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Age of acquisition and clausal order effects in temporal clauses. A cross-linguistic study in French Sign Language (LSF) and Italian Sign Language (LIS)

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1. Age of acquisition

When assessing linguistic performance in adult deaf signers, Age of sign language Acquisition (AoA) is a crucial factor that needs to be kept into account [a.o. Zorzi et al., 2022].

3. Hypotheses

AoA, sentence structure and clausal order were taken into consideration:

- Signers with an AoA = 0 (i.e., at birth) should outperform signers with an AoA ≥ 3 (i.e., from 3 years old onward), showing higher accuracy and/or lower RTs;
- This effect is stronger in LIS, since temporal constructions involve subordination, which is syntactically more complex and harder to process;
- Moreover, sentences featuring a counter-chronological order of mention are more demanding, resulting in lower accuracy and/or higher RTs (effect of iconicity of sequence) [e.g., Politzer-Ahles et al., 2017].

2. Temporal clauses

Temporal clauses are analyzed in LSF as instances of *asymmetric coordination* (with a fixed order of clauses), and in LIS as instances of *subordination* (with a fixed order of clauses) [Aristodemo and Hauser, 2021]. This entails that, for both LSF and LIS, 'BEFORE' clauses display a counter-chronological order of mention, whilst 'AFTER' clauses display a chronological order of mention.

BEFORE-clauses [counter-chronological order of mention]

LSF: *Asymmetric coordination* (fixed order)

(1) WOMAN WATER POUR BEFORE MAN PEN MOVE.

'The woman pours water and before the man moves the pen.'

LIS: *Subordinate + Main clause* (fixed order)

(2) WOMAN WATER POUR NOT-YET BEFORE, MAN PEN MOVE.

'Before the woman pours water, the man moves the pen.'

AFTER-clauses [chronological order of mention]

LSF: *Asymmetric coordination* (fixed order)

(3) WOMAN WATER POUR AFTER MAN PEN MOVE.

'The woman pours water and then the man moves the pen.'

LIS: *Subordinate + Main clause* (fixed order)

(4) WOMAN WATER POUR AFTER, MAN PEN MOVE.

'After the woman pours water, the man moves the pen.'

4. Methods and participants

Test: Truth-value judgment task of a total of 108 experimental items, namely 12 sentences with *after*-clauses, 12 with *before*-clauses, and 12 with *when*-clauses, each combined with three different non-linguistic videos (one 'match' condition: the sentence corresponds to the non-linguistic video; two 'mismatch' conditions: the sentence does not correspond to the non-linguistic video). Sentences are evaluated after viewing the non-linguistic video.

LSF participants:

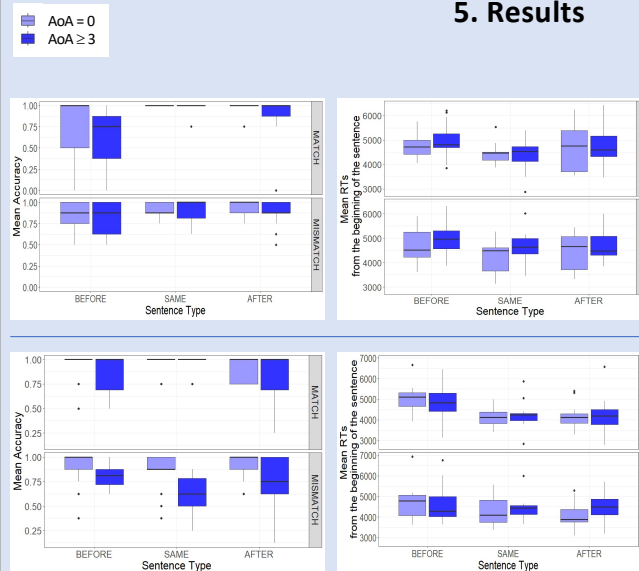
32 adult Deaf LSF signers
(13 with AoA = 0; 19 with AoA ≥ 3).

LIS participants:

25 adult Deaf LIS signers
(13 with AoA = 0; 12 with AoA ≥ 3).

5. Results

Only significant results are reported



LSF

Accuracy (glmer analysis)

- MATCH: AFTER, SAME > BEFORE
- MISMATCH: SAME > BEFORE

RTs (lmer analysis)

- Group with AoA = 0:
MATCH > MISMATCH

LIS

Accuracy (glmer analysis)

- Group with AoA = 0 more accurate than group with AoA ≥ 3
- MATCH: SAME > BEFORE, AFTER
- MISMATCH: BEFORE > SAME

RTs (lmer analysis)

- MATCH: BEFORE > AFTER, SAME

6. Discussion

Our studies were conducted on small groups of participants hence we should be cautious in drawing conclusions. From our data, in LIS but not in LSF we found AoA effects on mean accuracy: this might be due to the different syntactic complexity between LIS and LSF, as hypothesized, as well as to sociolinguistic factors (i.e., a school environment (not supporting sign language). In addition, accuracy was lower in BEFORE-clauses in LSF, as expected by our hypothesis, but not in LIS. We suspect this is due to the presence of the negation NOT-YET, which served as a marker that eased comprehension. Data coming from a larger sample are needed to obtain clearer and stronger results.

Selected references

Aristodemo, V., and Hauser, C. (2021). Similar but different: investigating temporal constructions in sign language. *Glossa: a journal of general linguistics*, 6(1): 2.

Politzer-Ahles, S., Xiang, M., and Almeida, D. (2017). "Before" and "after": Investigating the relationship between temporal connectives and chronological ordering using event-related potentials. *PLOS ONE*, 12(4).

Zorzi, G., Giustolisi, B., Aristodemo, V., Cecchetto, C., Hauser, C., Quer, J., Sánchez Amat, J., and Donati, C. (2022). On the Reliability of the Notion of Native Signer and Its Risks. *Front. Psychol.* 13:716554.

Acknowledgments

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