

Jason's Case Study for Problem-Based Learning

EPSE 549 074 2020W Seminar in Autism

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Client Description

- Jason is a 7 years old boy with a diagnosis of Autism Spectrum Disorder (ASD)
- **Strengths:** Following 1-2 step instructions, play skills with toys, toilet trained
- **Challenges:** Limited speech (i.e., Jason can say a few words with prompts), engages in problem behaviour as a result of people not understanding him or being able to communicate with him



Client Description: Communication

- Jason's family understands his limited speech and gestures
- Difficulties communicating with teachers and peers
- The team is discussing which AAC method to begin teaching to Jason



Communication Systems





What is AAC

Augmentative and alternative communication (ACC):

- Various communication systems, devices or strategies that help support or replace natural speech/writing¹
- Includes approaches based in high-tech, low-tech or unaided¹
- The AAC mode being used by a child may change depending on the context, preference or skill level¹

AAC Video²

<https://www.youtube.com/watch?v=Mcr56leaVWA>

0:00-1:05

AND

8:15-10:02

Overview of different communication systems

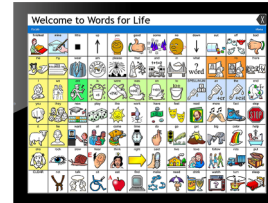
- Manual signs/gestures



- Picture Exchange Communication System (PECS)



- iPad with communication app



Manual Sign

- Any communication using the articulation of hand signs; for example, signing “more” or signing “eat”³
- Used to mediate messages between communication partners³



Manual Sign: Pros

- Does not require any additional materials in order to be effective⁴
- An accessible communication system to use with individuals with a range of ability levels⁴
- Can result in a faster and overall more complete acquisition of receptive/expressive vocabulary, specifically manding language⁴



Manual Sign: Cons



- Requires both fine and gross motor skills to be able to effectively utilize this communication system; fine motor skills can be difficult for children with ASD⁴
- More difficult to teach labeling (tacting) in response to questions⁴
- Accuracy of sign formation and size of vocabulary is heavily impacted if the learner has a severe intellectual disability⁴
- Reliance on communication partner in the environment to recognize the signs and interpret them appropriately⁴

Manual Sign: Who will benefit?



- Learners that do not have any impairment on their motor skills⁴
- Learners that have shorter attending/joint attention spans⁴
- Learners that may also have hearing impairments or are part of the deaf community⁴



Manual Signs video (Andy manual signing - drop box)

Picture Exchange Communication System



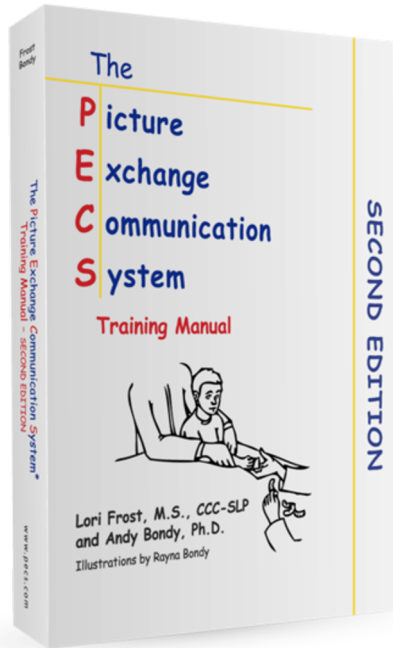
- PECS is a set of instructional procedures for teaching picture exchange
- Picture exchange taught through PECS is an augmentative and alternative communication system (AAC) for individuals without functional speech⁵

Picture Exchange Communication System (PECS) vs. Picture exchange

- In **picture exchange** the individual learns to give someone a picture to ask for what they want (i.e., communicate). It can be taught in a variety of ways (e.g., discrete trial training)
- **PECS** is a specific instructional approach for teaching picture exchange
- Most people call every form of system that involves pictures, PECS. Picture exchange that does not follow the six phases of the PECS manual is not considered PECS!

