Effects of Interventions that Include Aided AAC Input on the Communication of Individuals with Complex Communication Needs: A Meta-analysis

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Background

- The primary channel of language input provided to most individuals who use aided AAC systems is in the form of spoken language (Light, 1997).
- However, multimodal AAC is their primary channel of expression, resulting in an asymmetry between the input mode and the expected output mode (Smith & Grove, 2003).
- Aided AAC input occurs when a partner points to (or activates) aided AAC symbols while speaking with an individual who uses AAC.

- Aided AAC input may retard input-output asymmetries by providing linguistic input using both speech and AAC (Light, 1997; Smith & Grove, 2003).
- Various names have been used to describe aided AAC input: natural aided language (e.g., Cafiero, 2001); aided language modeling (e.g., Drager et al., 2006); aided language stimulation (e.g., Gooren's, 1989); and natural aided language (e.g., Cafiero, 2001).

Goals of the current study:

- Determine the effect of interventions including aided AAC input on the expression and comprehension of individuals with developmental disabilities who use AAC.
- Evaluate how effects may differ by variables related to participant, intervention, or outcome characteristics.
- Assess the strengths and limitations of the existing evidence.
- Consider clinical implications and directions for future research.

Methods

Inclusion Criteria:

- Included participants with developmental disabilities who used AAC.
- Included aided AAC input in isolation, or in combination with other intervention components.
- Used an experimental or quasi-experimental design.
- Reported outcomes on comprehension and/or expression.
- Published in a peer-reviewed journal or approved as dissertation of thesis.

Results of Single Case Studies

The single case studies involved 88 participants. The mean effect size (Tau-U) was 0.83 (range: 0.18 - 1.00), indicating a very large overall effect. Below, results are summarized by participant, intervention, and outcome characteristics.

Effects by Participant Characteristics

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number of cases</th>
<th>Tau-U</th>
<th>Level of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autism</td>
<td>6</td>
<td>0.90</td>
<td>Very large</td>
</tr>
<tr>
<td>Autistic</td>
<td>47</td>
<td>0.63</td>
<td>Very large</td>
</tr>
<tr>
<td>Intellectual</td>
<td>58</td>
<td>0.67</td>
<td>Very large</td>
</tr>
<tr>
<td>Down's Syndrome</td>
<td>4</td>
<td>0.86</td>
<td>Very large</td>
</tr>
<tr>
<td>Developmental</td>
<td>7</td>
<td>0.57</td>
<td>Moderate</td>
</tr>
<tr>
<td>Age</td>
<td>34</td>
<td>0.74</td>
<td>Large</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>21</td>
<td>0.86</td>
<td>Very large</td>
</tr>
<tr>
<td>Down's Syndrome</td>
<td>19</td>
<td>0.90</td>
<td>Very large</td>
</tr>
<tr>
<td>Developmental</td>
<td>10</td>
<td>0.94</td>
<td>Very large</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>6</td>
<td>0.97</td>
<td>Very large</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>0.88</td>
<td>Very large</td>
</tr>
<tr>
<td>Diagnosis age</td>
<td>24 to 36 months</td>
<td>0.68</td>
<td>Large</td>
</tr>
<tr>
<td>6 to 12 months</td>
<td>23</td>
<td>0.87</td>
<td>Very large</td>
</tr>
<tr>
<td>1 to 6 months</td>
<td>18</td>
<td>0.89</td>
<td>Very large</td>
</tr>
</tbody>
</table>

Results of Group Studies

- Effects by Intervention Characteristics:
  - Number of cases: 56, Tau-U: 0.88, Level of Effect: Very large.
  - Number of cases: 66, Tau-U: 0.79, Level of Effect: Large.

- Nature of input:
  - Keyword: 88, Tau-U: 0.84, Level of Effect: Very large.
  - Full phrase, multiple symbols: 9, Tau-U: 0.91, Level of Effect: Very large.
  - Semantic symbol: 13, Tau-U: 0.72, Level of Effect: Large.

- Intervention components:
  - Partner: 102, Tau-U: 0.84, Level of Effect: Very large.
  - Isolated: 20, Tau-U: 0.77, Level of Effect: Large.
  - Multiple locations: 60, Tau-U: 0.88, Level of Effect: Very large.
  - Time spent in intervention: 62, Tau-U: 0.72, Level of Effect: Large.

- Effects by Outcome Characteristics:
  - Nature of outcome measure: 96, Tau-U: 0.84, Level of Effect: Very large.
  - Comprehension: 12, Tau-U: 0.76, Level of Effect: Large.
  - Language domain: 57, Tau-U: 0.76, Level of Effect: Large.
  - Semantics: 35, Tau-U: 0.85, Level of Effect: Very large.
  - Morphosyntax: 30, Tau-U: 0.93, Level of Effect: Very large.

Discussion

- Individuals with developmental disabilities and complex communication needs associated with various diagnoses, ages, and language skills can derive benefits in both expression and comprehension across the domains of pragmatics, semantics, and morphosyntax as a result of interventions that include aided AAC input.

Limitations and Future Research

- Considerable variability in the goals and delivery of aided AAC input across studies results in difficulty specifying best practices.
- Only two comparison (group) studies.
- Few studies provided information regarding the rate of aided input.
- Telegraphic models may guide production of specific target behaviors, but may potentially limit development of comprehension and advanced expressive skills.

Future research:

- Explore the impact of implementation factors associated with aided AAC input on communicative outcomes.
- Procedure, intensity of models.
- Uptake by participants.
- Use in multiple contexts.
- Examine the use of aided AAC input to support comprehension of morphosyntax.
- Investigate strategies to reduce demands on partners implementing aided AAC input.
- Examine the effects of partner input (aided and unaided) on long term language development.

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