AAC and Peer Partner Instruction: Treatment Approaches of Nonverbal or Minimal Verbal Children with Autism

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Outline

• Review of AAC approaches
• Prelinguistic and intentional communication
• Measuring changes to document outcomes in prelinguistic and intentional communication
• Setting up the environment for success
• Peer-mediated AAC interventions and outcomes
AAC and Children with Complex Communication Needs

• Severely restricted in participation in education, family, and community environments
• Substantial benefits from AAC – communication, language and literacy
• No risk to speech or language development
• Studies show improvements in
  – Turn-taking, requests, comments, receptive and expressive vocabulary, MLU, PA, reading & writing

(Light & McNaughton, 2012; Schlosser et al., 2009; Wendt, 2009)
The question now is NOT:

*Can children with CCN learn AAC systems and symbols to improve communication, language, and literacy?*

The question now IS:

*What is the best way to teach children with CCN using AAC systems to improve communication, language, and literacy?*
We need to keep up!

• **Mobile technologies**
  – Inexpensive
  – Readily available
• **Parents purchasing on their own**
• **Wide range of apps and programs**
• **What is driving selection and teaching approaches?**
Common AAC Instructional Approaches

- Picture symbols systems (e.g., PECS)
- Speech-generating devices (SGDs)
- Sign language
Combined or Blended AAC Communication Interventions

• Developmental/behavioral interventions
  – Joint Attention Symbolic Play Engagement and Regulation (JASPER, Kasari et al., 2008; 2010)
  – Enhance Milieu Teaching (EMT, Kaiser & Goetz, 1993; Kaiser et al., 2000)

• Combined with a SGD intervention (Kasari et al., 2014)
Kasari, Kaiser et al., 2014
J of the Am Academy of Child and Adol Psychiatry

- N = 61 children with ASD; age 5 to 8 years
- Minimally verbal (less than 20 spont words)
- Receptive language age 24 mon
- 2 years of prior early intensive behavior intervention
- Naturalistic communication intervention that taught JA, symbolic play, and social use of language during child preferred activities
- SGD – models provided for 50% of spoken communication
- 2-3 hours per week; 24 weeks
Outcomes of the Blended Intervention

• Random assignment to:
  JASP + EMT + SGD
  JASP + EMT alone

• Beginning the intervention with the SGD led to significantly increased spontaneous communicative utterances

• Increase in different types of words and functions beyond requesting (e.g., comments and novel words)

• Adding SGD later (after 12 weeks) for slow responders did not provide same benefit
Who are the typical ‘PARTNERS’ in AAC Intervention Research?

- Parents
- Educational assistants
- Teachers

(Kent-Walsh & Binger, 2008)
Who Are the Communication and Play Partners in Inclusive Classrooms?

• Peers without disabilities
What does a typical child-peer interaction look like? (without adult support)
Rationale for Combining AAC and PMI Approaches

- PMI most replicated strategy for addressing core social deficits in children with ASD – necessary component of effective interventions (Strain, Schwartz, & Barton, 2011)
- Peer-mediated interventions are recommended as EBP (McConnell, 2002; National Standards Project, 2015)
- Growth in comprehension over the preschool years is related to # of peers using AAC to interact with child (Barker, Akaba, Brady, & Thiemann-Bourque, 2013)
- Emerging data on increases in communication and SGD use between children with autism and TD peer partners (Thiemann-Bourque et al., submitted JSLHR; Thiemann-Bourque, 2013)
- Communication systems should provide opportunities for engagement and reciprocal social interactions, relies on BOTH communication partners
iPad Instruction Only

iPad + PMI
Is Child Minimally Verbal or Preverbal?

• Minimally verbal (or nonverbal)
  – Few words; limited functions (e.g., to request)
  – Difficulty responding to and initiating JA
  – Fewer gestures and vocalizations; restricted consonants

**25-30% fail to develop functional spoken language

• Pre-verbal
  – Show emerging pre-linguistic skills
  – Respond to JA and initiate JA (still low)
  – More gestures and vocalizations; range of consonants

**Age 4 without phrase speech - 70% attained phrase speech by age 8 years

(DiStefano & Kasari. January 2016, *Perspectives on Language Learning and Education* Vol. 23 Issue 1; Anderson et al., 2007; Tager-Flusberg & Kasari, 2013; Wodka et al., 2013)
Yoder, Watson & Lambert, 2015 (JADD)

N = 87 nonverbal children with ASD; 24-48 months
Multiple measures administered at 5 time points: 12-16 mon

• Expressive language predictors
  – Intentional communication
  – Responding to joint attention
  – Consonant inventory
  – Parental linguistic responses

• Receptive language predictors
  – Intentional communication
  – Responding to joint attention
  – Receptive vocabulary
  – Parental linguistic responses
  – Autism symptomatology
How does this impact what we teach with peer partners?

