Final lengthening in Danish

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Research conducted within the project *Improving Second Language Pedagogy at the Prosody-Pragmatics Interface Using Human-Robot Interaction*

In many languages final lengthening is used as a cue for telling listeners that the speaker is approaching the end of an intonation phrase. Among other things, this helps turn-taking.

In Danish, final lengthening is claimed to be so moderate that it does not serve as a cue. Is that it, also in real talk-in-interaction?

Final lengthening

Final lengthening means that a speaker speaks slower at the very end of an intonation phrase (IP). Grønnum [1, p. 191] finds that final lengthening in Danish is moderate.

This may cause problems for speakers of other languages to recognize the end of a Danish utterance, which is important for smooth turn-taking [2].

- Grønnum's findings are based on read speech.
- Maybe the pressure of smooth turn-taking in authentic talk-in-interaction make people use final lengthening?

How to Measure Final Lenghening?

Here, three different ways to measure are tested:

- **The easiest measurement: Beginning + end of IP**
  Pre-accent syllables are compared to post-accent syllables. (Accented syllables are left out because of longer duration).
- **A clean measurement: Same word, different IPs**
  The duration of the same word (with the same word form and stress level) at initial/middle vs. late position are compared [1]. In the data, the pronoun *noget* fulfilled these requirements.
- **Analyzing the whole IP**
  Hansson [3] measures the speech rate of all the phonological words throughout the IP. The first phonological word turned out always to be fast ("initial shortening"?), but the penultima and ultima phonological words made for a good comparison.

Data and definitions

The analysis is based on conversations from the Danish part of Taklbank (https://samtalebank.talkbank.org).

The Danish basic rhythmic and tonal unit, the so-called stress-group [1], was used as a correspondent for a phonological word.

Segmentation and measurements were made with the help of the phonetic analysis program PRAAT [4].

Measuring speech rate in syllables/second was difficult due to the *schwa*-assimilation (and other reductions) of spoken Danish:

Unstressed endings often contain a *schwa*-vowel. In spontaneous speech, the *schwa*-ending is often assimilated to a neighboring sound, often resulting in a prolongation of the fused sound. Syllabicity may remain, or be lost. An example: 5 or 9 syllables?

(1) *har i* [*wEEkend*]$_{\text{phon word 1}}$ [*Arbejd non gang os*]$_{\text{phon word 2}}$
"do you have weekend work sometimes, too"

(2) *har i* [*wEEkend*] [*Arbejd-**e** nogl-**e** gang-**e** ogs-**å***]

A word can be pronounced as two, or sometimes with *schwa*-assimilation, as one or one prolonged syllable. I count only syllables that I can hear, but the decision has a huge impact on the results.

Results

Table (1) shows the speech rate in syllables/second for three different kinds of questions:

Tab. 1: Question type and the speech rate in syllables/second

Question Type	Pre-Accent	Post-Accent	First Phon Word	Penultima Phon Word	Ultima Phon Word
V1 17 items	10,4 4,7-16,7 17 items	7,2 2,2-11,7 16 items	8,1 3,8-13,0 14 items	6,0 45-8,3 5 items	6,8 3,6-11,9 12 items
V2 11 items	8,4 5,2-12,0 10 items	7,0 4,3-11,9 6 items	5,7 4,1-7,2 5 items	6,1 1 item	4,4 2,7-6,6 5 items
WH 11 items	10,9 7,4-17,6 6 items	6,4 3,6-11,1 6 items	6,9 4,0-8,7 6 items	6,8 6,4-7,0 3 items	5,1 3,3-6,7 6 items
TOTAL 39 items	9,9 5,8-15,5 33 items	6,9 3,7-11,6 27 items	6,9 4,0-9,6 25 items	6,3 5,5-7,7 9 items	5,4 3,2-8,4 23 items

In the case study of *noget*, I measured length in milliseconds. I also calculated the part of *noget* of the prosodic word of which it was part to see if the environment was fast or slow speech. The expression *så no* (< *sådan noget*, "such things") turned out to be a linguistic environment, in which *noget* was extremely reduced:

Tab. 2: Speech rate of pronoun noget *in ms, its part of the phonological word, and categorized by position in the IP and, when relevant, turn*

	IP-Final + Turn-Final	*så no*, IP-Final	*så no*, IP-Internal	Other positions in IP
Items	7	5	5	17
Length	254 ms 220-286 ms	147 ms 65-235 ms	145 ms 106-221 ms	186 ms 124-300 ms
Part of Phon Word	45% 31-59%	28% 15-45%	16% 10-22%	36% 24-84%

Discussion

Despite great variation, the pre-accent and post-accent syllables in the question study and the turn-final vs. not turn-final occurrences of *noget* show that the end of IP tend to be slower.

The study of *noget* ("something") indicates that it is the turn-final position that is relevant for final lengthening, not the IP-final position in general. In retrospect, almost all the questions are turn-final.

I suggest that there is a tendency for final lengthening in Danish talk-in-interaction, at least in turn-final phrases. However:

- a larger sample needs to be examined
- is the final lengthening long enough to work as a cue for listeners?
- Grønnum's speech data is Copenhagenish, mine is Jutish

This research is supported by

DET FRIE FORSKNINGSRÅD
DANISH COUNCIL FOR INDEPENDENT RESEARCH

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