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Peer-Mediated AAC Instruction for Young Children with Autism and other Developmental Disabilities

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Abstract

Many young children with developmental disabilities (DD) have significant delays in social, communication, and play skills. For those children learning to use augmentative and alternative communication (AAC), successful social interactions with peers will require explicit instruction on the same system for both communication partners. Peer-mediated (PM) interventions are recommended best practice based on more than 30 years of research with young children with autism and other DDs. Integrating direct AAC instruction within PM programs to advance social reciprocity in typical preschool routines is a necessary and important next step for young AAC users. In this article, I will summarize the design and outcomes of two PM AAC studies documenting positive social outcomes for preschool children with severe autism. I will also teach peer partners how to use AAC highlight strategies to recruit peers without disabilities systems (e.g., Picture Exchange Communication System [PECS], Speech Generating Devices [SGDs]), and engineer the preschool classroom for successful AAC communication. I will describe data collection procedures for measuring changes in reciprocal child and peer social communication interactions.

Because of the significant and often persistent communication impairments present in young children with developmental disabilities (DD) learning to use augmentative and alternative communication (AAC), teaching functional communication with peer partners should be a priority at an early age. Researchers have found extensive support for peer mediated (PM) interventions for improving social communication of young children with autism and other DD (Chan et al., 2009; Goldstein, Schneider, & Thiemann, 2007; McConnell, 2002; Reichow & Volkmar, 2010). Training peers without disabilities to be responsive communication partners leads to many social communicative gains for young children. These include increased requests, comments, secures for attention, offers to share or help, expression of affection, and play organizers (McEvoy et al., 1988; Odom, Chandler, Ostrosky, McConnell, & Reaney, 1992; Thiemann & Goldstein, 2004). For nonverbal or minimally verbal children with DD learning to use AAC systems, communication and social gains will depend on opportunities to communicate with responsive, trained peers. Unfortunately, to date, the majority of AAC intervention researchers for this population have not examined communication outcomes in natural contexts with typically developing peers. With adult communication partners, young children with autism successfully can learn to use PECS or a speech-generating device (SGD) to make requests (Preston & Carter, 2009; van der Meer & Rispoli, 2010). In one of the few studies to date measuring communication with peer partners, Schwartz, Garfinkle, and Bauer (1998) documented the effectiveness of teaching children with DD to use PECS to communicate in an integrated preschool classroom. In this paper, I will describe peer training strategies that were developed and examined in two pilot studies implemented with preschool-age children with autism to teach AAC use within natural preschool routines.

I will describe recommendations for using simple strategies such as 'Stay-Play-Talk' provided the incentive for developing the PM AAC interventions (English, Goldstein,

Shafer, & Kaczmarek, 1997). Researchers successfully trained peers to use the “Stay-Play-Talk” strategy in a short amount of time (Thiemann-Bourque, Brady, McGuff, Stump, & Naylor, in preparation; Table 1).

Teaching strategies and outcomes from the two studies focused on training peers to use PECS (Study 1) and to use an SGD (i.e., GoTalk 4; Study 2). I summarized clinical applications on setting up preschool classroom activities for AAC interactions, prompting strategies to encourage independent child-peer engagement with AAC systems, and measuring social communication progress. Although the studies in this paper focus on children with autism, the peer training strategies, environmental supports, and examples of data collection procedures to measure changes in social communication can be applied to young AAC users with other DDs.

Overview of PECS PM AAC Intervention: Study 1

The participants were four preschool children with severe autism (age range 3;0 to 5;1), and seven peers without disabilities (age range 3;4 to 4; 11). Following baseline observations in typical preschool activities with zero or very low rates of communication acts, researchers trained peers to use PECS in five 30-minute sessions. Researchers then paired peers up in dyads with one child with autism and reminded the children without disabilities to “Stay-play- and talk using pictures” during adult-supported classroom activities. The intervention ran for 18 to 23 weeks, and the children engaged in play 3–4 times per week for 10–15 minutes.

Overview of SGD PM-AAC intervention: Study 2

Participants were three nonverbal preschool children with autism and three typically developing peers who attended the same public school program. After baseline observations, researchers trained the three peers individually in three 30-minute sessions to “Stay-play-and talk using buttons” using a GoTalk 4 SGD. They then paired each peer in a dyad with one child with autism and reminded the typically developing children to “Stay-play-and talk using buttons” during adult-supported classroom social activities. The intervention ran for 8 to 9 weeks, and the children engaged in dyadic play 2–3 times per week for 10–15 minutes.

Suggestions for Recruiting Peers

Teachers recommended peers with age-appropriate social skills, that could listen and follow directions, and that had consistent school attendance. I recommend that the same group of peers participate for a period of 3 to 6 months. This gives the peers time to become more competent AAC users and to learn other responsive interaction skills. It also provides opportunities for generalizing social skills across partners and for friendships to develop. Recruiting 3 to 5 peers allows for peer rotation in the groups to decrease demands placed on individual peers and accounts for any absences.

