Temporal patterns of representational hand gestures in conversational pauses

Delphine Charuau & Naomi Harte
School of Engineering, Trinity College Dublin
charuaud@tcd.ie, nharte@tcd.ie

Background. In face-to-face interactions, representational hand gesture timing contributes to conversational smoothness and coordination (Hendrick et al. 2023). While these gestures generally co-occur with speech (McNeill 1992), less is known about their timing relative to pauses. Some studies report gestures being held during hesitation pauses (Kosmala *et al*. 2019), while others show they may start during pauses in anticipation of upcoming speech (Beattie & Aboudan, 1994). These findings suggest that gesture-pause patterns may serve different functions, potentially leading to distinct patterns in turn-taking. Our previous work indicated that gestures show different alignment patterns depending on the type of pause: they align more closely with the end of the pauses between speakers' turns than intra-turn pauses (Charuau & Harte 2025). Here, we extend this work by focusing specifically on representational gestures (preparation, stroke, and retraction), and by examing not only gesture onsets and offsets, but also their internal phases, to investigate whether these temporal patterns reflect distinct functional roles in interaction.

Methods. We use the MULTISIMO corpus (Koutsombogera & Vogel 2018), a multimodal dataset of triadic in-person interactions in English. We analyse gesture timing in relation to intra-turn and inter-turn pauses, examining gesture onsets, offsets, and their phases in relation to pause boundaries.

Results. Data analysis is going. We aim to identify patterns of gesture-pause and their implications for interaction dynamics, potentially informing multimodal speech technologies for speech recognition and turn-taking detection.

References: • Beattie, G. & R. Aboudan (1994). Gestures, pauses and speech – an experimental investigation of the effects of changing social context on their precise temporal relationship, *Semiotica* 99, 1–40 • Charuau, D. & N. Harte (2025). Multimodal dynamics of hand gestures and pauses in multiparty interactions. In *Proc. Interspeech 2025,* 3030–3034. • Hendrick, K.H., Holler J. & C.L. Stephen (2023). Turn-taking in human face-to-face interaction is multimodal: gaze direction and manual gestures aid the coordination if turn transitions. *Phil. Trans. R. Soc. B, 378*: 20210473. • Kosmala, L., Candea, M. & A. Morgenstern (2019). Synchronization of (dis) fluent speech and gesture: A multimodal approach to (dis) fluency. In *Gesture and Speech Interaction*. • Koutsombogera, M. & C. Vogel (2018). Modeling collaborative multimodal behavior in group dialogues: The multisimo corpus. In *Proc. of the 11th International Conference on Language Resources and Evaluation (LREC 2018)*, 2945–2951. • McNeill, D. (1992). Hand and Mind: What Gestures Reveal about Thought. Chicago and London: The University of Chicago Press.