Augmentative Communication Systems for Children with Autism Spectrum Disorders

Facilitating Conversations
Joe Reichle, Ph.D.

As children develop, their social exchanges become comprised of three distinct parts
- initiating
- maintaining
- terminating

Press *6 to mute your line.
Press #6 to unmute.
Initiation

Examples of initiation of interactions

- Joining an ongoing activity
- Beginning well-established routines
- Calling attention to novel events
- Protesting the actions of another

Initiation Challenges for Graphic Mode Users With ASD

- Initiations are rare compared to typical counterparts
- More likely to initiate to request (Over time, may lead to learned helplessness)
- Difficulty engaging in listener preparatory behaviors
  - selecting a listener
  - establishing proximity
  - obtaining attention
- Message-behavior may not be recognized as communicative
Examples of Maintaining a Conversation

- add no new information
  - acknowledge one’s partner
  - confirm a message
  - agree with a message
- add new information
  - elaborate on partner’s message
  - correct partner’s message
  - request clarification
    ALTERNATIVELY
    if one’s partner requests clarification, then repair

Communicative Repairs

- Modified Act
  - The child does one of the following:
    • -uses a different communicative means
      • different gesture,
      • different sound, or
      • different combination of gesture and sound
    • -changes a quality of the signal (e.g., obvious increases in loudness or a syllable added to the vocalization)
Components of Interaction:
Maintaining: Challenges for AAC users with ASD

- Asymmetry in turn-taking balance with vocal mode partner dominating

- Communication partner may actively participate in construction of AAC user's conversational turns.

- With learners who have limited vocabulary - Communicative partners tend to use utterances that require short, discrete responses and do not encourage continuation

- Children with ASD tend to exhibit a limited range of speech acts and communicative intents

- Children with ASD tend to have more restricted vocabulary
Challenges in Conversational Repair Among AAC Users with ASD

- Often fail to realize that their message was not understood.
- Tend to change topic without appropriate context
- AAC users with ASD often repair by repeating the failed utterance, rather than modifying the utterance.
- AAC users often fail to request a clarification in a failed interaction
- AAC users with ASD have a greater propensity to move to “challenging behavior” as a conversational repair strategy

Circumstances that promote termination of interactions

- Terminating an undesired interaction
- Terminating a desired interaction to accommodate a schedule
- Terminating a pleasant interaction because of a more attractive alternative
Components of Interaction: Terminating: challenges for AAC users

- May be unable to terminate efficiently or fail to use social cues to terminate at all (particularly learners extensive communicative repertoires).

(May simply disengage when distracted by someone else or another activity)
Participants in Light, Collier, & Parnes (1985)
- 4-6 years
- physically handicapped
- cognitively typical
- typical receptive language skills
- direct select communication board user for 6 mos. prior to research
- 100 symbol vocabulary
- normal hearing
- normal vision

Turn Opportunities
AAC users utilized only 50% of turn opportunities available
Of Total Initiations-
mean probability of caregiver initiations
  » .85
mean probability of AAC user initiations
  » .15

Caregiver Responses
AAC users were less successful in eliciting caregiver responses when initiating
- caregivers responded to 78% of child responses
- they responded to 46% of child responses in which child initiated a new topic
INTERVENTION TO INCREASE CONVERSATIONAL MAINTENANCE

Using social routines as an intervention context

- routines are repetitive, predictable, turn-taking games and rituals (peek-a-boo, pat-a-cake, feeding)
- the predictable structure may help children remember their interactive role
- slight variations in routines may be particularly salient to children, enhancing adult models
- responsive teaching strategies
How do children progress in learning to imitate vocally?

- contingent vocalizations
  - vocal contagion
  - child initiated imitation
  - adult initiated imitation

Child Initiated Imitation

- Temporal proximity
- Form proximity

Form increasingly close
Early Exchanges Between Children and Caregivers

- 5 months: TAKE (receive object from reach)
- 6-8 months: GIVE (extend to another and relinquish)
- 7-8 months: BID FOR RETURN OF OBJECT (open and close hand)
- 8-11 months: GIVE
- 8-13 months: SHOW
- 8-10 months: CONVENTIONAL BID FOR RETURN (e.g., pound fist)
- 10-11 months: VOCALIZATIONS EMBEDDED INTO GAME
- 9-14 months: POINT

(Bates et al., 1975; Carpenter, Nagell, Tomasello, 1998; Crais, Douglas, & Campbell, 2004; Masur, 1983)

The Importance of Joint Attention

- Children who spent more time in mother/child dyads joint attention routines between 12-18 months had larger vocabularies at 18 months of age.
  