We are teaching picture exchange using the PECS instructional procedure

PECS: Six Phases



Phase 1: How to Communicate

- Individuals are taught to exchange one picture at a time for items or activities that are highly preferred. Two adults (i.e., the communicative partner and a physical prompter) are used to teach this phase. Picture discrimination is not required⁶



- The communicative partner presents a single picture of a highly preferred item. The learner picks up the picture and gives it to the partner's hand in exchange for the requested item. The communicative partner gives the item while naming the item (e.g., "doll")⁶

Phase 2: Distance and Persistence

- Still using only one picture at a time, individuals are taught to generalize this new skill across environments, people and distances. Single pictures continue to be used since picture discrimination is still not required⁶
 - Learners travel between their communication book and their communication partner⁶



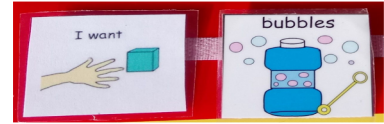
Phase 3: Picture Discrimination



- Individuals are taught how to select from an array of two or more pictures to ask for what they want⁶
 - Discrimination training begins between two picture symbols, one that is highly preferred versus one that is non-preferred. Teaching discrimination systematically expands to multiple pictures symbols of preferred items⁶

Phase 4: Sentence Structure

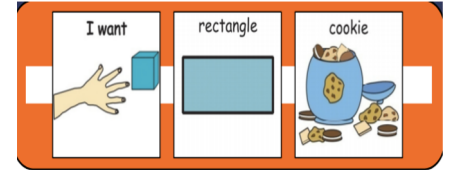
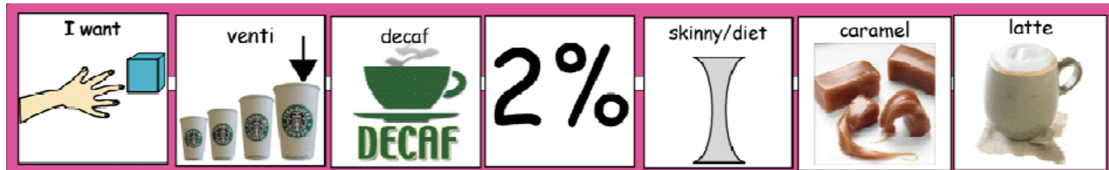
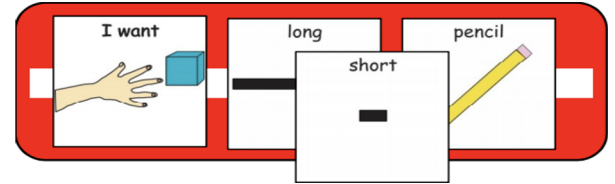
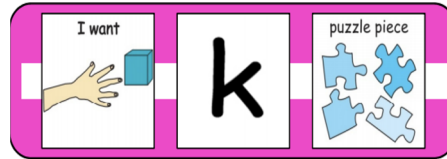
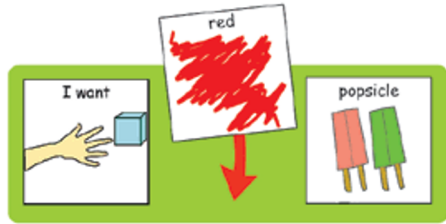
- Individuals are taught how to build simple sentences on a detachable Sentence Strip™ using an “I want” picture followed by the picture of the desired item⁶



- Building and exchanging a two picture sequence begins by teaching the learner to place the picture of the desired item on the Sentence Strip™⁶
- The learner is then systematically taught to bring down the “I want” symbol plus picture symbol and to point to the Sentence Strip⁶
- The communicative partner reads the Sentence Strip. If any vocal attempts occur, differential reinforcement strategies are used⁶

Phase 4 : Attributes & Language Expansion

- Individuals are taught to expand their sentences by adding adjectives, verbs and prepositions⁶



PECS video PECS (PECS Phase 4 - dropbox)