Peer-Mediated Strategies for PECS AAC intervention: Study 1

We split up seven peers into two groups for training; the three youngest were trained together, followed by the four oldest. Training took place in a quiet room over 1 week (per age group). Two adults facilitated all training sessions, which lasted 30 to 45 minutes. The children with autism did not attend the peer training sessions. The facilitators modified the ‘Stay-Play-Talk’ PM preschool intervention (English et al., 1997) to teach peers to use PECS and be responsive social partners. All peer training sessions included (a) giving each child a Buddy Book with pictures and words of each buddy skill, (b) adult-adult role play, (c) adult-child role play, (d) child-child role play, (e) adult feedback and reinforcement for

correct skill use, and (f) review of buddy steps. Reinforcement included giving stars on a laminated star chart with small prizes earned for good listening and correct use of skills. The training schedule during the five sessions included:

Day 1 (45 minutes):

- 15 minutes of sensitization training on ways children communicate by viewing a videotape of preschool children communicating using PECS, sign language, and SGDs.
- 15 minutes of instruction on *Stay with your buddy*—(a) sit close and (b) when buddy moves you move—taught using role play, feedback, and reinforcement.
- 15 minutes of instruction on *Play with your buddy*—(a) share with your buddy and (b) take turns playing—taught using role play, feedback, and reinforcement.

Day 2 (40 minutes):

- 20 minutes of instruction on *Talk with your buddy using words* and teaching “Ask and Tell” (i.e., use words to *ask* for toys and use words to *tell* about the toys).
- 20 minutes of instruction on *Talk with your buddy with pictures* and teaching “Pick and Put” (i.e., introduce picture symbols from PECS to ask for toys and how to *pick* a picture and *put* the picture in adult’s hand to request).

Day 3 (45 minutes):

- 30 minutes of instruction on steps *Take-Say-Give*, facilitators taught peers to *take* the picture symbol from another child, *say* the word, and *give* the toy requested.
- 15 minutes of instruction on *Putting it all Together*, strategies combining *Pick and Put* with *Take-Say-Give* using preferred toys.

Day 4 (30 minutes):

- 30 minutes of instruction on *More Ways to Talk*, reviewing responsive social communication skills to (a) gain attention and comment (e.g., “tap on shoulder/say name, it’s a big ball”), (b) share toys (e.g., say “here you go”), (c) agree (e.g., say “okay”), and (d) use play organizers (e.g., say “let’s play”).

Day 5 (30 minutes)

- 30 minutes of instruction on all steps and material covered in first four sessions. A review of *Stay-Play-Talk with pictures* to interact.

Peer-Mediated Strategies for SGD AAC intervention: Study 2

The three peers each attended training sessions individually in a quiet room over 3 days. Two adults facilitated the training sessions. We decreased the number of training sessions in Study 2 to increase feasibility of the procedures and to determine if a shorter training period remained effective. The children with autism did not attend peer training. Facilitators again modified the ‘Stay-Play-Talk’ PM intervention to teach peers responsive social communication skills and to use the GoTalk to communicate with classmates with autism.

Peer training sessions included (a) through (e) as above for Study 1 with a similar reinforcement system. The training schedule during the five sessions included:

Day 1 (45 minutes):

- 15 minutes of sensitization training on different ways children communicate by viewing a videotape of preschool children communicating using PECS, sign language, and SGDs.
- 15 minutes of instruction on *Stay with your buddy*—(a) sit close and (b) when buddy moves you move—taught using role play, feedback, and reinforcement.
- 15 minutes of instruction on *Play with your buddy*—(a) share with your buddy and (b) take turns playing—taught using role play, feedback, and reinforcement.

Day 2 (30 minutes):

- 10 minutes of review of *Stay* and *Play with your buddy* from Day 1.
- 20 minutes of instruction on steps to *Talk using buttons*: Adult models, adult-child role play, and reinforcement/feedback to push two larger programmed buttons and two smaller programmed buttons on GoTalk. Peers taught to gain attention before using SGD and to respond to adult requests for toys using the GoTalk.

Day 3 (30 minutes):

- 30 minutes of instruction on *More ways to talk* with your buddy using words and pressing buttons on GoTalk at the same time including say a name and tell about it (e.g., say comments - “It’s a ball^{1/}”; “Mine is red”), share (e.g., say, “Here you go” or “Want this one?”) and take turns (e.g., say, “My turn” or “Your turn”).