• Does child respond to peer requests for JA?
  – Orients to toy, orients to peer, points to choose a toy, smiles at what peer is doing, other?

• Does child initiate to engage peer in JA?
  – Orientation, triadic eye gaze with vocalization, gesture, or words, show objects, share in positive affect, other?

• Does child use any gestures with peers?

• Does child initiate and/or respond to peer intentionally using symbols (e.g., SGD, words, signs) and for a variety of reasons?
Assessing and Measuring Early Communication Behaviors

• Efforts underway to validate a measure that will describe the ways minimally verbal children communicate:

The Communication Complexity Scale (CCS)

The CCS was developed to describe an individual's prelinguistic and linguistic communication behaviors based on observations during specific contexts intended to elicit communication (for joint attention or behavior regulation)

Structured Communication Sample: Peer Partner

• Scripted communication assessment adapted with peer communication partner
  – 12 scripted opportunities to communicate with peer (6 Beh Reg and 6 Joint Attn)
  – Administered pre- and post-intervention (30-min)
  – Peer is ‘taught’ to be a helper, participate in the gentle sabotage for Behavior Regulation or Joint Attention Tasks
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<tr>
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<th><strong>End Time</strong></th>
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<tbody>
<tr>
<td>0</td>
<td><strong>No Response</strong></td>
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<td>1</td>
<td><strong>Alerting</strong> - a change in behavior, or stops doing a behavior</td>
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<table>
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<tr>
<th><strong>Pre-Intentional</strong></th>
<th><strong>Start Time</strong></th>
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<tbody>
<tr>
<td>2 Single orientation only -- on an object, event or person; can be communicated through vision, body orientation, or other means.</td>
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<tr>
<td>3 Single orientation only + 1 PCB (potentially communicative behavior)</td>
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<td>4 Single orientation only + more than 1 PCB</td>
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<tr>
<td>5 Dual orientation - shift in focus between a person and an object, between a person and an event using vision, body orientation, etc. (without PCB)</td>
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<tr>
<td>Intentional Non-Symbolic</td>
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<td>Intentional Symbolic</td>
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<td>12</td>
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<td>Communicative Function</td>
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Structured Communication Sample: Peer Partner
Pre-Intervention Wind Up Toy (BR)
Structured Communication Sample: Peer Partner
Post-Intervention Wind Up Toy (BR)
Structured Communication Sample: Peer Partner Pre-Intervention Fan Task (JA)
Structured Communication Sample: Peer Partner Post Intervention Fan Task (JA)
Changes in Intentional Non-Symbolic and Symbolic Communication: Cohort 1 (n=11)
Learning to **GIVE** is a gesture, part of sharing, taking turns, being engaged...
It can take time...one month later
Step-by-step for Getting Started

- Set peer schedules – post in the classroom
- Create peer training books; teacher scripts
- Select preferred activities that are motivating for both:
  ✓ Toys that make noise, move
  ✓ Snack/food
  ✓ Puzzles
- Create visual supports, text cues, find pictures, program AAC with vocabulary, etc.
- Purchase bins with lids, plastic containers, plastic baggies – for turn taking, clear roles
Step-by-step for Getting Started

- Plan short, frequent times for social interactions
  - 5 to 10 min across the day
- Start with table-top activities to increase structure
- Rotate same 3-4 activities for approx. first month
- Team meeting to share plan
- Decide how you will measure progress:
  - Teacher/staff impressions
  - Data collection forms
  - Monitor peer perceptions
Setting the Stage for Successful Activities

- Are there multiple reasons to communicate?
- How many toys are available?
- Do the toys lead to joint engagement?
- Do the toys have parts or pieces and are the play expectations clear?
- Are there choices of toys available, preferred and non-preferred?
YOU set the stage so consider...

1. Is their joint engagement (child-peer)?
2. Is there a reason for the children to communicate with each other?
3. What could that reason be? (e.g., what is one possible social communication goal?)
4. Are there LOTS and LOTS of opportunities to communicate in a short time? (well, at least 2-3 per minute)
Dinosaurs
Potato Head
Sensory Motor Activity
Tweaked....
Increased Engagement = Increased Learning

- All activities or games need to have ‘parts’ that can be controlled (i.e., REASON to communicate)
- Bins with lids or bags to hold materials
- Incorporate child interests - but don’t stop there
- Start with preferred activity then move to less preferred in same session (e.g., snack followed by ball toy or puzzle)
- Clear roles and turns: Do they know what to do?
- Create opportunities – *gentle sabotage*
- Keep turns moving quickly: peer-child-peer-child
Symbol Examples

Requests
- “I want ball;” “Turn it on”

Protests
- “All done;” “No more”

Comments
- “It’s a pig;” “Uh-oh!”

