


### Models of Parent-implemented AAC Intervention for Children With Severe Autism

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 ASHA 2014, Orlando, FL



### Disclosure Statement


Oliver Wendt is Chief Science Officer for SPEAK MODalities LLC; one of the products, SPEAKall!, will be shown in this presentation, but all intervention procedures are replicable with other apps

Miriam Boesch has no relevant financial or nonfinancial relationships to disclose.




### Autism Spectrum Disorder and AAC

- Autism includes a “delay in, or lack of the development of spoken language” (American Psychiatric Association, 2000)
- Up to 66% of children diagnosed with an autism spectrum disorder (ASD) do not develop communicative speech (Lord & McGee, 2001)
  - No sufficient natural speech or writing to meet their daily communication needs (Light, Roberts, DiMarco, & Greiner, 1998)
  - Candidates for intervention in **augmentative and alternative communication (AAC)**





### Benefits of Parent Involvement

- Involving parents as trainers can maximize benefits of speech-language interventions (Kaiser et al., 2000)
  - AAC interventions can be expensive
  - Often lack of qualified personnel
  - If parents can be trained to conduct AAC intervention at home, children may obtain more consistent benefits from AAC without extra costs
- Little research in AAC and ASD on parent-training (Park et al., 2011)
  - Particularly how to teach parent use of tablets with their children




### iPad Impact on AAC Services

<p><b>Pre-2010</b></p> <ul style="list-style-type: none"> <li>\$2,000-\$10,00 high price tag</li> <li>Prescriptive therapist led</li> <li>Isolation learner alone, 1-on-1 therapy</li> </ul>		<p><b>Post-2010</b></p> <p>\$0-\$200 low app price tags</p> <p>Do It Yourself <i>parental experimentation!</i></p> <p>Shared Community between learner, parent, clinicians</p> <p>⇒ <b>Important: when parents get involved they need proper coaching &amp; support</b></p>
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### Models for Parent Training

- Behavioral Paradigm**
  - Picture Exchange Communication System
    - Highly structured, manualized
    - Discrete trial format
    - Desired items as reinforcement
- Naturalistic Paradigm**
  - Naturalistic Teaching
    - Natural environments
    - Learning opportunities are child-initiated
    - Uses child interests



### Experiment 1: Parents using Modified PECS

- Multiple Probe Design across participants (Horner & Baer, 1978)
  - Intervention phase split into sub-phases derived from modified picture-exchange protocol
  - Generalization probes taken throughout baselines and all subsequent intervention phases
- Dependent measures:
  - Requesting skills: number of correct requests during 20-trials session
  - Emerging speech: intentional word vocalizations or word approx. or full word utterances
    - Full sentences ("I want cookie") counted as one utterance


### Modified PECS Protocol (after Bondy & Frost, 1994)

(Preference Assessment)

- iPad Phase I (Ph 1): One-Symbol Activation
- iPad Phase II (Ph 2): Distance and Persistence
- iPad Phase III (Ph 3): Discrimination Between Symbols
- iPad Phase IV (Ph 4): Sentence Structure
  - ⇒ *Added more rigorous speech elicitation, parent and child read "sentence strip" together*
- iPad Phase V (Ph 5): Responding to "What do you want?"/ Increasing Spontaneity (Boesch, Wendt, Subramanian, & Hsu, 2013a,b)

### Materials: iPad and *SPEAKall!*

- Purposely reduces processing difficulties through design (reduces cognitive and sensory load)
- Teach early symbol vocabulary and simple sentences
- Customizable to each child's specific needs
- Seamlessly connects with Picture Exchange (PECS) intervention
- Easy-to-use, parent-friendly
- Evidence- (Research-) based
  - Behavioral
  - Neurophysiological
- Free version available on iTunes search "*SPEAKall!*"



### Training Approach


- Parent-implemented intervention:* Parents receive comprehensive training
  - General workshop at parent support group
  - Written instructions
  - Modeling and role playing
  - Video resources
  - Sole trainer for child, clinician only provides feedback
- Two clinicians with advanced PECS training independently checking sessions for treatment integrity.
- Treatment schedule was 2 days/week, with 1-2 sessions each day

### Parent Training

iPad Instructions - Phase 1 Cheat Sheet

Purpose: Teach one symbol requests.  
 Setting: Trainer 1 will be sitting across a table from the child and Trainer 2 will be standing behind the child.

