Children Learn to Use Iconic Gestures with Different Words Through Exposure

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Introduction
• Children often gesture when speaking (McNeill, 1992).
• Iconic gestures depict aspects of concrete events and objects (e.g., the bouncing motion or round shape of a ball).
• Iconic gestures are used at different rates with different word types.
• Japanese monolingual adults gestured more with sound symbolic words (SSW; 97%) than verbs (40%; Kitah, 1997).
• In SSWs, an aspect of the sound relates to the word’s meaning, as for onomatopoeia (e.g., boing or pyon referring to jumping).
• 3- and 5-year-old Japanese monolinguals gestured more with descriptions containing SSWs (85%) than other words (40%: 55%; Kita, Özyürek, Allen & Ishizuka, 2011).
• They proposed that iconic gestures and SSWs are linked early in development because they share an underlying mental representation.
• But iconic gestures rates with SSWs increased with age.
• There is evidence that children learn gesture use from their caregivers (Özyürek & Goldin-Meadow, 2005).
• Similar amounts and types of gestures were produced by children and caregivers.
• Therefore, Japanese children might learn that SSWs and iconic gestures are strongly linked through exposure to their co-expression.

Methods
1. Are children’s iconic co-speech gesture rates linked consistently to specific word types across different languages? (Monolingual study)
   • SSWs are more frequent in Japanese than English or French. Thus we compared Japanese monolinguals’ gesture rates with SSWs and manner verbs (MV) that conveyed the same information.
   • Gesture rates with SSWs were compared across Japanese-, English- and French-speaking monolinguals.

2. Is the production of word-specific gesture rates learned through co-speech gesture exposure? (Bilingual study)
   • Compared to monolinguals, bilinguals have reduced exposure to each language.
   • Japanese-speaking bilinguals have reduced exposure to the frequent co-expression of SSWs and iconic gestures.
   • Bilinguals have exposure to the co-expression of SSWs and iconic gestures in each language, which is comparable to same-aged monolinguals’ exposure.

Results
• 3 groups of monolinguals aged 4- to 6-years.
  - 1 group of English-Japanese bilinguals and 2 groups of French-Japanese bilinguals aged 4- to 6-years.

<table>
<thead>
<tr>
<th>Language group</th>
<th>N (n male)</th>
<th>Age (y/m)</th>
<th>Vocabulary score (raw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English monolingual</td>
<td>22 (13)</td>
<td>4.10</td>
<td>63.96</td>
</tr>
<tr>
<td>French monolingual</td>
<td>22 (9)</td>
<td>4.11</td>
<td>38.41</td>
</tr>
<tr>
<td>Japanese monolingual</td>
<td>22 (8)</td>
<td>5.2</td>
<td>57.14</td>
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</tbody>
</table>

Predictions
• Japanese monolinguals higher gesture rates with SSWs than MVs.
• All monolinguals’ no difference in gesture rates with MVs.

Conclusions
• The findings suggest that some word-specific gesture rates, such as for MVs, are consistent cross-linguistically.
• Furthermore, children appear to learn to gesture at different rates with specific words through exposure to the co-expression of iconic gestures and those words.
• When exposure is reduced, as in the case of bilingualism, gesture use with specific words is also reduced, as was found for Japanese SSWs.

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References

Monolingual study Participants

<table>
<thead>
<tr>
<th>Language group</th>
<th>N (n male)</th>
<th>Age (y/m)</th>
<th>Vocabulary score (raw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English monolingual</td>
<td>11 (6)</td>
<td>6.0</td>
<td>49.55</td>
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<tr>
<td>French monolingual</td>
<td>9 (5)</td>
<td>6.0</td>
<td>54.89</td>
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<td>Japanese-dominant bilingual</td>
<td>8 (4)</td>
<td>5.1</td>
<td>13.75</td>
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</table>

Bilingual study Participants

<table>
<thead>
<tr>
<th>Language group</th>
<th>N (n male)</th>
<th>Age (y/m)</th>
<th>Vocabulary score (raw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English-Japanese bilingual</td>
<td>22 (10)</td>
<td>4.66</td>
<td>9.01</td>
</tr>
</tbody>
</table>

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Materials
• Referential Communication Task (RCT)
  • 4 pairs of animated animal cartoons with a star above the target cartoon.
  • Each cartoon pair was identical except for one difference in the animal’s manner of motion.

Procedure
• The bilinguals had a session in each language 1-3 weeks apart.
• The RCT sessions were video-recorded.

Coding
• Each verbal description on the manner of motion was coded as:
  • a MV, a SSW, a MV and SSW, or other word types.
  • with or without an iconic gesture.

Dependent measures
• Iconic gesture rates for MVs:
  # descriptions with MVs & iconic gestures
  # descriptions with MVs
• Iconic gesture rates for SSWs:
  # descriptions with SSWs & iconic gestures
  # descriptions with SSWs

Predictions
• All bilinguals speaking Japanese: no difference in gesture rates with SSWs and MVs.
• All bilinguals using MVs: no difference in gesture rates with MVs in each language.