Most human communication works by the communicator referring the recipient’s attention to something, and then the recipient uses this referential act – and perhaps other information – to infer what the communicator is intending to communicate. The referential act can be conceptually closer or farther from the communicator’s overall social intention.

14-month-old infants are able to infer the referential and social intention of a non-verbal pointing gesture when their attention is drawn to a location directly (Behne et al., 2005; Liebal et al., 2009).

3-year-old children understand verbal indirect communicative acts (Schulze et al., 2013; Schulze, 2013).

The current study addressed the question whether 18- and 26-month-old children make relevance inferences in an indirect non-verbal paradigm and whether these inferences are based on the children’s recognition of a speaker’s communicative intention.

**Participants:**
120 German-speaking children:
- N = 60, 18-month-olds (1.5 – 1.7)
- N = 60, 26-month-olds (1.11 – 2.5)

**Design:**
3 between subjects conditions (Ostensive Condition, Intentional Condition and Accidental Condition): 1 trial per condition

**Materials:**
- locked container, key
- 18-month-olds: plingmaschine, wooden cubes
- 26-month-olds: jigsaw-puzzle, pieces for the puzzle

**Procedure**

**Familiarization:**
E1 and the child wanted to play a game but parts of the game were missing.
E2 showed the child a locked container and demonstrated how a key opened a locked container in order to get the toys for the game.

E1 and child then played the game until one final toy was missing.

**Experimental variation:**

<table>
<thead>
<tr>
<th>Ostensive Condition</th>
<th>Accidental Condition</th>
<th>Intentional Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1:</td>
<td>E1:</td>
<td>E1:</td>
</tr>
<tr>
<td>- looked at the key</td>
<td>- accidentally pushed</td>
<td>- looked at the key</td>
</tr>
<tr>
<td>- engaged child with</td>
<td>key in front of the</td>
<td>- did not engage child</td>
</tr>
<tr>
<td>- placed key in front</td>
<td>child while pointing</td>
<td>with ostensive eye-</td>
</tr>
<tr>
<td>- placed key in front</td>
<td>of the game</td>
<td>contact</td>
</tr>
<tr>
<td>- did not establish eye-</td>
<td></td>
<td>contact</td>
</tr>
<tr>
<td>- placed the key in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- front of the child</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Results**

- We coded whether children took the key, went to the container, tried to open the container using the key and retrieved the toy in order to finish the game.

**Number of children retrieving the toy**

- Children of both age groups retrieved the missing toy significantly more often when the container’s key was shown to them (Ostensive Condition) compared to when the key was not communicated about (Accidental Condition & Intentional Condition).

- Comparison between conditions: 18-month-olds: $X^2(2) = 10.482$, p = .006
  - 26-month-olds: $X^2(2) = 8.352$, p = .015

**Conclusion**

- Young children are able to infer a communicator’s social intention not only from more or less direct referential acts, but from more indirect ones as well.
- Previous studies used rather direct referential acts (Behne et al., 2005; Liebal et al., 2009) and found that 14-month-old children made relevance inferences to uncover why a communicator pointed to an object.
- Not so much later, at 18 months, infants also use indirect communicative acts to make such relevance inferences.

- This study provides evidence that 18-month-old children display inferential abilities in *indirect* non-verbal communication.
- Infants not only understand why a communicator is pointing to a container (because a toy is hidden in this location) but also why a communicator is showing her a tool (because it can be used to open a container where a toy is hidden).
- Recognizing the communicative intention (that someone communicates for your benefit) starts off an inferential process that eventually leads to the computation of the communicator’s social goal (what she wants the recipient to know, do or share).
- Without communication, much less inferences follow (see difference between Ostensive and Intentional as well as Accidental Condition; see also Butler & Markman, 2012; Moore et al., 2013).

- The recognition of the communicative intention is based on the communicator’s use of ostensive cues.
- Comprehending indirect communicative acts non-verbally may be the basis for later comprehension of indirect verbal acts (Schulze et al., 2013).

**References**


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