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# Gesturing in aphasia, compensatory with or without speech?

## A case study

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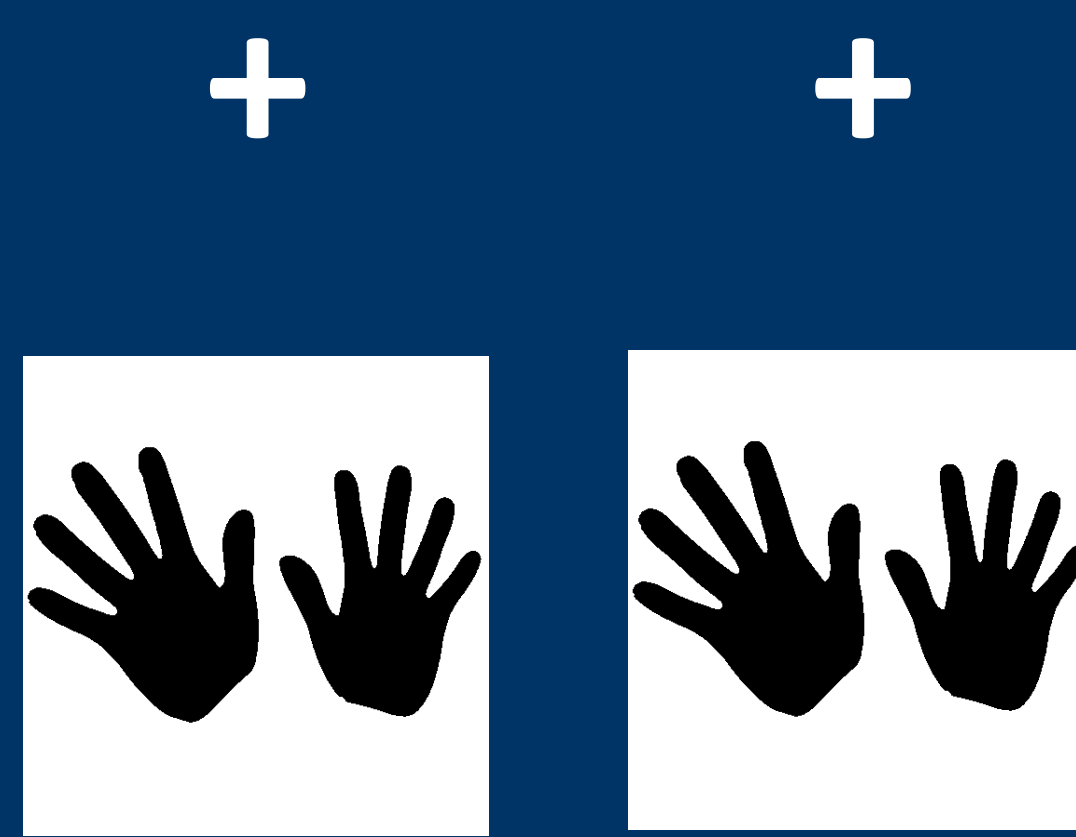
### Introduction

- **Pantomime** and/or **gesticulation** might compensate for speech loss in severe aphasia.
- **Pantomime** and **Gesticulation** result from different processes (Goldin-Meadow et al., 2008) with different functions;
- **Pantomimes:** without speech, describing objects/actions.
- **Gesticulation:** with speech, complex visual information/story.
- Little is known about these gesture modes in aphasia.

- A case study: QH
  - speech, but incomprehensible
  - difference in (comprehensibility) gesticulation and pantomime?

The current study addresses the following research questions:

- 1) Can **pantomimes** and/or **gesticulation** be used as compensation for fluent but meaningless speech in (QH's) aphasia?
- 2) Is (QH's) **gesticulation** and/or **pantomime** influenced by (his) fluent aphasia and/or apraxia?



**Gesticulation** **Pantomime**  
McNeill, (2000)

### Method

- Case:** QH
- Speech: fluent, but incomprehensible
  - Good comprehension of speech
  - Apraxia

Task 1: Naming objects (20 items) (BNT)<sup>1</sup>  
Task 2: Retelling a story (3 episodes) (T&S)<sup>2</sup>

Condition 1: Speech (**gesticulation**)  
Condition 2: Only gestures (**pantomime**)

<sup>1</sup>Boston Naming Task (Kaplan et al., 1983)  
<sup>2</sup>Tweety & Sylvester cartoon (McNeill, 1992)



