

## Syntax, Pauses, and Temporal Relations in the Final Part of the Sentence

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### ABSTRACT

*The paper is concerned with sentence final phenomena, viz. the question of final lengthening, and the occurrence of pauses in Danish news reading. The main findings were (1) that a complementary relationship exists between preboundary lengthening and the occurrence of a silent interval, sentence internally as well as between sentences; and (2) that there is a tendency for pauses to be overrepresented toward the end of the sentence. It is speculated that the latter tendency is related to information structure.*

### INTRODUCTION

In a previous investigation of the pattern of occurrence of perceived pauses in 174 read-aloud sentences from a Danish news broadcast (Molbæk Hansen, Spang-Hanssen & Reinholt Petersen, forthcoming) we examined the relation between syntactic boundaries and the occurrence of sentence *internal* pauses and the acoustic realisation of such pauses.

The present paper reports on further analysis of the material. We focused on pausal phenomena in the final part of the sentence, more specifically, we were interested in the following two questions: (1) does Danish have sentence final lengthening, and (2) does the distribution of pauses in the final part of the sentence (henceforth late pauses) deviate from that of pauses in the sentence as a whole?

### SENTENCE FINAL LENGTHENING?

In the investigation referred to above, we showed a perceived pause at a syntactic boundary to be realised *either* as a moderate lengthening (ca. 3.5 centiseconds) of the last syllable followed by a silent interval, *or* as a marked lengthening (almost 10 centiseconds) of the last syllable before the boundary without a following silent interval.

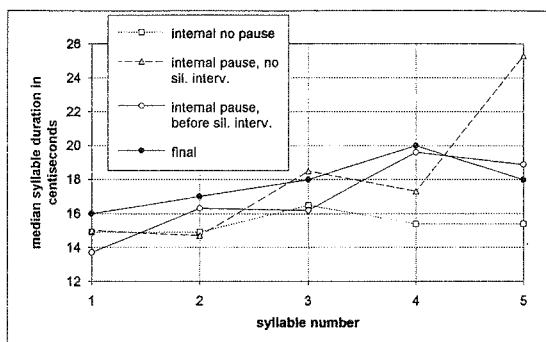
Here we shall compare this result with observations of syllable durations before the (stronger) boundaries *between* sentences. As in the previous investigation syllable durations were measured in the five syllables preceding the boundary. The median sentence final syllable durations are displayed in figure 1 together with the corresponding median durations before sentence internal boundaries.

The boundaries between sentences were always accompanied by silent intervals, and it is seen from figure 1 that the sentence final syllable durations correspond very closely to the durations obtained for sentence internal durations before silent intervals. Thus in Danish there seems to be a tendency towards a complementary relation between preboundary syllable lengthening and the insertion of a silent interval irrespective of the type of syntactic boundary associated with the pause.

### PAUSES IN THE FINAL PART OF THE SENTENCE

In our previous investigation we located pauses in the material and described their relationship with the syntactic boundaries derived from a rather finegrained surface syntactic analysis. The great majority of the pauses (1136) did in fact occur at the syntactic boundaries as defined by us, while some pauses (88) did not occur at such

boundaries. Further, there seemed to be a tendency for pauses of both types to be more frequent towards the end than at the beginning of the sentence.

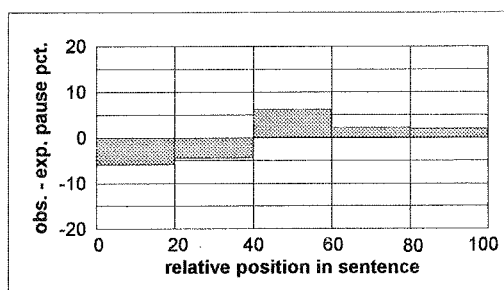


**Figure 1.** Median duration (in centiseconds) of the last five syllables before sentence internal and external boundaries.

In order to examine this matter further, we determined the position of all pauses. The position of a pause is defined as the number of syllables preceding it in the sentence. Since, of course, sentence lengths vary, the pause position was expressed in percent of the total number of syllables in the sentence, henceforth referred to as *relative position*.

