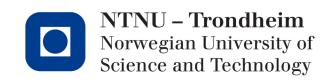


Ambiguous pronouns and visual context A crosslinguistic comparison

Discourse reference and situation models in situated child language comprehension

Basic question

How do extra-linguistic sensory affordances, such as visual actions, interact with event and information structure, e.g. linguistic focus, affect the real time comprehension of ambiguous discourse reference, e.g. ambiguous pronouns?



Clarification of key terms

What is ambiguous discourse reference?

- Peter and Paul are playing in the park while he sings a song.
- → Who is he? Is it Peter or Paul?

What is (contrastive) linguistic focus?

- Mary watches the news. \rightarrow canonical word order
- It is Mary who watches the news. → it-cleft, puts Mary into the focus of attention



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Experiment 1

- Ambiguous personal pronouns
- Visual actions
- Linguistic contrastive focus
- Imageability
- Theory of Mind
- Working memory



Participants

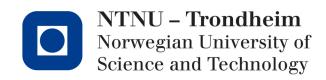
3 to 6 year old German children

Methodology

- Eyetracking with the help of a Tobii eyetrackers in connection with Eprime
 - → Auditory and visual stimuli



- Comprehension question after every item
- Auditory working memory test: Word List Recall
- Visual working memory test: Maze Memory
 - → How much information can be held accessible?
- Theory of Mind task
 - → Can they see something from somebody else's perspective and predict actions?



Bittner and Kuehnast (2011)

- Significant difference in the processing of personal and demonstrative pronouns in three and five year old children.
- Three year old children mainly use discourse- and context-based cues
- Five year old children employ syntax and discourse cues.



Cowles et al. (2007)

- Contrastive focus influences anaphora processing
- Makes referent more prominent
- More clearly when contrastive intonation is present
- Intonation enhances effect of contrastive focus



Revised Coordinate Interplay Account by **Knoeferle and Crocker (2007)**

- Depicted events had a strong influence on the processing of sentences
- The working memory representations of the events can experience decay when they are invisible or perceived as completed
- Emphasize the importance of working memory on language processing



Predictions

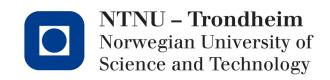
- On the one hand young children at the age of three or four will primarily rely on contextual and pragmatic cues and not on syntactic ones when resolving the ambiguous pronoun.
- On the other hand this behavior will presumably be different for the five to six year old children since by then their grammar will have become more robust so that they will use syntactic cues to resolve ambiguity.



The role of grammar factors and visual context in language acquisition

Basic questions

- How do 3 to 7 year-old Norwegian children process pronouns online and how is their understanding of the target event, their situation model, modulated by linguistic factors, referent's syntactic position and syntactically and prosodically expressed focus?
- How do these linguistic factors interact with sensory affordances?



Ambiguous pronouns and their interaction with:

- Clefting with agent focus (agent-clefts)
- Clefting with patient focus (patient-clefts)
- Visual action
- Verb imageability
- Working memory
- Theory of Mind



Agent-cleft

• It is Kari who hugs Ola

Patient-cleft

• It is Ola who Kari hugs



Participants

Norwegian 3, 5 and 7 year-old children

Methodology and pretests

• Similar to Friederike's experiment



Comprehension of clefts

 In English, patient-clefts are comprehended more slowly and less accurately than agent-clefts (Ferreira, 2003)

Clefts and ambiguous pronouns

- In German, agent-clefts make the agent more prominent than it is in a non-clefted sentence (for children, but not for adults) (Järvikivi et al., 2013)
- Patient-clefts make both the patient and the agent more prominent (Engelkamp & Zimmer; 1982, Järvikivi et al., 2013)

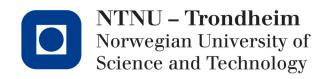


- German and English children and adults show an agent-preference in both agent- and patient-clefts (Järvikivi et al., 2013; Kaiser, 2011)
- However: Children show a patient-preference in a short timewindow right after pronoun onset (Järvikivi et al., 2013)
 - Suggests that the agent-preference is not yet stabilized in fouryear-olds
- Conflict between first-mention cue and agent cue in the patientcleft?



Predictions

- The different age groups will be equally proficient when the cleftsentence has agent focus
- When the cleft-sentence has patient focus, the older children will be more proficient than the younger ones, because they move towards adult competence
- The children will perform better when the action is visible than when it is not, specifically in the complex patient-clefts
- The younger children will rely more on visual context than the older children, because the older children are more proficient in using syntactic cues

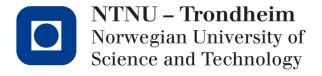


- 32 animals
- Each animal appears once in subject and once in object position (once as male once as female)
- 32 verbs
 - German verbs: all in accusative case, no phrasal verb (e.g. auslachen)
 - Imageability rating, age of acquisition, frequency



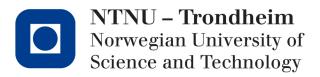
Conditions Norwegian version						
1	Clefting with agent focus	No visual action				
2	Clefting with agent focus	Visual action				
3	Clefting with patient focus	No visual action				
4	Clefting with patient focus	Visual action				

Conditions German version					
1	No focus	No visual action			
2	No focus	Visual action			
3	Focus	No visual action			
4	Focus	Visual action			



- Introductory sentence:
 - Her er en hund og her er en tiger.
 - \rightarrow image of both animals
- Experimental sentence condition2:
 - Det er hunden som børster tigeren.
 - → image of the dog combing the tiger
- Ambiguous pronouns sentence: Han vil gå en tur i skogen.

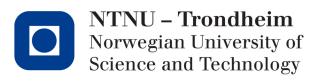
- Introductory sentence:
 - Da sind Herr Hund und Herr Tiger
 - \rightarrow image of both animals
- Experimental sentence condition2:
 - Herr Hund kämmt Herrn Tiger.
 - → image of the dog combing the tiger
- Ambiguous pronouns sentence:
 - Er hat viele Streifen.



Counterbalancing

- Ordering in the introductory sentence
- Active, passive
- Position on screen
- → E.g. each character is once active and once passive, the passive character is half of the time on the right and the other half on the left side of the screen





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