the “I see” card and the appropriate picture. Correct responses were not rewarded with the delivery of the item, but with another high-preference item. The next sub-phase consisted of interspersing the question “What do you see?” with the question “What do you want?” (from Phase 5).

2.4.3.1. Procedural modifications. During Phase-6 training, it became apparent that some procedural modifications needed to be made for Bob, Alex, and Dan to learn the textual discriminations. All three participants required an additional step of an extra-stimulus color prompt to differentiate between the “I want” and the “I see” cards. The “I want” card had a white background and the “I see” card had a blue background. Similarly, the sentence strip had either a white or blue background depending on what question was being asked by the experimenter. These color prompts were faded by making the blue color less vibrant, until the participant could independently respond with both sides of the strip being white in color.

In addition, Dan’s fine motor difficulties resulted in problems accessing the pictures and removing the sentence strip. This problem was solved by changing the picture cover from a flexible plastic baseball cardholder to an inflexible Plexiglas picture frame (5.1 cm × 7.6 cm). Similarly, the cardboard sentence strip holder was changed to an inflexible Plexiglas picture frame (7.6 cm × 22.9 cm) that was placed on the communication binder at a 45-degree angle, thereby making it easier for him to grasp and remove. Dan had difficulty placing the “I want/I see” cards to the left of the pictures in Phases 4, 5, and 6. Therefore, he was taught to use both hands to remove the “I want” or “I see” card simultaneously with the picture (one in each hand) and place them both on the sentence strip at the same time.

Finally, Jeff was provided only verbal instructions during each training phase due to his typical intellectual functioning. He was able to complete the highest sub-phase (at 100%) within each phase after being provided with only one verbal instruction.

2.5. Procedural integrity

Procedural integrity was assessed on experimenter behavior during training sessions. An integrity score was calculated for each session by dividing the number of correctly performed exchanges by the total number of exchanges and converting the ratio to a percentage. Procedural integrity was assessed for at least 89% of training sessions and averaged at least 88% for Phase 1, 95% for Phase 2, 93% for Phase 3, 89% for Phase 4, and 100% for Phases 5 and 6.

3. Results

As seen in Table 1, participants completed the PECS training protocol in an average of 28.7 (range, 12–52) sessions. Figs. 1–7 depict the primary findings from the composite test sessions. Across participants, PECS exchanges remained at or near-zero levels during baseline and increased only after training was completed in Phases 1–4. All of the participants showed an increase in the percentage of correct PECS exchanges during tests for Phases 5 and 6 as soon as training was completed in Phase 4. Further increases in PECS exchanges during Phase-6 tests were observed after Phase-5 training was complete. These exchanges were responses to the question “What do you want?”, never to the question “What do you see?”

<table>
<thead>
<tr>
<th>Participant</th>
<th>Training Phases (# of sessions)</th>
<th>Total # of sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bob</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Alex</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Sam</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Russell</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Dan</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>David</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Jeff</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Fig. 1. Frequency and percentage of correct PECS exchanges during Bob's composite test sessions.
Fig. 2. Frequency and percentage of correct PECS exchanges during Alex's composite test phases.
Fig. 3. Frequency and percentage of correct PECS exchanges during Sam’s composite test phases.
Fig. 4. Frequency and percentage of correct PECS exchanges during Russell’s composite test phases.
Fig. 5. Frequency and percentage of correct PECS exchanges during Dan's composite test phases.
Fig. 6. Frequency and percentage of correct PECS exchanges during David’s composite test phases.
Fig. 7. Frequency and percentage of correct PECS exchanges during Jeff’s composite test phases.
4. Discussion

