Peer-Focused AAC Intervention for Middle Schoolers with Multiple Disabilities who are Presymbolic Communicators
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• As a result of the interplay between a variety of intrinsic and extrinsic factors, some individuals with multiple disabilities are presymbolic communicators, i.e.:
  • They use primarily idiosyncratic facial expressions, vocalizations, and body movements to communicate;
  • They may be using some emerging symbolic communication, although often still idiosyncratic and inconsistent (Iacono, Carter, & Hook, 1998)
• Communication partners shouldered much of the responsibility in ensuring interactions with these individuals are successful given the difficulty associated with recognizing and interpreting presymbolic communication (Iacono et al., 1998)

Middle-School Students with MD
• Alyse (pseudonym)
  • 12
  • Movement of head, face, and arms; non-ambulatory
  • Facial expressions and movement communicated a limited repertoire
• Van (pseudonym)
  • 13
  • Movement throughout body; non-ambulatory
  • Pre-symbolic facial expressions, vocalizations, and movement were primary communication; emerging use of idiosyncratic symbols (gestures, facial expressions) with some consistency
• Frankie (pseudonym)
  • 16
  • Movement throughout upper body; non-ambulatory
  • Facial expressions and movement communicated a limited repertoire

Middle-School Students with MD, continued
• All of the students with MD were enrolled in the same self-contained special education classroom
  • The classroom housed upwards of 5 paraprofessionals (some full-time, some temporary) at a given time and a student teacher
  • All the professionals in the classroom interacted with all the students
• All of the students lived at home with their families
The Problem

• Middle schoolers who are presymbolic communicate with a variety of communication partners throughout their day
• Given the idiosyncratic and often subtle nature of their communicative behavior, communication partners may miss communicative behavior or interpret it in differing ways (Carter & Iacono, 2002; Iacono et al., 1998)
• Unfortunately, inconsistent responses from communication partners can make the already difficult process of language development for individuals with multiple disabilities nearly impossible, and a lack of responsivity can even cause presymbolic communicative behaviors to extinguish (Iacono et al., 1998)

A Potential Solution

• Supporting communication partners to recognize and distinguish between the communicative behaviors of individuals with multiple disabilities is a theoretically promising approach to AAC intervention for individuals who are presymbolic communicators
• A range of communication partners might benefit from such an intervention
• However, Alyse, Van, and Frankie both interacted 3-4 days a week with peers as part of an elective program
  • All three students enjoyed these interactions, so
  • The frequency and motivation associated with these communication partners made them good candidates for the current study

Goal of the Study

• Evaluate the effect of a video training on familiar peers’ judgements when viewing video of students with multiple disabilities
• Independent variable: short video training using mobile technology
• Dependent variable
  • Accuracy (0-18) in judging 18 video clips displaying behavior of the students with multiple disabilities
  • 6 of Alyse (2 – Communicative Behavior #1, 2 – Communicative Behavior #2, 2 – Non-Communicative Behavior)
  • 6 of Van (2 – Communicative Behavior #1, 2 – Communicative Behavior #2, 2 – Non-Communicative Behavior)
  • 6 of Frankie (2 – Communicative Behavior #1, 2 – Communicative Behavior #2, 2 – Non-Communicative Behavior)

Identifying Communicative Behaviors

• Interviewing the teacher
• Interviewing a parent
• Finding common ground (most of the ground was common)
• Reviewing video
• Identifying the most frequently occurring behaviors
Target Communicative Behaviors

<table>
<thead>
<tr>
<th>Ayse</th>
<th>Van</th>
<th>Franke</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Linguistic Map</strong></td>
<td><strong>Operational Definition</strong></td>
<td><strong>Communicative Behavior #1</strong></td>
</tr>
<tr>
<td>&quot;That’s funny.&quot;</td>
<td>Smiles</td>
<td>&quot;Yes, I want it.&quot;</td>
</tr>
<tr>
<td>• Moves hand/arm</td>
<td>• Moves head down</td>
<td>• Extends arm toward person/object</td>
</tr>
<tr>
<td>&quot;I want it.&quot;</td>
<td>• Shakes head</td>
<td>• Moves hand/fingers</td>
</tr>
</tbody>
</table>

| **Linguistic Map** | **Operational Definition** | **Communicative Behavior #2** |
| "I’m unhappy." | Moves eyebrows down and together | "I don’t want it." |
| • Moves hand/arm | • Vocalizes a sound that starts with a "buh" | • Extends arm with palm out to push person/object away |

**Method:**

- **Method:** Design

- **Pretest-posttest control group design (Campbell & Stanley, 1966; Campbell & Stanley, 1963)**

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\begin{align*}
R & \times X_1 \quad O \quad X_2 \\
R & \times X_1 \quad X_2
\end{align*}
\]

**Method: Participants**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Family Member at Home</th>
<th>Faced with Difficulty</th>
<th>Length of Handicapped Relationship with Person with Handicaps</th>
<th>Spoken Language of Early Intervention Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>M</td>
<td>Yes</td>
<td>Yes, Pretest</td>
<td>No</td>
<td>Yes, Pretest</td>
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<td>2</td>
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<td>12</td>
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<td>M</td>
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<td>Yes, Pretest</td>
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<td>Yes, Pretest</td>
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<td>Yes, Pretest</td>
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<td>Yes</td>
<td>Yes, Pretest</td>
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<td>Yes, Pretest</td>
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</table>
Method: Materials