Shares
- “Here you go”

Turns
- “My turn;” “Your turn”

Gain Attention
- “Look;” “_____ [child’s name]”
Mouse Shapes Puzzle

Blocks
• Recruit up 2-4 peers
• Same peers participate for most of the school year
• Recruit new peers as skills progress - generalization
• Explain to peer what their role will be in ‘buddy’ groups
• Peers rotate – dyads for older students; 1:1 with preschool
• Monitor peer performance; adjust peers as needed
Teacher Recommendations

- Age-appropriate social skills
- Not overly shy and quiet
- Similar class grouping/schedules
- Well-liked
- Good school attendance
- Child and parent interest
- Consider gender
Buddy Training ‘Stay-Play-Talk’: Using PECS

• Six 30–45 minute teacher-led sessions with peers only
  1. Sensitization Training: Video examples of different ways children communicate (e.g., sign, SGD, and PECS)
  2. Stay: Sit close; move when buddy moves
  3. Play: Take turns; share toys
  4. Talk: Child taught to “pick and put” PECS symbol
  5. Talk: Child taught to “take, say, and give” object
  6. Talk: More ways to talk (gain attention, comment, etc.)

Modified from Goldstein, English et al. (1997) published Buddy Skills Training Program; Thiemann-Bourque et al., submitted to JSLHR)
Teacher Steps and Directions for Peer-Mediated PECS Intervention

- Always have peer sitting next to focus child
- Place Buddy PECS book between the two children
- Assign peer role of holding/being in charge of parts
- Say, “Remember to STAY, PLAY, and TALK; [name of peer], you can TAKE, SAY, AND GIVE if [name of focus child] gives you a picture to ask for [object].”
- Show peer the STAY, PLAY, and TALK flag and say, “If you forget to STAY, PLAY, and TALK, or TAKE, SAY, and GIVE, I will wave this flag to help you remember.”
- Once every 30 seconds, prompt PEER using least-to-most hierarchy
  1. Peer holds up object and looks expectantly
  2. Peer asks, “What do you want?”
  3. Peer points to picture symbol to cue focus child to request object
  4. Adult assists if peer is unsuccessful in eliciting a response from focus child
- Prompt peer to respond to focus child’s request: TAKE, SAY, and GIVE the item to the focus child
- Provide specific reinforcement and feedback; at end of activity show Star Card and give prize
Snack with 1 Trained Peer: After PM PECS Tx 14
Snack with Class: PM PECS Tx 20
A Communication Intervention for Preschoolers with Autism Learning to Use AAC (CI-PAAC) 2013-2017

• Staff:
  – Sarah Feldmiller
  – Stacy Johner
  – Brooke Brown
  – Alicia Williams
  – Molly Brandenberg

• Consultants
  – Howard Goldstein
  – Nancy Brady
  – Paul Yoder
  – Ann Kaiser

NIH Grant: R01DC012530-03
The Population

- Nonverbal or minimally verbal preschoolers
  - Less than 20 spontaneous ‘functional’ words, signs, or AAC symbols
- Educated with typically developing (TD) peers or access to TD peers during the day
- Team recommendation for AAC system
- English is primary language
- Peers without disabilities (buddies) recruited for one school year
The Study

- 12 children with autism recruited each year for 4 years, total N = 48 by end of study; up to 72 peers
- Cohort 1 and 2 complete; working with Cohort 3
- 23 children with autism; 45 TD peers
- RA each year of 6 children to Group 1 (Control) and 6 children to Group 2 (PM-AAC)
  
  **Group 1** - iPad and instruction provided on voice output app only (n= 24 by end of 4 yrs)
  
  **Group 2** – iPad instruction and PM-AAC Intervention (n= 24 by end of 4 yrs)
The Research Design

• Multiple baseline design strengthened by randomization of 6 pairs of children (similar profiles) to Group 1 or Group 2 at the start of each year; staggered start of intervention across the 6 pairs

  Group 1 – Extended baseline data collected once per week of child-peer play for 10-min

  Group 2 – Intervention data collected 2-3 times per week for 10-min; trained school staff

• Generalization and maintenance data
The Intervention

• School staff training
  – Use of iPad as SGD
  – Training peers without disabilities
  – Creating reciprocal dyadic play activities and multiple, fast opportunities for communication

• Teach children to use the iPad as SGD within engaging, supported social activities

• Peer-mediation intervention
  – Stay-Play-Talk (English et al., 1997; Goldstein et al., 1992)
School Staff Training

• 2.5 hour in-service on iPad and Touch Chat
  – Layout for child’s needs
  – Symbol selection and wording

• Group 1 – directions given to, “Do what you would normally do with the children during your time with them.”

