The role of cross-cultural differences in the emergence of referential strategies in artificial sign languages

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Grammatical use of space for referential strategies such as spatial modification and role shift is common amongst many sign languages (e.g., Engberg-Pedersen, 1993; Liddell, 2003, Ergin et al. 2018). However, not all sign languages employ spatial strategies for non-spatial relations. Kata Kolok and Al-Sayyid Bedouin Sign Language (both rural sign languages, the former used in the North of Bali and the latter in southern Israel) have not developed referential strategies relying on anaphoric use of space (de Vos, 2012; Padden et al., 2010). A proposed explanation for the lack of such strategies is the relatively young age of these languages, suggesting that these strategies have simply not developed *yet* (Sandler et al., 2005). However, another "young" sign language, Nicaraguan Sign Language, developed spatial strategies early on (Senghas et al., 1997). Furthermore, hearing participants in a silent gesture experiment that simulated intergenerational transmission with an iterated learning design produced referential strategies using space anaphorically within just five generations (Motamedi et al., 2021). These results suggest that language age cannot be the full explanation for the presence of anaphoric use of space.

This preregistered study (https://osf.io/w4sgx) investigates another possible explanation as to why some sign languages develop spatial strategies and other do not. In a cross-cultural comparison we explore to what degree typological differences in sign languages can be explained by differences in their surrounding co-speech gesture systems. To do so we are currently replicating Motamedi et al.'s (2021) silent gesture experiment in the Netherlands and in Bali. Hearing people participate in a director-matcher task where they are asked to communicate short transitive events using only gestures.

The set-up of this study provides the opportunity to explore and compare the strategies produced by participants from different cultural backgrounds. Furthermore, we collect data from individuals that are users of the exact co-speech gesture system that surrounds Kata Kolok signers. The Balinese co-speech gesture system is different from most Western ones, for example, using a geocentric instead of an egocentric pointing system (Wassman & Dasen, 2006) – a feature it shares with Kata Kolok (de Vos, 2012). Thus, if the ambient co-speech gesture system is relevant to the development of spatial referential strategies the hearing Balinese participants should produce strategies that differ from the ones employed by the Dutch participants.

Preliminary pilot data for our Balinese experiment has suggested that this might be the case. The strategies developed by participants there do not employ space in the same way as our Dutch participants do and the English-speaking participants in Motamedi et al. (2021) did. We will present our comparative data, discuss what strategies the different participant groups have produced and evaluate what this suggests about the role of the co-speech gesture system in the emergence of sign languages, whether created in the lab or evolved from spontaneous interaction.

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