Antecedent preferences of Personal Pronouns and Anaphoric Demonstratives in German in Comprehension

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Demonstrative Pronouns

- Demonstrative pronouns can be used anaphorically
- German: personal pronouns – er, sie, es
demonstrative pronouns - der, die, das

(1) Der Kellner erkennt den Detektiv als das
Bier umgekippt wird. Er ist offensichtlich sehr
beer tipped over is. He is apparently very
fleißig.

hard-working.
Antecedent preferences of demonstratives

  - Grammatical Role: pron - subject, dem – object
  - Topichood: pron – topic, dem – non-topic
  - Information Structure: pron – old, dem – new
Previous work

- Focussed on three languages:
  - Dutch
  - Finnish
  - German
Dutch

- Topic based approach
  - Pronoun – hij
  - Demonstrative - die
- Used SVO antecedent sentences only
- Sentence completion and visual-world
- SVO – dem – Object/Non-topic preference
- SVO – pron – Subject/Topic preference
- Can’t separate Grammatical Role and Topic based accounts
Finnish

- Grammatical role
- Information structure

- Pronoun – hän
- Demonstrative – tämä

- SVO and OVS antecedent sentences
- Sentence completion and visual world
- SVO – dem – Object/Non-topic
- SVO – pron – Subject/Topic

- OVS – dem – No clear preference
- OVS – pron – Subject/Non-topic

- Pronouns – sensitive to grammatical role
- Demonstratives – both grammatical role and topichood
Finnish Information Structure

- SVO sentences have relatively neutral info structure.
- OVS sentences postverbal S refers to NEW information

- In SVO contexts (both dem and pron) early anticipatory effects to NP1, as likely continuation.
- In OVS contexts – for pron there was a sudden shift to NP2 (S), no pref for dem.
Bosch, Rozario and Zhao (2003)  
Grammatical role  
Corpus study found that Demonstratives preferred antecedents with accusative case, and pronouns, nominative antecedents.
(2a) Im Krankenhaus
In hospital.
(2b) Der Oberarzt untersucht den Notfallpatienten.
The senior doctor examines the emergency patient.
(2c) **Der/Er** ist gerade erst gekommen.
Dem/He has only just arrived.
(2d) Der ______ ist gerade erst gekommen.

(b) – SVO or OVS
Reading times, completion, memory questionnaire

- Bosch, Katz and Umbach
Experiment 1

• Judgement task – rated on a 7 point scale the probability that the two capitalized phrases referred to the same person

(3) DER MANN sieht den Jungen. ER ist sehr müde.
<table>
<thead>
<tr>
<th>Antecedent Sentence</th>
<th>Anaphoric Sentence</th>
<th>Judgement on which NP?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SVO</strong></td>
<td>Demonstrative</td>
<td>SVO</td>
</tr>
<tr>
<td></td>
<td>Pronoun</td>
<td>SVO</td>
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<td>SVO</td>
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<td><strong>OVS</strong></td>
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<td></td>
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<td>OVS</td>
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</tbody>
</table>
- Participants: Native speakers of German living in Edinburgh
- Sentences displayed using WebExp software
Figure 1: Graph to show antecedent preferences for SVO antecedent sentences
Figure 2: Graph to show antecedent preferences with OVS antecedent sentence
● Demonstratives preferred post-verbal antecedents, regardless of grammatical role.
● Personal pronouns preferred Subject antecedents in OVS condition, but had no preference in SVO condition.
Results

- Similar to Kaiser & Trueswell’s (in press) results for Finnish
- Different anaphors access different levels of representation
- In German Personal pronouns access both syntax and discourse
- But Demonstratives access mainly discourse
Potential Problems

- Attrition - all participants were native German speakers living in Edinburgh
- Experiment 1 was offline
- Results may have been affected by presentation of coreference judgement – capitalization may have had an effect.
Experiment 2 (with Matt Crocker)

- Visual world experiment
- Participants resident in Saarbrücken
- Materials are intended for use with L2 learners, so “easy” lexical items used.
- Subordinate clause introduced between antecedent and anaphor sentence to distract eye-movements from post-verbal NP
Der Kellner erkennt den Detektiv, als das Bier umgekippt wird. Er/Der ist offensichtlich sehr fleißig.
Results

- Similar to judgement task
- SVO – dem - Object/Non-topic pref
- SVO – pro – No preference
- OVS – dem – Object/Non-topic pref
- OVS – pro – Object/Non-topic pref
- Dem – discourse factors
- Pron – discourse factors and grammatical role
Proportion of Fixations

SVO pro

NP
Pre-verbal
Post-verbal

Proportion of Fixations

time (ms)
NP
Pre-verbal
Post-verbal

OVS pron

time (ms)

0.0
0.1
0.2
0.3
0.4
0.5

0-250 250-
500 500-
750 750-
1000 1000-
1250 1250-
1500 1500-
1750 1750-
2000
Proportion of Fixations

SVO dem

- NP
- Pre-verbal
- Post-verbal
OVS dem

Proportion of Fixations

NP
Pre-verbal
Post-verbal

0.0 0.1 0.2 0.3 0.4 0.5

0-250 250-500 500-750 750-1000 1000-1250 1250-1500 1500-1750 1750-2000

time (ms)
Time course

- Pronouns: OVS – early effect
- Demonstratives: reach significance late.

- Possibly due to faster processing of syntactic information than discourse information
Time course of effects

3 explanations:
- Demonstratives are ambiguous with definite determiners, delay is due to ambiguity resolution
- Late effects are due to the adjective triggering saccades to the referent
- Difference between processing speed for discourse and syntactic information
● SVO is earlier than OVS for dem

● Due to the Information Structure of SVO
  – SVO Post-verbal NP is more likely to be new info than in OVS

● Possibly anticipation of a change in topic

● Faster processing of demonstrative in SVO
Conclusions

- Different levels of representation are accessed for different types of anaphor.
- Clear evidence of cross-linguistic differences.
- Problematic for theories of anaphor resolution which do not take this into account, e.g., Informational Load Hypothesis.
Selected References