• Group 2 - 1 hour additional training on training peers and setting up the environment for success

• Adult leads dyad in classroom interactions
iPad Instruction

• Touch Chat ($150)
• Locked down for communication use ONLY (Guided Access)
• Minimum 2 pictures on page – preferred item and a foil (to show discrimination skills)
• Discrimination training for 2 weeks – with adult partner
• After baseline – peer buddies taught to use same system
• Daily opportunities for communication with peers (and adults) – across the day
‘Stay-Play-Talk’: Buddy Training with SGD

Three 30-minute sessions with all peers (only)

Session 1:
- Sensitization Training (10-min): Video examples of ways children communicate (sign language, PECS, SGD, words)
- Introduction of **STAY** Buddy Steps  1. Sit close  2. If buddy moves, you move

Session 2:
- Review/recall of **STAY** Buddy Steps
- Introduce **PLAY** Buddy Steps  1. Share  2. Take turns playing

Session 3:
- Review/recall of **STAY** and **PLAY** Buddy Steps
- Introduce **TALK**  1. Look and listen  2. Push and talk
- Introduce **OTHER WAYS TO BE A BUDDY**
  1. Get buddy’s attention  2. Hold and Wait

(Stay-Play-Talk adapted from Goldstein, English & Colleagues, 1997)
Controlled Practice and Feedback

• Each peer is given Buddy Book (all steps with pictures and words)
• Adult instructs and models skill
• Adult-adult role play (if 2 adults)
• Adult-child role play; child-child role play
• Feedback and reinforcement ongoing, be SPECIFIC
• Peer joins focus child in play in classroom
• Visual reminders of Buddy skills in classroom (e.g., flag with pictures of steps; posters of Buddy Skills)
Buddy Steps
Stay, Play, and Talk

1. STAY
2. PLAY
3. TALK
Review of Step #1 Stay
Introduce Buddy Step #2: *Play*

1. Take Turns
2. Share
Buddy Step #2: *Practice Play*

1. Take Turns
2. Share
Video Buddy Step #3: *Talk*

1. Look and Listen  
2. Push and Talk
Practice Buddy Step #3: Talk
Other Ways to be a Buddy

1. Get Buddy’s Attention    2. Hold and Wait
Hold and Wait In Action...
After Peer Training: Adult Guidance

- Children paired up in dyads: focus child:trained peer
- Minimum 3 times per week, structured table-top social activity
- Adult review of Stay-Play-Talk and practice using the iPad for 3-5 min prior to play (10 min observation)
- Adult prompts successful social exchanges once every 30 seconds (as needed, if no interactions)
- Adult prompts peer first, then steps in if peer is unsuccessful
- Keep activities moving at a fast pace, monitor engagement and FUN factor for all children!
Treatment Checklist for PMI-SGD Intervention

**MATERIALS:**

- iPad with appropriate programmed buttons for the activity
- Flag with Buddy Steps: STAY-PLAY-TALK
- 1 trained peer
- Star card and prize box or preferred activity list (as a reinforcer)
- Activity has pieces or parts placed in plastic bin/container (opportunities to request)

**TEACHER STEPS AND DIRECTIONS**

- Teacher aided model – pairs objects with programmed button and says each phrase
- Peer aided model – pushes each programmed button and says each phrase
- Teacher prompts focus child to push each button, says each phrase, and encourages imitation
- Teacher follows 4 direct instruction steps for exchanging toys
  1. Teacher asks peer to push a button to request item from focus child
  2. Teacher prompts focus child to respond (e.g., give toy, answer with Go Talk)
  3. Teacher asks focus child to push a button to request item from peer
  4. Teacher prompts peer to respond (e.g., give toy, answer with Go Talk)
- Teacher assigns peer role of holding/being in charge of parts
- Show peers the STAY, PLAY, and TALK flag to remind them
- Free play: Once every 30 sec if there are no interactions – prompt PEER using least-to-most hierarchy
- Provide specific reinforcement and feedback; at end of activity show Star Card and give prize
Treatment Session #1: Play with Peer
Basic Social Communication Skills

Teach to increase child’s RANGE of functional communication

- Requests
  - For actions
  - For objects
  - For information

- Comments
  - About self
  - About others actions/objects

- Make suggestions/play organizers

- Gain/secure attention

- Social niceties

- Protests
Typical Outcomes of PM Communication Interventions

- Rates of initiations (defined by 3 sec pause)
- Rates of responses (within 3 sec of peer act)
- Increases in different functions or types of communication acts - requests for objects, requests for actions, comments, secures for attention, protest
- Teacher, parent, or other’s perceptions of changes in child affect, fun factor, etc.
- Peer perceptions of changes
Tell us what you thought of the buddy group!!

