

CONSTRAINTS ON COMMUNICATING ORDER OF EVENTS IN PANTOMIME

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Pantomime, understood as a self-sufficient, predominantly non-conventional means of communication based on bodily mimesis (Żywiczyński et al. 2018), has become a strong candidate for “the original human-specific communicative system” (Zlatev et al. 2020). Although pantomime affords successful communication in many contexts, it also has its limitations (see e.g. Żywiczyński et al. 2021). In this study, we looked at its constraints on communicating order of events. We assumed that as pantomime unfolds in real time, it is fit for conveying simple narratives, where events are arranged in a chronological sequence. At the same time, it is less suitable for expressing events in a non-chronological order, characteristic of more complex narratives (Boyd 2017; Żywiczyński et al. 2018). This assumption was put to test in a study based on basic “semiotic games” (see e.g. Krauss & Winheimer 1966; Fay et al. 2010; cf. Fay et al. 2013, 2014).

The study consisted of 4 games, during which 52 participants, working in pairs, took turns as directors and matchers. The director was presented with a verbal representation of a story consisting of three events. In the chronological condition, the story was arranged so that the resultative event was at the end (e.g. “A man opened the door. Then he saw a bear. Then he ran away”). In the non-chronological condition, the resultative event was placed at the beginning (e.g. “A man ran away, because when he opened the door, he saw a bear”). The task of the director was to communicate the story to the matcher by means of body movements. The matcher was presented with 4 comic strips: one which

corresponded to the director's input and three distractors. Their task was to choose the correct alternative. Communicative success was operationalised as the accuracy of the matchers' responses.

We found that non-chronological representations had lower communicative success (34% correct matches) when compared to representations of chronological order of events (94% correct matches). To explore this result, we used a logistic regression model which included an interaction between two predictors (condition and game), and pairs of participants as a random effect. The model showed significant differences in communicative success between the conditions, as well as between the games (see Fig. 1).

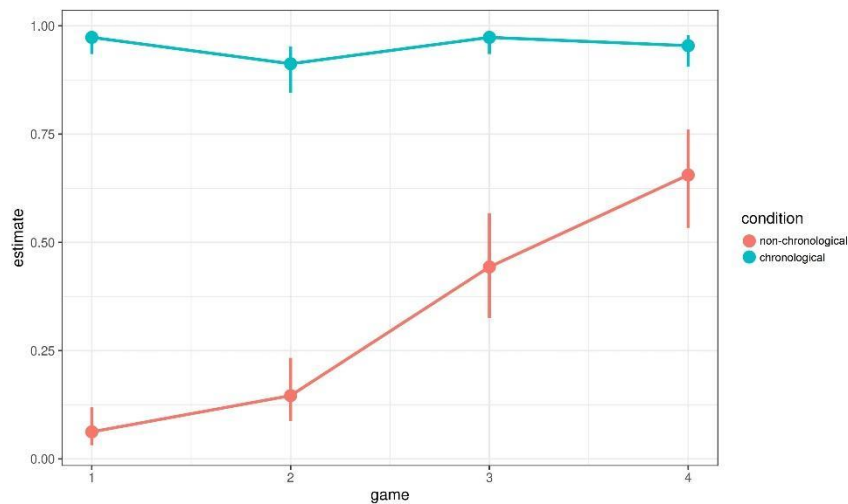


Figure 1. Predicted proportions of correct matches with 95% intervals, corresponding to the log odds from the logistic regression model described above. Post-hoc tests indicated that differences between all the games in the non-chronological condition were significant.

A possible explanation of this result is that some pairs of participants managed to indicate a disruption of chronology by means of specific movements, which conventionalised over the games. These results suggest that while it is fairly easy to communicate events in a chronological order in pantomime, the need to convey more chronologically complex narratives calls for a successful negotiation of specific communicative strategies over time, thus pushing pantomime towards “protolanguage”. We discuss these findings in the context of the bodily mimesis theory and the evolutionary trajectory of pantomime and narrative (e.g. Arbib 2012; Collins 2013; Donald 2001; Zlatev 2014; Zlatev et al. 2020).

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References

- Arbib, M. A. (2012). *How the brain got language*. Oxford: Oxford University Press.
- Boyd, B. (2017). The evolution of stories: From mimesis to language, from fact to fiction. *WIREs Cognitive Science*, 9(1), 1444, doi: 10.1002/wcs.1444.
- Fay, N. et al. (2014). Creating a communication system from scratch: gesture beats vocalization hands down. *Frontiers in Psychology*, 5, 354, doi: 10.3389/fpsyg.2014.00354.
- Fay, N., Arbib, M. A., Garrod, S., (2013). How to bootstrap a human communication system. *Cognitive Science*, 37, 1356–1367, doi: 10.1111/cogs.12048.
- Fay, N. et al. (2010). The interactive evolution of human communication systems. *Cognitive Science*, 34(3), 351–386.
- Krauss, R. M. & Weinheimer, S. (1966). Concurrent feedback, confirmation and the encoding of referents in verbal communication. *Journal of Personality and Social Psychology*, 4, 343–346.
- Zlatev, J., Żywicznyński, P., Wacewicz, S. (2020). Pantomime as the original human-specific communicative system. *Journal of Language Evolution*, 5(2), 156–174, doi: 10.1093/jole/lzaa006.
- Żywicznyński, P. et al. (2021). Evolution of conventional communication. A cross-cultural study of pantomimic re-enactments of transitive events. *Language & Communication*, 80, 191–203.
- Żywicznyński, P., Wacewicz, S., Sibierska, M. (2018). Defining pantomime for language evolution research. *Topoi*, 37(2), 307–318.