ARIPUC 23, 1989, p. 1-85

STRESS GROUP PATTERNS, SENTENCE ACCENTS AND SENTENCE INTONATION IN SOUTHERN JUTLAND (SØNDERBORG AND TØNDER) - WITH A VIEW TO GERMAN

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This paper investigates prosodic stress group patterns, the presence and manifestation of default and focal sentence accents and the nature of sentence intonation signalling in Standard Danish spoken on a substratum of South Jutland dialects, viz. Sønderborg and Tønder, and in two varieties of German, Standard North German and Flensburg. The following facts appear: sentence intonation (understood to encompass both utterance function and utterance juncture) is signalled globally in Tønder, locally in Sønderborg, and with a mixture of global and local signalling in German. Default accents are non-existent in the two Danish varieties, optional in German. Focus is signalled, optionally (and never in final position), by stress reduction of the surroundings in the Danish regions, but is compulsory and takes the shape of a proper sentence accent, though modest, in German. Sønderborg and German have unambiguous final lengthening, whereas both lengthening and shortening finally occurs in Tønder. Prosodic stress group patterns suffer a clean truncation when their duration is shortened in the Danish regions, but a mixture of compression and truncation in German. Finally, Tønder has stød, Sønderborg and (of course) German do not.

I. INTRODUCTION

This is the last paper in a series which deals with intonation in regional Danish. Similar investigations from Bornholm (and Swedish), Aalborg and Næstved were reported in ARIPUC 22

(p. 25-138 and 145-195, respectively). The original intention was to prick out on a map of Denmark some towns which - intonationwise - are clearly distinguished from Standard Copenhagen Danish, and easily identified. Among them, Bornholm was chosen for its affinity with Swedish, which proved to be very close indeed, and Sønderborg aroused my curiosity because it has a distinctly German ring to its prosody. Thus, the intention was to carry out a comparison between Sønderborg and German as spoken just south of the border (in Flensburg) as well as Standard North German, in the same manner that Bornholm was compared with Southern and Central Swedish. Sønderborg is situated on Als, an island north of Flensburg Fiord. Tønder is likewise situated close to the German border, but in the western part of South Jutland. It is my lack of familiarity with (and a lack of prosodic descriptions in the literature about) present-day regional southern Danish which led to Tønder's inclusion in the investigation. I did not at the outset have any precise idea of just how local any German influence might be, although I did expect Tønder speakers to have stød and Sønderborg speakers to lack it. (Readers not familiar with Danish should note that the five provinsial towns in my corpus do not exhaust the list of prosodically interesting and deviant varieties of Danish, far from it. Funish is one obvious omission.)

The results have become increasingly difficult to write up, and the descriptions correspondingly more messy to read, from my work with Copenhagen Danish through Bornholm, Aalborg and Næstved, to this last one. This is partly due to the fact that the prosodic systems differ greatly across regions, both with regard to the inventory of prosodic parameters, but also with regard to their manifestation. More particularly, not all systems are equally clear-cut, with equally explicit realization of the elements, nor with equal degrees of inter-speaker concordance. Partly, the description is complicated by the fact that there is so much more material now to compare it with. Further, the terminology has been changed and adapted, from paper to paper, to accommodate new facts; I have not been able to adhere to uniform graphical displays either (in terms of lines and annotations in figures), from one paper to the next.

terminologiforandringer

Apart from the complicating factors just mentioned, the present investigation turned out to be more difficult to handle than Bornholm, Skanian, Central Swedish, Næstved and Aalborg, for several reasons. I am less familiar with Southern Jutland Danish, for one thing. Secondly, there is a stronger distinction in this area, and a stronger sense among the speakers of the difference between the local language and (the approximation to) Standard Danish, to the point where one might actually talk about bilingualism. Speakers are generally very reluctant to use the vernacular in a conversation with a non-local person, and especially perhaps in reading aloud into a microphone. For this reason, a number of speakers had to be discarded who, in their dealings with me, were hardly distinguishable from Standard Copenhagen speakers. They were, perhaps not accident-

ally, also those with some form of higher education who had spent some time away from home during their studies. Of course, the type of material does not help here: highly monitored speech, presented in Standard Danish orthography, adhering to Standard Danish morphology and syntax, does not exactly further spontaneity and naturalness. But I do wish to point out that I did not encounter similar problems on, e.g., Bornholm, although the difference between Bornholm vernacular and Standard Danish as spoken in the capital is at least as great here, but Bornholm speakers seem much less inclined to shed their local phonological and prosodic habits. Surely, there are grounds here for interesting socio-linguistic observations, but this is far beyond the scope of this paper. As it turned out, three speakers from Tønder (out of four) and three speakers from Sønderborg (out of six) were subjected to further processing and compared with two Standard North German and one Flensburg speaker.

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In the course of analysis of the material from Bornholm, Malmö, Stockholm, Næstved and Aalborg, I came to distinguish two types of sentence accent, which are different to their function as well as to their phonetic form: the prosodically or syntactically determined, final, DEFAULT accent (in isolated utterances) and the contextually or pragmatically determined FOCAL accent. This distinction is, accordingly, carried through from the outset here. It also became clear that focus signalling may take two different prosodic shapes (according to the language investigated): it may be a sentence accent in the traditional sense, i.e. the focussed item is boosted: it carries larger and quicker fundamental frequency (Fo) movements, and the surroundings are only moderately affected, or the focussed item itself is subject to no apparent change but a notable shrinking and reduction of surrounding stress group patterns is encountered, which is perceived as a stress reduction of the surrounding stressed syllables. Thus, in both cases we are dealing with a relatively more prominent focussed item, a prominence that is attained either by upgrading the focus or by downgrading its surroundings.

I made two further observations, in the summary on p. 134-135 (ARIPUC 22), which are quoted here, because the results below will have a bearing on both: Bornholm turned up with predominant final shortening, Stockholm Swedish with extensive final lengthenings, which is curious because otherwise they share most sentence prosodic features, i.e. they both signal sentence intonation locally, and both have focal as well as default sentence accents (although neither is compulsory in Bornholm). Thus, final lengthening is clearly a completely independent parameter and in no way principally linked to the occurrence of extensive tonal movements (in the shape of final default sentence accents and final terminal junctures), as also maintained by Bannert (1982), nor is it a "universal" feature.

The distribution of sentence accents across Copenhagen, Bornholm, Skanian and Stockholm Swedish (Copenhagen and Malmö do not have final default accents, they are optional in Bornholm and compulsory in Stockholm) might motivate a speculation that the manifestation of sentence intonation (which is globally signalled in Copenhagen and Malmö and local (final) in Bornholm and Stockholm) is linked to the presence (and manifestation) of final default sentence accents. Not in any insoluble, one-to-one relation, though, because local sentence intonation appears also in utterances produced without final default accents (in Bornholm). But it is not unlikely that globally distributed sentence intonation, i.e. a rather gentle overall slope, would be masked perceptually by the extensive final movements pertaining to the default accent, so, in the presence of default accents, sentence intonation signals need to be contained within or tagged on to the tonal movement of the accent. This strategy is generalized, it becomes the way to render sentence intonation, also in the occasional absence of a default accent. The hypothesis would state that global intonation precludes final default accents - which leaves the possibility of having local sentence intonation without default accents.

II. PROCEDURES

1. MATERIAL

a. The Danish recordings.

The material is exactly the same as previously recorded in other parts of the country, except that names of cities to be born in or travelled to have been substituted with places in Southern Jutland. The reader is referred to the corresponding sections in ARIPUC 22 (p. 27ff and 146ff, respectively) for a fuller account and motivation. I shall limit myself here to a mere listing of the utterances:

Kamma stammer fra Padborg.	(K. comes from P.)
Anders og Kamma skal til Ballum.	(A. and K. are going to B.)
Torbens søster hedder Kamma.	(T's sister is called K.)

These were presented in isolation and as answers to questions which invited focus either on Kamma, or elsewhere, i.e. on Padborg, Ballum, and Torbens.

I would like to make explicit here (which I omitted to do in ARIPUC 22) that my investigations were never conceived as a contribution in the more syntactically or semantically/pragmatically oriented debate about what determines focus placement; when and whether a focus is 'broad' or 'narrow'; what is focus and what is contrastive stress or emphasis; what determines the default location of sentence accents; etc. For an excellent treatment of these questions, see Ladd (1978) and the references therein, and for a more recent overview, see

Fretheim (1988). But I would like to note that the distinction between focal accents and emphasis for contrast may not always be clear-cut semantically or pragmatically in spontaneous speech. There will doubtless be many instances where a prominence is open to both interpretations. But in a read material of this kind it ought to be possible to elicit either one or the other (or both, naturally). Thus, the question 'Ved du hvor Kamma er født?' (Do you know where K. was born?) focalizes on K's birthplace, but does not contrast it with other possible places of birth as, e.g., the question 'Er Kamma født i Padborg eller i Ballum?' (Was K. born in P. or in B.?) would have done. Furthermore, focal accent and emphasis for contrast may have different phonetic manifestations, as is evident in German data published by Bannert (1985): A focal accent may be preceded by accented syllables (stressed syllables associated with an Fo excursion), but no such syllables may follow it, so stressed syllables after a sentence accent steer a smooth, undeflected course to the end of the utterance. Bannert (1985) notes that in his material, emphasis for contrast is associated with a larger Fo movement on the stressed syllable of the contrasted item, and it appears from his figures that there is a further difference between focal accent and contrast: the Fo movements preceding the contrasted syllable are also partially suppressed or completely deleted, so the only clear Fo excursion is the one associated with the contrast. This is also how emphasis for contrast is manifested in Standard Danish, cf. Thorsen (1980b). It would have been very interesting to compare focal accents and emphasis for contrast in this material, but I did not dare include the necessary dialogue material, for fear that speakers would - in the course of reading - get confused about the two types and mix them up.

The total of nine utterances above (one isolated and two from context) will allow me to look at default and focal accents, as well as at the realization of terminal declarative intonation and final lengthening.

A long declarative runs as follows:

Kofoed og Thorsen skal med rutebilen fra Tinglev til Tønder klokken fire på tirsdag.

(K. and T. are taking the bus from T. to T. at four o'clock on Tuesday.)

A question word question plus a one-stress echo-question:

Hvor langt er der fra Tønder til Padborg? - Til Padborg? Der er ca. 30 kilometer.

(How far is it from T. to P.? - To P.? It is about 30 km.)

Two utterances which have (a) one stress group (underlined) with a fairly large number of post-tonics, and (b) a polysyllabic word with stress on its last syllable (to certify that word boundaries per se leave no trace in Fo - as it generally does not in other varieties of Danish, or in Swedish, cf. Thorsen 1980a, 1982, 1984, Bruce 1977, Touati 1987):

De mange grænsehandelsbutikker vil snart blive nedlagt. (Sønderborg)

De sidste vadehavsfugle vil snart være forsvundet. (Tønder)

Fabrikken solgte elektronik for to millioner kroner.

(The numerous border trade shops will soon be closed down./ The last wading birds will soon have disappeared. / The factory sold electronics worth of two million crowns.)

Five utterances with a stress group, voiced throughout, which grows progressively shorter from top to bottom:

De fik kanerne frem til nytår. (They got out the sleighs for New Year's.)

Hun fik kanderne fyldt til kanten. (She had the jugs filled to the brim.)

Hun fik kanden fyldt med mælk. (She had the jug filled with milk.)

Koldt vand slukker tørsten. (Tønder) (Cold water quenches your thirst.)

Hun fik vand med på turen. (Sønderborg) (She brought cold water along on the trip.)

En grå kat kradser. (Tønder) (A grey cat scratches.)

Hendes kat lå på sofaen. (Sønderborg) (Her cat lay on the sofa.)

The last two utterances (as recorded by the Tønder speakers) were ill considered, because the stress group under scrutiny is not - as in the upper three cases - the first one in the utterance. They were changed prior to the Sønderborg recordings.

Two sentences to further pinpoint final lengthening:

Turisterne gør befolkningstallet større om sommeren.

Mange forretninger lever af turisterne.

(The tourists increase the population during the summer. Many shops live off the tourists.) The Kamma-utterances may of course also serve as data here, which will supply different sentence accentual conditions.

The total of twenty utterances were typed out on library index cards, in three different randomizations, twice, numbered consecutively from 1 to 120. Sentences in context were uttered in their context, i.e. the speaker took two roles here: asking the question and providing the answer.

b. The German recordings.

The sentences were translated into German, as close copy as possible:

(Wissen Sie wo Kamma geboren ist?)

(Wer von ihnen ist in Kappeln geboren?)

Kamma stammt aus Kappeln.

(Wo werden die jungen Leute den Urlaub verbringen?)

(Wer, ausser Anton, wird nach Kassel fahren?)

Anton und Kamma fahren nach Kassel. (Note that this utterance has four stressed syllables.)

(Wie heisst Bertha's Schwester?)

(Wer hat eine Schwester, die Kamma heisst?)

Bertha's Schwester heisst Kamma.

Wie weit ist es von Hamburg nach Kassel?

Nach Kassel? - Es sind ungefähr 200 Kilometer.

Die letzten Wattenmeervögel werden bald verschwunden sein.

Die Fabrik hat Elektronik für zwei Millionen Mark verkauft. (Note that the stressed syllable under investigation here has been shifted to 'Fabrik', since 'Elektronik' is stressed on the penultimate.)

Hannah und Markus werden am Donnerstag Nachmittag mit dem Autobus von Hamburg nach Kassel fahren.

(Note that the final stress group is longer than in the Danish recordings, because 'fahren' has reduced stress.)

Den Kähnen fehlten die Segel.

Die Kannen stürzten vom Tisch.

Die Kanne fiel auf den Boden.

Der Kamm fiel aus seiner Tasche.

Das Kap lag am Horizont.

Die Touristen verdoppeln die Bevölkerung im Sommer.

Im Sommer ist Glücksburg voll von Touristen.

(I presumed that if a sentence accent would be assigned to this utterance, it would hit 'voll' rather than 'Touristen', which turned out to be the case.)

2. SPEAKERS AND RECORDINGS

Three speakers from Tønder were selected, two males (AS and JC) and one female (KaP), all in their forties, and three speakers from Sønderborg, of approximately the same age (HS and PBP, males) and ES (female). HS and ES are married, and PBP is ES's brother. The Flensburg speaker (JB) is a male in his early thirties, and the two Standard North German speakers are MS (female, in her early thirties) and JoW (male, in his early forties). The Danes were all recorded in their homes with a portable Sony TC-D5M tape recorder, a Sennheiser clips back-elektrate MKE2-6 microphone on to BASF 90CR-MII tape. The Germans (who are all residents in or near Copenhagen) were recorded in our quasi-damped room, with a Sennheiser KD21 condensator microphone, Revox A700 tape recorder, Agfa PEM369 tape, at 7½ ips.

Actually, more speakers were recorded, as mentioned in the introduction, but a number of them had to be discarded for their lack of clear regional (phonological and prosodic) characteristics. Furthermore, KP and JC from Tønder were rather fanciful readers, i.e. they would subject some of the utterances (particularly, of course, the isolated Kamma-utterances, which stood out from other isolated utterances by the fact that they also occurred in various contexts) to a number of different "readings", so only part of the material by them is presented here. Another source of variety was introduced by the fact that some speakers consistently (KaP, JC, HS), another sporadically (ES) would adapt the utterances to the morphological demands of their regional language, i.e. they would preposition the definite articles, which has consequences for the last two sets of (5 and 2) utterances above.

The first twenty items of each of the German recordings were sent to Professor Klaus Kohler in Kiel for evaluation as to their authenticity. According to him, MS represents the North German Standard norm (as does JoW), whereas JB goes down as a Flensburg speaker. This is curious, since MS and JB are brother and sister, born and raised in Flensburg; both are bi-lingual (though with a clear German accent, stronger in JB's case, to their Danish) and have lived the greater part of their adult life in Copenhagen. MS, when confronted with Klaus Kohler's verdict, put the difference down to differences in social contacts during childhood and youth.

