The licensing of discourse particles in complex questions: Evidence from graded judgments and event-related potentials

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Background

Question-sensitive discourse particles → Q-DPs in German:
- denn (lit. only), noch (lit. only), schon (lit. literally), wohl (lit. well...)
Q-DPs:
- enrich the pragmatic impact of questions, modifying illocutionary force
  - need to be licensed by interrogative clause type / mood
Syntactic licensing constraints:
- licensed by a c-commanding licensor in the FORCE projection
  - must be locally accessible: either minimally c-commanding the DP, or c-commanding the DP via a wh-chain (1)
Wer hat [denn] gesagt, dass Peter [wer] weiß? Who has (DP) said that Peter (DP) knows?

Semantic scope of Q-DP depends on its surface position:
- Wenn, denn (when), dass Sue (whether), mitgekratzt hast? What have you (DP) scratched Sue (DP) with?
  - What does he think that Sue has understood?

→ New type of long-distance dependency with an interplay of syntactic, semantic and pragmatic licensing constraints

Research Questions

What are the exact licensing conditions for Q-DPs?

How are licensing violations for Q-DPs reflected in the EEG?

What are the effects of failed licensing of the Q-DP (denn) if
- (1) the interrogative element (here a wh-phrase) is missing altogether
- (2) the interrogative element c-commands the DP while the DP is not locally accessible ("too far away"?)

Discussion

Q-DP licensing in questions is subject to syntactic licensing constraints,
- graded reduction in acceptability for inaccessible compared to absent licensors
  - "less acceptable" or "illocutionary licencing?" We assume the former.

ERP for Q-DP vs. non-Q-DP
- root clauses: ERP effects are surprisingly weak, no N400 for unlicensed Q-DP.
  - embedded clauses: no licensor no N400, but P600 for inaccessible licensor no N400, but P600.
  - descriptive contrast for embedded clauses matches behavioral data.

Q-DP licensing in questions is subject to syntactic licensing constraints,
- graded reduction in acceptability for inaccessible compared to absent licensors
- "less acceptable" or "illocutionary licencing?" We assume the former.

In EEG measurements, there are no N400 to reflect this (as could be expected with failed licensing).

- The licensing failure is not caused by problems in lexical retrieval.
- EEG patterns match the processing of syntactic and possibly semantic/pragmatic dependencies.

Link to negative polarity items

Negative polarity items = NPIs: English: ever, only; German: ja(m)ah
- may enrich the pragmatic impact of negation (strengthening)
- licensed in the semantic scope of negation (= c-commanded by licensor, occasionally excluding long-distance licensing)
- behavioral/retrieval licensing by present, but inaccessible licensor:
  - higher acceptance rates for inaccessible licensors than absent licensors (1)

ERP effects for licensed vs. nonlicensed NPI
- German: N400 [4]
  - N400 + P600, N400 amplitude decreased for inaccessible licensor (2)
  - N400: amplitude decreased for inaccessible licensor (6)
  - also for discussion of laconic licensing

Questions: Mechanisms behind laconic licensing?
- Reason for discrepancy between languages?

Relationship of our findings to NPI literature:
- Our findings for embedded clauses are more similar to findings for English NPI than for German NPI.
  - no N400 in conditions without licensor
  - P600 for absent or inaccessible licensor (descriptively weaker for inaccessible licensors)

This suggests that contrast between findings for English and German NPI do not reflect a general contrast between processing of long-distance dependencies in both languages.

Experiments

Stimuli

40 items in 8 different conditions (2x2x2 design), factors CLAUSE TYPE (declarative or question), DP (denn vs. jetzt), DP position (root or embedded).

<table>
<thead>
<tr>
<th>Clause Type</th>
<th>DIP Position</th>
<th>Clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td>declarative</td>
<td>root clause</td>
<td>denn nicht viele Jahre, dass der Koch die Zwiebeln anbraten soll. have DP said that the cook the onions should anbraten sollen. have P600 said that the cook should by the onions.</td>
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</tr>
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<td>interrogative</td>
<td>root clause</td>
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Experiment 1: Acceptability ratings

Magnitude Estimation task, 57 participants

Analytical: LMM, fixed eff.: clause type * position, random terms intercept (rand. slope & interaction clause type*position) and resid.

Separate analyses for yes and denied fixed eff.: clause type * position, random terms intercept (rand. slope & interaction clause type*position).

<table>
<thead>
<tr>
<th>Clause Type</th>
<th>DIP Position</th>
<th>N400</th>
<th>P600</th>
</tr>
</thead>
<tbody>
<tr>
<td>declarative</td>
<td>root clause</td>
<td>-1 µV</td>
<td>0.8</td>
</tr>
<tr>
<td>declarative</td>
<td>embedded clause</td>
<td>-1 µV</td>
<td>0.8</td>
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- Unlicensed den in rated worse than yes.
- den in present, but inaccessible licensor is rated worse than other interrogatives, but better than unlicensed den.
- yes condition makes good baseline for all conditions.

Experiment 2: EEG

visual stimulus presentation, channeled word-by-word, 400 ms for single words, 200 ms blank screen ISI.

22 participants, 64 electrodes, filtered bandpass 0.5-70Hz before segmentation.

ERP effects are surprisingly weak, no N400 for unlicensed Q-DP.

For both declaratives and interrogatives:
- more positive-going for denn than altijd at root anterior sites,
- more negative-going for denn than altijd at central posterior sites

For both declaratives and interrogatives:
- no statistically significant effects or interactions of clause type*position.

ERP effects for Q-DP relative to non-Q-DP

For both declaratives and interrogatives:
- more positive-going for denn than altijd at posterior sites,
- more negative-going for denn than altijd at left anterior sites

Descriptively weaker for interrogatives than declaratives.

<table>
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<tr>
<th>Clause Type</th>
<th>DIP Position</th>
<th>Voltage difference map:</th>
</tr>
</thead>
<tbody>
<tr>
<td>declarative</td>
<td>root clause</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>declarative</td>
<td>embedded clause</td>
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Affiliations: University of Konstanz, Department of Linguistics (everyone) Please see the handout for full references.
References


