Gestures in language across cultures

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Background non-verbal communication

- Importance of nonverbal communication, evidence from:
  - Psychology & Anthropology (see work by Edward T. Hall; Albert Mehrabian)
  - Communication Studies (see work by Judy Burgoon and colleagues)
  - Neuroscience (e.g., Willems & Hagoort, 2007; Ozyurek, Willems, Kita, & Hagoort, 2007; Kita & Ozyurek, 2003)
  - Spotlight to broader aspects of language, some proven to be part and parcel of language. **Non-verbal phenomena.** Gestural component may precede verbal in ontogeny and in phylogeny (Tomasello, 2008)
  - Also crucial in language-mediated tasks: teaching (Macedonia, 2014)
  - **Gesture typology** - speech-accompanying gestures:
    - follows speech rhythm, no semantic content
Background cultural differences

- Cultural factor
  - Investigation of a stereotype: do people from Spain rely more on gestures than people from Finland?

Previous research:
- Differences in use of gestures British and Finnish toddlers (Huttunen et al., 2013)
- Speech gestures expressed differently according to culture (Japanese, Turkish and English) (Kita & Ozyurek, 2003)
- Data on cultural differences in perception of speech gestures scarce
Research question/ hypotheses

- Is the role of gestures in language modulated by culture? There will be a **difference** between Spanish and Finnish people.

**Motor areas:**

H1) Spaniards more sensitive to gestures than Finns (often use and see them) motor cortex activated more when they see people co-speech gesturing.

H2) Alternatively, Finns may activate their arm motor cortex more than Spaniards because they are less used to seeing co-speech beat gestures.

**Comprehension:**

a) Spanish people have an advantage in comprehension when speech is accompanied by beat gestures.

b) Finnish people will not experience an advantage in comprehension by co-speech beat gestures.
Method

- 90 participants: 45 U Tampere, 45 Autonomous U Madrid
- Pre-test of potential differences in gesture production
  - Some precedents in British and Finnish children (Huttunen et al., 2013)

Comprehension

**Diffusion tensor imaging**: structural pathways
Wernicke’s – arm motor cortex

**fMRI**: online engagement

**Behavioural**: recall
Design and expected results

Linear mixed-effects models

**DTI (structure):** Finnish < Spanish

**fMRI:** arm motor cortex

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<th>Gesturing degree</th>
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**BEHAVIOURAL:** comprehension test on story with complex relationships between colleagues, friends, and sports mates

**Recall:** concrete queries

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Summary and conclusion

Differences would show that:

- Importance of (co-speech) gestures may be related to cultural norms
- Neural connections between motor-areas and language areas may develop differently according to culture
- Speech gestures possibly hinder comprehension when less familiar with them?
- Refining knowledge about cultural variation relation speech-gestures
- Implications for teaching, international relations
References


