AG 2
The Relation between Prosodic and Referential Structure

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Introduction: Prosody and Referential Structure
Overview

- Referential structure

- Marking of referential structure (especially by prosody)

- Empirical evidence for systematic relation between prosodic and referential structure (here: accent type & accessibility)

- Workshop programme (rough assignment of topics)
Referential Structure

- Reference chains of (co-)referring expressions
- Referential and lexical/conceptual activation
  - Anne bought a book yesterday.
  - Mary bought a book as well. (ref-new but lex-given)
  - She adores the author. (ref-given, ref-bridging)

- Topic continuity and topic shift
  - Topic continuity: Mary ... She
  - Topic shift: Anne ... Mary
Referential Structure

- Reference chains of (co-)referring expressions
- Referential and lexical/conceptual activation
  - Anne bought a book yesterday.
  - Mary bought a book as well.  (ref-new but lex-given)
  - She adores the author.  (ref-given, ref-bridging)

- Prominence profile: Ranking of discourse referents according to various prominence-related factors; here: pronoun she interpreted as referring to Mary (subject of preceding sentence)
Referential Structure

- Factors determining referential structure
  - Grammatical role (subject vs. object)
  - Thematic role (agent vs. patient)
  - Information structure (information status, focus/Question Under Discussion, topic)
  - Coherence relations
  - Cognitive factors (expectation, attention, processing load)
  - etc.
Marking of Referential Structure

- Interplay of various linguistic means

- Syntactic
  - Word order (including clefts and dislocations)

- Morpho-syntactic
  - Pronominalisation
  - (In-)Definiteness
  - Particles (e.g., wa and ga in Japanese)

- Prosodic
  - Highlighting: pitch movement, duration, intensity, position and type of accent
  - Phrasing: pauses, final lengthening, initial strengthening, glottalisation, boundary tones
Relation between Prosodic and Referential Structure

- Example: Types of pitch accent in West Germanic languages

- Pierrehumbert & Hirschberg (1990, Am. Engl.)

Meanings of starred tones are shared among different accent types, marking the information status of referring expressions

\[
\begin{align*}
\text{new} & \quad \Rightarrow \quad \text{accessible} & \quad \Rightarrow \quad \text{given} \\
H^* & \quad \Rightarrow \quad !H^* & \quad \Rightarrow \quad L^*
\end{align*}
\]
### Production: Accent Type and Information Status

- Baumann & Riester (2013): Corpus study, probabilistic distribution of ATs

<table>
<thead>
<tr>
<th>Reflex combinations</th>
<th>H*</th>
<th>!H*</th>
<th>H+L*</th>
<th>L*</th>
<th>No pitch accent</th>
</tr>
</thead>
<tbody>
<tr>
<td>r-new / l-new</td>
<td>19</td>
<td>19</td>
<td>35</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>r-unused / l-new</td>
<td>43</td>
<td>8</td>
<td>5</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>r-generic / l-new</td>
<td>30</td>
<td>12</td>
<td>14</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>r-bridging / l-new</td>
<td>28</td>
<td>4</td>
<td>9</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>r-given / l-new</td>
<td>22</td>
<td>3</td>
<td>13</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>r-bridging / l-accessible</td>
<td>9</td>
<td>3</td>
<td>47</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>r-new / l-accessible</td>
<td>6</td>
<td>17</td>
<td>57</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>r-bridging / l-accessible</td>
<td>4</td>
<td>38</td>
<td>5</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>r-given / l-accessible</td>
<td>16</td>
<td>4</td>
<td>13</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

**distribution of accent types (%)**
Perception: Accent Type and Coreference

- Perception experiment on coreference in German (Baumann & Roth 2014)

Have you met your cousin?

On Monday I met Tamara.

L+H*  
H+L*  
Ø

'How likely do you think it is that the cousin is Tamara?'

Significant main effect (p<0.001)

newness  L+H*  (rise)

coreference  H+L*  (fall)

no movement (Ø)
Perception: Prominence of Accent Types

Baumann & Röhr (2015)

'Sie hat mit der Lana telefoniert.'
('She was on the phone with Lana.')
Perception: Accent Type in Cognition

- Schumacher & Baumann (2010): neurolinguistic perception study

**Context:** *Sabine repariert einen alten Schuh.*
‘Sabine is repairing an old shoe.’

**Target Sentence:** *Dabei zerschneidet sie die Sohle.*
‘In doing so, she is cutting the sole.’

(*sole = accessible info, whole-part relation*)

H*  H+L*  Ø
Perception: Accent Type in Cognition

- Significant three-way difference in processing effort: **N400** for unexpected accent types: $\emptyset > H^* > H+L^*$
- **Late positivity** for deaccentuation shows strongest mismatch between information status and prosodic realisation
- Least integration costs for ‘accessibility accent’ $H+L^*$
Production: Accent Type in Referent Tracking

Pilot study (Baumann & von Heusinger, in preparation)

- Which accent types on an object (given vs. bridged/accessible in the context) are strong enough to outweigh the assumed general subject bias (Kaiser 2011) in a story continuation task?

- Contrastive accents (L+H*), ‘accessibility accents’ (H+L*) and deaccentuation (Ø) tested
Referent Tracking: Setup

“Given” context

a) Gestern ist Peter erst spät ins Fitnessstudio gekommen. (Yesterday, Peter arrived at the gym rather late.)

b) Der Trainer und der Masseur waren ganz unruhig. (The trainer and the masseur have been worried.)

c i) Peter hat den Trainer beobachtet. (Peter observed the trainer.)