  Tomasello and Todd (1983)

- Mothers who more often followed their child’s lead had children with larger productive vocabularies.
  
  Tomasello and Farrar (1986)
Areas of Joint Attention Difference Include

- Referential Looking-Gaze attention between object and adult
- Declarative Pointing and Showing-Pointing to share information with others
  Charman et al. (1997)
  Wetherby Prizant & Hutchinson (1998)
- Receptive/Responsive Joint Attention -Looking When Others Look and Point
- Social Referencing-Using adult behavior to influence one’s own actions
  Sigman Kasari Kuos & Yirmija (1992)

Pointing/Joint Attention

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-10 months</td>
<td>Follow a gaze</td>
</tr>
<tr>
<td>10-12 months</td>
<td>Follow a point</td>
</tr>
<tr>
<td>12-14 months</td>
<td>Protoimperative pointing</td>
</tr>
<tr>
<td>14-16 months</td>
<td>Protodeclarative pointing, Begin to show objects</td>
</tr>
</tbody>
</table>
Facilitating Receptive Joint Attention

Receptive-
- Have item move into envir. When learner is not looking. As interventionist points at the item have the item activate to draw learners attention.
- Continue this pairing
- Provide just the point without the event activating

Facilitating Expressive Joint Attention-Requesting

- Offer item of interest to learner and let him take it.
- Once reaching is established, offer item from greater distance. As learner reaches for it, deliver item quickly
- Continue to fade distance
Cognitive flexibility

• Difficulty shifting attentional focus from one stimulus to another.

• Children with autism have been shown to have difficulty with attention shifting.

Possible Intervention

Discontinue one preferred activity to move to another
  - signaled delay
  - visual schedules
Disengaging momentarily from activity
Inhibition

The ability to stop oneself from carrying out a well-practiced response when that response would not be appropriate.

Inhibition deficits have been associated with:

• Obsessive compulsive disorder
• Attention deficit/hyperactivity disorder

The Yellow Post-It program

• Implement graphic schedule

• Have study halls placed frequently

• Shift uncompleted work to one of the “study hall” areas on the visual schedule.
Social Cognition

- Taking the perspective of others
- Attribute mental states and characteristics to others
  - behavioral intentions
  - attention
  - affect
  - prior experience
  - shared/non-shared knowledge

Theory of Mind

The ability to make inferences about what other people believe to be the case in a given situation
Barrier Games

Matching task in which a barrier is established between two children.

Speaker- Has picture to describe (collie).
Listener-Has four related pictures.
(collie, lab, Dalmatian, cat with same colors as collie, horse with same colors as collie)

Coaching can be used to facilitate more effective communicative exchanges

Play as a potential Facilitator of Conversation

- strong correlations have been found between symbolic play, vocal imitation, and language production in typically developing children (Bates, Benigni, Bretherton, Camaoni, & Volterra, 1979)
- symbolic play is also a strong correlate of early language development among children with mental retardation (Casby & Ruder, 1983)
- correspondence between the emergence of combinatorial behavior in language and play (McCune-Nicholich, 1981)
Play skills correlate strongly with communicative ability in both normal and language delayed/disordered populations

- vocabulary diversity
- utterance length
- utterance frequency

<table>
<thead>
<tr>
<th>Age</th>
<th>Props</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 mo.</td>
<td>- Uses one realistic object at a time</td>
<td>- Everyday activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Puts lids on pans</td>
</tr>
<tr>
<td>22 mo.</td>
<td>- Uses two realistic objects at a time</td>
<td>- e.g., feeds mother, than feeds doll</td>
</tr>
<tr>
<td>30 mo.</td>
<td>- Uses two realistic objects at a time</td>
<td>- Less frequently occurring activity</td>
</tr>
<tr>
<td>36 mo.</td>
<td>- Uses two realistic objects at a time</td>
<td>- Activity that was observed but not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>experienced</td>
</tr>
<tr>
<td>42 mo.</td>
<td>- Imaginary props</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Miniature props</td>
<td></td>
</tr>
</tbody>
</table>