- Conduct a preference assessment. Repeat this every 5 trials.
- Put a bag of the preferred snack item on the table and have the corresponding graphic symbol displayed in SPEAKall!
- Trainer 1** show that in front of the child and entice with the preferred item.
- Trainer 2** provide prompting for dragging and dropping graphic symbol onto sentence strip. Fade out over time.
- Trainer 1** once sentence strip is activated, give desired item to child and say the item name.
- Give the child time to consume the snack item or play with the preferred toy.
- Trainer 2** gives "return candy" button to start a new trial. Begin to entice with the desired item again.
- Switch communication partners. Make sure child can request at least 2 different items before moving on to the next phase.



Training materials:

- Cheat sheets
- YouTube videos

[www.youtube.com/channel/UCNq-ywqu0ESwLlawPDvhGU0g](http://www.youtube.com/channel/UCNq-ywqu0ESwLlawPDvhGU0g)

### Parent Training (cont.)

- Modeling of intervention steps
- Role-playing with clinician



iPad Phase I (Trainer 1) - Treatment Integrity Checklist - Parent Implementation

Name: \_\_\_\_\_ Today's Date: \_\_\_\_\_ Participant: \_\_\_\_\_  
 Session: \_\_\_\_\_ (Date/Time) \_\_\_\_\_ Session Date: \_\_\_\_\_ Trainer 1: \_\_\_\_\_

COMPONENT: <sup>1</sup> "Make PECS component is fulfilled"  
 1. Parent is offering at least two, and if possible more, reinforcing items during each session \_\_\_\_\_  
 2. Any reinforcing item is not used more than 10s \_\_\_\_\_

COMPONENT: <sup>2</sup> "Preference assessment is performed"  
 1. Preference assessment is performed \_\_\_\_\_  
 2. Parent places only one symbol on iPad display \_\_\_\_\_  
 3. Parent is child offering preference of symbol on iPad display with every new trial \_\_\_\_\_  
 4. Parent withdraws item within 5 seconds \_\_\_\_\_  
 5. Parent entices child with challenge \_\_\_\_\_  
 6. Parent gives feedback to child within 5 seconds \_\_\_\_\_  
 7. Parent provides verbal model (optional) \_\_\_\_\_

