Topic and focus in sentence initial position

![Bar chart showing distribution of focus and topic with various labels and percentages.]

- **H**
- **H*L
- **L**
- **OTHER**
- **no-accent**

Legend:
- **H**
- **H*L
- **L**
- **OTHER**
- **no-accent**
Learning phonetic marking

- Test case: sentence-initial topic and focus
  - Do children distinguish them phonetically even though they use the same accent type?
  - Do they differ from adults?
Wie kleurt het bed?
Who paints the bed?

De paashaas ...
The Easter-bunny …
Results from the perception test

Effect of knowledge of Dutch
(4- to 5-year-olds)

- Native: 54%
- Intermediate: 48%
- Beginning: 50%
- Zero: 40%
Results from the perception test

Effect of knowledge of Dutch
(7- to 8-year-olds)

<table>
<thead>
<tr>
<th>Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native</td>
<td>64%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>53%</td>
</tr>
<tr>
<td>Beginning</td>
<td>63%</td>
</tr>
<tr>
<td>Zero</td>
<td>63%</td>
</tr>
</tbody>
</table>
Results from the perception test

Effect of knowledge of Dutch (adults)

- Native: 78%
- Intermediate: 76%
- Beginning: 62%
- Zero: 60%
Results from the perception test

Effect of speaker
(4- to 5-year-olds)

<table>
<thead>
<tr>
<th>Speaker</th>
<th>67%</th>
<th>67%</th>
<th>45%</th>
<th>36%</th>
</tr>
</thead>
<tbody>
<tr>
<td>k6</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>k24</td>
<td></td>
<td></td>
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<tr>
<td>k26</td>
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<td></td>
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</tr>
<tr>
<td>k34</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Results from the perception test

Effect of speaker
(7- to 8-year-olds)

- k1: 82%
- k4: 76%
- k15: 68%
- k18: 50%
- k23: 53%
Results from the perception test

Effect of speaker (adults)

- v9: 59%
- v12: 87%
- v13: 53%
- v14: 87%
- v16: 56%
- v23: 97%
- v25: 79%
Method

- Pairs of sentence-initial nouns accented with H*L in both topic and focus
- Phonetic annotation

Mixed-effect modeling in R

Chen (2009)
Results: Pitch (adults)

- Larger pitch excursion in focus
  - pitch-minimum lower in focus

Chen (2009)
Results: Duration (adults)

- General lengthening in stressed as well as unstressed syllables

Chen (2009)
Results: Alignment (adults)

- Alignment of F0max: relative to end of stressed vowel (why?)
- Alignment of F0min: relative to end of word (why?)
Results: 4- to 5-year-olds

- No use of phonetic means

Wie …?  Wat … poetsvrouw?

(De) poetsvrouw
‘cleaning-lady’

Chen (2009)
Results: 7- to 8-year-olds

- Adult-like use of pitch lowering

Chen (2009)
No use of phonetic means at 4 or 5
Adult-like use of pitch lowering at 7 or 8

Implications
- Phonetic marking acquired later than phonological marking
- Less salient cues are more difficult to learn

But why the asymmetry in acquisition of different phonetic cues?
- Duration initially used for lexical purpose in Dutch vs. duration is a more difficult cue for all children

Chen (2009)
The (a)symmetry between production and comprehension
The alleged asymmetry

- Adult-like in using accentuation to mark (narrow) focus by age 5

- Not adult-like in interpreting & processing the focus-to-accentuation mapping at the age of 4 and 5

The problem

- Limited comparability between production data and comprehension data in past work
On production

- By age 5 children can use accentuation …
    
    e.g. *A horse is eating carrots* vs. *A RABBIT is eating carrots.*

  - to mark non-contrastive narrow focus (Chen 2011)

    e.g. *Look! Carrots! Who is eating carrots? A RABBIT is eating carrots.*
On comprehension

- Directing attention to certain words in narratives (Cutler & Swinney 1987)
- Creating acceptable intonation in a sentence (Lahey 1974, Bates 1976)
  - e.g. The farmer only sold a banana to Snow White.
- Pronominal disambiguation in coordinate sentences (Solan 1980, McDaniel & Maxfield 1992)
  - e.g. The camel hit the lion, and then HE hit the elephant.
- Distinguishing focus from topic in SVO sentences (Hornby 1971)
  - e.g. The rabbit is eating CARROTS.
The present study