3. REGISTRATION AND MEASUREMENTS

For the account of the technical procedures, see ARIPUC 22, p. 30-31 (and note that pages 30 and 32 have been interchanged in the printing!).

III. RESULTS

A. SENTENCE ACCENTS

1. AUDITORY EVALUATION

The presence (or not) and location of any relatively more prominent stressed syllables in each utterance was ascertained while listening to the tapes and providing the mingograms with identification and proper text. Where the two sets of Danish recordings are concerned, the procedure was unproblematic: there were no specially prominent final stressed words in the isolated utterances (default accents), there was no focus indication in utterances where a final focus was invited by the preceding question, and non-final focus signalling always took the non-boosted form, i.e. the relative prominence was attained by a stress reduction of the succeeding stressed words.

The German recordings were less unambiguous to me, so I listened to the tapes about 6 months after the first processing, and again now - when another year has elapsed. The difficulty is

in ascertaining the presence or not of final (be they default or focal) sentence accents. (Non-final - focal - accents are clearly present when expected to be, and are of the Fo-boosting kind, i.e. the Fo movement during the accented stress group is audibly and visibly of greater extent than in non-accented cases.) There are, fortunately , a sufficiently large number of instances where I feel quite confident that a final accent is present and absent, respectively, and from those I can extract what seems to be the pertinent feature: the final stress group pattern is falling, which is a feature of sentence intonation and juncture, cf. below, but the onset of the fall is higher relative to the preceding stress group pattern under accent. The extent of the fall in itself is no stable cue. - This is a rather different situation from Stockholm Swedish,[1] where the sentence accent resides in a tonal movement (a rise) tagged on to the stressed syllable, a separate gesture (succeeded by yet another movement: the final terminal juncture Fo fall); and it is also different from Bornholm, where final sentence accents had both larger and more complex (bi-directional vs. unidirectional) movements than when no accent is present. The German final sentence accents are thus less explicitly and less generously signalled. Inspection of those, numerous, instances where I cannot make up my mind, where I react with a "yes, maybe" and a "no, I think not" on the next replaying of the tape, turn out in the Fo traces to be intermediate, as far as the relative location of the final stressed syllable is concerned, between the clear accented cases and the clear non-accented ones. Thus, the relative prominence of an utterance final element is not a binary feature with clearly non-overlapping manifestations, but a scalar feature. Add to this that there is a considerable difference between speakers in their inclination to supply default accents, it seems evident to me that this phenomenon has a different status in the German prosodic system than in, e.g., Stockholm.

Tables I through VII present the results of my auditory evaluation, which should be taken cum grano salis where the Germans are concerned, because I have given myself a forced choice, so shady cases, cf. above, have been assigned to definite categories. Due to inter-speaker differences, speakers are presented individually, except that HS and PBP are collapsed in one table. Note that the number of utterances counted in the tables will not always correspond to the number displayed in the tracings, where items may have been left out for independent reasons.

No final default accents occur with any of the Danish speakers. Besides, their focus assignments are always of the stress reduction type, and, apparently, only succeeding stresses suffer a reduction - but I have only one utterance to back up this statement (*'Anton og Kamma skal til Ballum'*). Furthermore, and maybe consequently, final focus does not get signalled at all. I.e. an utterance whose context invited a focus assignment finally (like *'Do you know where Kamma was born? - Kamma was born in Padborg.'*) is perceptually indistinguishable from the same utterance elicited in isolation. Initially invited

Tables I - VII

Number of focus assignments or sentence accents, in percentage of the possible maximum (given beneath the legend of each column), determined a priori by the context, i.e. columns should add up to one hundred.

Table I

Speakers HS and PBP, Sønderborg

	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS			
	None (isolated utterances) (34)	Initially (23)	Medially (12)	Finally (35)
Utterances which received				
No accent	100%		16%	100%
Default accent				
Initial focus		100%		
Medial focus			84%	
Final focus				

Table II

Speaker ES, Sønderborg

	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS			
	None (isolated utterances) (15)	Initially (12)	Medially (5)	Finally (17)
Utterances which received				
No accent	100%	50%	100%	100%
Default accent				
Initial focus		16%		
Medial focus				
Final focus				
Double focus		34%[1]		

1) on the initial and medial word.

Table III

Speaker AS, Tønder

Utterances which received	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS: None (isolated utterances) (17)	Initially (12)	Medially (5)	Finally (18)
No accent	100%	16%	60%	100%
Default accent				
Initial focus		84%		
Medial focus			40%	
Final focus				

Table IV

Speaker JoW, German

Utterances which received	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS: None (isolated utterances) (15)	Initially (12)	Medially (6)	Finally (18)
No accent				
Default accent	100%			
Initial focus		100%		
Medial focus			100%	
Final focus				100%

Table V

Speaker MS, German

	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS			
	None (isolated utterances) (18)	Initially (12)	Medially (6)	Finally (18)
Utterances which received				
No accent	89%			44%
Default accent	11%			
Initial focus		100%		
Medial focus			100%	
Final focus				56%

Table VI

Speaker HH, German

	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS			
	None (isolated utterances) (18)	Initially (11)	Medially (6)	Finally (17)
Utterances which received				
No accent	100%			
Default accent				
Initial focus		100%		
Medial focus			100%	
Final focus				94%
Double focus				6%[1]

1) on the initial and final word

Table VII

Speaker JB, Flensburg

	CONTEXTUALLY INVITED FOCAL ASSIGNMENTS			
	None (isolated utterances) (18)	Initially (12)	Medially (8)	Finally (20)
Utterances which received				
No accent	67%	8%	13%	30%
Default accent	33%			
Initial focus		50%		
Medial focus		42%	87%	
Final focus				70%

foci are more prone to be signalled than medial ones. This is very reminiscent of the results from Copenhagen, Næstved and Aalborg, cf. Thorsen (1988a, p. 193). We may conclude that default sentence accents are non-existent in these two Southern Danish regions, and that focus signalling by prosodic means (succeeding stress reduction) is optional, and seemingly excluded in final position.

The picture is more varied in the German variants. A Standard German speaker, HH, who is not otherwise employed in the analysis, due to his generally very high, but also erratically varying speech rate, is presented in Table VI. He is included here in order to alleviate any doubt that might be cast about the status of default accents in Standard German if MS's status is questioned (her being born and raised in Flensburg, in a family where the brother goes down as a typical Flensburg speaker). HH and JoW are both linguists, they know each other very well (and, of course, speak German among themselves), and they both agree that the other does indeed speak Standard German with no definable local traits. Thus, the inclusion of HH here allows me to state that default sentence accents exist in Standard German, but are apparently not compulsory: HH never produced one, MS rarely, JoW did so invariably. Otherwise, the Standard German speakers generally assign focal accents when and where the context invites them (but note MS's final focus omissions). The Flensburg speaker vacillates more and actually leaves out most default accents as well as a total of

9 (out of 40) focal accents, more often so in final position, which tallies with the Danish results, where final foci do not get signalled at all. I shall return to the deviant behaviour of final position below.

I should insert that listening to the Tønder and Sønderborg speakers, I would still maintain that Sønderborg speakers have elements in their prosody that are reminiscent of German, and Tønder speakers do not. This kinship cannot reside in sentence accent phenomena, however, since Sønderborg lacks default accents and the means to signal focus is different (downgrading of the surroundings versus upgrading of the focussed item).

2. FUNDAMENTAL FREQUENCY

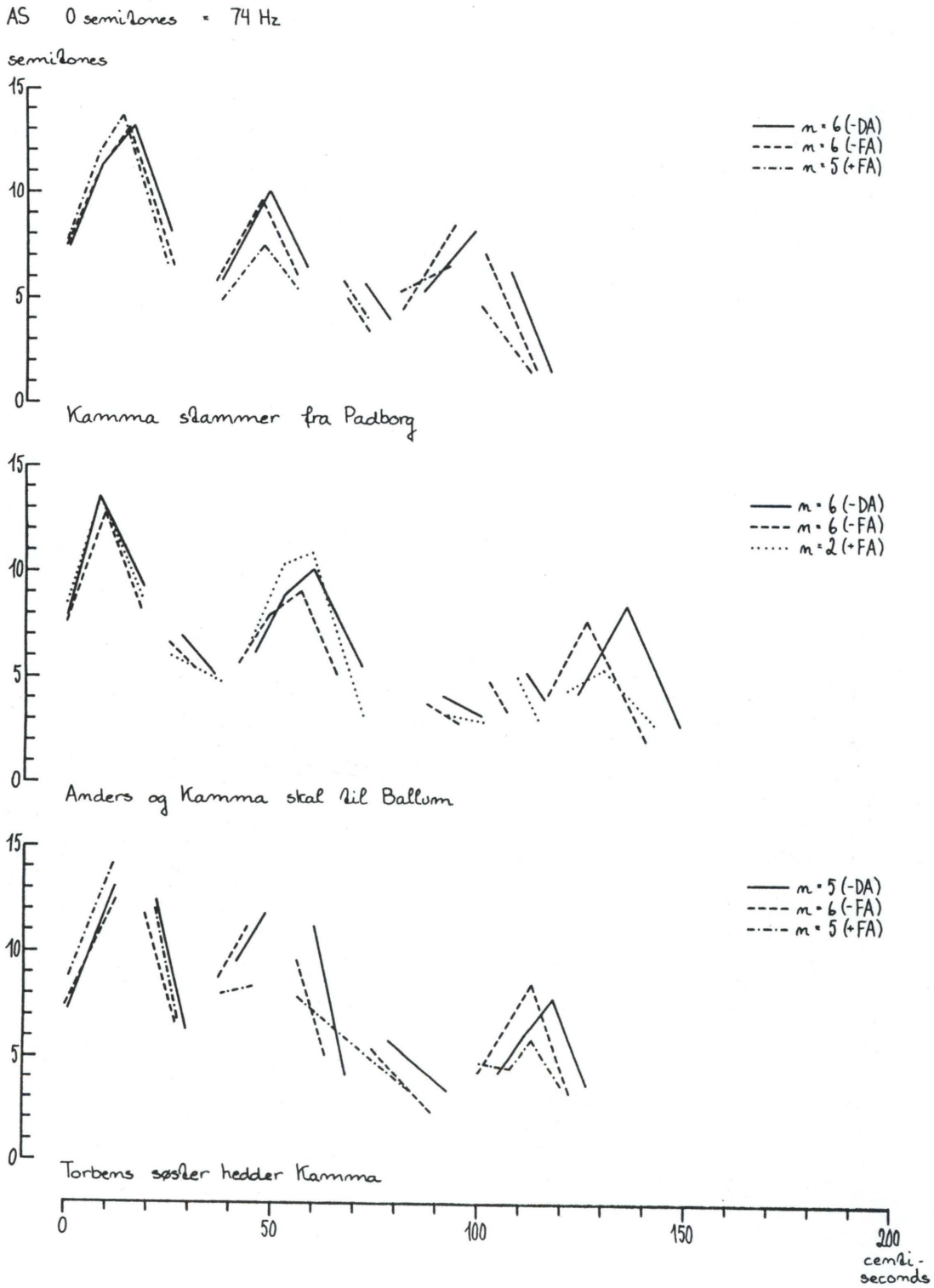
The Fo traces should establish the acoustic foundation for my auditory impressions.

a. The Danes

Looking at figures 1-4 (the Danes) it is apparent that full line tracings (isolated utterances) and broken line tracings (utterances from context which invited a final focus assignment) are very similar in shape, qualifying the auditory impression that they are indistinguishable. However, the utterance from context is generally somewhat shorter, see further below, section 3. Another trend appears (notably with HS and ES), namely for the isolated utterance as a whole to be situated slightly higher in the frequency range. This might be put down to a textual effect: All speakers actually took both roles, asking and answering, in the small dialogues, and thus the answers are all, in a way, text final, and - ceteris paribus - a text final utterance will onset and run lower than an isolated one, cf. Thorsen (1985 and 1986) and the references therein. It would be very interesting to see whether a similar effect exists across speakers, i.e. whether a speaker producing an answer to a question put to him will subordinate it to a textual contour enveloping the first speaker's question. (I note in passing that a cursory inspection of that part of the previously published material which fulfills a ceteris paribus condition confirms that this is a question worth pursuing, though it is beyond the scope of the present paper.)

Figures 1-7

Average fundamental frequency tracings (logarithmic display) by three Sønderborg, one Tønder, two Standard German and one Flensburg speaker, with different focus assignments (FA) and varying presence of final default accents (DA). Speakers are identified at the top left of each figure, as is the frequency value which is the basis for the conversion to semitones. The number of items behind each average is given at the top right of each subpart of the figures. Isolated utterances are traced in full lines, utterances from context which invited initial



foci are traced in broken-dotted lines, medial foci in dotted lines, and utterances where final focus was invited in broken lines. Occasionally (with MS and JB, figures 6 and 7) a thicker and thinner edition of the same line occurs, in utterances that were produced in two editions (without and with, respectively, a sentence accent). Note that 'Anton und Kamma fahren nach Kassel.' contains four stressed syllables, and that JoW (figure 5) produced 'Kamma stammt aus Kappeln.' with secondary stress on 'stammt'.

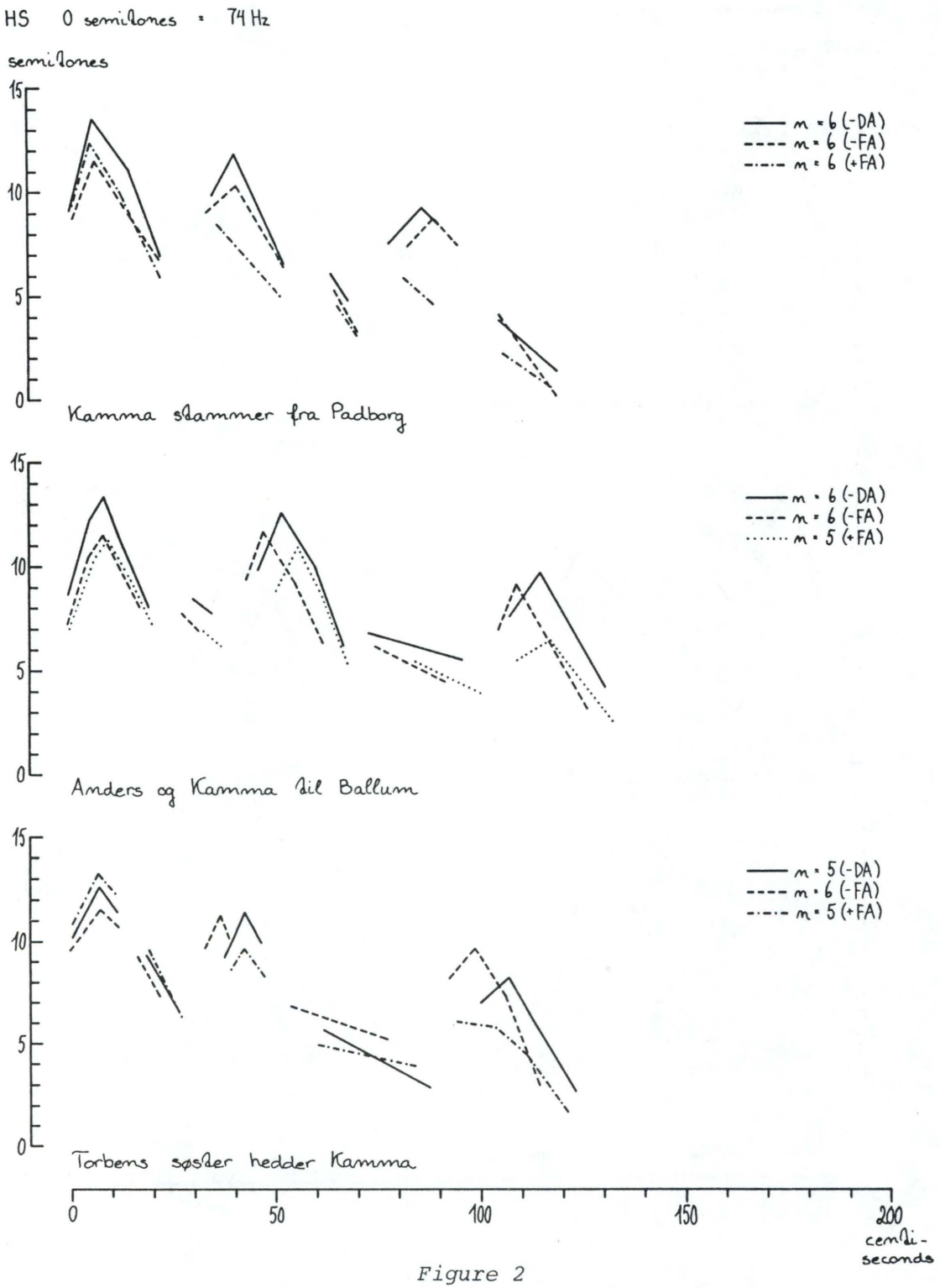


Figure 2

full line: isolated utterance
broken line: final focus invited
dotted line: medial focus invited
broken-dotted line: initial focus invited