Direct Instruction on AAC Use in the Classroom: Study 1 and Study 2

Following peer training, each child with autism was paired up with one trained peer at a table with a PECS book between them. Just prior to the start of the activity, the teacher said to the peer, “Remember to *stay*, *play*, and, *talk*, (name of peer). When (name of focus child) gives you a picture, you *take* the picture, *say* what the picture is, and *give* your buddy the toy on the picture. Then you put the picture back on the book.” The teacher then showed a flag that had the words “stay, play, and talk on it, and said, “If you forget to stay, play, and talk or take-say-give, I will wave this flag to help you remember.” The teacher then moved away to observe. If the peer and/or focus child did not interact within 30 seconds, the teacher prompted the peer to prompt the focus child. Prompts were provided in a least-to-most hierarchy: (a) peer held up desired object and waited 5 seconds (time delay prompt); (b) peer held up desired object and pointed to picture symbol on PECS book; (c) peer put picture symbol in focus child’s hand and asked, “Want ___?”; and (d) adult prompted focus child by touching elbow (or hand) to initiate picture exchange with peer. No prompts were provided if the dyad engaged in spontaneous communicative exchanges with or without using PECS.

In Study 2, facilitators introduce the GoTalk AAC system to the peers during peer training sessions, followed by introduction to the children with autism immediately following peer training within a classroom activity. See Table 2 for description of direct teaching steps provided to the peer-child dyad learning to communicate using the GoTalk.

Teachers used a least to most prompting hierarchy to encourage child-peer interactions during the SGD classroom AAC sessions: (a) adult prompted peer to show/tell focus child to push an appropriate button; (b) adult pointed to the appropriate button on the GoTalk for focus child; and (c) adult modeled expected request or comment and gave hand-over-hand prompt to focus child to push appropriate button.

Classroom Opportunities and Environmental Supports for AAC Use

We know that simply placing a child with autism in inclusive environments with typically developing preschoolers is not sufficient to increase social communicative interactions. Without adult guidance, this approach may lead to an increase in aberrant social behaviors, creating a situation in which peers withdraw from and perhaps actively avoid the child (Goldstein & Thiemann-Bourque, 2012). Teaching AAC use within peer-mediated interventions may lead to more efficient and effective communication exchanges and an increased understanding of behaviors of children with significant communication deficits.

Activities should be rewarding and preferred for all children and should be provided within small social groups where there is shorter wait time between turns and fewer social rules. For example, in both of our pilot studies we noted increased AAC communication during snack time, because food was a preferred item for all children. Other socially engaging activities included switch toys with cause-effect (e.g., remote control switch activated car), toys with lights (e.g., electronic ball popper toy), music, and toys with clear expectations (e.g., puzzles). The implementer placed objects in containers to create opportunities for requesting. Once the focus child began communicating requests, the roles were reversed and (if appropriate) the focus child was placed “in charge” of the objects. It is important to create many opportunities for practice within a short time. Our sessions ranged from 6 to 10 minutes, with 12 to 20 opportunities for AAC communication within each session. We also need to capitalize on daily social opportunities across the child’s day—such as greetings in the morning, calendar, and circle—time and adapt activities so that children have opportunities to communicate using the selected AAC system.

Measuring Changes in Peer-Directed Social Communication Skills

In order to measure functional communication changes with peers, observers should collect rates of specific social and communication skills within a certain time (e.g., 6, 8 or 10 minutes) prior to the start of peer training. This baseline period consists of pairing up the focus child with a peer and telling them to stay at the table (or on a carpet area) together. The AAC system should be available for use and should be placed between the two children. Following peer training, researchers then would collect data on social communication skills within dyadic play interactions in the intervention setting (e.g., centers, snack, or recess). Researchers can collect specific data based on communication mode (e.g., speech, AAC system, gesture), communication act (e.g., initiation or response), and communication function (e.g., request, comment, share, and gain attention). They can collect these measures based on total frequency of occurrence (i.e., rate) or based on occurrence during specific intervals (e.g., every 30 seconds, 1 minute, etc.). Observers commonly define initiations and responses based on a 3-second pause between a child’s communication acts, such that each initiation must be separated by a 3-second pause. Observers code a response if an act takes place within the 3-seconds following an initiation (or other response). They count rates of peer and adult prompts to show changes in spontaneous communication. Researchers collect rates of different communication modes, acts, and functions for both the focus child and the peer. Researchers can use peer data to report positive changes in communication and social interaction behaviors directed towards children with DD and as potential goals for establishing typical rates of behaviors for children with DD.

Review of PECS Peer Mediated Outcomes

Outcomes from our preschool PM PECS project revealed increases in total communication acts across the four children with autism following peer training. Average peer-directed communication acts increased from 0.1 (range 0–0.3) in baseline to an average of 5.4 (range 3.2–7.8) acts per 6-minute activity after peer training. Overall PECS use increased from an

average of 0 before training to 4.4 (range 2.8–5.4) following peer training. For the peers, average communication acts increased from 0.2 in baseline to 7.4 per session after training. The trained peers occasionally used PECS as a mode of communication (range 0.25–3.5 per session), but not as often as the children with autism. The majority of peer acts were responses to requests, averaging 6 per session compared to 1 peer initiation. Results demonstrate the effectiveness of training peers to be responsive partners. This outcome also suggests the need to teach turn-taking in addition to initiating and responding behaviors. For example, we observed that once the focus child initiated a request and the peer responded by giving the desired item, this would generally end the interaction (i.e., one initiation-response sequence per social turn) as there was no longer a need for the child with autism to communicate.