Press *6 to mute your line.
Press #6 to unmute.
Development of Symbolic Play

- **Decontextualization:** Producing an action or action combination using objects that are not realistic or are in a different context than the action usually happens
- **Decentration:** Using others as agents and/or recipients of actions
- **Sequential Organization:** Organize actions in sequence

Facilitating Spontaneity in Maintaining/Conversations

**HIGH PROBABILITY REQUESTS**

Davis and Reichle (1996) used HPR to increase AAC users’ participation in conversational maintenance.
- 2 intermediate school students
  - both used electronic communication devices
  - both used their devices primarily to respond to queries that required a response
  - neither used their system to initiate conversation
  - both did not often take advantage of opportunities to maintain conversation
High-Probability Requests

Procedure:
- deliver high-p utterances at a logical point in conversation
- wait 10 seconds
- deliver an elaboration
- deliver the low-p utterance

Press *6 to mute your line.
Press #6 to unmute.

Press *6 to mute your line.
Press #6 to unmute.
Ensuring Correct Use of Yes/No

- Reject/accept vs. confirm/deny
- Teach only one active response initially
- Subsequently add the second
INTERVENTION TO INCREASE CONVERSATIONAL INITIATIONS AND CONTINUATION

Press *6 to mute your line.
Press #6 to unmute.

Establishing a Conversation Notebook

- Often topics don’t get introduced because the listener doesn’t understand the speaker’s communicative overture

- Often the AAC user, when placed in a challenging situation, can’t remember topics to introduce
Steps in establishing a conversation notebook

1. Select a receptacle for symbols representing key topics about which a learner may wish to communicate.
2. Create a mechanism to select symbols.
3. Decide (in consultation with the learner) where to place symbols on display.
4. Teach the strategy described by Goetz et al.

Basic Conversational Strategy
(From Hunt, Alwell, & Goetz, (1991)

“Turntaking” 1 Question or Answer. *Question or Comment

“Turntaking” 2 Answer. Question Answer. *Question or Comment

“Turntaking” 3 Answer. Question Answer. *Question or Comment

*on a topic on student’s menu
**Teaching an Initiation (and Continuing) Strategy**

Press *6 to mute your line.
Press #6 to unmute.

---

**Example of Introduction Strategies**

Sam, uses a voice output communication aid. The following introductory message was placed on his main page:

Hi, I’m Sam. I understand just fine so don’t talk loud. You can hear my message once I finish picking pictures that express what I want to communicate. Please give me a few minutes to answer. I may be slow, but it’s worth waiting for!”

Press *6 to mute your line.
Press #6 to unmute.
SCRIPTING

• “A script is an audio-taped or written word, phrase, or sentence that enables young people with autism to start or continue conversation (McClannahan & Krantz, 2005).”

Script Fading

- After a learner can reliably use a script,
- The script is systematically faded using backward chaining (back to front).
- After fading, a learner may continue to use the script even though the script is not present
- The learner may combine parts of scripts or language used by their conversational partner thus which creates increasingly more novel communication (McClannahan & Krantz, 2005).
Scripts (with fading procedures) have been used with young children and adolescents with autism

Audio taped scripts (Stevenson, Krantz, & McClannhan, 2000)

Textual scripts (Krantz & McClannhan, 1998; and Sarokoff, Taylor & Poulson, 2001)

Scripting Procedures Have Included:

- Initiating communication about an impending event or completed activity (Krantz & McClannhan, 1998)
- Initiating an observation about objects present in the environment, (Sarokoff, Taylor & Poulson, 2001)
- Using conversational skills during shopping trips (Brown, 2003)
Providing the Correct Phrases in the Script

- We already discussed Introduction Phrase
- Teaching Conversational repair overtures
  “I don’t understand”, “Tell me in another way”, “requesting help”

Sometimes standard phrases can be built into a script that may be useful in a variety of activities-

- For example, when completing an activity:
  - “May I go play?”
  - “Look what I finished”
  - “I think I’m done, come look”
Pierce and Schreibman (1997)

- Two children with autism, Derek (7 yr) and Stan (8 yr) with IQ scores of 76 and 50, and 8 typical peers participated.
- Both children utilized some language (typically requests).
- Derek’s and Stan’s peer trainers were 8 years old and were from different classrooms.
- Two other children from different classrooms served as generalization peers without any special training.
- A multiple baseline design was used across peer trainers, and was replicated across the 2 participants.

