The Picture Exchange Communication System (PECS®)

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The Picture Exchange Communication System (PECS®) was first described in autism research literature in the early 1990s. Since that time, there have been almost 200 publications about the PECS protocol from countries around the world. The manualized PECS protocol has six key phases beginning with simple requests involving single icons, and building toward commenting, responding to other people's communication, and increased message length through picture combinations.[1] We developed the protocol with very young children with autism spectrum disorder (ASD), but there are now publications involving adolescents and adults, as well as individuals with a wide variety of learning needs.

The six key phases of the PECS protocol are briefly summarized below.

PHASE ONE

The first goal of the PECS protocol is to teach the learner to effectively engage in functional communication with others by learning how the use of pictures can lead to important outcomes from the user's perspective. The initial goal does not require, nor involve, distinguishing the meaning of the picture. That skill will be addressed after the user has acquired a reasonable history of successful picture use within a request function. More importantly, the initial skill aims to promote spontaneous communication rather than tying the child's performance to questions such as "What do you want?" This step is rapidly accomplished by using two trainers. The first acts as the 'listener,' or communication partner (CP), who shows the learner a highly preferred item, waits for the picture exchange, and then provides the reward. The second helps the child to pick up the picture, reach out to the CP and put the picture into the CP's hand.

PHASE TWO

The second phase expands the use of single pictures by introducing more items and activities that can be requested, as well as new communication partners and locations. It also expands the distance users need to travel to access both the picture and the communication partners.

PHASE THREE

The third phase of the protocol initially involves teaching picture discrimination, which may be challenging for some learners. We start by ensuring that there are significant differences between the outcomes for two pictures, such as requesting a highly preferred toy or snack versus an item of little or no interest, such as an old sock. Teaching strategies that are crucial for progress at this level involve immediate feedback for the correct selection of an icon, as well as systematic error correction following mistakes. Research has shown that parents and paraprofessionals learn to use these strategies as effectively as professionals. The latter part of this third phase introduces a unique strategy known as a correspondence check which helps us determine which outcome or item the learner wants. When a learner is presented with two equally valued items or activities and gives one of the two pictures to the CP, the CP offers both items and lets the learner reach toward the corresponding item. When the child selects the item that corresponds with the selected picture, we can be more confident that a strong discrimination has been made.

PHASE FOUR

The next fundamental lesson introduces a simple sentence structure to bridge the path from requesting to commenting. The unit "I want" is introduced. In this unit, users learn in a manner similar to that of typically developing children who modify how they are using a single word, such as ball, by varying their intonation. In other words, ball can be said in such a way that the parent understands it is a request for the ball as opposed to a comment about the ball. In the long term, PECS users will discriminate between sentence starters indicating "I want" versus "I see, hear, smell, etc."

ATTRIBUTES

The PECS protocol next teaches learners to use a variety of attributes and descriptors to help the user be more specific about which item or activity is most desired. After all, although we may like cookies, we still have our favorites! Attributes may involve color, size, shape, number and other factors that are traditionally thought of as 'concepts' and taught in a variety of receptive lessons, such as "Touch the red paper." However, children do not need to first respond to this type of lesson before learning the power of requesting the red apple that they prefer over a green apple. Most importantly, several studies (including the use of parents as trainers) have demonstrated that PECS users can improvise with their current picture repertoire- if that includes attributes- to ask for and describe items about which they do not have specific pictures.

PHASE FIVE

This phase of the protocol ensures that users will respond to the question, "What do you want?" This phase introduces another time-delay strategy to ensure that users can both answer this question, as well as remain spontaneous when needed. Those who are using attributes in their spontaneous requests are encouraged to use them when answering questions.

PHASE SIX

The final phase of the PECS protocol works on developing commenting. Many young children with ASD find that commenting is challenging to acquire, not because they are inattentive to what's happening but because the social nature of the outcome may not yet provide compelling motivation. Once learners are taught to comment in a variety of ways, (i.e., I see, I hear, I smell, etc.), they are encouraged to use attributes in their comments.

PECS – The Effect on Speech

The primary fear of parents and professionals when considering a picture-based system such as PECS is its possible effect on speech. Will the use of PECS interfere with the development of speech or undermine whatever speech currently exists? PECS is part of a broad field known as augmentative and alternative communication (AAC). For over forty years, there has been no documented evidence to suggest that using a variety of AAC strategies with a variety of learners will interfere with or undermine speech. In fact, there is growing evidence that the use of such strategies, specifically PECS, helps most young learners acquire and expand speech. For example, a recent study compared the use of PECS to a speech-oriented program for a large number of learners with ASD (39 in total, 19 in the PECS group). Participants had an average age of two and a half years and were using ten or fewer spoken words upon entry into the study.[2] The study randomly assigned learners into two groups and taught the learners both within a clinic setting and focused parent training. After six months of training, the children in the PECS group averaged over 88 spoken words. At a three-month follow-up, they were averaging over 129 spoken words. The group showed no significant speech outcome differences compared with the speech-oriented group (spoken word respective means were 83 and 113). As far as we know, this is the largest such study with any AAC strategy involving young learners with ASD.