Probe Response Forms
- Probes allowed participants to write their judgement of 18 short video clips
  - Communicative: Y/N?
  - If so, what's being communicated?
- Different versions were created and counterbalanced so participants completed different probes for the pre- and post-tests

VideoVSD Software (Jakobs, Invotek)
- Allowed video to be chunked into video visual scene displays
- The VideoVSD software was used both to:
  - Provide stimuli for the pretest and posttest probes, and
  - Provide a the content and context for the video training (i.e., the independent variable)

Method: Probe Procedures

- With the response form in front of him/her, the participants viewed 18 video clips (each repeated twice) in the VideoVSD software and responded to the following prompt on the Probe Response Form for each of the 18 items:

<table>
<thead>
<tr>
<th>Clip</th>
<th>Was the person communicating?</th>
<th>Circle one: Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If yes, what was the person communicating?</td>
<td></td>
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<td></td>
<td>How sure are you about your decision?</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>I just guessed</td>
<td></td>
<td></td>
</tr>
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<td>2</td>
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<td>4</td>
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</tbody>
</table>

Method: Intervention Procedures

- After introducing the task and providing participants an opportunity to express buy-in (Kent-Walsh & McNaughton, 2005), the investigator modeled using the app to create hotspots on the video VSDs of each of the target communicative behaviors
  - Hotspots mirrored the linguistic maps reported by expert partners
  - The investigator also operationally defined the behavior
- Then, participants engaged in independent practice creating hotspots for video VSDs, receiving feedback from the investigator

Method: Analysis

- Pretest scores were subtracted from posttest scores to create a gain score for each participant
- Then, an ANOVA was completed to compare the gain scores of the two groups (i.e., experimental and control)
Results

<table>
<thead>
<tr>
<th>Participant</th>
<th>Pilot Score</th>
<th>Control Score</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>15</td>
<td>13</td>
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<td>2</td>
<td>8</td>
<td>16</td>
<td>8</td>
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<td>3</td>
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<td>12</td>
<td>9</td>
<td>13</td>
<td>10</td>
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</tbody>
</table>

| Mean(SD)    | 9.5(3.2)    | 8.5(2.8)      | 8.5(2.8)    |

Results

Discussion

> summary(aafuk)

```
   DF    Sum Sq mean sq  F value   Pr(>F)
DataGroup       2  610.0  305.00  78.07  1.09e-08 ***
Residuals       22  175.0  8.0000
```

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
Discussion

- Using a three-tiered analysis (Light, 1989; Light, 1999):
  - At the molar level, experimental group performance increased markedly from pretest to posttest while control group performance did not,
  - At the intermediate level, every participants’ performance was consistent with the overall findings, and
  - At the molecular level, participants who performed relatively well in the pretest also performed relatively well in the posttest; however, variation was much higher among pretest than posttest scores for the experimental group
- The video training seemed to be an effective approach to increasing middle school peers’ performance in identifying communicative and non-communicative behaviors in individuals with multiple disabilities

Discussion: Research Implications

- Consistent with research focused on professional communication partners (e.g., Carter & Iacono, 2002), peers do not always pick up on the idiosyncratic communication of individuals with multiple disabilities;
  - When they do recognize communicative behavior, they often ascribe meaning far different than the meaning interpreted by expert communication partners
- Thankfully, a very short and simple video training seemed to support peers’ discrimination between communicative and non-communicative behavior and their performance in ascribing accurate and consistent meaning to communicative behavior

Discussion: Limitations

- Relatively small n (n=24), limiting generalizability of results
- Probe measures did not evaluate application of learning
- Not all participants received the intervention
  - Although this is being addressed outside the study
- Students with multiple disabilities had potentially communicative behaviors that were not targets in the intervention
- The intervention was evaluated on only one communication partner demographic group (i.e., peers)

Discussion: Future Directions

- Evaluate video training with other partner groups
  - Professionals (e.g., paid care providers)
  - Distant relatives, family friends, etc.
- Evaluate the impact of video training on responsivity in interactions
- Evaluate other interventions that may support the effectiveness of communication partners of individuals who are presymbolic
- Evaluate intervention introducing video VSDs to individuals who are beginning communicators for their expressive communication
Challenges

Head-On: Addressing Challenges

• How can we maximize the certainty with which we ascribe meaning to the communication of individuals who are not yet using symbols to confirm such ascription?
• What sources of information can we gather and synthesize?
• What information should be prioritized or weighted most heavily?

Head-On: Addressing Challenges

• Are there strategies we can draw upon or conditions we can create that will maximize the equity of interactions and relationships between school-aged and older individuals who are pre-symbolic or early symbolic communicators and their peers?

Head-On: Addressing Challenges

• What outcomes might be most important to consider from both a language development and quality of life standpoint?
• How can we measure with sensitivity more incremental changes that could be occurring before the emergence of symbolic communication?