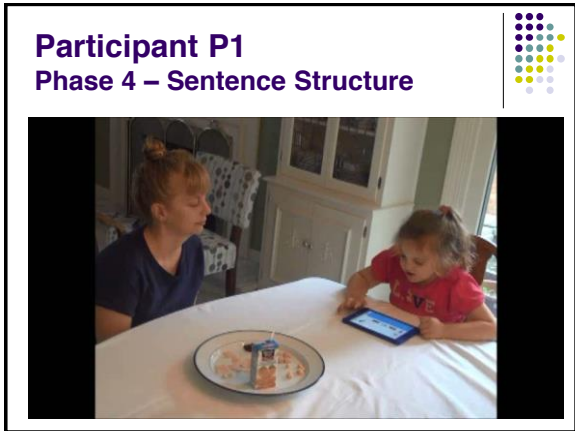
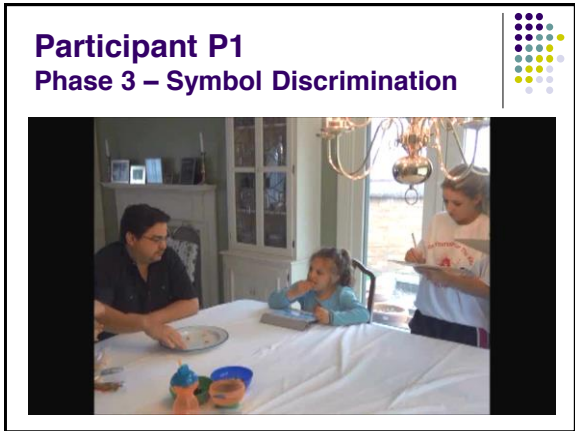
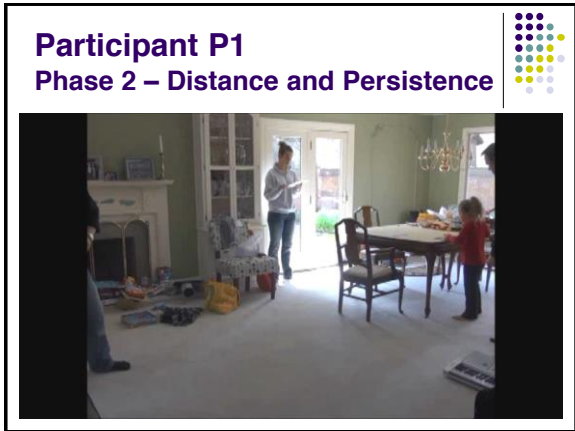
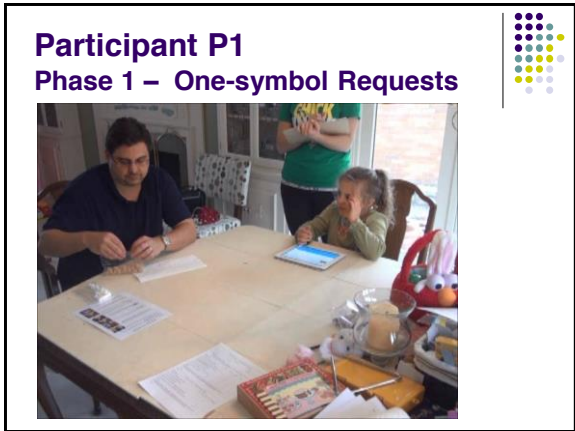
<sup>1</sup> "Make PECS component is fulfilled"  
<sup>2</sup> "Preference assessment is performed"  
<sup>3</sup> "A component is not performed during this observation."  
<sup>4</sup> "A component is to be failed, and is currently not applicable for this session mark (0/0)"

- Treatment integrity checklists for each phase
- Need to have 100% correct during role-play

### Participant Characteristics

Participant	Age/ Gender	Dx*	Communication Skills
Sally	7 yrs./ Female	severe autism	some echolalia and scripted speech, less than 15 functional words
Leo	8 yrs./Male	moderate- severe autism, dual diagnosis: Down syndrome	no vocalizations, no functional speech
Stan	6 yrs./Male	severe autism	vocalization and jargon, no meaningful words, no functional speech

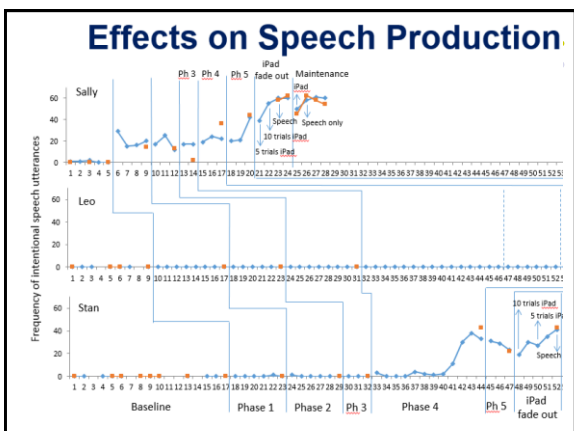
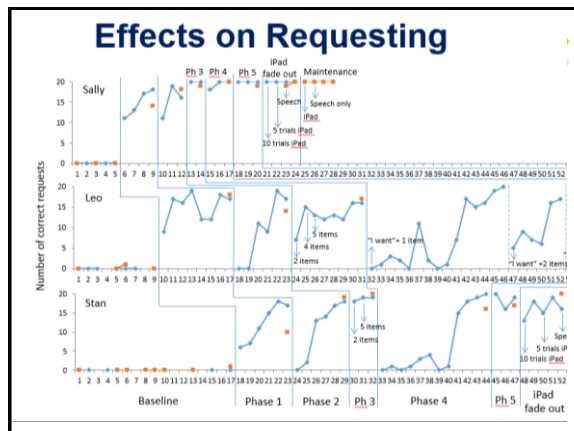
\*based on ADOS and CARS scores