Ø

c ii) Peter hat den **Train**ner beobachtet. ...  

H+L*

c iii) Peter hat den **Train**ner beobachtet. ... 

L+H*
Referent Tracking: Setup

“Bridging” context

a) Gestern ist Peter erst spät ins Fitnessstudio gekommen. (Yesterday, Peter arrived at the gym rather late.)

b) Das Personal war ganz unruhig. (The staff has been worried.)

c i) Peter hat den Trainer beobachtet. (Peter observed the trainer.)

c ii) Peter hat den TRAIner beobachtet. ....

H+L*

c iii) Peter hat den TRAIner beobachtet. ...

L+H*
Referent Tracking: Results

Topic shift / Topic continuity

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<tr>
<th>Topic in first sentence</th>
<th>Peter (subject)</th>
<th>Trainer (object)</th>
<th>Masseur (alternative to object)</th>
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<tbody>
<tr>
<td>Given</td>
<td>Ø</td>
<td>36%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>H+L*</td>
<td>36%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>L+H*</td>
<td>23%</td>
<td>73%</td>
</tr>
<tr>
<td>Bridging</td>
<td>Ø</td>
<td>23%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>H+L*</td>
<td>27%</td>
<td>59%</td>
</tr>
<tr>
<td></td>
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<td>50%</td>
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- Contrastive accents (esp. given context) overwrite the subject bias most clearly (e.g. Schafer et al. 2015)
## Referent Tracking: Results

### Topic shift / Topic continuity

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- Deaccentuation in bridging context strongly activates accessible referent
Referent Tracking: Results

- Two types of activation process

- a) Signal-driven activation
  
  **Accents activate a referent by prosodic prominence/highlighting ('more'):** esp. L+H* as the most prominent accent type

- b) Accomodation
  
  **Deaccentuation activates a referent by lack of prosodic prominence ('less'):** referent is interpreted as already activated
Accent Types and Accessibility

- So far: Interaction between information status and accent types in production and perception
  - Different levels of cognitive activation
  - Analysis by reference chains and topic shifts
  - The mediating role of prominence and – implicitly – the inverse relation between discourse prominence (= givenness) and prosodic prominence (= highlighting)

... but there is much more to come...
Workshop programme – Wednesday (March 7)

- **Main Topic:** Information status and prosodic form

  - **Arnold:** Information structure (i.e. information status & focus), fluency and predictability and their influence on prosody

  - **Greif & Skopeteas:** Information status in scripted speech

  - **Meyer-Sickendiek & Hussein:** Spoken corpus analysis; recognition of rhythmic patterns in read poetry

  - **Riester, Eckart, Rösiger, Schweitzer, Schweitzer & Stehwien:** Spoken corpus analysis at various levels (information status, focus, syntax, prosody)
Workshop programme – Thursday (March 8)

- Main Topic: Semantic-pragmatic functions of prosody
  - **Cole**: Information status and intonational meaning
    (in prenuclear position)
  - **Gotzner & Spalek**: Expectations and choice of referential form
    (triggered by focus particles and pitch accent types)
  - **Zappoli, Vespignani, Baumann, Grice & Schumacher**: Processing of information status-prosody relation in L1 and L2 listeners
  - **O‘Grady**: Marking of a referent‘s “informational meaning“ by lexical form and prosody
Workshop programme – Thursday (March 8) contd.

- **Main Topic: Semantic-pragmatic functions of prosody**

- **Belz**: Dialogue structure indicated by different (prosodic) types of filled pause

- **Schlechtweg & Härtl**: Prosody of quotations in referring and name-mentioning expressions

- **Kentner & Wagner**: Information status of referring expressions in narratives (direct and indirect speech)
Workshop programme – Friday (March 9)

- Main Topics: (Morpho-)Syntax and prosody; typology
  - de Beer, Huttenlauch, Hanne & Wartenburger: Speaker-specific variability in resolving (morpho-)syntactic ambiguities
  - Tönnis: Acceptability of clefts in written and spoken German
  - Pesková & Feldhausen: Prosodic forms and functions of pronominal subjects in Buenos Aires Spanish
  - Torregrossa & Andreou: Prosody of personal and demonstrative pronouns in German child language
  - Maas & Louriz: Prosody of referential markers in spontaneous and canonical Moroccan Arabic
Change in programme today

- **New:**
  - 14:15-15:15  **Keynote Jennifer Arnold:** Is prosody an intentional signal of information structure?
  - 15:15-15:45  **Markus Greif & Stavros Skopeteas:** Discourse status, lexical mention, and pitch accent plasticity
  - 15:45-17:00  **Coffee break (extended) incl. poster session computational linguistics**
  - 17:00-18:00  **Arndt Riester, Kerstin Eckart, Ina Rösiger, Antje Schweitzer, Katrin Schweitzer & Sabrina Stehwien:** Studying the prosodic properties of referring expressions in corpus resources: Obstacles and state of the art
Social Events

- **Wednesday, 6:30: Reception at town hall (4th floor)**

  Located at market square in the city centre, only a 5-minute walk from the U-Bahn-Station 'Rathaus' and a 10-minute walk from the S-Bahn-Station 'Rotebühlplatz/Stadtmitte'

- **Wednesday, 8:00: Workshop dinner at Murrhardter Hof**

  (Wilhelmsplatz 6, information see handout)

- **Thursday, 7:30: Conference dinner at Mensa Stadtmitte**

  (Holzgartenstr. 11) 5-minute walk from K1/K2 towers
Questions?