LANPERCEPT'S **MILA VULCHANOVA, SOBH CHAHBOUN** AND **FRIEDERIKE VOSS** ON PROJECTS AIMED AT CREATING A BETTER UNDERSTANDING OF HOW PEOPLE OF DIFFERENT AGES UNDERSTAND LANGUAGE IN DIFFERENT ENVIRONMENTS

The traps of communication

Language is an important part of our life, and we depend on it every day. Quite often, however, we experience that our interlocutor fails to understand what we are saying, or, even worse, they manage to completely misinterpret the content of our message. In the worst of cases, this can lead to a complete communication breakdown.

One common reason for this can be that the interlocutor and the speaker do not share sufficient common background knowledge. Furthermore, the way of interpreting language differs between age groups (e.g. children and adults) and between clinical and normally developing populations.

LanPercept

Two projects of the EU-funded LanPercept-Network (http://www.ntnu.edu/lanpercept) have been set up to investigate the influence of visual stimuli on the processing of ambiguous language.

The first project, entitled 'The processing of figurative (indirect) language and pragmatic inferencing from visual context in typical and atypical language', examines the influence of visually presented material on the processing of figurative language, such as idioms and metaphors, in individuals with autism (ASD).

Misunderstanding the speaker's communicative intentions is a common problem for individuals with ASD, especially when using figurative language. If figurative and extended uses of language essentially depend on the perception and processing of more concrete core concepts and phenomena, then there is main question to answer concerning atypical populations: Why is a failure in this domain still commonly observed in atypical populations?

Idiomatic

We are currently conducting a study aimed at answering this question by focusing on idiomatic language processing in individuals with high functioning autism. Our main goal is to investigate how ASD individuals process idioms and, specifically, how they integrate information from multiple sources (e.g. visual modality and language) in this process.

Fig. 1 Images for 'You are a tomato'

We hypothesise that the visual context may help typically developing individuals but will interfere in processing the idiom and thus increase the difficulty of understanding these expressions in ASD populations. Furthermore, we expect that, since ASD individuals have a tendency for literal interpretation, they will have difficulties in appreciating the subtle linguistic nature of idioms and figurative language more generally.

To test this hypothesis, we have used different visual stimuli (pictures and sentences) that reflect literal meanings and idiomatic meanings, and we use different types of figurative expressions. For example, the metaphor 'You (have turned into) a tomato' is about a boy who has spent many hours on the beach without sun-protection. Participants have a choice between different pictures on screen for their answer (see Fig. 1).

The participant's task is to click on the stimulus he or she considers adequate and to decide which image best suits the figurative meaning of the stimulus. Both eye movements and the movement of the computer mouse are recorded. We expect that this method will help us to determine how participants process such expressions online and provide fine-grained information about the real-time course of participants' responses.

Ambiguous pronouns

Autistic individuals don't only present problems in conversations, but also in any situation in which contextual information, seeing the global 'big picture', or combining local 'detail' to an overall whole is crucial. As part of LanPercept, the project 'The development of local and global processing: from perception to language' deals with global and local perception in autism across the domains of vision, hearing, and language. A large body of research has suggested that ASD individuals show a bias towards local processing (faster or more accurate performance), whereas

Fig. 2 Frau Eichhörnchen fotografiert Frau Esel

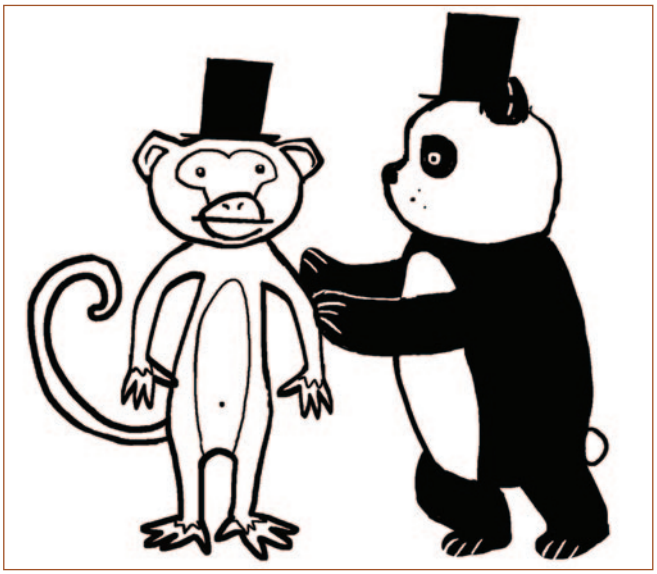

Fig. 3 Herr Panda schubst Herrn Affe

typically developing (TD) individuals show enhanced global perception; however, more recent research is inconsistent with those original assumptions. Our aim is to explore factors associated with enhanced global or local processing, and to clarify from where the differences arise in the two groups. We hope to shed light on this issue by assessing ASD and TD individuals in a range of local-global tasks and questionnaires.

In another project, entitled 'Discourse reference and situation models in situated child language comprehension', we investigate the influence of visual actions on the understanding of ambiguous pronouns in young children.

Pronouns are tricky, 'small' words which replace nouns and, for this reason, frequently trigger communicative misunderstanding. Such words as 'he' and 'she' carry a lot of meaning, and their misinterpretation can have an enormous impact on the understanding of what is being said.

In this project, we investigate the understanding of pronouns that can have two possible referents. Since language and perception are two basic cognitive systems, which constantly interact and rely on each other in our daily existence, we aim to investigate how visually-presented actions interact with event and information structure and affect the real-time comprehension of these ambiguous pronouns in children of different age groups. While the effects of visual actions on language and pronoun interpretation have been investigated in the past, how they influence each other has never been examined.

The participants are three to seven-year-old children, all native German speakers, and we track their eye movements while they are listening to the text and watching pictures of familiar animals (such as those shown in Fig. 2).

By using this method, we are hoping to develop a better understanding of how children use different sources of information, including grammar and visual information, to conclude who the sentence is signifying.

While some of the projects in LanPercept examine the influence of vision on language and understanding, other projects look at the reverse mapping: How does language affect how we see the world and remember what we see? In one project at the University of East Anglia, for instance, we are investigating whether language affects how people perceive and remember where objects are located in front of them. In normal language use, people would say 'this cup' if a cup is within their reach, and 'that cup' if it is beyond their reach. We therefore manipulate where objects are presented in front of people, and the language paired with that object.

Early results suggest that it is indeed the case that people remember objects associated with 'this' as being closer by compared to objects associated with 'that'. These results help explain how important it is to consider language and vision together, for instance with applications to police interviews or (teaching) interfaces.

All of these projects and the EU LanPercept project that they are a part of aim to better inform our understanding of how people of different ages understand language in different environments and how language competence interacts with the environment in which we live and function.

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