Review of SGD (GoTalk) Peer Mediated Outcomes

Outcomes from the preschool PM SGD project revealed an increase in total communication acts across all three children with autism following peer training. Spontaneous focus child communication acts (i.e., speech, gestures, and SGD use) averaged zero in baseline and increased to 6.3 per session (range of 5.4–7.1) during SGD instruction. Using the GoTalk, the children with autism increased their ability to make requests from an average of zero in baseline to 5.5 per treatment session. Use of gestures (e.g., giving toys, looking when peer asked child to look) was the second most common communication mode. Peers also increased their communication acts from an average of zero per baseline session to 11 during SGD instruction. Total initiations increased to an average of 4.5 per session and total responses increased to an average of 6.6 per session. These results suggest more balanced communication exchanges using GoTalk, with researchers observing higher initiations (i.e., 4.5 on average) compared to peer initiations using PECS (i.e., 1.0 on average). The peers communicated to their buddy with autism the most often during snack time, with total acts ranging from 14 to 18 per session.

Summary and Recommendations

The two pilot studies reviewed in this paper provide preliminary data on the effectiveness of a modified published peer training program (i.e., Stay-Play-Talk) on increasing social communication between children with and without autism. Teachers supported children's interactions in dyads 2–3 times per week for 10–15 minutes during typical classroom activities such as center play, switch toy play, and snack time. Following 3 to 5 peer training sessions (or 2 to 3 hours total training time), the effects on peer and focus child communication were immediate and rates of requests (and occasionally comments and secures for attention) increased steadily over the remainder of the course of treatment. The type of activity markedly influenced rates of AAC social communication, with snack being the most preferred activity across both studies. Setting up the social communication environment for success depends on a number of variables, including (a) recruiting appropriate peer partners, (b) number of children in the group, (c) selection of activity, (d) individualizing the AAC system to meet communication needs (e.g., number of pictures used for selection/exchange, number of locations programmed on SGD and vocabulary programmed on AAC system), and (e) prompting strategies to encourage peers to elicit focus child communication. Attending to these variables can lead to socially rewarding experiences for both peers and children with DD, experiences that could increase appropriate functional communication and decrease inappropriate social behaviors. These experiences may lay the foundation for relationships and friendships to develop in inclusive classrooms, a priority for children with significant social and communication deficits related to autism or other developmental disabilities.

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Table 1

Stay-Play-Talk Strategy

Buddy Step	Action
Stay with your friend	Sit close, when your buddy moves you move
Play with your friend	Share with your buddy and take turns
Talk to your friend	Use words and talk with pictures (PECS) or talk with buttons (SGD)

Table 2**Direct Teaching Steps to Use GoTalk within Dyad Play in Classroom**

<p>1. Social environment is set up to include:</p> <ul style="list-style-type: none"> • GoTalk programmed with 2 objects on larger buttons to make requests • GoTalk programmed with 2 “social phrases” on two smaller buttons (on top) • One trained peer • STAY-PLAY-TALK sign/flag to remind peers of skills learned during training. • One cooperative activity with multiple parts placed in a plastic bin/container
2. Teacher pairs up objects with large pictures on GoTalk and pushes button; says words out loud.
3. Teacher pushes small buttons (social phrases), says words out loud, and acts out request or action (e.g., “your turn”: give peer a turn; “look”: hold up toy in front to look).
4. Peer pushes each button on GoTalk once to practice; adult responds by reinforcing child for pushing all the buttons and saying the pictures out loud.
5. Focus child is prompted to push each button on GoTalk once to practice; adult responds by reinforcing child for pushing all the buttons and saying pictures out loud.
<p>6. Teacher implements the following 4 teaching steps for three different toys (or three activities that are part of one toy set):</p> <ul style="list-style-type: none"> a. Teacher asks peer to push a button to request item from focus child. b. Teacher prompts focus child to respond (e.g., give toy, answer with GoTalk). c. Teacher asks focus child to push a button to request item from peer. d. Teacher prompts peer to respond (e.g., give toy, answer with GoTalk).
<p>7. Teacher observes interaction, providing prompts for child-peer communicative interactions at least 12 times in a 6-minute session (once every 30 seconds).</p> <p>Note: If focus child is pushing buttons and not discriminating between two objects, teacher responds based on the function of the communication attempt and assigns meaning to act.</p>