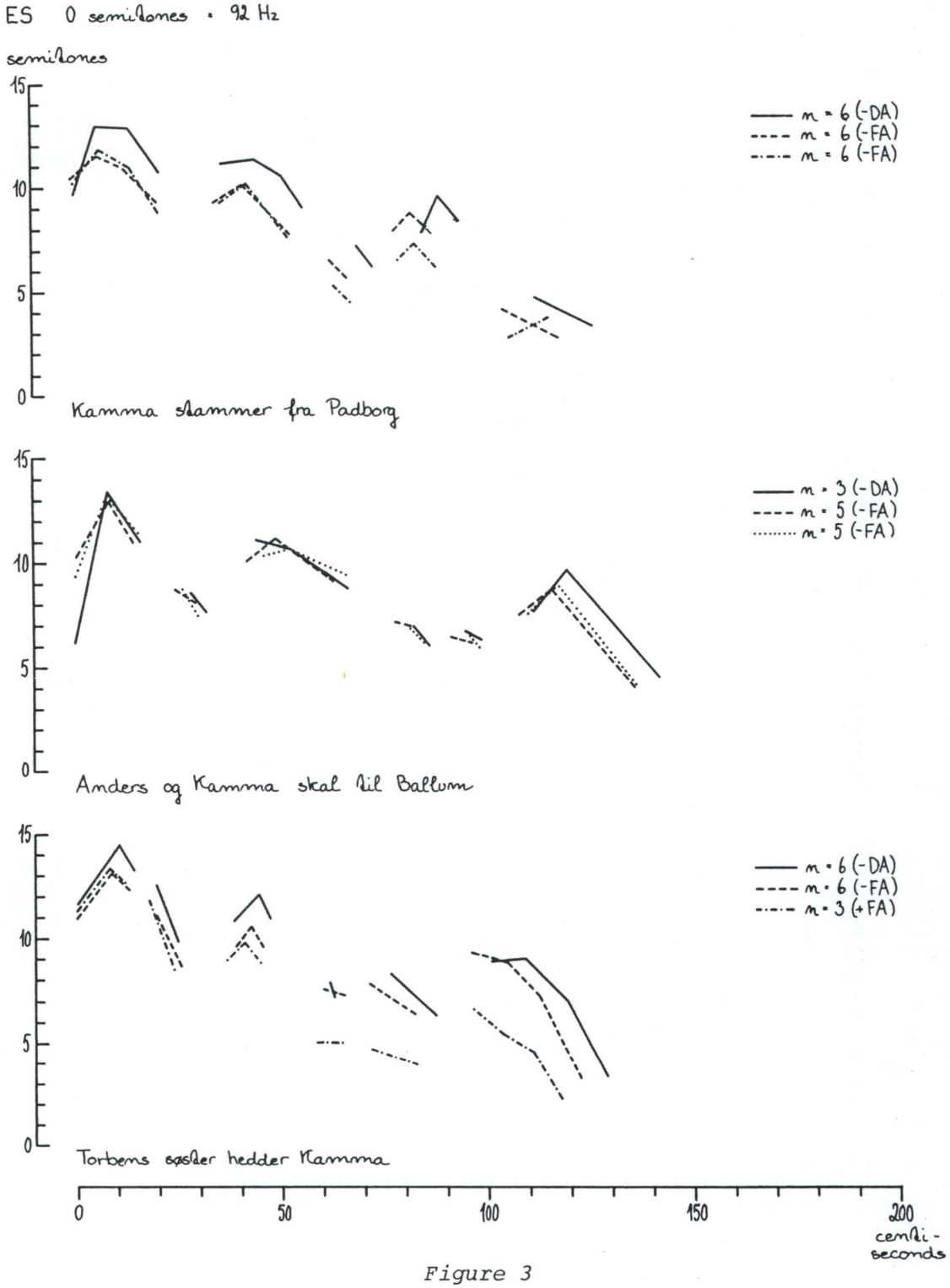

ES 0 semitones = 92 Hz
semitones
15
10
5
0
n = 6 (-DA)
n = 6 (-FA)
n = 6 (-FA)
Kamma skammer fra Padborg
n = 3 (-DA)
n = 5 (-FA)
n = 5 (-FA)
Anders og Kamma skal til Ballum
n = 6 (-DA)
n = 6 (-FA)
n = 3 (+FA)
Torbens søster hedder Kamma
0
50
100
150
200
centi-seconds

Figure 3

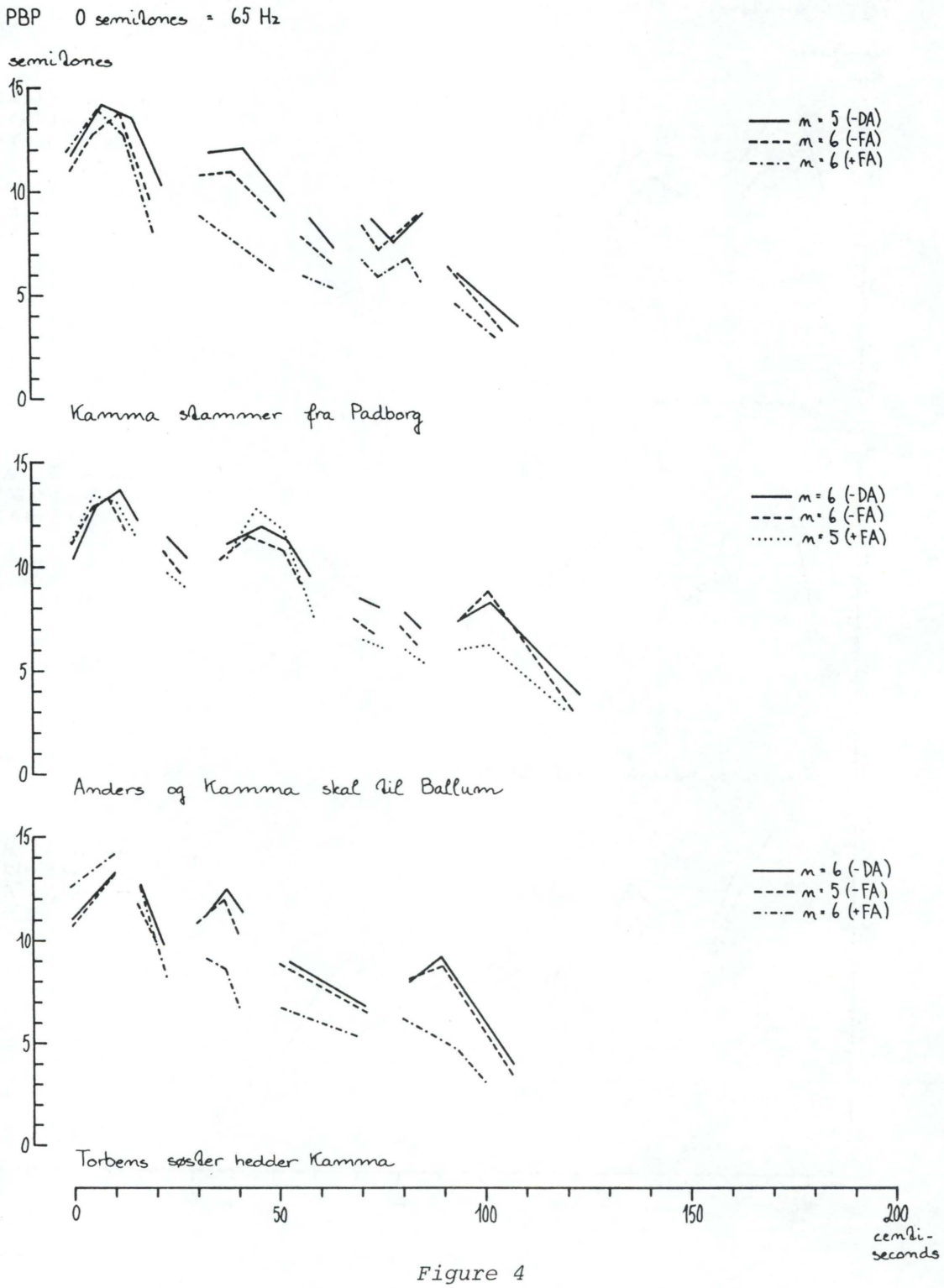


Figure 4

full line: isolated utterance
broken line: final focus invited
dotted line: medial focus invited
broken-dotted line: initial focus invited

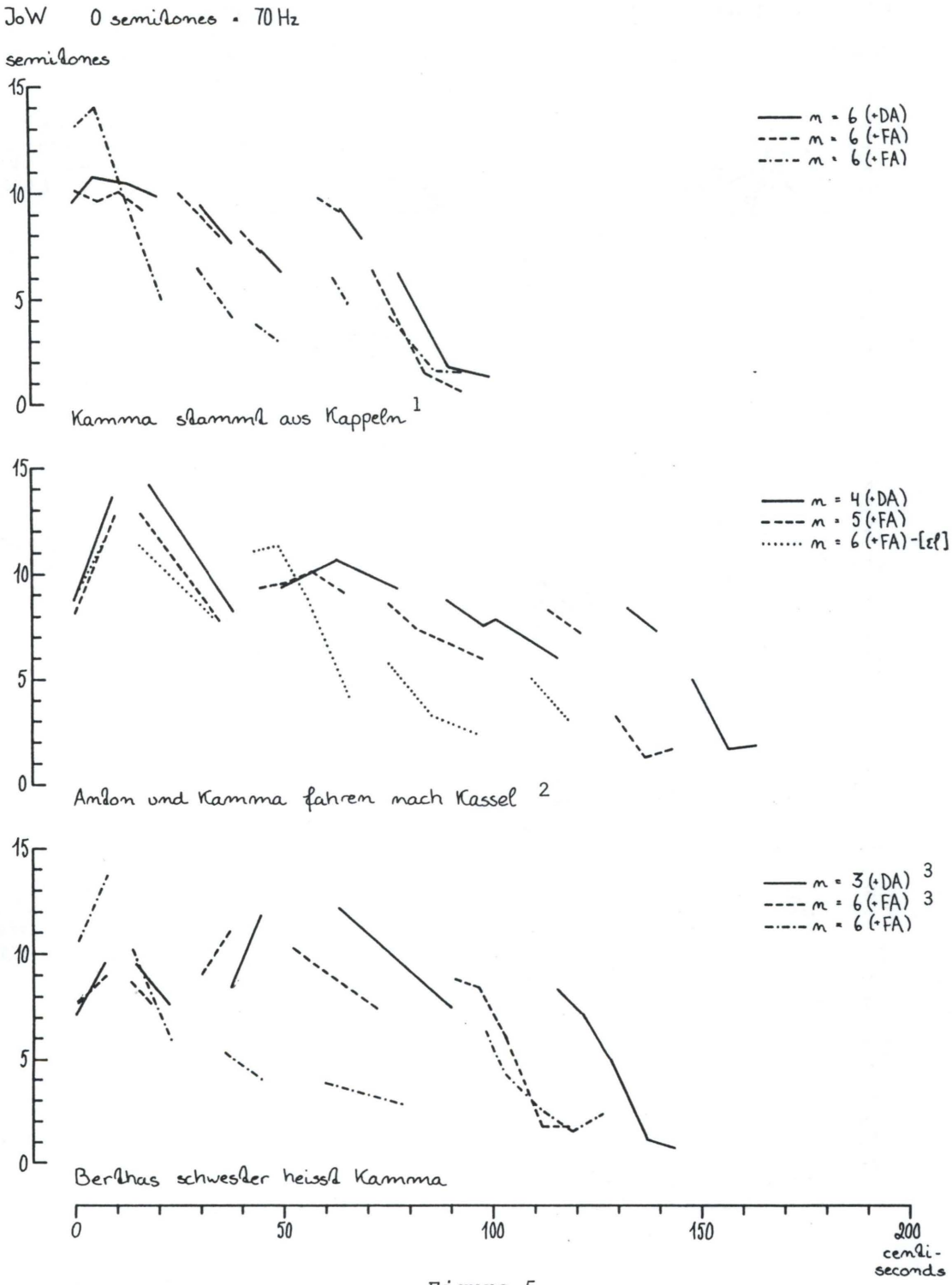


Figure 5

1) *two stresses only (secondary stress on 'stammt')*
2) *four stresses*
3) *'Bertha's Schwester' had a weak-strong prominence relation, i.e. only two full stresses in the utterance*

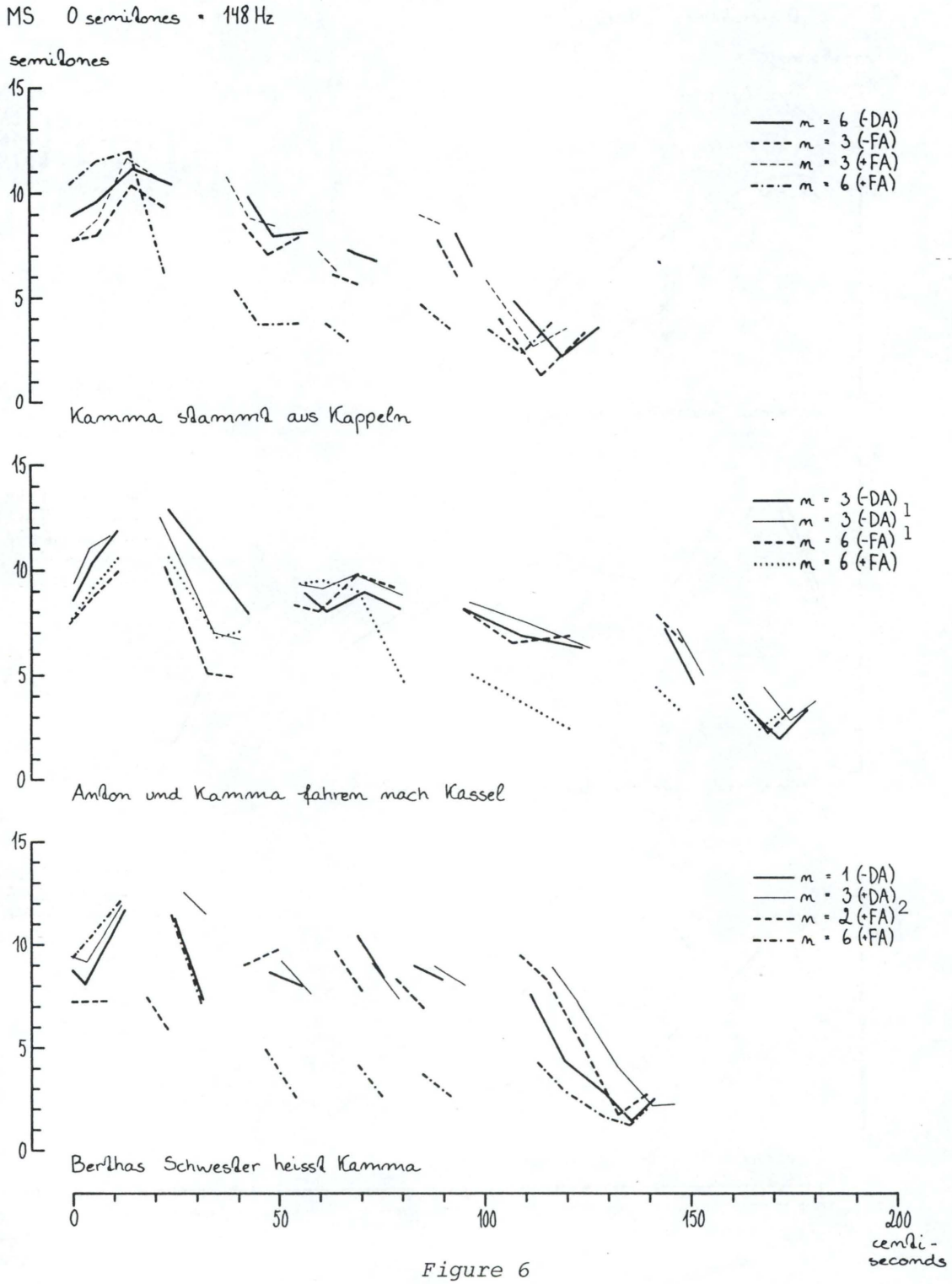


Figure 6

1) *'Anton und Kamma' had a weak-strong prominence relation, i.e. only three full stresses in the utterance*
2) *'Bertha's Schwester' likewise, i.e. only two full stresses.*

full line: isolated utterance, thin: with default accent, thick: without accent
broken line: final focus invited

