The role of duration as a phonetic correlate of focus

Frank Kügler
f.kuegler@gmail.com

Fourth Conference on Speech Prosody – Campinas, Brazil, 06 – 09 May 2008

1. Introduction

Duration and f0 are phonetic correlates of pitch accents, and pitch accents indicate a focused element in German.

Question:

Is duration an independent correlate of focus?
Or is duration dependent on higher scaling of f0?

➤ Focus causes an increase in duration (e.g. Féry & Kügler, to appear)
➤ Duration of a constituent depends on its position in a sentence
➤ Duration appears to correlate with the size of focus domain (e.g. Baumann et al. 2006)
➤ Duration and focus appear to correlate – even without f0 correlates (SOF) (e.g. Ishihara & Féry, 2006)

Specific goal: To determine the durational patterns in German

2. Duration – A production study

Question:

Does duration depend on information structure?
Does duration depend on position of the constituent?
Does duration depend on the length of the sentence?

Conditions:
1. **Information structure:**
   (i) wide focus   (ii) narrow focus   (iii) contrastive focus
   (iv) pre-focally given   (v) post-focally given
2. **Position:**
   (i) early   (ii) late in the sentence
3. **Length:**
   (i) short (7 – 8 σ)   (ii) long sentence (13 – 20 σ)

3. Stimulus Materials

Sentences:
a. Frau **Mohn** will ein Lamm malen.
b. Ein Lamm will Frau **Mohn** malen.
c. Frau **Mohn** will ein Lamm im Berliner Tierpark malen.
d. Im Berliner Tierpark will Frau **Mohn** ein Lamm malen.
'Mrs Mohn wants to paint a lamb / in the zoo of Berlin'

Target words:
[mo:n] [li:.nɐ]

Contexts:
a. What happened?
b. Who does want to paint a lamb?
c. Does Mrs Drahner want to paint a lamb?
d. Does Mrs Mohn want to paint a hoarse?
e. Does Mr Mohn want to paint a lamb?

4. Experimental design and procedure

Design:

8 unique question-answer pairs:
  2 items × 2 positions × 2 sentence lengths
5 information structure conditions:
  all-new, narrow & contrastive focus, pre- and post-focally given
= 40 sentences per speaker

Procedure:
• 10 native speakers of German (Standard variety around Berlin)
• Pseudo-randomized order of stimuli including filler
• Sound proof booth, condenser microphone
• Contexts were presented visually and orally
• Participants had to answer the question reading the sentence presented on the screen.

Data processing:
• 44.1 kHz, 16 bit resolution, Praat
• Hand labeling on syllable level
• Repeated measures ANOVA, dependent variable: *duration*

5. Predictions

Information structure:
Focus: Increase in duration
Givenness: Decrease in duration
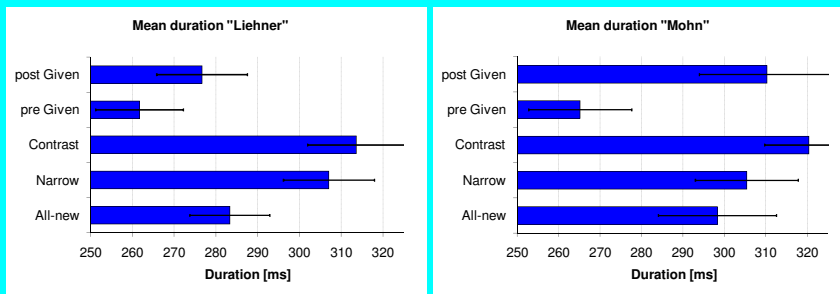**Position:**
Longer durations for *earlier* target words
Sentence length:
Shorter durations in *longer* sentences

6. Results – Information structure

Baseline: All-new sentence

Mean duration "Liehner" / Mean duration "Mohn"

• **Focus:**   Longer duration than baseline
            No difference between Contrast & Narrow

• **Givenness:**   Shorter duration only in pre-focal position
              Post-focal duration is similar to baseline

7. Results – Position of target word

Mean duration "Liehner" / Mean duration "Mohn"
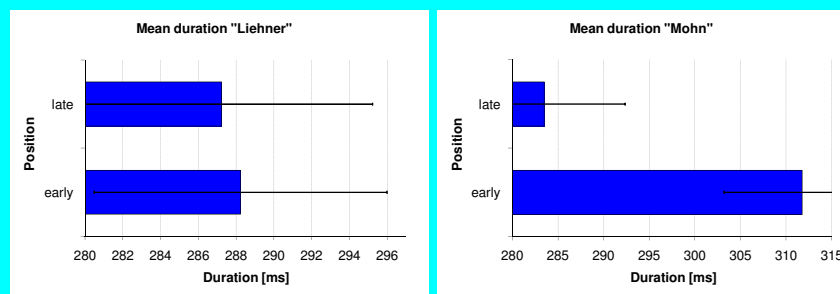
• **Difference between monosyllabic and disyllabic target word**

• **Disyllabic** *Liehner* no durational difference

• **Monosyllabic** *Mohn* on average 28 ms shorter if occurring earlier in the sentence

8. Results – Sentence length

Mean duration "Liehner" / Mean duration "Mohn"
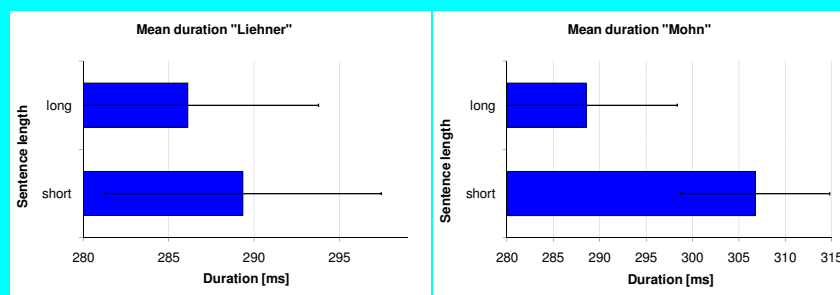
• **Longer target constituents in short sentences**

• **Disyllabic** *Liehner* no significant difference

• **Monosyllabic** *Mohn* on average 18 ms shorter in long sentences

9. Discussion & Conclusion

Predictions by and large borne out: Focus increases, givenness decreases duration, yet only in pre-focal position. Post-focal correlates of prominence seem to survive (cf. SOF, Féry & Ishihara, ms).

The data do not support a division of different focus categories prosodically.

Position & Sentence length affect the duration of a constituent. The difference between mono- and disyllabic target words remains unclear, however.

References

Ishihara, S.; Féry, C., 2006. Phonetic Correlates of Second Occurrence Focus. *Proceedings of NELS 36. GLSA,* University of Massachusetts, Amherst.
Féry, C.; Kügler, F., to appear. Pitch accent scaling on given, new and focused constituents in German. *Journal of Phonetics.*
Baumann, S.; Grice, M.; Steindamm, S., 2006. Prosodic Marking of Focus Domains - Categorical or Gradient?. In Hoffmann, R.; Mixdorff, H. (eds) *Proceedings of Speech Prosody 2006, Dresden, Germany, Dresden: TUDpress,* 301-304.