### Participant P1 Phase 5 – “What Do You Want?”

### Participant P1 Phase: iPad Fadeout

### Participant P1 Maintenance and Generalization



### Discussion

- M-PECS Model Pros:
  - Step-by-step instructions easily to follow
  - Can be done with high treatment integrity
    - Ex.: Family #1: Overall TI= 97.75%; range 87%-100%
  - Familiarity with PECS materials used in school
  - Can target generalization
- M-PECS Model Cons:
  - Difficulties with error correction procedures
  - Overuse of speech elicitation
  - Identifying and changing reinforcers

## Experiment 2: Parent Training using NT

- Purpose:
  - Pilot test parent-training program
  - Increase child's requesting
- Design:
  - A-B-C Design with Follow-up
- Dependent Measure:
  - Requesting skills via SPEAKall! app during snack time
    - Independent activation of single icon (food/drink item)

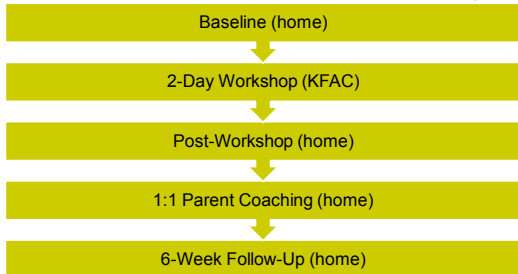
## Participant Characteristics

- Parent:
  - 40-year old father
  - Asian descent; spoke Cantonese & English
  - Master's degree in Business
  - Knowledge of iPhone & iPad but no exp. w/ AAC
- Child:
  - 12-year old boy with severe ASD
  - Asian descent; 1 word utterances in English (prompted); understood Cantonese; some pointing
  - Exposure to iPad (games only)
  - Not current user of SGD but prior exposure to low-tech AAC system @ school

## Setting & Materials

- UNT Kristin Farmer Autism Center
  - Workshop training
- Home environment
  - Baseline
  - Post-Workshop
  - 1:1 Parent Coaching
  - Follow-Up
- iPad tablet with SPEAKall! App
  - Pictures of preferred foods and drinks

## Study Phases



## Workshop Training

- **Day 1: Naturalistic Teaching Strategies** (Franzone, 2009)
  - ~ 4 hours
  - Overview of NT (research support, rationale)
  - Specific instruction (manding, mand-modeling, modified-time delay, environmental arrangements, etc.)
  - Modeling techniques & role-playing
- **Day 2: AAC**
  - ~3 hours
  - Overview of AAC (principles, research support, rationale)
  - SPEAKall! App (setting it up, trouble-shooting, using it)
  - App demonstrations & role playing

## Post-Workshop

- 3 sessions during snack time routine
- Purpose was to determine if the child's requesting skills improved after the parent attended the 2-day workshop
- Parent was asked to train the child to request preferred food/drinks using the SPEAKall! app
- No additional instruction beyond the workshop was given

### 1:1 Parent Coaching

- 1 in-home coaching session per week
- Coaching varied but were based on the prior week's videos
- Parent Feedback (strengths/weaknesses):
  - Structuring the environment to elicit requesting
  - Preventing satiation
  - Allowing sufficient wait-time
  - Minimizing prompts
- Modeling teaching strategies; role-playing

### Data Collection

- 3 video-recorded sessions per week
  - But not on the same day as the coaching session
  - Sessions were ~5-20 min. each

Data Recording Form [Child]

Participant: \_\_\_\_\_ Phase: \_\_\_\_\_  
 Observer: \_\_\_\_\_ Date Collected: \_\_\_\_\_