Phase 5: Responsive Requesting

- Individuals are taught to respond to questions using picture symbols such as “What do you want”?⁶
 - This is the first time within the PECS protocol where the learner is asked a question, such as, " what do you want?" and is provided a gesture prompt. Over time, that prompt is systematically faded and a different questions are taught⁶
 - It is important to remember to maintain spontaneous communication that was taught in Phases I-IV⁶



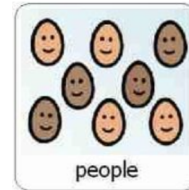
Phase 6 : Commenting



- Individuals are taught to comment in response to questions⁶
 - “What is it?”/“What do you see/hear?”
 - Learners then start their sentences with “I see,” “I hear,” “I feel,” “It is a___,” etc.
 - The ultimate goal is for learners to comment about the world around them

PECS: Pros

- It's an evidence based system for teaching picture exchange communication
- PECS instruction may have a positive impact on the development of speech (i.e., spontaneous, imitative and expressive speech)⁷
- PECS does not require prerequisite skills (e.g., pointing, labeling, or matching)⁵
- PECS instruction can be used with people of all ages and for individuals with different diagnoses⁶



PECS: Pros

- Picture symbols are inexpensive to make and can be used anywhere





- It may result in a decrease in problem behaviour⁵



- Picture exchange is highly interpretable (a written word follows the picture as well)⁸



PECS: Cons

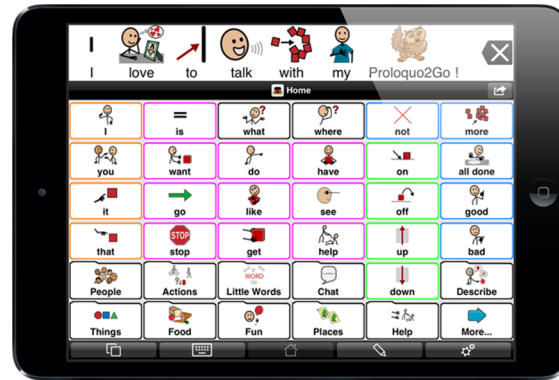
- PECS requires a manual and (ideally) training
- Pictures can be lost, therefore there is a need to create multiples of important pictures⁸ 
- There will be times when an individual will seek to communicate about something that is not yet in their system⁸ 
- The total number of symbols in one's communication binder can be between (~80-120 pictures), or even grow beyond this range⁸

PECS: Who will benefit?



- Individuals with range of speech, language and communication needs⁹
- Individuals at any age who are diagnosed with ASD or other diagnoses (e.g., cerebral palsy, Down syndrome)⁶
- PECS is highly effective for individuals with autism, especially those without comorbid diagnoses (e.g., intellectual disability)¹⁰
- PECS may have positive speech outcomes for children who have some speech at the outset of intervention¹⁰

Application on iPad



App on iPad vs. SGD

- SGD: Speech Generating Device
- Designated speech generating devices are electronic devices that are designed to be used only for producing verbal speech output¹⁰
- SGDs produce digitized voice output¹⁰
- Recently, applications on iPads and computer/tablet devices have become more common¹⁰



App on iPad: Overview

- iPads can be used as speech generating devices (SGDs)¹¹
- Can download different applications that suit the learner and family¹¹
- Applications can be adapted based on preferences¹¹
- An iPad is a more affordable alternative than dedicated SGDs¹¹



App on iPad: Pros

- Research shows the most maintenance compared to picture exchange (PE) and manual signs (MS)¹²
- Quick acquisition¹¹
- Only requires one response topography¹¹
- Does not require listener's attention before speaking¹¹
- Digitized output that is similar to speech¹¹



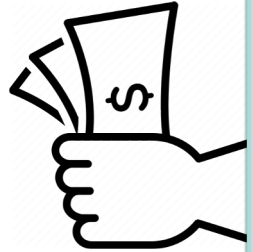
App on iPad: Pros



- Cheaper than SGD
- Meta-analysis and systematic reviews have shown at least moderate effects for individuals with ASD¹³
- Customizable and adaptable
- Easily transported across settings¹³

App on iPad: Cons

- Might be misplaced, lost, or left behind
- Learner must have enough dexterity to point/touch or use stylus
- Expensive
- Needs to be charged



App on iPad: Who will benefit?