1. Did you enjoy being a friend in the group today?
   - 😞 😐 😊 not at all a little very much

2. Did you like the games and activities we played?
   - 😞 😐 😊 not at all a little very much

3. Would you like to be asked to come to the group next week?
   - 😞 😐 😊 not at all a little very much

4. Do you think your buddy had fun today?
   - 😞 😐 😊 not at all a little very much

5. Did you learn something about being a friend today?
   - 😞 😐 😊 not at all a little very much
Cohort 1 and 2 Outcomes to Date

• iPad only (Control) group (N = 11)

• iPad and PMI (Treatment) group (N = 12)
Children with Autism Communication to Peers: Rates of All Communication Behaviors in Baseline and Intervention

- **Control Group**: 1.5 acts per 10-min Sn
- **PM AAC Group**: 2.2 acts per 10-min Sn

**Average Spontaneous Focus Child Acts per 10-min Play Sn**
Average Spontaneous Peer Acts per 10-min Play Sn

Peer Communication to Children with Autism: Rates of All Communication Behaviors in Baseline and Intervention

<table>
<thead>
<tr>
<th>Group</th>
<th>Average Acts per 10-min Sn</th>
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<tbody>
<tr>
<td>Control Group</td>
<td>3.5</td>
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<td></td>
<td>5.9</td>
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<tr>
<td>PM AAC Group</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>22.5</td>
</tr>
</tbody>
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Cohort 1, Pair 2: Spontaneous Communication Acts/10 min

**Treatment Group Child**

- Baseline
- Treatment
- Unfamiliar Peer Probes

**Control Group Child**

- Baseline
- Extended Baseline
- Unfamiliar Peer Probes

Number of Sessions

# of Acts per 10-min Session
Cohort 1, Pair 4: Spontaneous Communication Acts/10-min

**Treatment Group Child**

- Baseline
- Treatment
- Unfamiliar Peer Probes
- Maintenance

**Control Group Child**

- Baseline
- Extended Baseline
- Gen Probes
- Unfamiliar Peer Probes
- Maintenance
Cohort 1 and 2 Generalization Outcomes

Generalization of Communication Skills for Children with Autism with Familiar (Trained) and Unfamiliar Peers (Untrained)

Average Acts per 10-min Sn

Control Group
- Baseline: 1.5
- Familiar: 1.3
- Unfamiliar: 1.3

PM AAC Group
- Baseline: 2.0
- Familiar: 4.9
- Unfamiliar: 9.3
Changes in Mode of Communication for Children with Autism in PMI Group: Cohort 1 and 2 Combined

Average per 10-min Session

- SGD: Baseline 0.4, Treatment 10.0
- Speech: Baseline 1.1, Treatment 4.1
- Gesture: Baseline 0.3, Treatment 1.9
- SpSGD: Baseline 0, Treatment 1.7
- Vocal: Baseline 0.3, Treatment 0.9
Changes in Mode of Communication for Trained Peers in PMI Group: Cohort 1 and 2 Combined

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<tr>
<td>Vocal</td>
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Play is an Important Outcome

• Play assessment with peer partner
  – Four 5-minute play sets (barn and animals, doll/dishes, trains and tracks, race car toy)
  – Administered pre- and post-intervention

Measures

• Object interest - # of different toys explored
• # of appropriate actions on objects
Changes in # of Different Toys Explored Between Control and PM AAC Groups Cohort 1

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Systematic and Effective Instruction

• If it’s not working, based on data, what needs to change?
  – Training to the instructor (SLP, teacher, para, TA)
  – Reinforcement system
  – Intensity of instruction
  – The instructional strategy or approach

(Johnston et al., 2003)

• Additional training of the peer, or change the peer
Final Helpful Hints for Implementation

• Create as many opportunities for peer interactions and peer-directed communication as possible - understand it may take years!

• Monitor progress in prelinguistic skills – gestures, JA, vocalizations, etc. directed to or in response to peers

• Challenge each child to expand their play repertoire – keep it simple, cause-effect activities, most followed by least preferred activities; stick with it

• Provide as much support as necessary for both child and peer to be successful – if you’re not needed, that is a good thing😊