Training occurred during recess in the classroom for Derek and in a recreation room for Stan.
1. *Maintaining Interactions* in same verbal or nonverbal activity as peer. During intervals of peer initiations, desired responses included complying with request.

2. *Initiates conversation*: initiating communication that was not in direct response to a preceding question. It also included utterances occurring at least 5 s after a preceding communicative act.

3. *Initiates play*: any initiation of novel play or game (verbal or nonverbal).

Investigators found that utilizing multiple peer trainers may enhance generalization.

- Both children engaged in their newly learned social skills with generalization peers
- At baseline, interactions between the children and their generalization peers were nonexistent,
- After treatment, interactions reached levels of 100%.
**Video Modeling and Imitation**

- **Modeling**
  - “the process in which an individual referred to as a ‘model’ demonstrates a behavior that can be imitated by another person”

- **Video Modeling**
  - Behavior is demonstrated on a TV
  - The videotape is viewed repeated by the autistic individual.  
    (Corbett, 2003)

---

**Video Modeling**

- Children are uncomfortable with human interactions.
- Children will model their behavior after the “verbalizations and actions” of what they see on TV.

(Corbett, 2003)
What has been taught with Video Modeling

- Identifying Particular Emotions in Faces (Corbett, 2003)
- Traffic safety (Racicot & Wogalter, 1995)
- Social/Play skills (Dowrick, 1986)

Effects of Video Self-Modeling on Spontaneous Requesting in Children with Autism

(Wert and Neisworth, 2003)

- Purpose
  - Test Video Self-Modeling for improving social-communicative development.
  - Focus on a particular social deficit in autism
  - 4 preschool children with autism

- Preschoolers lacked Spontaneous Requesting Behaviors
- Children were taped during play sessions where trained behavioral therapists would try to elicit spontaneous requests.
- Recordings were edited down to five minutes showing only desired requesting behaviors
- Children viewed their own tapes every day for five days.
VSM Study - Results

- Increased the number of spontaneous requests substantially
- Skills were maintained
- Generalization to school environment

(Wert and Neisworth, 2003)

VIDEO MODELING-EFFECTS ON CONVERSATIONAL SKILLS

- Three boys (2 preschool and one early elementary) observed videotaped conversations consisting of two people discussing specific toys.
- All children were verbal and could answer simple questions, generally in three- or four-word phrases.
- Generalization of conversational skills learned was assessed with untrained topics of conversation; new stimuli (toys); unfamiliar persons, siblings, with peers who had ASD; and other settings.
- Results indicated that the children learned through video modeling, generalized their conversational skills, and maintained conversational speech over a 15-month period.
- Video modeling showed promise as a rapid and effective procedure for conversational speech.

Charlop & Milstein (1989)
- Interventionist: What do you have?
- Child: A car. Are you holding something?
- Interventionist: Yes, a boat. What's in your boat?
- Child: A duck. Is there something in your boat?
- Interventionist: Yes, a dog. Do you want to play with the toys?
- Child: Yes. Can I play with the dog?
- Therapist: Yes.

Prior to the video- child was asked to sit and watch T.V.
Initially, a conversation was modeled three times
Subsequently child assessed to see if the modeled conversation was used with the interventionist eg "Let's do the same" before providing the first line of the conversation.
Child and interventionist held the toys used in videotapes.
Correct answers and comments were acknowledged, questions were answered, and access to requested toys was provided.
• All 3 boys acquired and generalized conversational speech after exposure to the modeling procedure
• Conversational skills maintained at 15 months follow-up,
• There were increases in question asking, and spontaneous response variation
• The number of un-modeled, new responses provided during conversations with the therapist increased for all children