#### Syntactically defined late pauses

Figure 2 shows, for all boundary types pooled, the distribution of syntactically defined pauses on 20 percent intervals over the sentence. The height of the bar within an interval indicates the difference between the percentage of pauses observed in the interval and the percentage to be expected if the pause probability associated with a boundary were evenly distributed over the sentence.

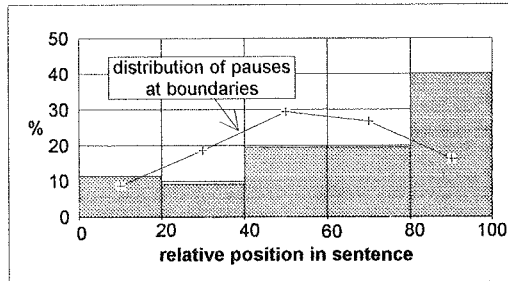


**Figure 2.** Distribution of syntactically defined pauses on 20 percent intervals over the sentence. For further explanation, see text.

As appears from figure 2 the distribution of pauses over the sentence is slightly skewed: the tendency for a syntactic boundary to be accompanied by a pause is greater in the final part of the sentence than in the beginning.

### Syntactically undefined late pauses

Figure 3 shows the distribution over the sentence of the pauses which did not coincide with syntactic boundaries, as defined by us. It is evident that there is a pronounced overrepresentation of these pauses in the final part of the sentence: 40 percent of them occur within the last 20 percent of the sentence, and 60 per cent occur within the last 40 percent.



**Figure 3.** *Distribution of syntactically undefined pauses over the sentence. For comparison, +——+ indicates the distribution of syntactically defined pauses.*

One fourth of the 88 syntactically undefined pauses occurred between preposition and prepositional object and this position might, of course, have been included in our inventory of syntactically defined boundary types, but this would not have changed the general picture: 12 of these, i.e. more than 50 percent, occurred in the last 20 percent of the sentence. The remaining 66 undefined pauses occurred at various positions which were difficult to classify in a syntactically meaningful manner.

### DISCUSSION

The results reported above suggest a general tendency for pauses to occur more frequently late in the sentence, whether at syntactically well defined boundaries or not. The explanation of this tendency is thus not to be sought in syntax. In our view, it should rather be considered in terms of the information structure of the sentence and of the text as a whole.

Besides having a grammatical structure related to the participants in the action described (*subject, object, indirect object, etc.*), a sentence also has a structure related to the information to be conveyed. This information structure is generally considered to be a binary structure, the first part consisting of *given* knowledge, and the second part conveying the *new* knowledge. The first part, the *topic*, is used to identify what the sentence is about, whereas the second part, the *comment* or *rheme*, gives the information intended to make a change in the hearer's mental model. For these concepts, see e.g. Brown and Miller (1991).

The new information is also the information which is most prominent. Therefore, new information/rheme has to do not only with end position, but also with prominence or focus, and consequently with various linguistic means of expressing relative prominence: stress, pitch (Quirk et al. (1972), and certainly also pauses.

The comment part of the sentence may just add new information, but clearly the new information has a tendency to be more clearly signalled when it *deletes* or *restricts* old knowledge. It has been claimed, for instance, that negations are often placed between topic and comment (Sgall et al. (1986)).

If the syntactically undefined late pauses are viewed in this light, a somewhat different pattern appears: For instance, in 9 of the 12 cases of pause after preposition, the prepositional object introduces a *new referent* or *theme*, and in the remaining 3 cases of this kind the prepositional object contains the only information on *time* and *place* in the sentence. A few of the remaining pauses occur just before the *main verb* (which introduces the comment/rheme), and in the remaining cases there is a clear tendency for syntactically unusual pauses to occur in the neighbourhood of *restrictive expressions* with contrastive stress (*not yet, not before, not only, exclusively, purely, for the moment*, etc.) or after adjectival or adverbial modifiers of nouns/adjectives *not representing new information*, i.e. it is the *modifiers* which represent the new (restrictive) information in these cases.

Needless to say, our last remarks are highly speculative, and as long as we have no unchallengeable way of identifying topic, comment, etc., such remarks may seem empirically vacuous. There can be no doubt, however, that more knowledge can be gained on the relation between information structure and prosodic structure (in a wide sense) by investigating systematically how readers treat texts specifically designed to have a well defined information structure.

#### REFERENCES

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