



Asli Özyürek

Language is much less effective without gestures

Ten years ago Asli Özyürek started combining language and gestures in her research. As it turned out, this new perspective led to new insights as well as publications in top journals such as *Science*. Nowadays more and more researchers look at language in a 'user context', instead of studying it merely as an abstract system. Asli is Professor of Gesture Language and Cognition at Radboud University Nijmegen.

It's almost impossible not to gesture when you talk; even blind people do it while talking to other blind people. On the phone we gesture to get our message across, precisely as we do when we talk face to face.'

Prof. Özyürek has been studying language within the context of gestures for ten years now, specializing in iconic gestures. 'When you tell someone you're cutting something while making a cutting motion, the message is more easily understood and it's remembered longer.'

It's not only the listener who benefits from gestures; they are also useful for the speaker. 'If you instruct participants to speak without gesturing, their speech is less fluent and they will have more difficulty finding the right words. And gestures help you remember. When you're giving someone directions, you make directional gestures in the space in front of you. We do that even when we're talking on the phone. Speech fades away and cannot be externalized; on the other hand we can see our gestures

as we speak and the visual traces of gestures remain. These gestures might even restructure our thoughts while we're speaking.' Gesturing also probably off-loads some of the cognitive load to our hands, leaving more space for memory and speaking.

Cultural differences

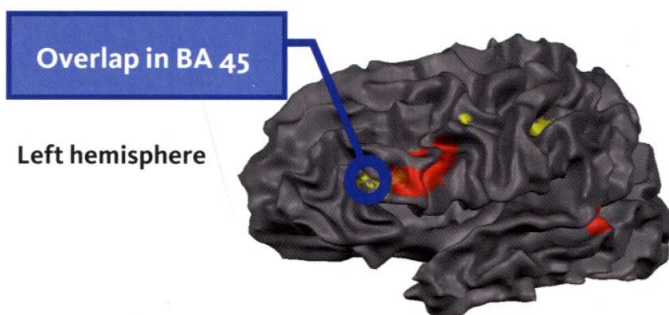
People talking different languages use different gestures. 'We showed participants a video of someone walking down the stairs and asked Japanese, Turkish and English people to describe what they saw. Turkish and Japanese people put more emphasis on the verbs in a sentence. In English the sentence is 'he ran down the stairs', whereas in Turkish I have to say 'he ran and he went down the stairs', segmenting the sentence into different verbs. We looked at people's iconic gestures when they talked about the same events. English speakers integrate the gesture of walking with a downwards movement. Turkish people first gesture 'walking' and then 'downwards', separating their gestures as they have to do with their verbs.' This provides

evidence that gesture and language are part of a single integrated system.

Different brain areas

Perception of language and meaningful bodily actions are grounded in overlapping brain areas of the listener. Broca's area plays an important role in both. That is where we deduce information from language, but also from the gestures that people use. Whether the production of language is also closely related to action, however, is more difficult to prove. However the overlapping brain areas that are involved in interpreting gesture and language suggest that language and action systems are not as separate as was previously thought. In fact gestures are probably grounded in a neuro-cognitive system that has roots both in the action system and in the communication/language system.

Prof. Özyürek also refers to interesting evidence with aphasia patients. 'As their ability to speak decreases, their ability to use supportive, iconic gestures also diminishes. Their use becomes less lively and the timing



Left hemisphere



Semantic Integration of Language
 Left Inferior Frontal (BA, 25, 44)
 Left STS



Semantic Integration of Gesture
 Left Inferior Frontal (BA 45)
 BA 6
 Left Inferior Parietal

Distinct but overlapping areas (BA45) for linguistic and gestural processing of semantic information. Willems, Özyürek, Hagoort. 2007, Cerebral Cortex

deteriorates. But if you ask these patients to pantomime without using words, their proficiency stays intact. From this result we can conclude that action with or without language involves different brain functions.'

Unconventional

It took time for linguists to get used to this research on language and physical context, such as gestures. For years they've studied language as an abstract system, with experiments in which participants responded to words on a screen. 'It's now evident that a more situated approach delivers interesting insights and so more attention is being given to contextual elements.

'I think that, because language is always used in context, it can hardly be studied in the abstract. Most experimental studies on language production have been carried out in very controlled situations, where you see a picture and speak the corresponding word into a microphone. Nobody looked at what your hands were doing.'

Asli Özyürek would like to expand her field of research to a more conversational context and to cross-cultural communication. 'I would love to find out which area of the brain is involved during gesture production. And we

definitely need to know more about how gesture or speech comprehension is linked to the other social bodily cues such as eye gaze and facial expressions that convey communicative intent. We are currently investigating this as part of a collaborative project between researchers at the Max Planck Institute for Psycholinguistics (MPI), the Centre for Language Studies (CLS) and the Donders Institute.'

Asli Özyürek (Ankara, Turkey, 1967) studied psychology at Bogazici University in Istanbul and received her PhD in Psychology and Linguistics at the University of Chicago. In 2009 she received an NWO-Vidi and European Research Council Starting Grant and became Professor of Gesture, Language and Cognition. She is the first and currently the only Dutch-Turkish female professor at the university. Prof. Özyürek is a researcher at the CLS and the MPI and a research fellow of the Donders Institute for Brain, Cognition at Behaviour of Radboud University Nijmegen.

RvdN

"Language in our hands: the role of body in language, cognition and communication": inaugural speech by Asli Özyürek, Professor of Gesture, Language and Cognition

"During a conversation we constantly use meaningful bodily actions, such as gesturing with our hands. This is how we convey meaning which is relevant to what we're saying and it actually reveals a lot more than what we say. We can learn a great deal from this new window on language, communication and cognition."

Being able to study the emergence of a new sign language in Nicaragua provided a unique opportunity for Asli Özyürek who, together with Dr Annie Senghas, studied groups of deaf people in the community who had not yet fully established their sign language. 'I wanted to find out how sign language changed over three generations,' she says. 'Are deaf people influenced by the gestures used in their community? Participants were shown a short movie, which they were then asked to describe in sign language. It became clear that the signing of the first generation resembled speech gestures they'd seen in their environment. The third generation, who were 25 years younger, made both smaller and more non-iconic gestures, which indicate the development of lexical items. You need new generations to alter the system. The youngest generation consisted of children, who analyze, segment and add elements, thus making the system more language-like.' This study, which was published in Science in 2004, shows that sign language and gestures support different systems. Sign language is very different from the co-speech gestures that Asli Özyürek is now studying, even though they share the purpose of facilitating communication and use the same visual modality.