

Stroke-to-stroke turn-boundary prediction in Sign Language Language of the Netherlands

In spoken interactions, interlocutors carefully plan and time their utterances, minimising gaps and overlaps between consecutive turns.¹ Cross-linguistic comparison indicates that spoken languages vary minimally in their turn timing, with mean turn transition times of 229ms.² Pre-linguistic vocal turn taking has also been attested in the first six months of life.³ These observations suggest that the turn-taking system provides a universal basis for our linguistic capacities.⁴ It remains an open question, however, whether precisely-timed turn taking is solely a property of spoken languages.

It has previously been argued that, unlike speakers, signers do not attend to the one-at-a-time principle, and instead form a collaborative turn-taking floor with their interlocutors, thus having a higher degree of social tolerance for overlap.⁵ But recent corpus analyses of Sign Language of the Netherlands (NGT) have revealed that, although simultaneous signing is more frequent in NGT than overlapping speech in spoken languages, the additional overlap may come as a consequence of having larger and thus slower articulators.⁶ The beginnings and ends of signed utterances are bookended by preparatory and retractive movements — phonetically necessary articulations that do not add to the interpretation of the utterance.⁷ When turn timing is calculated on the basis of stroke-to-stroke turn boundaries, i.e. measured from the end of one signer's final stroke to the beginning of the stroke of his interlocutor's consecutive turn, NGT turn timing and turn overlap are consistent with documented averages for spoken turn taking.⁶ This paper presents new experimental evidence supporting the psychological reality of stroke-to-stroke turn boundaries for signers by using an adapted button-press paradigm, originally developed for measuring spoken language turn prediction.⁸

We asked 52 deaf signers to watch 80 short video sequences. Each experimental sequence was contained a few seconds of context and then a target turn, both segmented from spontaneous NGT conversation (Example: <http://hdl.handle.net/1839/00-0000-0000-0020-6C0D-C@view>). Participants were asked to watch the context and then, when one signer disappeared, to focus on the remaining signer and to try and press the button at the moment they anticipated that the turn would end. They were told that, if they saw the screen freeze at the end of the target turn, they should then press the button as quickly as possible because they had already reached the end of the turn. This gave us a measure of their predictive and reactive button presses.

Our results indicate that signers indeed anticipated turn boundaries at the ends of turn-final strokes. Signers often responded at potential turn ends that preceded the actual turn end, mirroring findings from experimental and naturalistic turn-end anticipation with spoken language users.^{8,9} They also responded later for questions than for non-questions, though younger signers and signers who received earlier linguistic input were less likely to show this difference. These results are the first to experimentally support the idea that signers use something like stroke-to-stroke turn boundaries to coordinate conversational turns. They also suggest that linguistic processing, represented by participant age and age of acquisition, plays a role in the ability to use precisely-timed turns in conversation.

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