**Analysis 1:** comprehensibility

- forced choice task
- 15 students

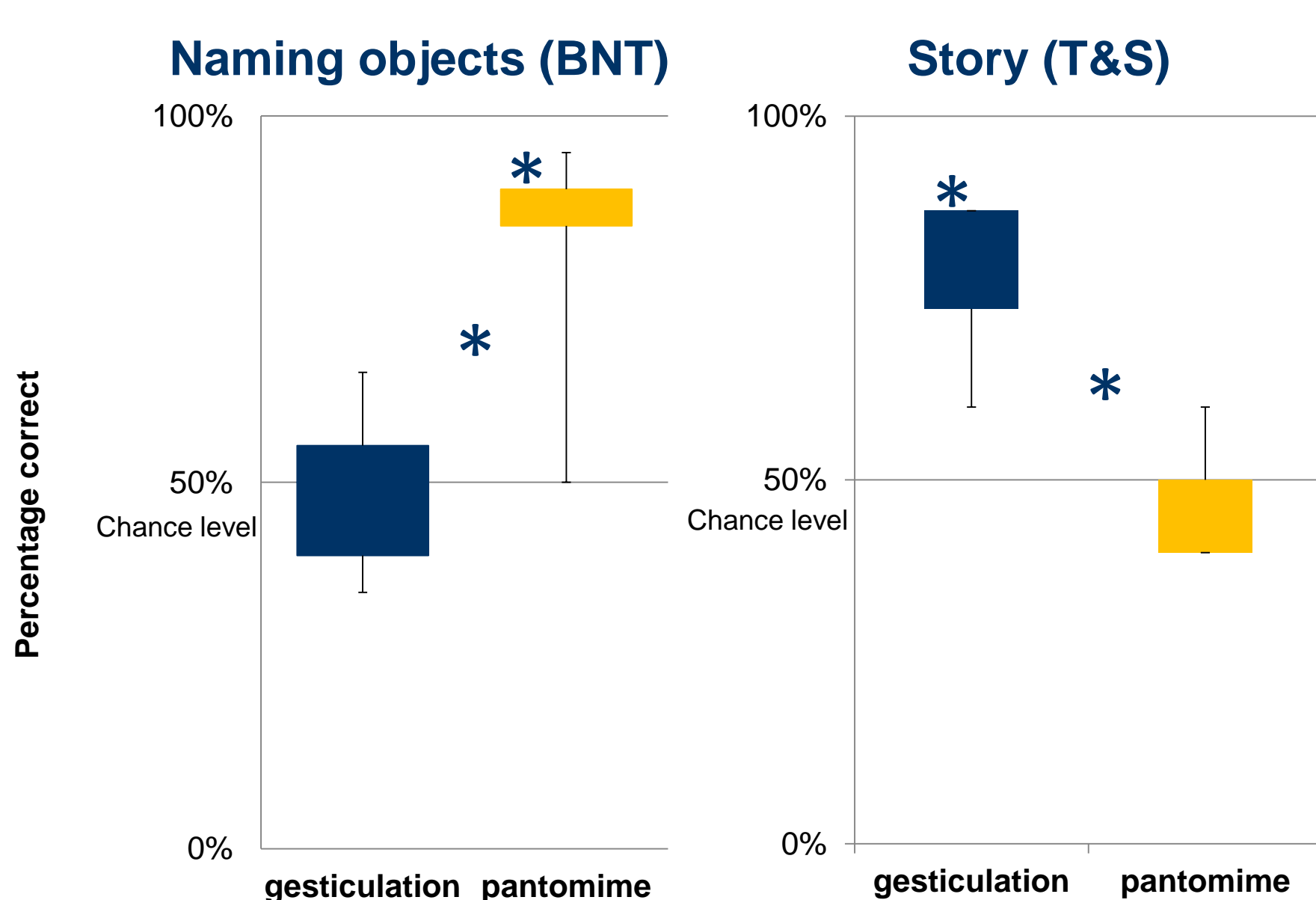
**Analysis 2:** gesture techniques

- gesture technique per item/episode
- comparison to 20 controls

### Results

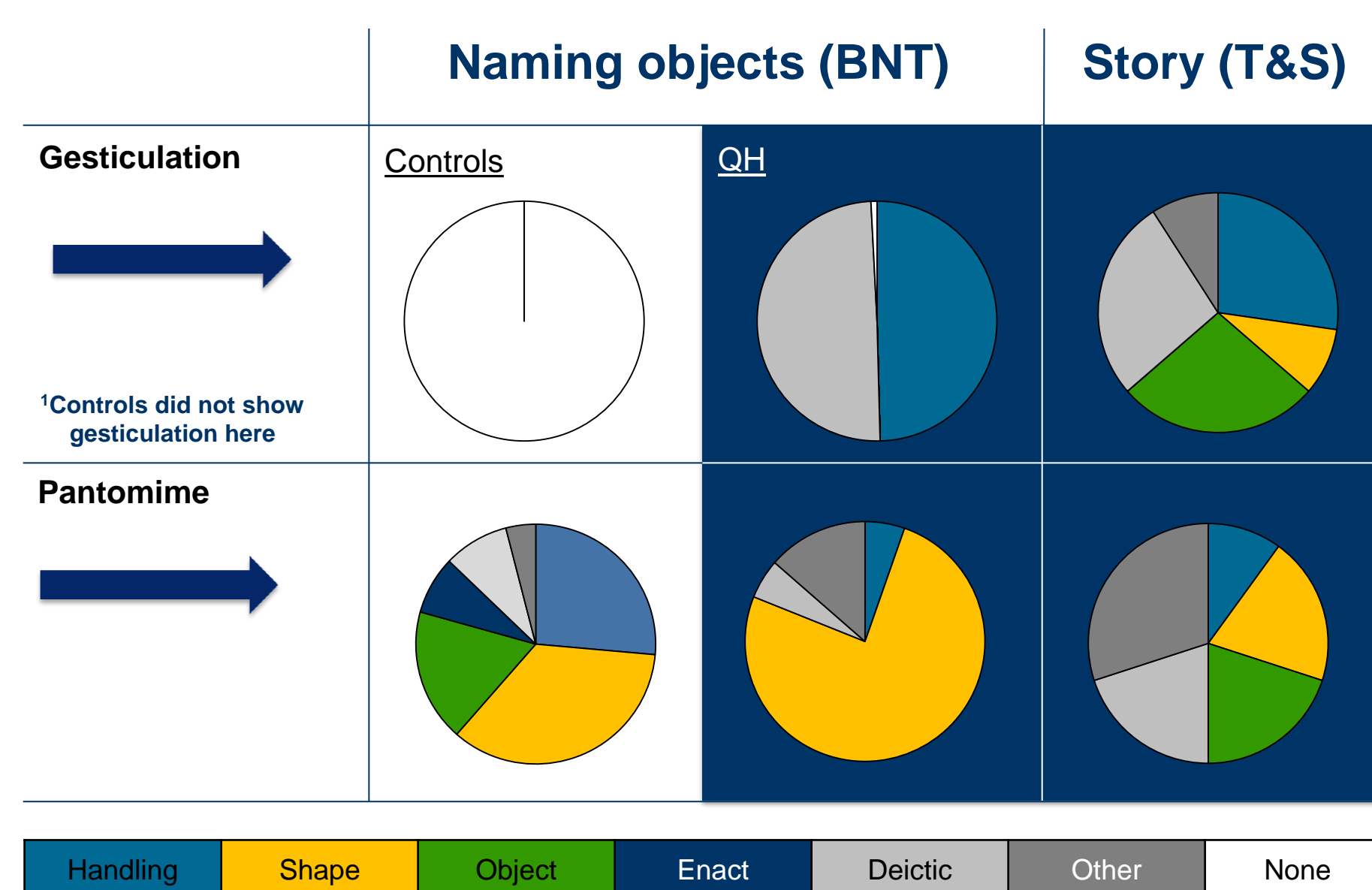
**Analysis 1:** Comprehensibility

- Naming Objects (BNT)
  - **Speech:** incomprehensible
  - **Pantomimes**, 82% correct: comprehensible ( $p \leq 0.05$ )
  - **Gesticulation**, 48% correct: incomprehensible ( $p > 0.05$ )
  - **Pantomime** > **Gesticulation** ( $p \leq 0.01$ ).
- Retelling a story (T&S)
  - **Speech:** incomprehensible
  - **Pantomimes**, 47% correct: incomprehensible ( $p \leq 0.05$ )
  - **Gesticulation**, 78% correct: comprehensible ( $p > 0.01$ )
  - **Gesticulation** > **Pantomime** ( $p \leq 0.05$ )



**Analysis 2:** Representation Techniques

- Naming Objects (BNT)
  - **Pantomimes**
    - Controls: specific techniques for specific objects
    - QH: mostly 'shape gestures'
  - **Gesticulation**
    - Controls: no gesticulation
    - QH: gesticulation for every object (handling & deictic)
- Retelling a story (T&S)
  - **Pantomimes & Gesticulation**
    - QH: various techniques
    - No difference between **pantomime** & **gesticulation**
    - Comparable to healthy controls?



### Discussion

**QH's gesticulation:**

- No explicit compensation
    - Word finding difficulties or 'normal' gesticulation