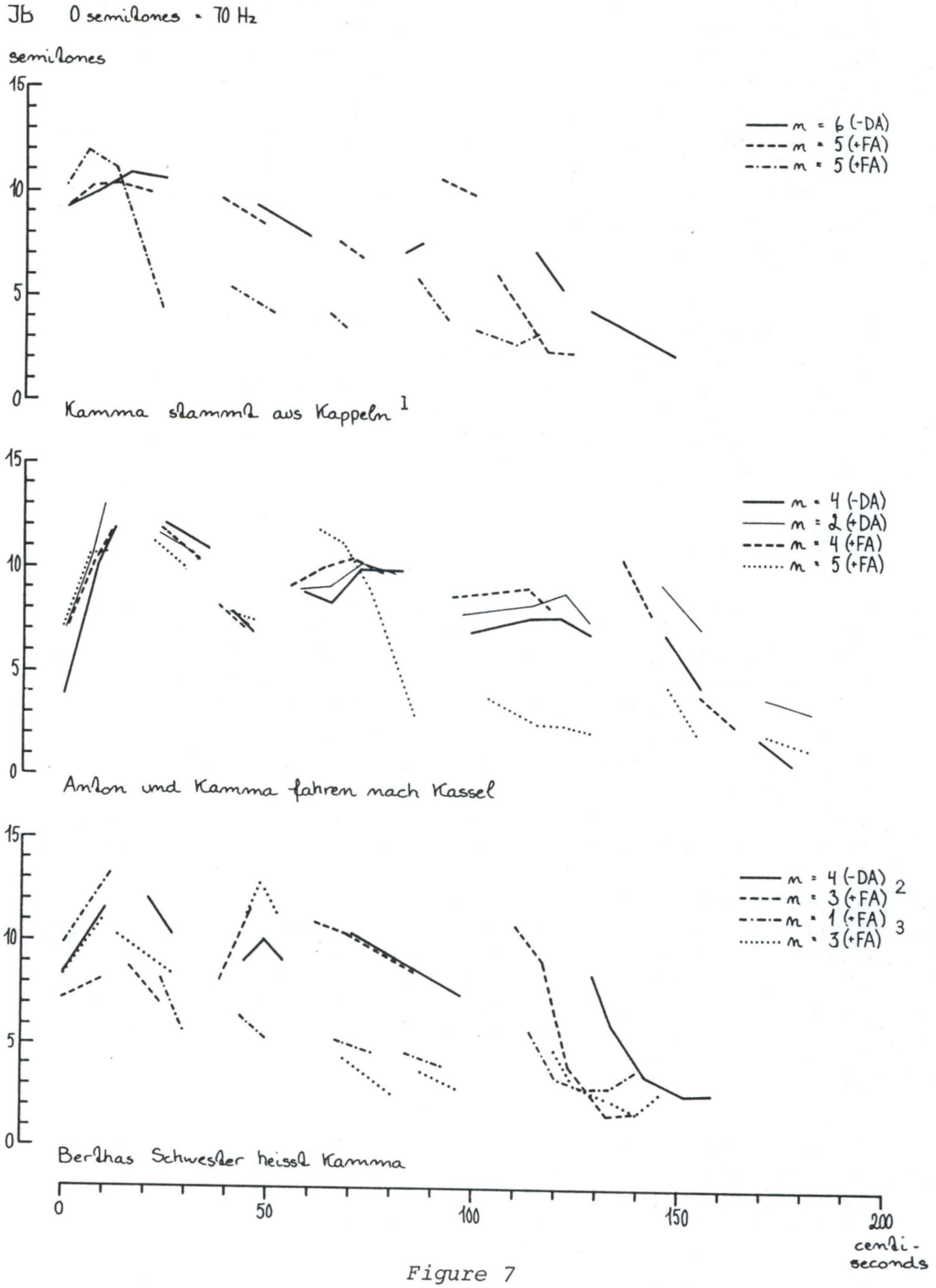


Figure 7

1) *I am uncertain whether 'stammt' has full or secondary stress*
2) *'Bertha's Schwester had a weak-strong prominence relation*
3) *The focal accent is misplaced to medial position*

dotted line: medial focus invited
broken-dotted line: initial focus invited

Utterances from context that invited initial focus and medial focus bear clear testimony to a downgrading of stress groups succeeding the focussed item in those instances where a focussing was perceived (denoted with a +FA in the figures). I.e. Fo deflections are smaller and situated lower in the range, although they cannot be said to be completely deleted. - Thus, if we distinguish two types of stressed syllables, those that are associated with an Fo movement, accented ones, and those that are not, unaccented ones, then we must state that the de-accentuation caused by a preceding focussed word is only partial. For a further discussion about the utility of a distinction between accented and unaccented stressed syllables in Danish, see Thorsen (1987a). This would leave a possibility for distinguishing between (non-contrastive) focus and emphasis for contrast, in line with the way emphasis gets signalled in Copenhagen: emphasis for contrast might entail a complete annihilation of succeeding (and preceding) stress groups, a complete de-accentuation, cf. Thorsen (1980b).

b. The Germans[2]

A note about the German speakers' production of 'Anton und Kamma ...' and 'Bertha's Schwester ...' is called for. JoW (fig. 5) produced the NP in 'A. und K. ...' with equal stress or prominence on the two proper names, whereas 'B.'s Schwester ...' got a distinct weaker-stronger relation, which comes out in the tracings as a relatively lower position of 'Bertha's'. MS (fig. 6) produced isolated 'A. und K. ...' in two different editions, with equal and weaker-stronger weighting, respectively, of the two proper names. 'A. und K. ...' from the final focus context got the same weaker-stronger distribution. The relatively weaker 'Anton' comes out primarily in a lower offset of the first stress group. The relatively weaker 'Bertha's' in the utterance with final focus accent has been completely stripped of any autonomous Fo movement. JB (fig. 7) had equal weighting of 'Anton' and 'Kamma' (except when 'Kamma' was in focus) and likewise in the isolated version of 'B.'s Schwester ...'. But in the final focus accent edition, 'Bertha's' was relatively weaker, and compares well with MS (fig. 6).

It is interesting that a weighting of the individual elements of noun phrases never seems to occur in any of the Danish varieties I have looked at (although I suppose that that is what a metrical phonological representation would prescribe), but it is equally interesting that though this is a distinct possibility in German, it is not a must. A further discussion is beyond the scope of this paper, however. These facts are mentioned here mainly so they will not obscure the issues in point in the tracings.

Before proceeding to a closer scrutiny of sentence accents, note that stress group patterns - when not under sentence accent, and in non-final position - have relatively smaller Fo deflections than with any of the Danish speakers, cf. the

the non-final parts of full line utterances. Initial 'Anton und' does, however, have a larger rise and fall than other non-final stress groups with JoW and JB's isolated utterance. A higher rise in 'An-' could be due to a glottal attack in JB's isolated utterance, and a larger fall through '-ton und' could be a cue to the boundary in the NP, cf. that JB actually produced a glottal stop between these two unstressed syllables.

It is reasonably evident in the tracings that those I have marked '+DA' do indeed have comparatively more prominent Fo movements. Compare the full line tracings (+DA) of JoW on the one hand and MS and JB (-DA, thicker lines) on the other and note that with JoW the onset of the final stress group is higher in relation to the preceding part of the utterance than is the case with MS and JB. The same relatively higher onset is observed in those instances where MS and JB produced the same utterance in two editions (thin and thick full line, fig. 6 bottom part, fig. 7 middle part). (See also Table IXa below.) Note that the fall is not greater under default accent, but it runs higher up in the range. As mentioned above, this is a rather miserly signalling of default accents, compared with Bornholm and Stockholm speakers, cf. Thorsen (1988a).

Final focal accents do not seem to be distinguished in any significant and consistent way, as far as Fo goes, from default accents, but they do abbreviate the whole utterance, cf. below, section 3. In Central Swedish and in Bornholm default and final focal accents differed somewhat: focal accents had slightly more comprehensive Fo movements and/or preceding tonal movements were somewhat lowered and diminished in amplitude. Thus, focal accents are - comparatively - even less generously signalled in North German.

Non-final focal accents have an unmistakable and nearly uniform manifestation: An extensively falling movement - accomplished within the stressed and first post-tonic syllable (or alternatively: within the focussed word - the issue cannot be decided, since the focussed words are all di-syllabic here. But from JB's misplaced medial focal accent in 'Bertha's Schwester heisst Kamma', where 'heisst' is unstressed and thus forms the tail end of the prosodic stress group beginning with 'Schwester', it appears that the slope is not expanded to cover the whole stress group). The fall is nearly to the floor of the speaker's range, after which Fo runs low and nearly level. The last stressed syllable performs a slight step up from the floor, succeeded by a slight fall to the post-tonic, see further section C.2.b. Pre-accentual items seem unaffected. - With JoW, the onset of the fall in initial position is considerably higher than in non-accented items, in initial position, but otherwise the "boosting", i.e. the expansion of movement in accented vs. non-accented position, is downwards.

At this point an ambiguity stands out with regard to the parameters involved. The line of argument runs as follows: Final sentence accents, whether default or focal, were never very prominent perceptually or acoustically, and quite a few cases

remain perceptually ambiguous to me (accented or non-accented?). Medial and initial focal accents stick out a mile perceptually, although, as can be seen in the traces, their associated Fo pattern (the fall) is neither qualitatively nor quantitatively different from final sentence accents. This would suggest that the perceptually salient feature of a non-final sentence accent is the downgrading of succeeding stressed elements. And that would explain the relatively weak perceptual status of final accents. But it simultaneously raises the question of the "phonological" status of the Fo fall. Is it anything to do with the sentence accent per se? Or is it a juncture and sentence intonation function signal (terminal, declarative)? Let me recapitulate: (a) the "same" utterance in this German material appears in three different variants: (1) without any extra prominence on the last lexically heavy item (when isolated), i.e. the last stressed word does not sound any more prominent than other stressed words in the utterance; (2) with an extra perceived prominence on the last lexically heavy item (when isolated); (3) with an extra perceived prominence on the last lexically heavy item (when in answer to a question which focalizes that word). (2) and (3) are not distinguishable in their Fo course, but they are both different from (1) in a relatively higher onset of the Fo fall. (b) The common denominator to these three variants (and to utterances which are prosodically marked at the end as non-terminals (questions)) is that the final stress group changes its stressed vowel movement from rising to falling (rising stressed vowels being characteristic of stress groups in non-final position), and the final post-tonic fall is larger and/or steeper than in non-final stress groups. This would deprive the fall as such (but not its relative onset) of any sentence accent status, and assign it rather to juncture and sentence intonation, see further sections B.1., B.5., and C.2.b below. Under this analysis, the manifestation of final sentence accents consists in a (modest) boosting of the given stressed syllable, i.e. a raising of the onset of the final fall. Non-final (focal) sentence accents tend to preserve their rising stressed vowel movements (most pronouncedly so in initial position). They need not be boosted, as they are not with MS and JB (figs. 26, 27). Both facts can probably be ascribed to the earlier location on contours which are globally declining, cf. section B.3., which leaves plenty of space for a significant fall to be performed, without straining the speaker's lower Fo limit.

Although the purpose here is not to shed light on such theoretical issues as focus scope, theme/rheme distribution, reference, default location of sentence accents, etc., I do feel tempted to ask why a contextually coaxed final focal accent, in the German prosodic system, is permitted to be so much weaker acoustically and perceptually than non-final ones (and weaker, too, than in Stockholm and Bornholm, cf. Thorsen 1988a) - and why do final foci go prosodically unsignalled in the Danish variants? If final position per se is rhematic or highlighting, which is a common enough assumption, then why do German speakers not uniformly omit any prosodic, focal

singling out of final elements? And is German syntax so significantly different from Swedish and Danish, respectively? That is not a reasonable assumption, and I think that linguists and phoneticians will probably have to end up accepting that some languages are simply more prosodically expressive than others.

The data presented here are not entirely in accordance with Bannert (1985) (or with Bannert and Thorsen 1988). Firstly, default and focal accents are not distinguished in his (our) nomenclature. Both are subsumed unter the heading 'nucleus, main accent, Satzakzent'. Be that as it may, but Satzakzent is said to be compulsory, which is contradicted by the present data. JoW is the only one to invariably produce final default accents; and even contextually invited final focal accents may occasionally be missing. One might argue that in monitored speech like this, speakers will not always behave according to their normal habits - and undoubtedly this is a valid objection. For instance, the normal answer to most of the probing questions here would not be in terms of a complete sentence, but rather more elliptical, like 'Who has a sister called Kamma? - Torben does'; or 'Do you know where Kamma was born? - She's from Padborg', etc., etc. However, to this objection I will counter that all the speakers, from all the towns I have worked with have been subjected to the same conditions, and they did react differently between groups and in most respects consistently within groups. Surely, this must have some bearing on their different prosodic systems. Also, Bannert's (1985) material was, in this sense, just as 'unnatural' as the present one. And yet results differ.

3. DURATION

It is apparent from the previous figures, that utterances with a final focal accent are generally shorter than isolated utterances (whether these latter ones are produced with or without a default accent). Of course, this difference might be due exclusively to the difference in condition: final focal accents occur in utterances which are final in a larger textual context, which in itself might induce a difference in utterance duration (abbreviation of non-isolated utterances).

The durational data presented here does not lend itself to any statistical treatment, because of its disparity and scarcity, but a trend can at least be observed. The speakers fall into three groups: I: MS and JB who produced all four possible variants (isolated utterances (a few) with and without DA, utterances from context with and (a few) without final FA; II: JoW (who only produced utterances with DA and FA); III: HS, ES, PBP, AS (who only produced utterances without DA and without final FA). To make the durational data comparable across speakers, a normalization is required. The average total duration of the isolated, -DA edition of each utterance is set at 100, and other sentences adjusted proportionately. JoW ("II") had no isolated utterances without DA, so when the

average normalized total duration of isolated utterances with DA by group I had been found (101.4), that was the value assigned to the same utterances by JoW, and his utterances from context were calculated to this proportion.