- Prosody and language comprehension in adults (Birch and Clifton 1994)
  - The Reaction Time technique
  - The ‘make-sense’ task
  
  *e.g. Isn’t Kerry pretty smart? Yes, she teaches MATH.*

- Main finding
  - Faster and more ‘making sense’ judgments when focus-to-accentuation mapping was appropriate in the answer sentences than when otherwise

- Processing of focus-to-accentuation mapping in Dutch 4- to 5-year-olds
  - Exp 1: active comprehension
  - Exp 2: passive comprehension

Chen (2010)
Experiment 1: method

- ‘Correct-incorrect’ judgment in question-answer dialogues
- Location of focus (subject vs. object) and accent placement were varied in answers in experimental dialogues
  - subject focus (N=12): as answers to WHO-questions
    - Accent placement and focus matched (N=6)
    - Accent placement and focus did not match (N = 6)
  - Object focus (N=12): as answers to WHAT-questions
    - Accent placement and focus matched (N=6)
    - Accent placement and focus did not match (N = 6)
- Fillers
  - With lexico-semantic errors: duck -> chicken
    - Location of focus and accent placement
  - With pronunciation errors: jongen ‘boy’-> jangen
    - Location of focus and accent placement
What is the pig washing?

Who is washing the blouse?
Experiment 1: method (cont’d)

- **Measurements**
  - Correct-incorrect judgments
  - Reaction times

- **Participants**
  - 4- to 5-year-olds (N=20): 4;3 – 5;7, mean age 5;1
  - Adults (N=15)
Experiment 1: method (cont’d)
Experiment 1: Results - RT

Repeated measures ANOVA:
- Age group *
- Focus location *
- Accent placement *
- Age group x accent placement *

Graph showing mean reaction time (ms) vs. accent placement with data points:
- Children: 479, 1209, 1429
- Adults: 512

Axes:
- Y-axis: Mean reaction time (ms)
- X-axis: Accent placement (appropriate, inappropriate)
Experiment 2: method

- ‘emphatic’ judgment
  - Why?
  - ‘emphatic’ -> The speaker finds it exciting (‘spannend’) to answer the question.
  - ‘not emphatic’ -> The speaker finds it boring (‘niet spannend’) to answer the question.

- Question-answer dialogues
  - Fillers: no accent (flat intonation) (N = 16)
Experiment 2: Results – adults

- A significant effect of appropriateness of accent placement
  - More emphatic judgments when accent placement is appropriate.
  - No effect of accent placement on RT: the task was too easy?
Experiment 2: Results – children

- A clear effect of appropriateness of accent placement on RT

![Bar chart showing mean RT (ms) for children (N=11). The chart has two bars: one for inappropriate and one for appropriate accent placement.](chart)

- df = 10
- t = 2.88
- p < 0.05
Discussion

- Past work provides no conclusive evidence for children’s inability to process the focus-to-accentuation mapping.
- Current results show 4- and 5-year-olds can process the focus-to-accentuation mapping, which they also produce.

Implication
- Production is as good as comprehension: almost adult-like, with differences of a gradient nature.

Further studies
- Focus-to-accentuation mapping in sentence constituents other than arguments of the verb.
- Accentuation in broad focus (e.g. VP focus).
- Effects of accent type on processing of focus-to-accentuation mapping.
Conclusions

≤2 yrs

- Frequent use of a small set of patterns
- Distinguish focus from topic intonationally but in a non-adultlike way
- !H*L≠ not accenting
- Devoicing when not accenting

3 yrs

- Figuring out choice of accent type
- Adult-like in marking initial topic and focus & preferring accentuation over no accent in focus…
- No preference for H*L in final focus
- No use of phonetic variables to distinguish focus from topic

5 yrs

- Later acquisition of phonetic marking
- Adult-like in marking focus and topic intonationally
- Use pitch but not yet duration to distinguish focus from topic phonetically

8 yrs

- Physiologically constrained
- Later acquisition of phonetic marking
Course assignment

• A review article on a topic on acquisition of intonation that has not been discussed in the class
  – Review at least 3 papers (more is welcome)
    • Provide the state of art on the topic under review
    • Give your opinions on the drawbacks in the specific line of research
    • Speculate on research topics for further research
  – List relevant papers that are not included in the review in an appendix
• Single-spaced, font 12, doc file
• Finishing date: 15 May 2011