- 1) Can be compensatory when (re)telling a story
  - 2) Influenced by aphasia and/or apraxia?

**QH's pantomime:**

- Simplified pantomimes (shape)
    - No use of conceptual features
- 1) Can be compensatory when talking about objects
  - 2) Impaired because of apraxia

### Conclusion

- 1) **Gesticulation** and **pantomime** can be used to compensate for speech.
  - Gesticulation for retelling a story
  - Pantomime for naming objects
- 2) **Pantomime** (and **gesticulation**?) influenced by apraxia. Influence of aphasia?

### References

Goldin-Meadow, S., So, W. C., Özyürek, A., & Mylander, C. (2008). The natural order of events: How speakers of different languages represent events nonverbally. *Proceedings of the National Academy of Sciences*, 105(27), 9163-9168.

Kaplan, E., Goodglass, H., & Weintraub, S. (1983). *The Boston Naming Test*. Philadelphia: Lea & Febiger.

McNeill, D. (1992). *Hand and Mind: What gestures reveal about thought*. Chicago & London: The University of Chicago Press

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### Clinical Implications

- **Gesticulation** and **pantomime**: different processes, with different functions, which can be impaired differently
  - assess both **gesticulation** & **pantomime**
- Pantomime of tool use does not represent **pantomime** or **gesticulation** ability
  - assesses various representation techniques

