

# The influence of visual context and grammar factors on ambiguous pronoun processing in German and Norwegian children

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Using eye-tracking, we investigated how ambiguous pronoun processing is influenced by visually depicted actions and linguistically marked focus constructions. We aim to reveal at which age children learn to follow these cues in the same way as adults, and whether there are differences between German and Norwegian children's pronoun resolution.

Based on prior research, we expected to find a subject preference that grows stronger in children as they grow older (Järvikivi et al., 2013) We also expected younger children to rely more on visual context, and older children to pay more attention to syntactic structure (Bittner & Kuehnast, 2011).

The participants were 3-, 5- and 7-year-old children, as well as adult control groups. They listened to sentences with subject focus (2a) or object focus (2b) in the Norwegian experiment, and canonical order (2c) or subject focus (2d) in the German experiment. At the same time, they watched illustrations of two animals (corresponding to the subject and the object) on a screen. The animals were half of the time shown performing the action (e.g, tickling), and the other half of the time not. Thereafter, the participants heard an ambiguous pronoun sentence (3), and eye-tracking data were collected to determine whether they looked

1	Introduction sentence	Der er bjørnen og tigeren / Da sind Herr Bär und Herr Tiger
Norwegian 2a	Subject-cleft	Det er bjørnen som kiler tigeren
Norwegian 2b	Object-cleft	Det er tigeren bjørnen kiler
German 2c	Canonical sentence	Herr Bär kitzelt Herrn Tiger
German 2d	Subject-cleft	Es ist Herr Bär, der Herrn Tiger kitzelt

at the subject referent or the object referent. In addition, offline data were collected, by asking the participants to name or point at the pronoun referent (4).

Example of the stimulus sentences:

3	Pronoun sentence	Han kan telle til ti / Er kann schon bis zehn zählen
4	Question sentence	Hvem kan telle til ti? / Wer kann schon bis zehn zählen?

In both online and offline results, adults showed a significantly stronger subject preference than children. We found overall no significant differences between German and Norwegian participants.

The offline results suggested that German 5-year-olds chose the object referent significantly more often than the subject referent when the action was visually depicted than when it was not. Also, Norwegian adults chose the subject referent significantly more often in subject-clefts than in object-clefts.

The online results are only preliminary, as the gaze data will be further investigated.

### References

Bittner, D., & Kuehnast, M. (2011). Comprehension of intersentential pronouns in child German and child Bulgarian. *First Language*, 32(1-2), 176-204.

Järvikivi, J., Pyykkönen-Klauck, P., Schimke, S., Colonna, S., & Hemforth, B. (2013). Information structure cues for 4-year-olds and adults: tracking eye movements to visually presented anaphoric referents. *Language, Cognition and Neuroscience*, 29(7), 877-892.

### Preferences:

We do not have any preferences, you can decide whether we should have oral or poster presentation. If oral presentation, we would like our abstract to be evaluated for the main session.