

## **THE ROLE OF CROSS-CULTURAL DIFFERENCES IN REFERENTIAL STRATEGY EMERGENCE: DATA FROM ARTIFICIAL SIGN LANGUAGE LEARNING**

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The grammatical use of space for referential strategies such as spatial modification and role shift can be found across many sign languages (e.g., Engberg-Pedersen, 1993; Liddell, 2003). Signers, for example, use pointing signs towards arbitrary locations in space to refer to different agents. However, not all sign languages use spatial strategies for non-spatial relations. The rural sign languages Kata Kolok (used in the North of Bali) and Al-Sayyid Bedouin Sign Language (used in southern Israel) have not developed strategies relying on anaphoric use of space (de Vos, 2012; Padden et al., 2010). This raises the question of why there are such typological differences. A proposed explanation attributes the absence of such strategies to the relatively young age of these sign languages, suggesting that these strategies have not developed *yet* (Sandler et al., 2005). However, while Kata Kolok and Al-Sayyid Bedouin Sign Language are younger than, for example, American or British sign language they differ considerably in age and furthermore, another “young” sign language, Nicaraguan Sign Language, developed spatial strategies early on in its emergence (Senghas et al., 1997). Moreover, hearing English-speaking 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). Therefore, the age of respective sign languages alone cannot serve as an explanation, and hence, the question remains: What can account for such differences across sign languages?

This preregistered study (<https://osf.io/w4sgx>) aims to investigate another possible factor contributing to spatial strategies emerging in a sign language: To

what degree can these typological differences be explained by differences in their respective surrounding co-speech gesture system? Indeed, 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, we should see speakers of Balinese produce strategies that differ from the ones employed by speakers of Indo-European languages like Dutch in a silent gesture task. This in turn could shed light on why Kata Kolok has not developed anaphoric use of space.

We are currently conducting replication studies of Motamedi et al.'s (2021) silent gesture experiment in the Netherlands and in Bali allowing for cross-cultural comparison of the results. Fifty hearing participants of either language group (speakers of Dutch or speakers of Balinese) are paired up and asked to perform a communicative director-matcher task using only gestures. The design of the experimental stimuli is such that participants have to distinguish agents in order for their partner to be able to choose the right option from an array. The experimental set-up was slightly adapted to use the online video conferencing app Zoom to function in a remote setting during the pandemic. Participants' gestured responses are recorded and adhering to an iterated learning design (like Motamedi et al., 2021), the videos of one participant were used in training trials for the following dyad. Using a director-matcher task in combination with iterated learning allows us to analyse the strategies emerging through language use and to record the possible entrenchment of these strategies through the simulation of repeated generational transmission.

Our set-up not only provides the opportunity to explore and compare the strategies produced by participants from different cultural backgrounds but also collects data from individuals that are users of the exact co-speech gesture system that surrounds Kata Kolok signers.

Pilot data from our Balinese experiment has already given us some indications that the strategies developed by participants there do not make use of space the same way as our Dutch participants do and the English-speaking participants in Motamedi et al. (2021) did. Thus, at the conference, 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.

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