- Individuals diagnosed with: ASD, ODD, ADHD, intellectual disability, multiple disabilities, Down syndrome, and others¹¹
- Data show high acquisition rates across studies and variety of participants¹⁰
- SGDs most effective for learners without comorbid disabilities¹⁰

iPad video (Cub Scout iPad - dropbox)

Research



Ganz et al. (2012) Meta-analysis¹⁴

- **Purpose:** Evaluate effectiveness of various AAC systems and procedures
- **Method:**
 - Literature search → evaluated → data extraction
 - Utilized studies that met Horner et al. criteria
- **Participants:**
 - 58 individuals across studies
 - Range of ages from preschool-aged to over 15
 - Across settings



Ganz et al. (2012)¹⁴

- **Results:** Studies were categorized based on intervention types
 - PECS (9)
 - Picture-based systems other than PECS (7)
 - SGDs (8)
- **Findings:** **Picture exchange taught through PECS and SGDs showed similar effect on communication**

Ganz et al. (2014)¹⁰

- **Purpose:** investigate how individual characteristics moderate effectiveness of three types of AAC
- **Method:**
 - Literature review (produced 292 sources)
 - Evaluated sources using same criteria from the Ganz et al. (2012) article
 - Data extraction- 35 articles met criteria after evaluation, data were extracted and analyzed



Ganz et al. (2014)¹⁰

- **Findings:**
 - **Participants with only ASD benefitted the most from SGD**
 - **Participants with both ASD and IDD benefitted the most from PECS**
 - Participants who had some speech at the onset of intervention were more likely to show speech development as a side effect of PECS/SGD use
 - PECS had the largest effect size for preschool age participants

Ganz et al. (2017) Meta-analysis¹⁵



- **Purpose:** Examine overall effect of high-tech AAC interventions (i.e., SGDs) on communication outcomes for individuals with intellectual or developmental disabilities
- **Method:**
 - Literature search → reviewed → data extraction
- **Results:**
 - 24 studies (single-case design)
 - **SGDs effective for most conditions, for most participants, and for most communicative functions**
 - Instruction within natural environment was as effective as didactic instruction

Ganz et al. (2017)¹⁵

- **Implications:**
 - Provided evidence supporting teaching through natural contexts and settings
 - Time delay was found to be effective
- Morin et al. (2018) expanded on this study, specifically looking at children with ASD¹⁶
 - **High-tech AAC (i.e., SGDs) can be considered EBP for individuals with ASD**

Van der Meer et al. (2012)¹⁷



- **Purpose:** determine and evaluate teaching and preference (across time and follow-up)
- **Participants:** 4 children with ASD
- **Method:** Compared acquisition and preference of manual signs, picture exchange, and SGDs using alternating treatment designs
- **Instruction:** Taught using graduated guidance and time delay procedure

Van der Meer et al. (2012)¹⁷

- **Findings:** Authors found that parents and teaching staff were suitable teachers for different methods of communication
- **Picture exchange and a SGD (iPad with ProLoquo) were found to be the most successful**
- **Implications:** Preference was found to be hugely important & teachers/parents can teach

Barlow et al. (2013)¹⁸



- **Purpose:** Compare the efficiency of training picture exchange and manual sign for teaching simple mands
- **Participants:** 3 boys with ASD and language deficits
- **Method:**
 - Taught mands using picture exchange cards and manual sign for individualized preferred items
 - Graduated - hierarchy prompting was used to teach the target mands
- **Findings:** All participants acquired the picture-exchange responses faster than manual sign mands, and none of the participants met mastery criteria for manual signs