Figure 8 presents the results. The number of sentences behind each average is given in raised numerals. For groups II and III there are generally 6 items behind the average of each of those sentences that constitute the basis for the conversion, but that cannot be so for group I, where the sum of items behind the same utterance with and without DA, and with and without FA, respectively, does not exceed 6. Granted the reservations which are due to the relative scarcity of +DA and -FA data in group I, the following statements can be made. Putting an utterance into context (in text final position) will abbreviate it by about 4%, compare full and broken line in groups I and III. Give an isolated utterance a default accent, and it is very slightly lengthened (though I doubt whether the difference of 1.4%, group I, would prove to be statistically significant - it seems just as likely that the default accent has no consistent consequences for the duration of an utterance). Utterances with a final focal accent come down to about 90% of the duration of isolated utterances (dotted lines, groups I and II). The context is responsible for about 4% of the abbreviation, the remaining 6% must be due to the focal accent. This figure tallies with what I found with Bornholm and Stockholm speakers. Note, however, that (the more explicit) default accents would also shorten the utterance in those regions, but only about 3.5%. The abbreviation due to a final focal accent is mainly due to an accelerated prelude, cf. figure 9. I measured the duration of the prelude (more accurately: I took down the time coordinate of the last Fo measuring point in the prelude, which actually excludes its final consonant), and held that up against total duration, after a normalization procedure as described above had been performed. Only data from JoW, MS and JB are relevant here. It appears that the duration of the final word itself, as expressed in the durational units which result from the normalization procedure, varies very little across conditions (between 35.6 (+FA) and 36.8 (+DA)). Accordingly, it is the prelude which is shortened under final focal accent, and - consequently - the final, accented word takes up a larger proportion of the utterance, cf. the percentages in figure 9. This tallies well with the results from Bornholm and Stockholm.

4. CONCLUSION

The two southern Danish regions do not have default accents at all, whereas in German (Standard as well as Flensburg) they are optional, i.e. one speaker will apply it invariably, another will just as invariably leave it out, and others produce occasional default accents. The one Flensburg speaker, who produced rather few default accents, cannot of course justify generalizations about Flensburg speech, except to say that

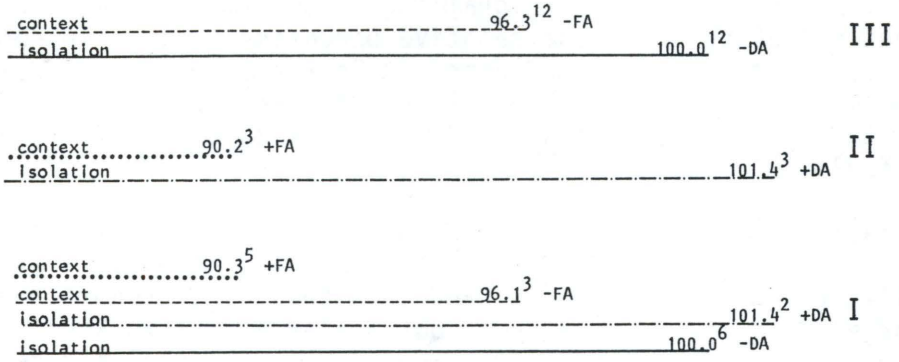


Figure 8

Normalized duration of utterances produced in isolation and in context with and without default and focal sentence accents, respectively, as indicated. Three groups of speakers: I comprises MS and JB, II consists only of JoW, and III contains AS, HS, ES, and PBP. See further the text.

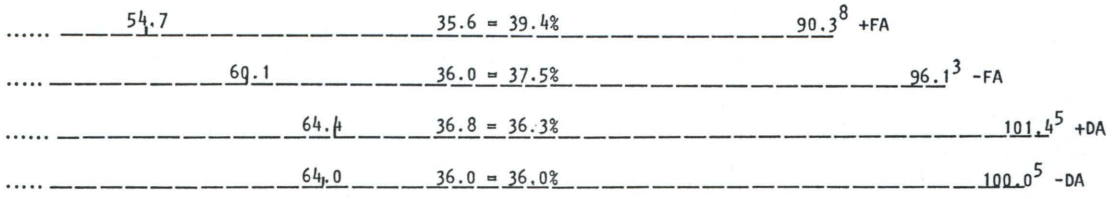


Figure 9

Normalized average durations of utterances by JoW, MS, and JB, with and without final default and focal sentence accents, as indicated. See further the text.

default accents there are not compulsory. - Focus is signalled - in the Danish regions - exclusively by stress reduction of the succeeding passage, i.e. the focussed item carries neither different nor larger Fo movements than when un-focussed. This stress reduction (consequently) never applies when the rhematized item is final, and it is optional in non-final positions, with a preference for initial focus signalling. In the two German varieties, focus signalling is a sentence accent proper (but see above about the relative perceptual weight in non-final and final positions), and it is - roughly speaking - compulsory, though final focal accents are occasionally omitted, by those same speakers who did not invariably produce final default accents.

Default and final focal accents have different consequences for the durational relations within an utterance, a focal accent will accelerate its prelude and thus take up a proportionately larger part of the utterance, but as far as the Fo course is concerned, no consistent differences between focal and default accents were observed. This last aspect differs from results from Bornholm and Stockholm, where focal and default accents were found to be somewhat different both with regard to durational relations and with regard to Fo.

B. SENTENCE INTONATION

The central issue here is how phenomena associated with utterance function, in casu declarative and interrogative, are signalled prosodically, but juncture, resetting of the intonation contour, and speaker pre-planning will also be treated. It is a trivial observation that utterances which syntactically are questions may not function so pragmatically, and even if their function is interrogative, they may not, in the presence of syntactic cues, have any prosodic question markers. Likewise, utterances which syntactically are declaratives may not function as such, and the pragmatic function may (or may not) be accompanied by prosodic signals. To simplify matters, when I do not need to be more specific, I shall talk about (syntactic) declaratives and questions or interrogatives and about (prosodic) terminals and non-terminals. The declaratives in this material actually functioned as such, and were all produced as terminals (excepting a few deviant renderings, due to "list-reading" effects). The questions (including all those which probed the 'Kamma'-utterances) likewise functioned as such (at least within the pseudo-communicative framework in the experiment), but were not necessarily, by all speakers, produced as non-terminals. However, sufficient non-terminals exist to make a comparison with terminals meaningful.

The criteria for categorizing signals to terminal and non-terminal intonation, respectively, as local versus global, are as follows: (1) is the last stress group qualitatively or quantitatively different from preceding ones, ceteris paribus (i.e. final and non-final stress groups should be compared under identical accentual conditions and in prosodically similar utterance types)? A "yes" implies local signalling.

If "yes", does the difference reside (a) within the stressed syllable (a change in the magnitude of its movement and/or in the direction of movement) and/or (b) in the course of the post-tonic syllables? (2) Is the last stress group discontinuous with the course described by the prelude? I.e., will it be positioned outside (whether below or above) the grid which envelops the preceding part of the utterance? A "yes" implies local signalling. Of course, (1) and (2) are not mutually exclusive. Conversely, if the final stress group does not deviate in any principled way from preceding ones, and if it forms the termination of one smooth overall course (which varies in terminals versus non-terminals), intonation signalling will go down as global. Local and global signals may co-exist, if final cues are preceded by global ones.

In the long declarative, intonational phrasing is expected to occur, which may be accompanied by resettings of the contour (cf. Thorsen 1983, 1988a, 1988b). This will disrupt the smooth course of top- and/or baselines (the connection of Fo maxima and minima, respectively).

The data to be dealt with here are figures 1-7 (the isolated utterances), figures 10-18 (the long declarative), and figures 19-27 (wh- questions).

1. LOCAL VERSUS GLOBAL

Figures 10-18 display the long declarative utterance. Cursory inspection of figs. 1-7 and 10-18 would put down Tønder subjects (1, 10-12) as global speakers: there is nothing to distinguish the last stress group from preceding ones (except, of course, when an initial or medial focus indication downgrades its Fo pattern). If anything, its movement is less extensive. (One exception is AS's long utterance, fig. 10, where the last stressed vowel movement is falling.) The utterance as a whole describes a smooth fall, made only slightly bumpy by the resetting at the arrows, with AS and KaP. This fall is carried primarily by the Fo maxima, i.e. by the stressed syllables. That is most apparent in figs. 10-12: the fall through the post-tonics is so steep that when the stress group contains two or more post-tonics, its offset will almost hit the bottom of the speaker's range, irrespective of position in the utterance, which makes the baseline, the connection of Fo minima, only very weakly declining.

Contrarily, the three German subjects (5-7, 16-18) - with no apparent distinction between JoW and MS versus JB in this respect - have clear local traits: the prelude floats well above the floor, though with a clear downwards trend, while the last stress group twists its stressed vowel movement downwards and performs a steep fall (i.e. steeper than in preceding stress groups) to the bottom of the range. With MS and JB I am certain that the last stressed word in the long declarative, 'Kassel', was neither more nor less prominent than preceding words (whereas it carries a default accent with JoW). So again,

the fall per se cannot be a manifestation of sentence accent, cf. section A.2.b above and see below.

The Sønderborg subjects (2-4, 13-15) appear intermediate between Tønder and German.

Among the questions (figs. 19-27), only JoW (25) is conspicuous by his falling-rising final post-tonic. - Note that resetting of the contour occurred before the first PP with AS (19), JC (20) and ES (23), and possibly also with HS (22), although it is impossible to distinguish between resetting and a non-declining intonation contour here, when only one prosodic stress group precedes. Furthermore, higher intrinsic Fo in 'Tøn-' than in the surrounding low stressed vowels may account for part of the apparent upstep. Note also that 'fra' which syntactically belongs with 'Tønder' teams up prosodically with the preceding stress group, i.e. the syntactic and prosodic boundaries do not exactly coincide: the prosodic boundary is located immediately before the stressed vowel, after the syntactic boundary, or - in other words - the stress group patterns cut across the syntactic boundary. This pattern is repeated with the Danes in the long utterances, with a few possible exceptions, see 2. below. This is entirely in line with previous results, cf. Thorsen (1983).

Figures 10-18

Average fundamental frequency tracings (logarithmic display) of a long terminal declarative utterance by three Tønder speakers (AS, JC, KaP), three Sønderborg speakers (HS, ES, PBP), two Standard German speakers (JoW, MS) and one Flensburg speaker (JB). The stressed vowels are drawn in thicker lines. The number of items behind each average is given in the upper right of each figure. Zero on the frequency scale corresponds to the same values as indicated in figures 1-7, and 20-21, respectively. Note that the time scale is compressed compared with previous figures. Arrows indicate places where I have perceived prosodic boundaries.

Figures 19-27

Average fundamental frequency tracings (logarithmic display) of a question with question word, succeeded by an echo-question. Three Tønder-speakers (AS, JC, KaP), three Sønderborg-speakers (HS, ES, PBP), two Standard German speakers (JoW, MS), and one Flensburg speaker (JB). The stressed vowels are drawn in thicker lines. The number of items behind each average is given in the upper right of each figure. Zero on the frequency scale in figures 19 and 22-27 corresponds to the same values as in figs. 1-7, respectively. Arrows indicate places where I have perceived prosodic boundaries.

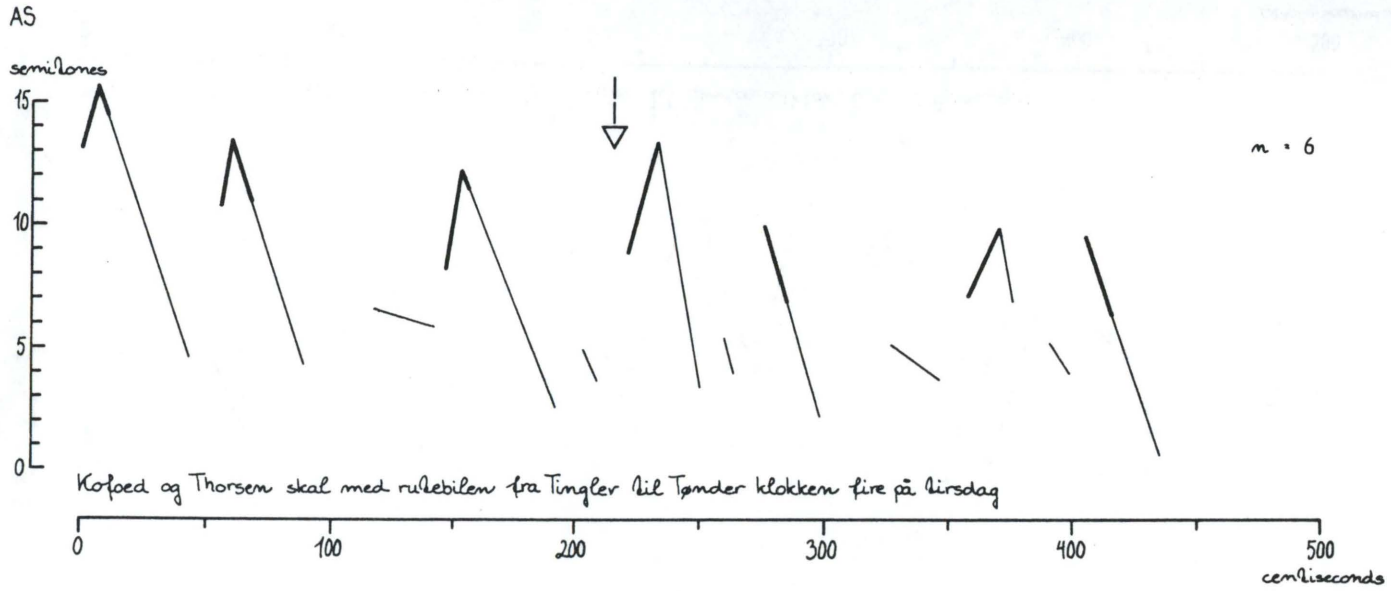


Figure 10

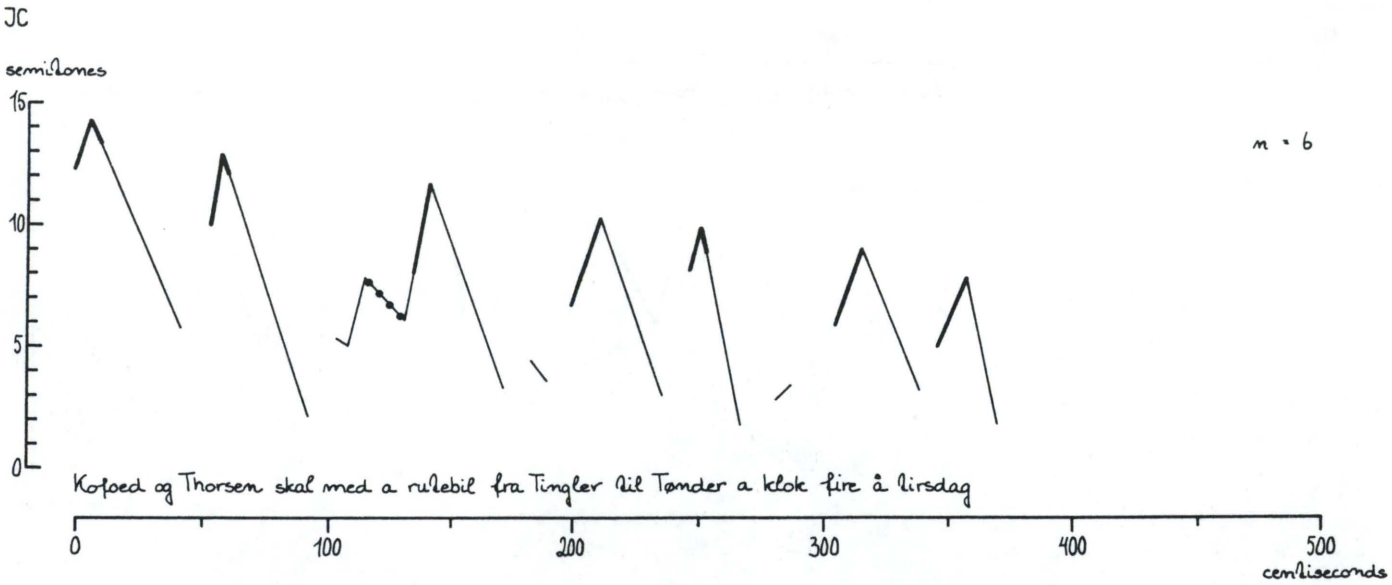


Figure 11

Note that 'med' has secondary stress (dotted here)

