External group

Language in our hands: Gesture and sign language

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Goals of the project

Fundamentals of human communication reside not only in our ability to use speech but also to recruit our body movements for meaningful expression. Our group investigates how our bodily actions interact with language structure, processing, and use in communication across languages and cultures. We focus on two domains of human communicative behavior: (1) gestures that speakers use while speaking, and (2) sign languages (established or emerging) used by deaf people.

Speech and gesture processing

Gesture and speech are assumed to form an integrated system during language production. Based on this view, we investigated whether in comprehension the two modalities also interact mutually. In one experiment we presented participants with action primes (e.g., someone chopping vegetables), and with bimodal speech and gesture targets. Participants related primes to targets more quickly and accurately when they contained congruent information (speech: 'chop'; gesture: chop) than when they contained incongruent information (speech: 'chop'; gesture: twist). Moreover, the strength of the incongruence affected processing, with fewer errors for weak incongruities (speech: 'chop'; gesture: cut) than for strong incongruities (speech: 'chop'; gesture: twist) suggesting that comprehenders take the semantic relations between the two modalities into account when processing either modality. These effects persisted in a subsequent experiment when we asked participants to focus on speech only, indicating the obligatory influence of gesture processing on speech.

Role of modality in sign language

We aim to investigate the roles that modalities (i.e., visual-spatial or oral-aural) play in shaping language structure. By comparing different signed languages and spoken languages we can broaden our understanding of the range of structures used in natural language to encode spatial relations. Sign languages have been assumed to exploit affordances of the visual modality for analogue representations in spatial expressions, and to do so similarly across many sign languages. In this sense they have been considered to differ radically from spoken languages. We tested this claim by comparing two unrelated sign languages, German and Turkish Sign Languages, by eliciting locative descriptions from 12 signers from each sign language encoding 'on' (e.g., a cup on the table) and 'next to' (e.g., two cups next to each other) relations. Even though both sign languages showed general modality effects in locative expressions, we also found that both languages used language-specific and categorical as well as analogical structures in locative expressions. Thus, even in the domain of space, the affordances of visual modality seem to be constrained by linguistic structures and reveal linguistic diversity.

Selected publications

Furman, R., Özyürek, A., & Küntay, A.C. (2010). Early language-specificity in Turkish children's caused motion event expressions in speech and gesture. In K. Franich, et al. (eds.), Proceedings of the 34th Boston University Conference on Language Development. Volume 1 (pp. 126–137). Somerville, MA: Cascadilla Press.

Kelly, S.D., Özyürek, A., & Maris, E. (2010). Two sides of the same coin: Speech and gesture mutually interact to enhance comprehension. *Psychological Science*, 21, 260–267.

Özyürek, A., Zwitserlood, I., & Perniss, P.M. (2010). Locative expressions in signed languages: A view from Turkish Sign Language (TID). *Linguistics*, 48(5), 1111–1145.

Other subprojects

- Neurocognition of gesture
- Sign/gesture development