Combining Exchange-based Communication with Speech-output Technology: A Series of Experimental Investigations

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BACKGROUND

The Picture Exchange Communication System (PECS) is a structured behavioral program to teach the use of visual-graphic symbols for communication.

- Often initial intervention choice for augmentative and alternative communication in learners with autism and little or no functional speech; open questions include:
  - (a) How to transition from PECS (low technology) to a speech-generating device (SGD; high technology)?
  - (b) Can children with autism master later PECS phases?
  - (c) Can PECS or SGDs facilitate speech production?

RESEARCH GOALS

- Modify traditional PECS protocol for implementation and transition to an SGD
- Evaluate effects of modified PECS protocol on requesting skills, social-communicative behaviors, and emerging speech (dependent measures)
- Evaluate effectiveness of particular devices for such purposes, built upon PECS principles

RESEARCH DESIGN

- Multiple Baseline Design across participants (Baer, Wolf, & Risley, 1968)
  - Intervention phase split into PECS phases and SGD phases, followed by maintenance phase

MODIFIED PECS PROTOCOL

(Preference Assessment)

- PECS Phase I (P1): Physical Exchange
- PECS Phase II (P2): Distance and Persistence
- SSD Implementation (ProxTalker)
- ProxTalker Phase I (PT1): Picture Card Activation
- ProxTalker Phase II (PT2): Distance and Persistence
- ProxTalker Phase III (PT3): Picture Discrimination
- ProxTalker Phase IV (PT4): Sentence Structure
  - Added more rigorous speech elicitation
- ProxTalker Phase V (PT5): Responding to “What do you want?”

MATERIALS

- Two clinicians with advanced PECS training independently checked 33% of sessions for correct protocol implementation yielding an average treatment integrity score of 98.5% (range 86–100%). Agreement between observers was $r = 1.00$ ($p < .001$).

CONCLUSIONS

- All participants mastered SGD transition and maintained newly learned requesting skills, but varied in ability to complete later protocol phases
- Improvements in social-communicative behaviors and natural speech development evident for two participants, but lesser effects for third participant
- Pre-treatment vocalization skills and degree of cognitive impairment likely moderator variables
- Gains in speech production most notable after speech elicitation was enforced more strongly

Participants:

- Adam: Male, 9 yrs., severe autism, limited speech – vocalizations; gestures
- Quincy: Male, 11 yrs., severe autism, mainly nonverbal with minimal vocalizations; gestures
- Jerry: Male, 10 yrs., severe autism, nonverbal; gestures