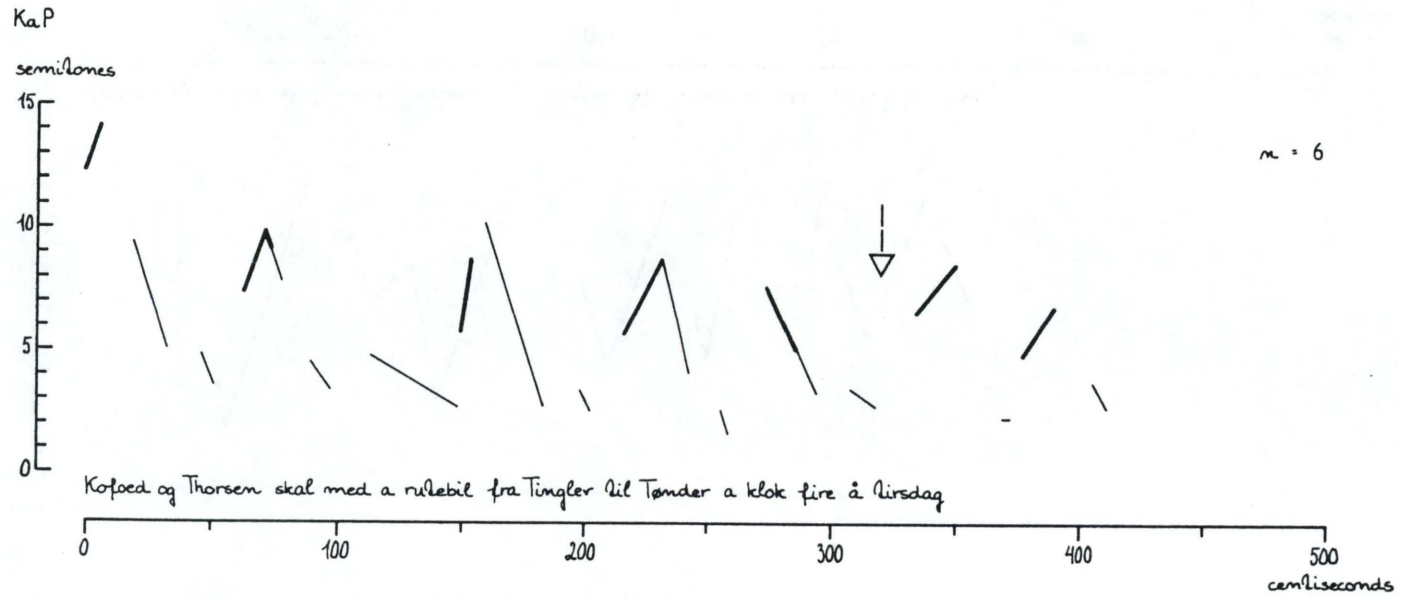


Figure 12

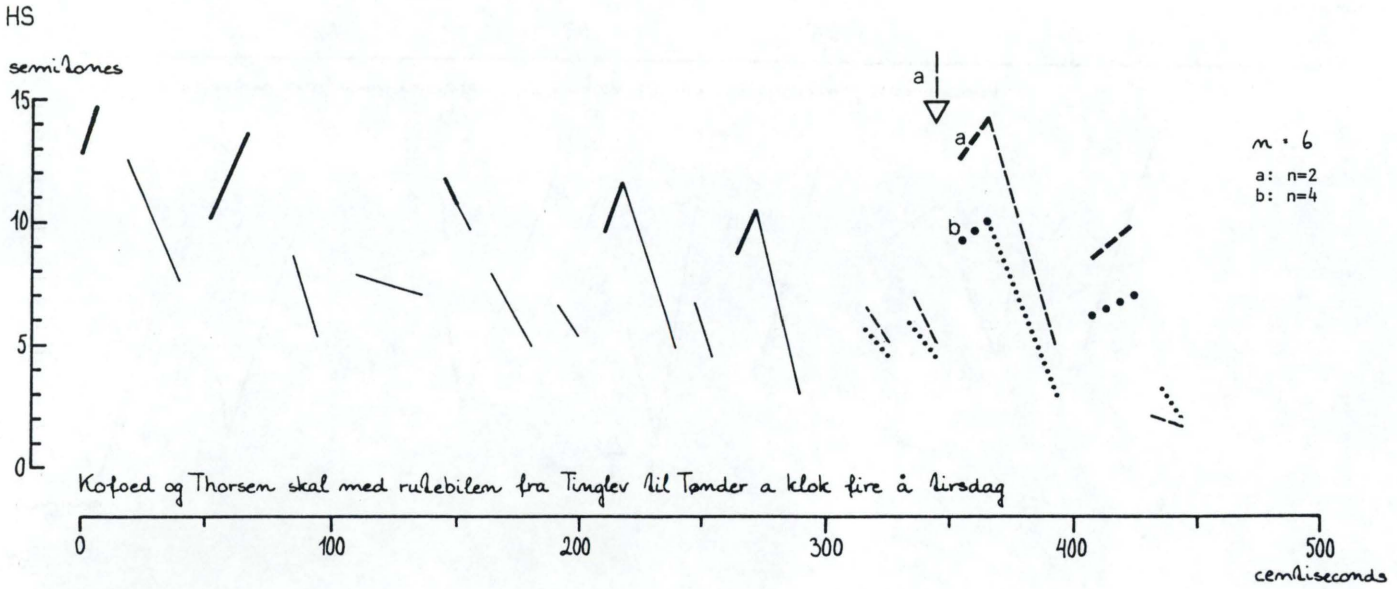


Figure 13

ES

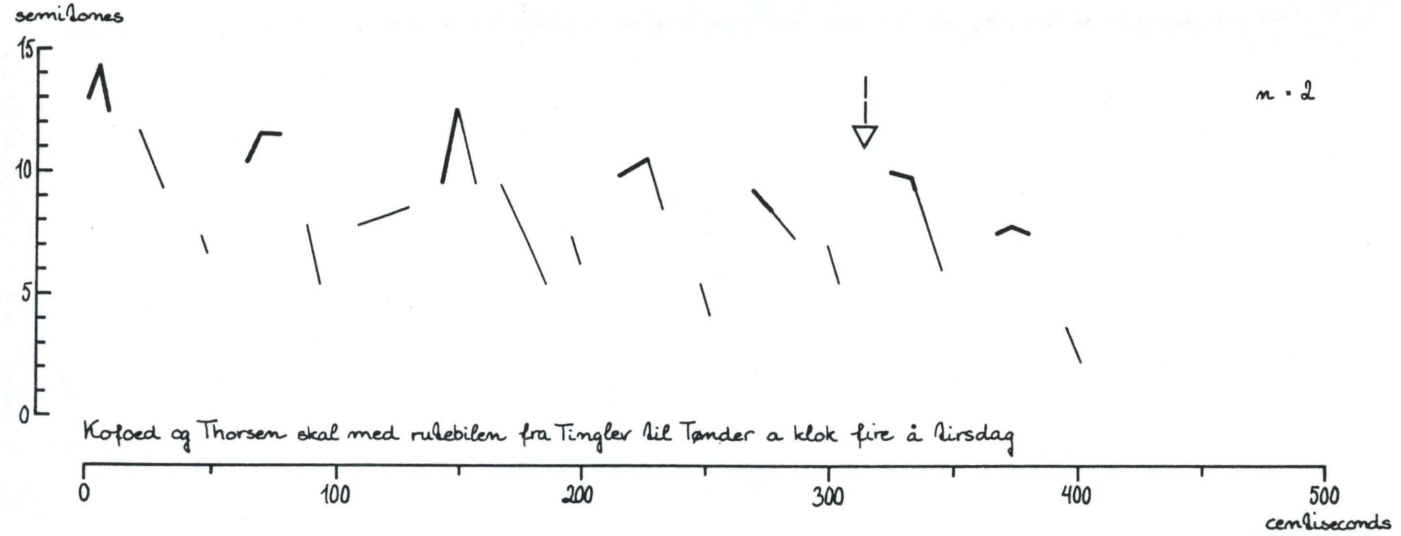


Figure 14

PBP

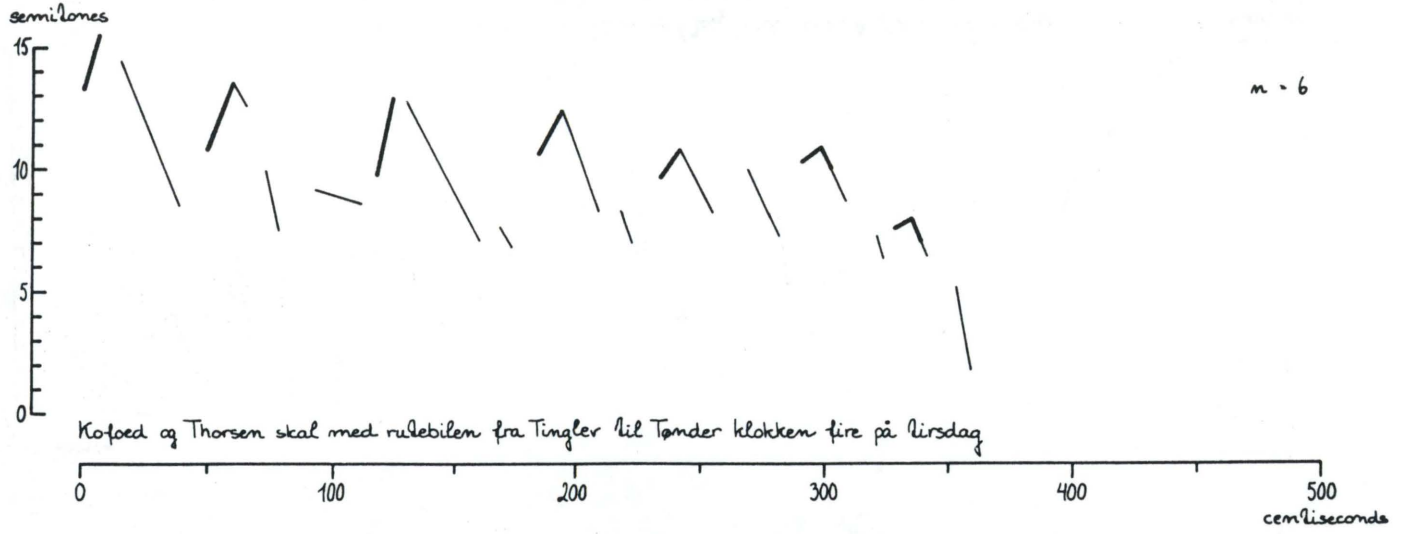


Figure 15

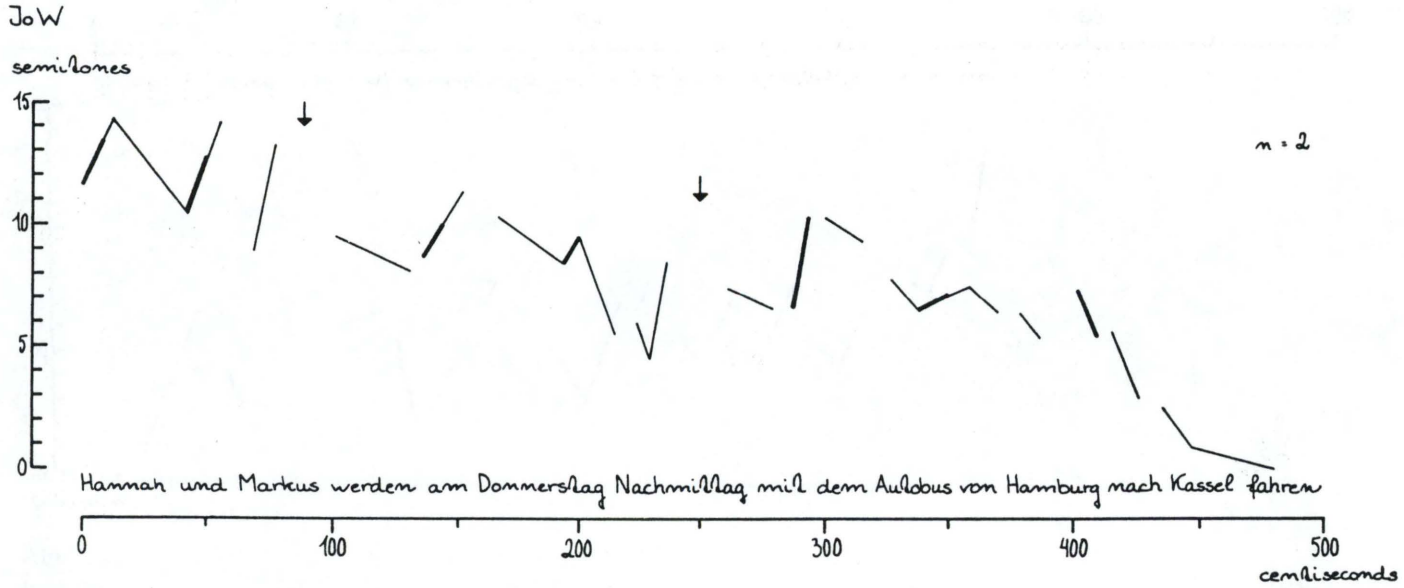


Figure 16a

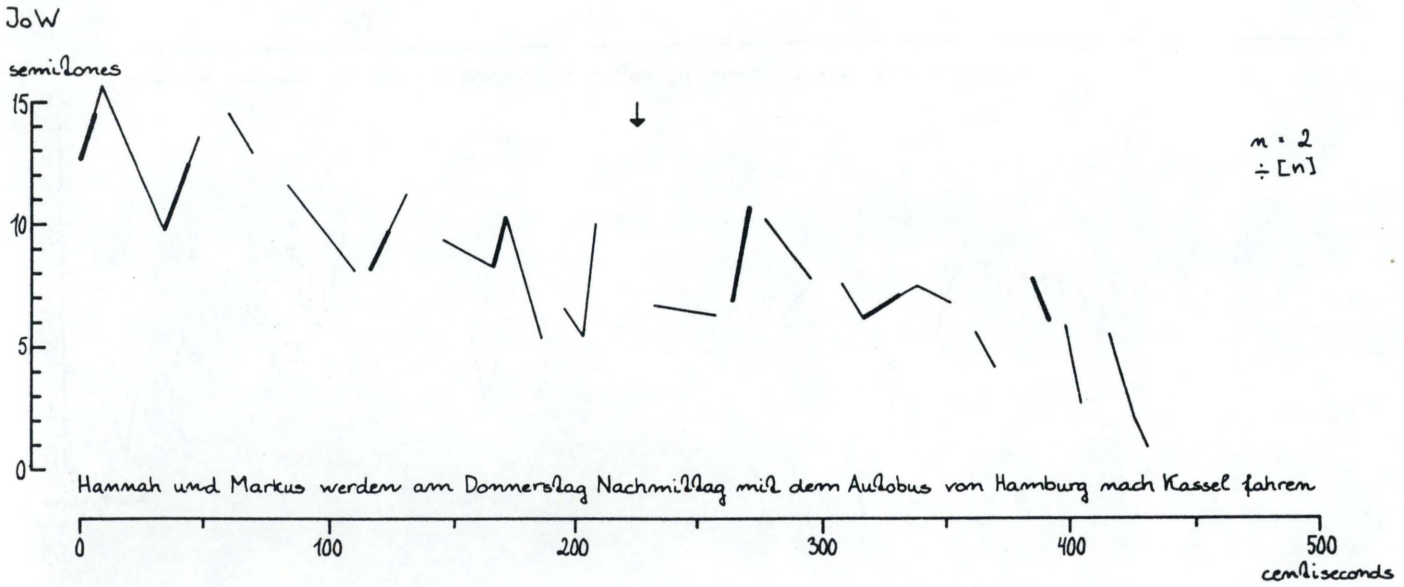


Figure 16b

