The (controversial) nature of intransitive gestures

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Limb Apraxia

Deficit in gesture processing resulting from neurological dysfunction, which cannot be explained by elementary motor or sensory defects, by task-comprehension problems, or by inattention to command.
Limb Apraxia

Deficit in **GESTURE** processing resulting from neurological dysfunction, which cannot be explained by elementary motor or sensory defects, by task-comprehension problems, or by inattention to command.
GESTURES

MEANINGLESS
GESTURES

MEANINGFUL

Transitive

MEANINGLESS
GESTURES

MEANINGLESS

MEANINGFUL

Transitive

Pantomime
GESTURES

MEANINGFUL

Transitive

Pantomime

Intransitive

MEANINGLESS
Intransitive gestures
Egypt
"Be patient"

Italy
"What do you mean?"

Greece
"That's just perfect"
Cognition in Action: Testing a Model of Limb Apraxia

Roberto Cubelli, Clelia Marchetti, Giuseppina Boscolo, and Sergio Della Sala

Input (OTG) -> Meaningful gestures -> Action semantic

Input (Gestures) -> Visuo-motor conversion mechanism

Action output lexicon

Gesture execution
DOUBLE DISSOCIATION BETWEEN MEANINGFUL AND MEANINGLESS GESTURE REPRODUCTION IN APRAXIA

Angela Bartolo¹, Roberto Cubelli², Sergio Della Sala¹, Silvia Drei² and Clelia Marchetti³

Cortex, (2001) 37, 696-699
### GESTURE PRODUCTION

![Diagram of gesture production process]

**Input (Objects)**
- Action semantic
  - Action output lexicon
- Visuomotor conversion mechanism

**Gesture execution**

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<th>GESTURE IDENTIFICATION</th>
<th>Meaningful gestures</th>
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<tr>
<td></td>
<td>Transitive</td>
<td>Pantomime</td>
</tr>
<tr>
<td></td>
<td>Use</td>
<td>Verbal</td>
</tr>
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</table>

| | Use | Verbal | Imitation | Verbal | Imitation |
| Cut-off | 11 | 13 | 11 | 13 | 12 | 13 | 13 |
| BS | 14 | 14 | 13 | 14 | 13 | 14 | 4* |
| LL | 13 | 10* | 6* | 10* | 3* | 11* | 15 |

*Pathological scores*
COGNITIVE DEFICIT IN BS

Input

Action semantic

Action output lexicon

Gesture execution

Visual input (Gestures)

Visuo-motor conversion mechanism
COGNITIVE DEFICIT IN LL

Input

Action semantic

Action output lexicon

Gesture execution

Visual input (Gestures)

Visuo-motor conversion mechanism
ONE ROUTE TO PROCESS ALL MEANINGFUL GESTURES?


**Cognition in Action: Testing a Model of Limb Apraxia**

Roberto Cubelli,* Clelia Marchetti,† Giuseppina Boscolo,* and Sergio Della Sala‡

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**Original Paper**

*European Neurology*

Eur Neurol 2003;49:45–52
DOI: 10.1159/000067027

**Apraxia of Tool Use: An Autopsy Case of Biparietal Infarction**

Toshio Fukutake
Pantomimes are special gestures which rely on working memory

A. Bartolo,¹,² R. Cubelli,¹,* S. Della Sala,¹ and S. Drei²
Action output lexicon

Gesture execution

Visuo-motor conversion mechanism

Action semantic

Input (OTG)

Input (Gestures)

Action output lexicon

MEANINGFUL

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<th>PANTOMIME</th>
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<td>11</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>VL</td>
<td>10*</td>
<td>8*</td>
<td>10*</td>
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<tr>
<td></td>
<td></td>
<td>Transit.</td>
<td>Pantom.</td>
</tr>
<tr>
<td>Bartolo et al. 2001</td>
<td>BS</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>MF</td>
<td>-</td>
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</tr>
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<td>Bartolo et al. 2003</td>
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<td>-</td>
</tr>
<tr>
<td>Fukutake 2003</td>
<td>Single case</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>
ICONIC/DESCRIPTION

EXPRESSIVE
(MENTAL STATES)

COMMUNICATIVE

SYMBOLIC
INTRANSITIVE GESTURES

A woman is with her little son, who has just fallen asleep. Another child enters in the room making noise. What gesture should the woman perform?
<table>
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<th>PRODUCTION OF GESTURES</th>
<th>T-TEST (p value)</th>
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<td></td>
<td>Pantomimes</td>
<td>Intransitive</td>
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<td>LBD PATIENTS (n=10)</td>
<td>9(3.8)</td>
<td>11(3.3)</td>
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A TREND TOWARDS A BETTER PRODUCTION OF INTRANSITIVE GESTURES
Many Thanks