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The implication of working memory in gesture/speech integration: Validation study of iconic gesture videos among French speakers

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Introduction

Iconic gestures convey semantically related information to the simultaneous verbal utterance (Özyürek, Willems, Kita, & Hagoort, 2007). → Impact of iconic gesture on language comprehension (Beattie & Shovelton, 1999).

Suggested involvement of verbal working memory (vWM) because of semantic connection (Wu & Coulson, 2014) → Clear relation not observed → Possible explanations:
- Low complexity of task
- Lack of sensitivity of task

Suggested task modification → Individual span assessment / Word memorisation

BUT

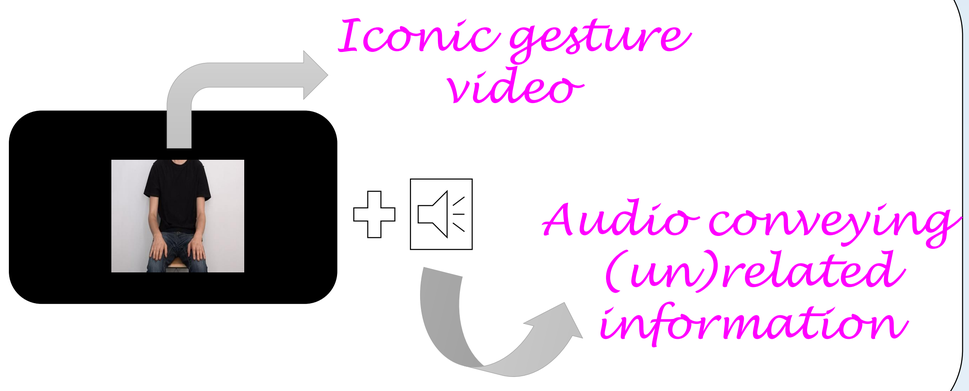
Previous studies having been conducted among English-speakers

Study aim: Creating a French database of iconic gesture videos → Requires pre-tests to validate stimuli before testings can be conducted

Methodology

Creation of stimuli

- 34 iconic gesture videos were filmed and assembled into 17 pairs
- 34 voice recordings spoken either by a man or a woman
- 1 pair = 1 iconic gesture + 1 conguent (or incongruent) audio word
- Videos were enacted by either a man or a woman
- Total of 102 pairs for participants to judge ((34 pairs x 2 gender) + 34 pairs for incongruent condition))
- 289 stimuli created (17 different pairs x 17 assembly possibilities)

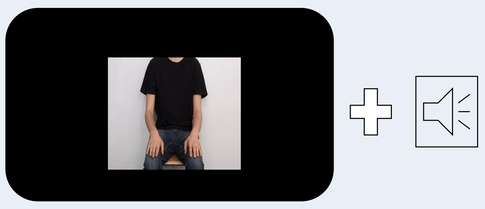


Population and Tasks

1 Semantic (in)congruency judgment task

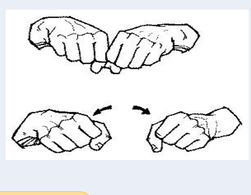
46 healthy participants (13 men)
French-speaking
M_{age} = 23,7 ; SD = 2,7

Task : Three judgment tasks on Likert scale



Two conditions:
- Congruent
- Incongruent

Example



« Break » → Congruent

« Stir » → Incongruent

2 Voice recognitition task

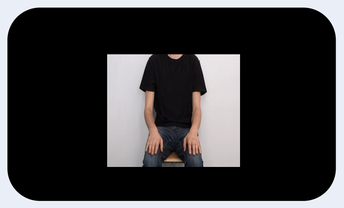
Task : Recognition of voice gender

Man's voice or Woman's voice

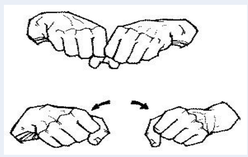
3 Iconicity judgment task

13 healthy participants (2 men)
French-speaking
M_{age} = 19,7 ; SD = 4,05

Task: Naming the gesture seen on screen (interpretative task)



Example



What do you see ?
« Break »

Results

Task 1	Task 2	Task 3
• Congruent gestures judged congruent at 4,5/5 • Incongruent gestures judges incongruent at 1,75/5 → 16 pairs chosen, 1 pair rejected	100 % of correct answers on voice gender recognition	Mean % of recognition = 60% Since the context is required to fully understand the meaning of an iconic gesture, these results support the claim that our videos are in fact depicting iconic gestures.

Conclusion

The present validation study allowed us to create a database of 256 stimuli (16 different pairs x 16 assembly possibilities between enacted gesture and heard sound). These stimuli will be usable in a gesture/speech integration study, in order to investigate the links between iconic gesture/speech integration and verbal working memory.

Bibliography

Beattie, G., & Shovelton, H. (1999). Mapping the Range of Information Contained in the Iconic Hand Gestures that Accompany Spontaneous Speech. *Journal of Language and Social Psychology, 18*(4), p.438-462.

Özyürek, Willems, Kita, & Hagoort (2007). On-line integration of semantic information from speech and gestures: Insight from ERP. *Journal of Cognitive Neuroscience, 19*(4), p.605-616.

Wu, Y., & Coulson, S. (2014). Co-speech iconic gestures and visuo-spatial working memory. *Acta Psychologia, 153,* p.39-50.