Despite the widespread dissemination and recent experimental evaluations of PECS, the present study is the first to experimentally evaluate its training structure. For PECS Phases 1–4, seven children with various developmental or language disorders only emitted a phase’s target behavior after it had been trained, validating that portion of the PECS protocol. However, there did appear to be a relation between the target behaviors taught in Phases 4–6. From a behavior-analytic perspective, the target behavior in Phase 4 can be considered a free-operant mand—a response influenced by the motivation to obtain a specific reinforcer. Phase 5 merely establishes stimulus control of the previously free-operant mand by the trainer’s question “What do you want?” Thus, because Phases 5 and 6 differ only in terms of the stimulus control over the response, it is not surprising that some responses occurred in the Phase 5 test prior to its training. The new target behavior established in Phase 6 (i.e., responding to “What do you see?”) can be considered a tact—a response influenced by a nonverbal event and maintained by nonspecific reinforcement. These responses never emerged prior to training. Because Phase 6 included both “What do you want?” and “What do you see?” trials, responses to the former question occurred prior to explicit training in that phase whereas responses to the latter question, which had never been trained, did not. Thus, although target behaviors from Phases 5 through 6 did occur prior to being explicitly taught, plausible conceptual explanations for their occurrence exist. In sum, the present data generally support the recommended PECS training structure.

One of the claims regarding PECS is that it can be trained in a relatively short period of time (Bondy & Frost, 1993). Consistent with other experimental evaluations (e.g., Charlop-Christy et al., 2002; Ganz & Simpson, 2004), the present study supports this claim in that the entire protocol was taught to mastery by each participant in 520 or fewer trials, even with procedural modifications for some participants. These findings suggest that as long as trainers employ a sufficient density of trials, PECS can be taught in a relatively efficient manner.

Another claim made regarding PECS is that the protocol requires few prerequisite skills (Bondy & Frost, 1994). Although all of the participants in the present study were able to complete the protocol, three of them had some difficulty with training and, thus, required procedural modifications before mastery was obtained. Alex, Sam, and Dan, all of whom had some difficulty on the matching-to-sample or ABLA assessments, required the most time to complete training (51, 30, and 52 sessions, respectively). Dan, in particular, had difficulties with PECS training from Phases 3 through 6 and required several modifications at each phase before completing the protocol. Moreover, Dan was the only participant who was unable to complete any level of the matching-to-sample assessment and he was the participant with the lowest ABLA score (Level 2, position discrimination). That said, Dan was eventually able to complete the entire PECS protocol. These data suggest that, although PECS might require no specific prerequisite skills, certain discrimination skills might facilitate progression through the protocol. Future research might more clearly identify these relations. The present data also suggest that someone with expertise in troubleshooting stimulus control problems (see Green, 2001) should be available for consultation as soon as progression through the PECS protocol falters.

The evaluation strategy employed in the presentation investigation might be useful in assessing the PECS repertoires of individuals who have experienced PECS training, but not to mastery. Each 12-min composite test session included a 2-min test of each PECS phase. Several of these sessions, along with a prior stimulus preference assessment, should enable a clinician to determine which PECS skills have been acquired, if any, so that subsequent training efforts could proceed more efficiently. This practice might be especially relevant for individuals with a history of repetitive instructional experiences establishing escape from instruction as a reinforcer for problem behavior.

The results of the present study should be interpreted in the context of at least one methodological limitation. Because the frequency of test sessions was based on a participant’s progression through PECS training, the number of sessions between the post-intervention period of one phase and the subsequent pre-intervention period of the subsequent phase was sometimes rather brief. Such brevity weakens the experimental control demonstrated by the multiple-baseline design. However, the consistency of results across seven diverse participants mitigates this concern.

In conclusion, the present study provides experimental validation of the PECS training structure. Although relations between target behaviors in Phases 4–6 were identified, they generally constituted the emergence of responding prior to training, which may be a practical benefit. In addition, a number of researchers have evaluated abbreviated versions of the PECS protocol, such as Phases 1–3 which produces a low-effort mand (no sentence strip required – Phase 4) that is not under the stimulus control of a trainer’s question (Phase 5) (e.g., Carr & Felsce, 2007). The present data suggest that such abbreviated protocols included well-sequence training phases. Finally, the test strategy employed in the study might be used to evaluate future modifications to the PECS protocol (e.g., changes in Phase 3 discrimination training) and the repertoires of individuals who have previously received inconsistent or low-quality PECS training.

References