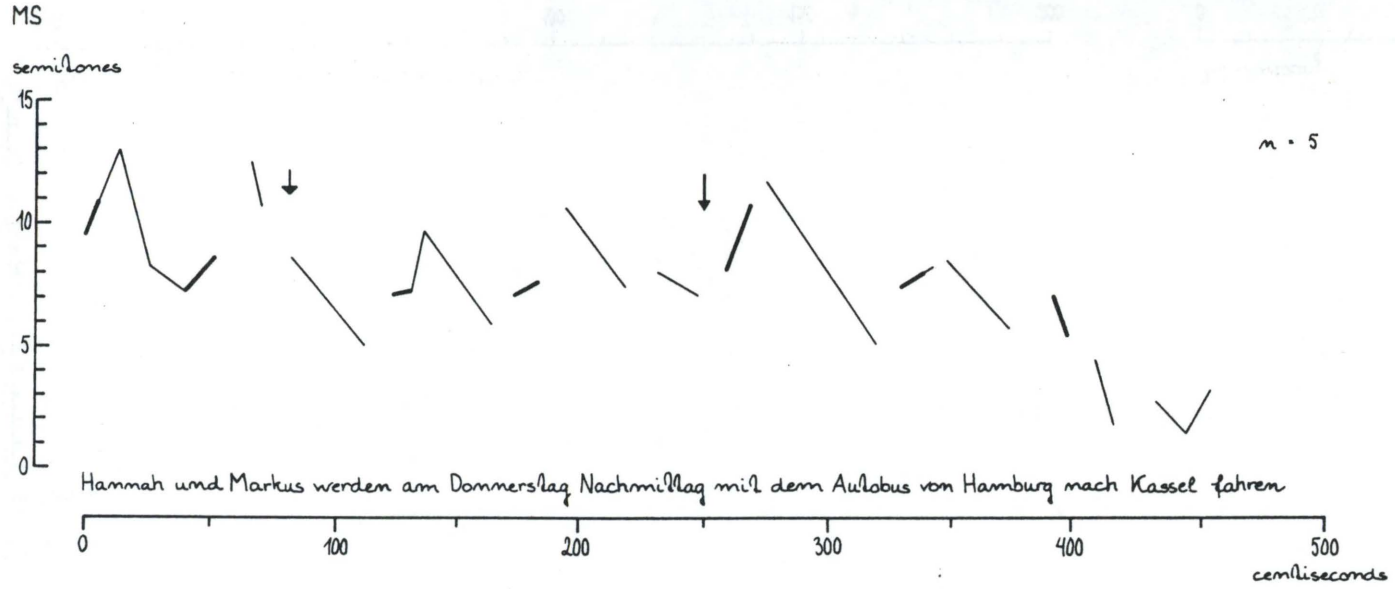


Figure 17

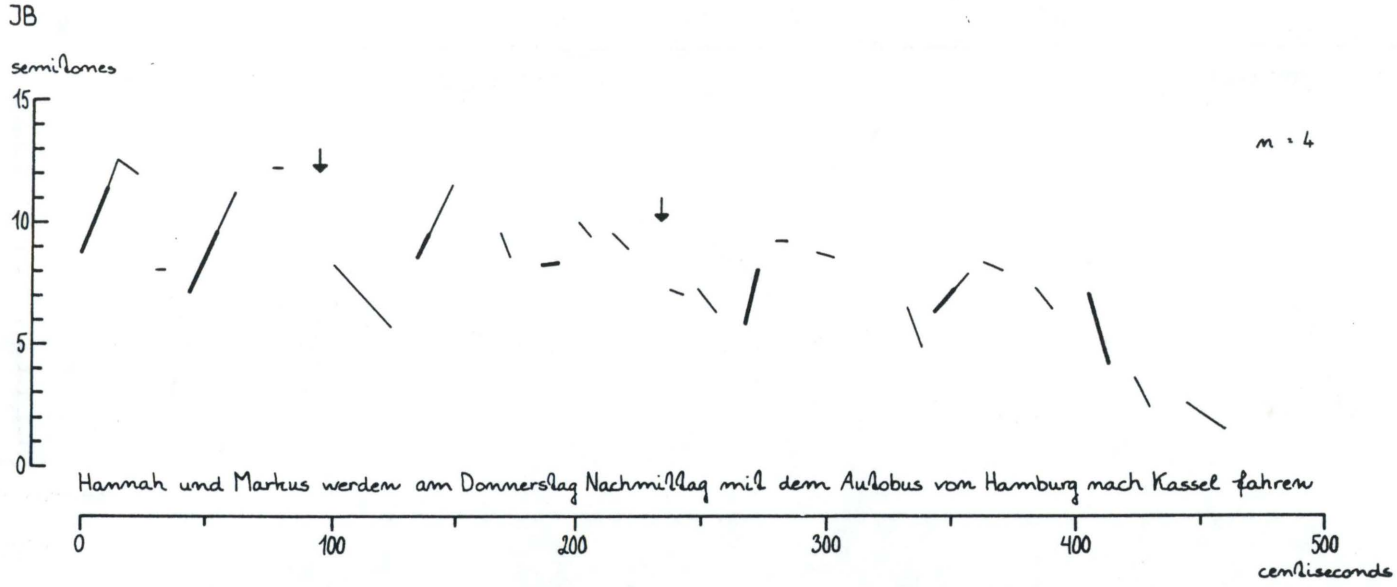


Figure 18

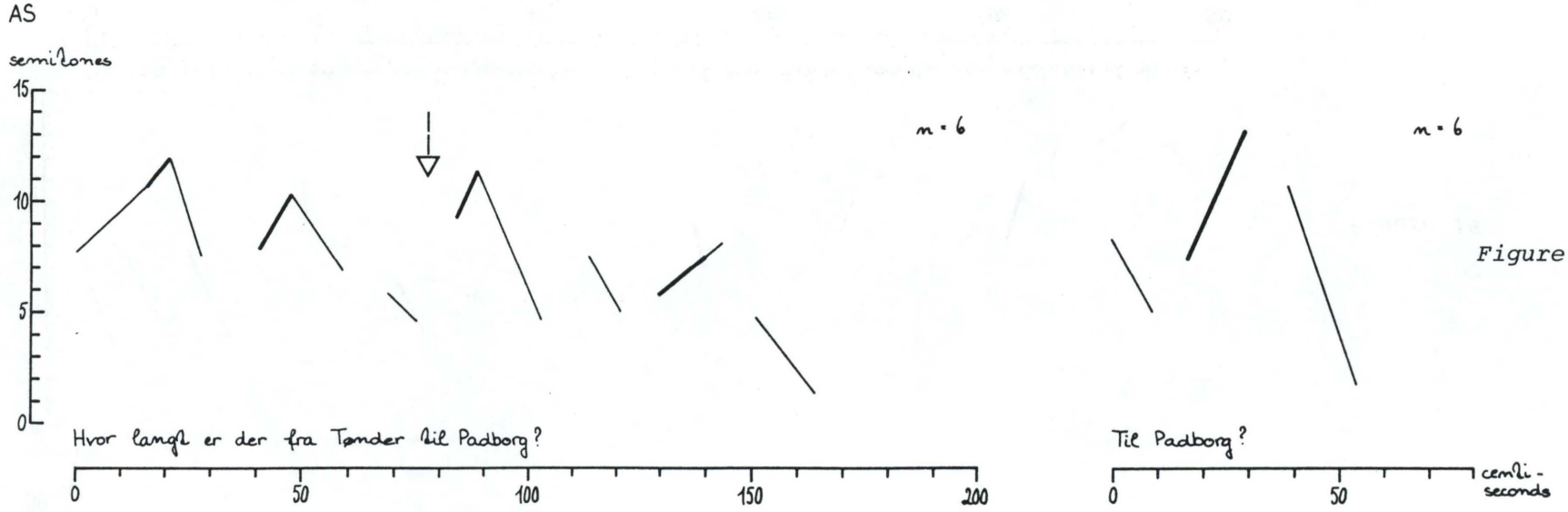


Figure 19

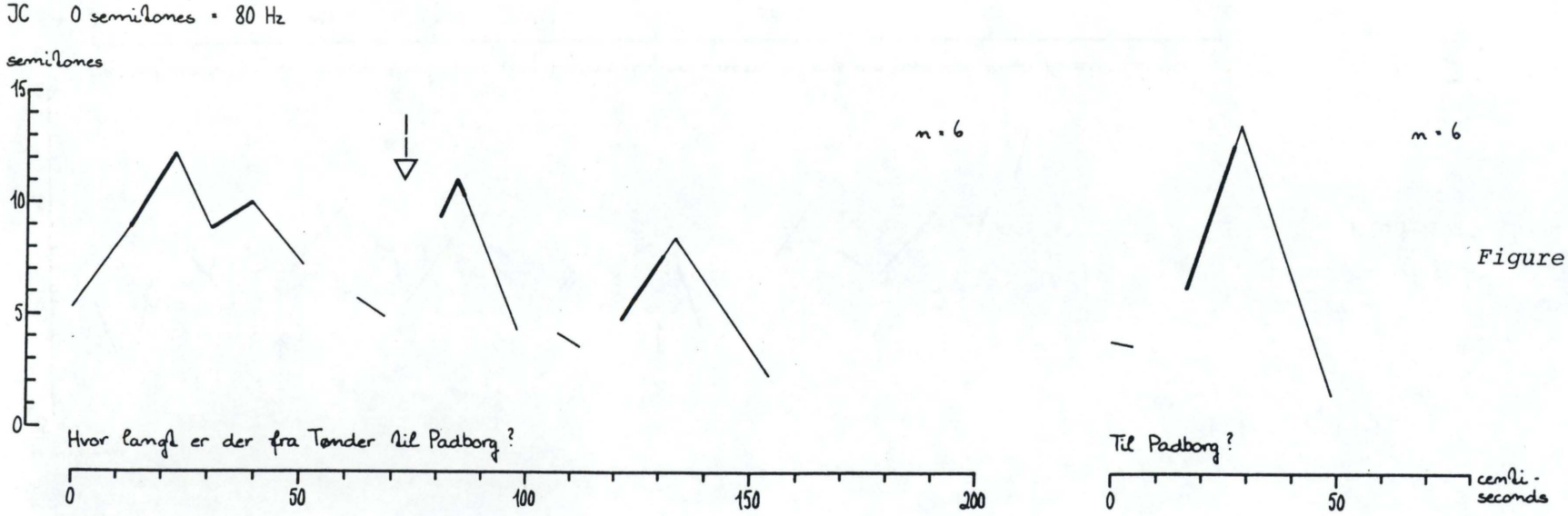
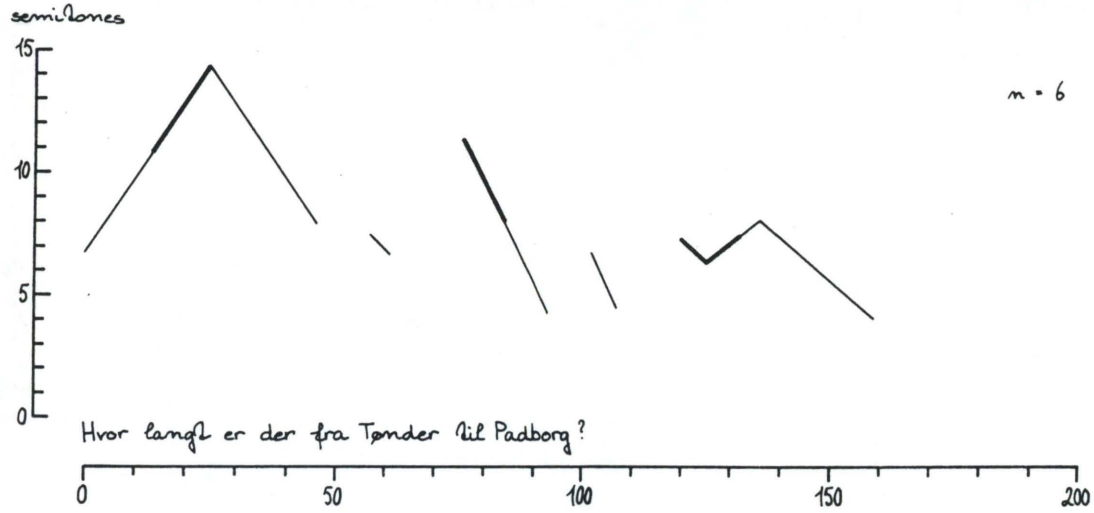


Figure 20

KaP 0 semitones = 132 Hz



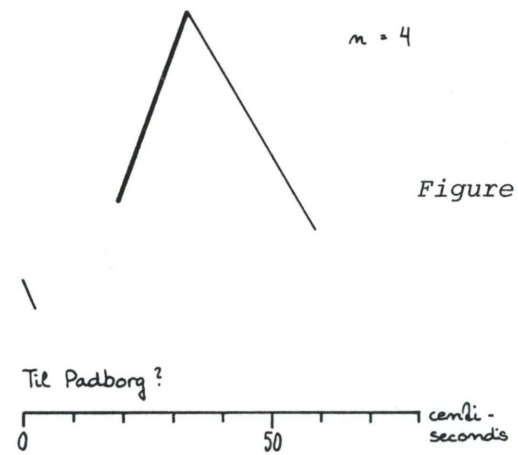
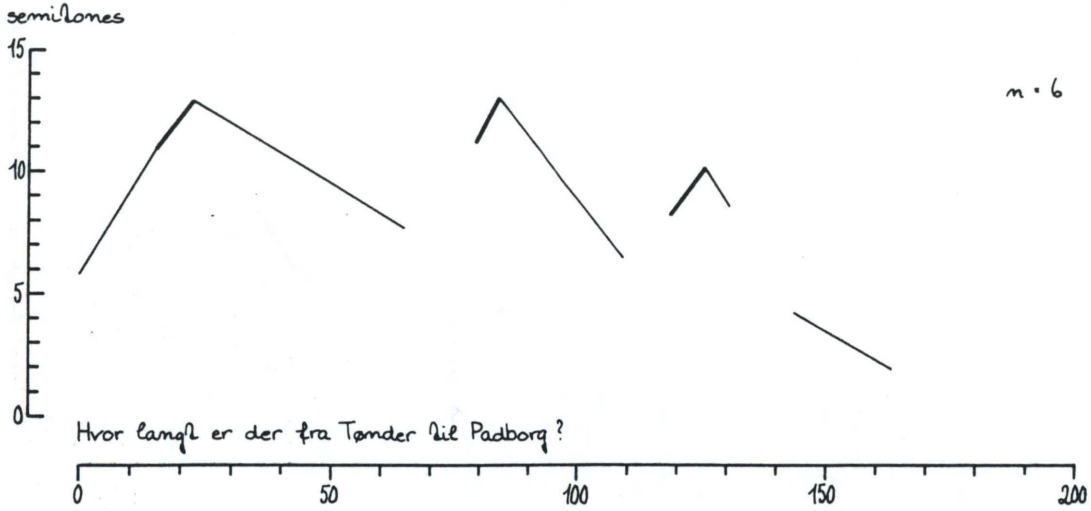