Couper et al. (2014)¹⁹

- **Purpose:** Compared acquisition of and preference for manual signs (MS) , picture exchange (PE), and iPad based SGD
- **Participants:** 9 children with ASD
- **Method:**
 - The SGDs used were an Apple iPod Touch or an Apple iPad. Both devices were loaded with the “Proloquo2Go” application.
 - A “more” symbol was programmed to produce the synthetically generated words “I want more”



Couper et al. (2014)¹⁹

- The same symbol was also provided in the Picture exchange system
- The participants were taught how to request “more” using manual signs as well
- **Findings:** The results were consistent with previous studies showing that **the iPad/iPod-based SGD was more successful** and was learned faster in most cases

Agius et al. (2015)²⁰

- **Purpose:** Compared acquisition of manding skills with Picture Exchange Communication System (PECS) and iPads used as speech generating devices (SGDs) using alternating treatments designs
- **Participants:** 3 children with ASD
- **Findings:** **Both PECS and an iPad could be appropriate for teaching requesting skills to beginning communicators**



Preference Assessment

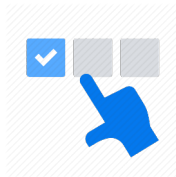


Preference Assessment

- Typically used to create a hierarchy of reinforcers for a given learner to use as part of an effective intervention¹²
- Can also be used create learner buy-in when deciding between materials used in programs/interventions¹²
 - iPad
 - PECS
 - Manual sign
- There are findings suggesting there is a relationship between preference and maintenance¹²

Sigafoos et al. (2005)²¹

- **Compared:** Preference between 3 SGDs and then between SGD and communication board
- **Participants:** 2 adolescents (1 diagnosed with intellectual disability; 1 diagnosed with autism)
- **Phase 1:** Taught participants to activate the 'WANT' button on 3 SGDs to get more of their preferred snack



Sigafoos et al. (2005)²¹

- **Phase 1:** Assessed child's preference
 - Gave child some of preferred snack
 - 3 devices were placed 3m away
 - Experimenter told child '*let me know if you want more*' and allowed child to retrieve device to gain more snack
- **Phase 2:** Taught participants how to hand over a picture symbol in exchange for a snack
- **Phase 2:** Assessed child's preference
 - Same as phase 1, but with communication board & SGD

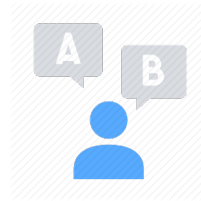


Sigafoos et al. (2005)²¹

- Each student consistently made a choice
- **Most often chose SGD**
- **Implications:** Crucial for learner to make informed choices
 - Opportunities
 - Fluency
 - Alternative devices
 - Avoid instructor bias

McLay et al. (2015)¹²

- **Compared:** PE card, MS, and SGD
- Authors taught requesting “more” with a picture exchange card, manual sign, and using a SGD until 80% or higher



McLay et al. (2015)¹²

- The authors conducted probes of preference during baseline, intervention, and follow-up phases
 - Three modalities placed within reach and the experimenter asked which one they would like to use
 - The participant was able to choose which modality they preferred in order to ask for 'more'
 - **SGD was the most commonly selected for all participants**
- McLay et al. (2017) was a replication of this study with two more participants²²

Our Advice

- Manual signing has the least research support, overall
- Research shows that the individual's preference and input is crucial
- Conduct a preference assessment between PECS and iPad. A further meeting or assessment can be done to discuss which application best suits Jason and his family



Preference Assessment

- 1 Use PECS to teach Jason to exchange a picture for “more” and use DTT to teach to activate a “more” symbol on an app on the iPad, until 80% mastery



- 2 Present a box of toys for Jason to play with 



- 3 Remove box of toys and have both modalities within reach 



- 4 Ask, “what do you want”? OR “which one do you want to use”? 



- 5 Provide 10 seconds for Jason to make a choice, record data 

Preference Assessment



- 6 Allow Jason to use that modality to request for more time with toys



- 7 This should be run across several 'sessions' across several days, so that Jason has multiple opportunities to express his preference



All Done



Thank You



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