PECS is Used with Speech-Related Skills

We should be clear that we do not believe that the use of PECS is a zero-sum situation. Especially with young learners, we always work on promoting sound production and blending, vocal imitation, and other speech-related skills when implementing PECS. However, our observations over the past 35 years support that there is no need to wait a set amount of time for speech strategies to fail before implementing PECS. When a young learner has limited or no functional communication skills, we immediately implement PECS along with strategies to promote speech.

PECS - Evidence

There is strong evidence related to the success of properly implemented PECS, as summarized by the National Professional Development Center on ASD (https://afirm.fpg.unc.edu/node/907) and the Cambridge Center for Behavior Studies (https://behavior.org/aba-evidence-based/). Our website, www.pecsusa.com, provides summaries from almost 200 publications from around the world that range from case descriptions to randomized control trials.

Speech-generating Device (SGD)

Not all learners develop speech following high fidelity PECS implementation, even after the introduction of accompanying speech development interventions. In some cases, their picture-based vocabulary continues to expand beyond what is practical for a PECS binder. That's why some PECS practitioners plan to transition to a speech-generating device (SGD) after learners successfully progress through the PECS protocol. Our experience in this process has led us to develop a set of guidelines for the transition.[3,4] Selection of the SGD to match a learner's existing language skills and allow for growth requires understanding of various customizable features of the device. Learners who have progressed through at least the first four phases of the protocol will have mastered several skills that will make this transition easier and require less customization of the SGD. Mastery of the first two phases ensures that the learner has the skills necessary to gain a communication partner's attention prior to pushing buttons. Learners who have mastered picture discrimination in Phase 3 and are combining pictures for phrases in Phase 4 require less instruction time to navigate between different displays on the SGD and to build phrases and sentences.[5]

Once a team has chosen an SGD, we recommend mirroring the PECS protocol to teach the learner to use it effectively and efficiently. Most dedicated SGDs and AAC apps involve similar processes for learners to select vocabulary. Interventionists should use the two-person prompting procedure to teach initial device use. After Phase 4 in which the PECS user is combining pictures, the interventionist must know the button sequences required by the SGD so that the learner continues using phrases and develops expanded message length. Writing a task analysis of these initial phrases ensures that the interventionists are prompting and reinforcing correct sequences of button pushes. As a learner's vocabulary continues to grow, assessing new picture discriminations can be accomplished by using the correspondence checks found in Phase 3 of the PECS protocol.

While SGD lessons are being created and implemented, the learner should have continued access to his or her PECS book. Even once the learner has matched all PECS skills with the SGD, the PECS book should continue to be available and updated. This ensures that if the device breaks, the learner can use the PECS book while repairs or updates are being made to the device. As technology advances, remember that our responsibility is to teach functional communication that is always accessible to our learners.

The popularity of SGDs has also led many to consider starting communication training with a device, as opposed to the traditional PECS format and materials. While there have been a few interesting studies thus far, no attempt to introduce SGD use to children with ASD as a first intervention has led to the rapid acquisition of an array of functional communication skills, something that has been demonstrated frequently with the PECS protocol.

We first wrote about the PECS protocol and its impact upon functional communication over 30 years ago. It is natural for many to think its usefulness has lapsed. Our efforts to teach the protocol around the world continue to involve over 30,000 professionals, paraprofessionals and family members each year, demonstrating the large and sustained interest in teaching individuals with ASD how to rapidly acquire crucial functional communication skills. We see PECS as a tried and true approach that continues to deliver proven results across the globe.

References
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Andy Bondy, Ph.D., has almost 50 years of experience working with children and adults with autism and related developmental disabilities. For more than a dozen years he served as the Director of a statewide public school program for students with autism. He and his wife, Lori Frost, pioneered the development of the Picture Exchange Communication System (PECS). He designed the *Pyramid Approach to Education* as a comprehensive combination of broad-spectrum behavior analysis and functional communication strategies. He is a co-founder of Pyramid Educational Consultants, Inc., an internationally based team of specialists from many fields working together to promote integration of the principles of applied behavior analysis within functional activities and an emphasis on developing functional communication skills. He currently serves as Vice-Chair of the Board of Directors for the Cambridge Center for Behavioral Studies. He was the recipient of the 2012 Society for the Advancement of Behavior Analysis (SABA) Award for International Dissemination of Behavior Analysis.

Lori Frost, M.S., CCC/SLP is vice-president and co-founder of Pyramid Educational Consultants, Inc. and has 40 years of experience working with individuals with autism and related developmental disabilities. She has been the driving force behind creating the Picture Exchange Communication System (PECS), unique Augmentive/Alternative Communication system that allows individuals with limited communication abilities to initiate communication with teachers, parents, and peers. She is co-author of the *PECS Training Manual, 2nd Edition*. Ms. Frost has a wealth of background in functional communication training and applied behavior analysis. She has assisted in the development of a number of training packages designed to teach language and academic skills. Ms. Frost received her BA in speech pathology and audiology from the University of Arkansas, and MS in speech and language pathology from the University of North Carolina at Chapel Hill in 1982. She has worked in many public and private school settings as a speech pathologist. As a Pyramid consultant, Ms. Frost has traveled across the country and the world, teaching workshops on PECS and the Pyramid Approach to Education. She has presented a number of papers and lectures on autism and communication, co-authored several articles and chapters, and is respected by professionals in her field as a leader in functional communication systems.

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