**Definition** (in specific, observable, measurable terms):

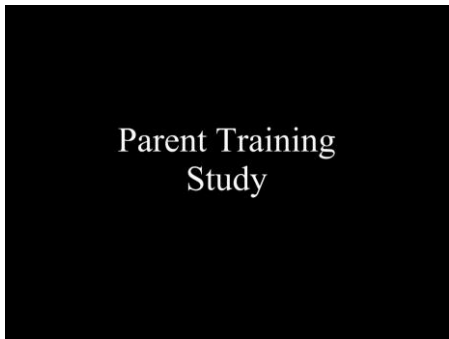
**Independent Request:** Initiating a vocal request (response to or after hearing the verbal cue "What do you want?") for material through the use of a vocalized syllable, word, or phrase.

**Prompted Request:** Initiating a vocal request (response to or after hearing the verbal cue "What do you want?") for material through the use of a vocalized syllable, word, or phrase.

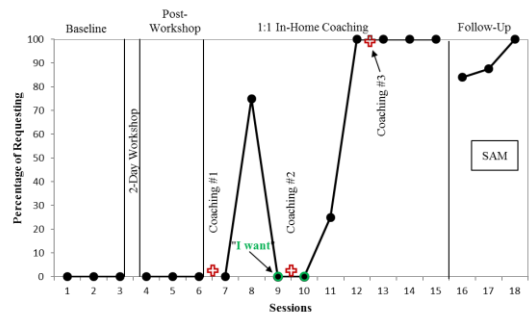
**Request Type:**  
 • In-Hand-Hand  
 • Manual Control  
 • Verbal  
 • Symbolic

Session Date	Opportunities per Session										Independent Request %	Prompted Request %	
	1	2	3	4	5	6	7	8	9	10			

### Video Demonstrations



### Effects on Requesting



### Discussion

- NT-MODEL Pros:
  - Strategies are flexible in most environments
  - Intuitive training techniques suitable for parents
  - Uses the child's interests to elicit a teaching moment
- NT-MODEL Cons:
  - Because of flexibility in training techniques, it's easy for the parent to revert to previous behavior (excessive prompting)
  - Parents may find it difficult to structure the environment to elicit communicative opportunities

### Discussion (cont.)

- Potential limitations to any parent-implemented intervention:
- Burden on family schedule
  - Ability to handle problem behavior
  - Finding trained personnel to work with
  - Procedural integrity
  - Environmental constraints in the home
    - Ex: extra distractions, space limitations, inability to keep strong reinforcers restricted to training sessions only

## Conclusions

- Results underscore the potential of including parents for maximizing benefits of AAC intervention in autism
- Clinicians should recognize the value of joint parent-professional partnerships, and develop expertise for parent training
- Workshop style training alone is not sufficient in increasing parents' intervention skills
  - Ongoing supervision and consultation recommended
  - Coaching element critical

## Acknowledgements

- Aforementioned projects were supported by
  - Project Development Team within the ICTSI NIH/NCRR Grant Number RR025761
  - Technology Development Grant from the Innovation and Commercialization Center – Information Technology
  - Research Fellowship from Purdue Center for Families
  - Purdue Research Foundation Trask Development Fund
  - University of North Texas Research Initiative Grant

## Acknowledgements (cont.)

- Thanks to Purdue EPICS Team!
- Thanks to the families who agreed to participate in our research!

## Acknowledgements (cont.)

- Thanks to the following individuals for their help with data collection and reliability analyses:
  - Anna Goss
  - Minghua Tan
  - Amber Torelli

## SPEAKall! Resources

- Website: [www.speakmod.com](http://www.speakmod.com)
- YouTube Channel:  
<http://www.youtube.com/channel/UCNq-yvqu0ESwLawPDvhGUOg>  
 OR SEARCH: SPEAK MODalities
- Facebook Site:  
<https://www.facebook.com/speakmod>
- Twitter: <https://twitter.com/speakmodalities>

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## Questions ???



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