Figure 21

HS



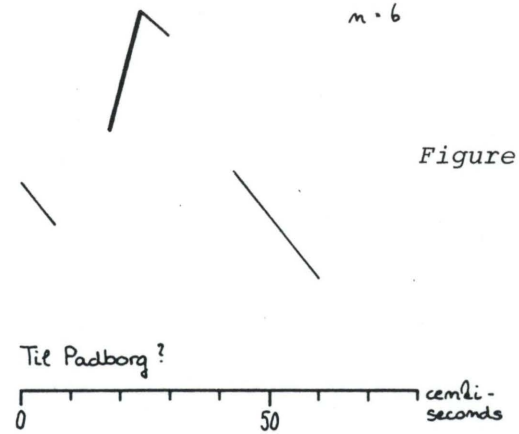


Figure 22

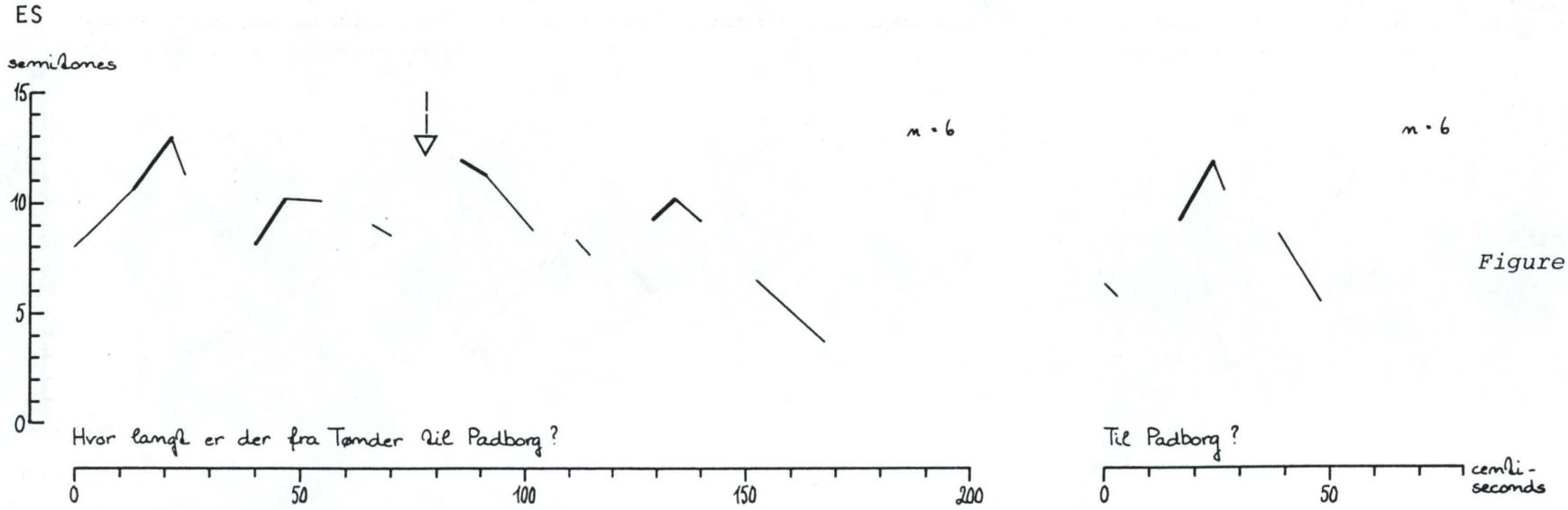


Figure 23

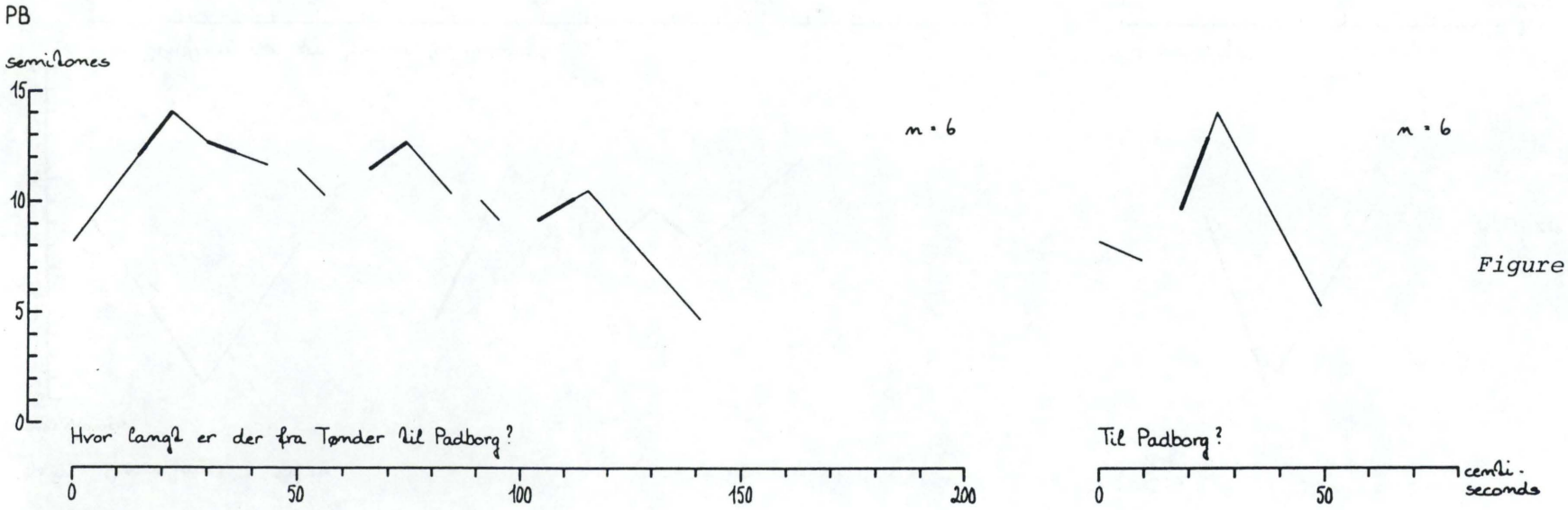
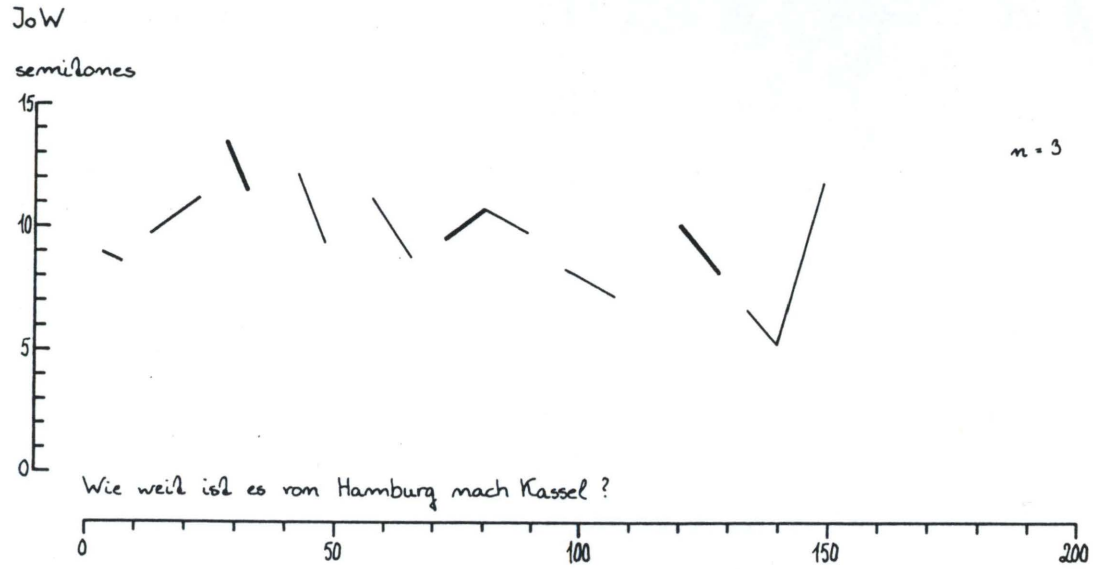


Figure 24



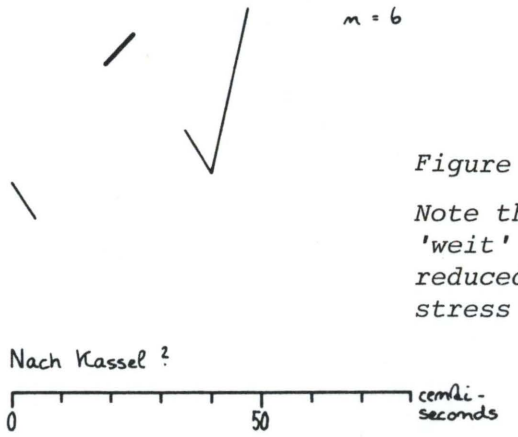
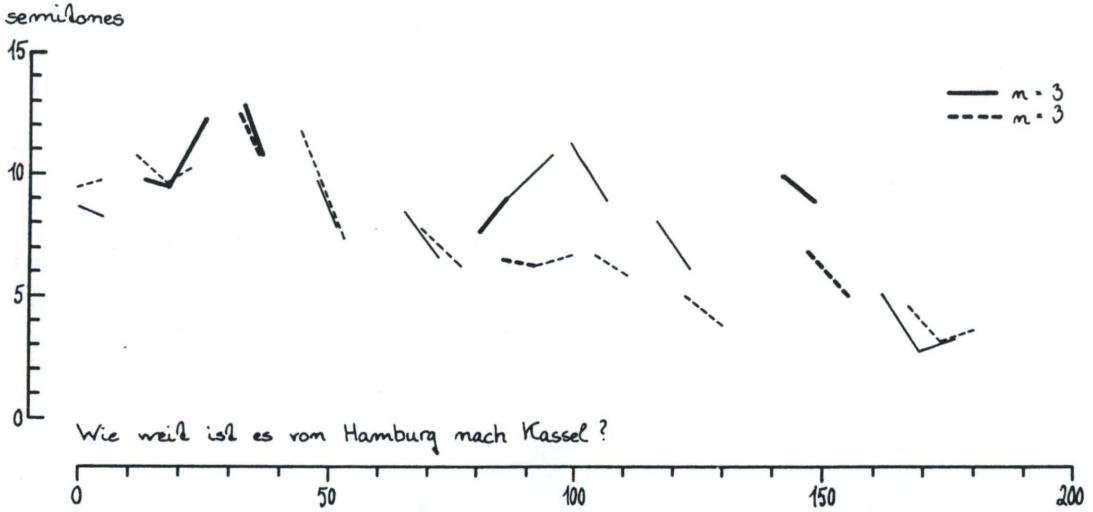


Figure 25

Note that 'weit' has reduced stress



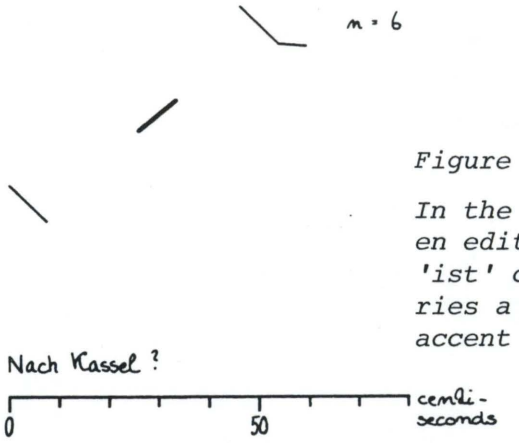


Figure 26

In the broken edition, 'ist' carries a focal accent

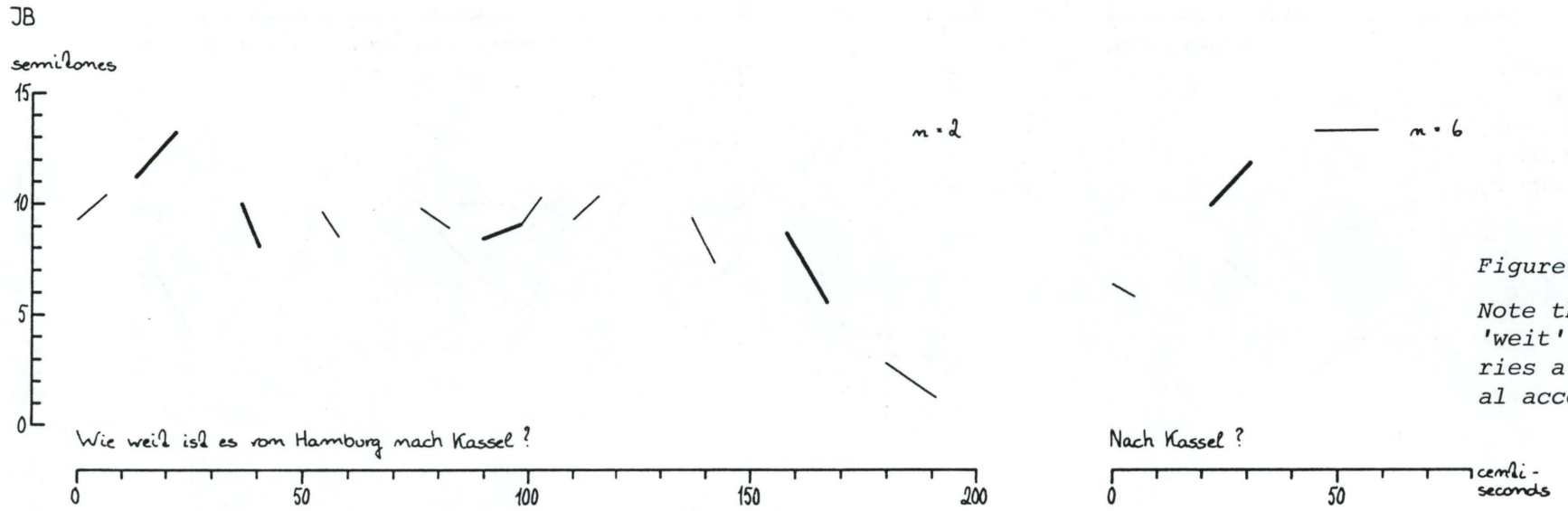


Figure 27

Note that 'weit' carries a focal accent

A closer scrutiny of figs. 1-7, 10-18 and 19-27 and the various locality markers resulted in Table VIII, with the following notes:

(1) This factor is connected with the relation between the last stressed and post-tonic vowels, of course.

(2) Comparing this with the other Kamma-utterances, it is obvious that it is not the last stressed vowel which is (deviantly) lower, but the middle 'søs-' which onsets higher, maybe due to an intrinsic effect from the preceding /s/.

(3) At least not if we take the resetting into, or rather out of, account.

(4) Note that the fifth stressed vowel, before the resetting, is falling.

(5) The final downstep in these utterances is admittedly not large, but if you compare with AS, it is clear that the trend is different here: two nearly level stressed vowels and one which is lower than both by 2-3 semitones, cf. also Table IXa below.

(6) In the same way, the interval between the first and second Fo minimum is smaller than between the second and third.

(7) The extremely low onset of 'An-' disturbs the picture, but if you look at the same utterance from the context which invited final focus it is apparent that the same tendency prevails as with HS's and ES's "K_i"-utterance.

(8) The last Fo minimum may not be discontinuously lower than preceding ones but nevertheless, the single final post-tonic performs more of a fall than does the post-tonic in the initial stress group.

(9) If you consider only the nearest preceding Fo minima, then the last one is unambiguously discontinuously lower, less unambiguously so, if all of the preceding baseline is included.

(10) On the contrary, it is rising.

(11) 'ton und' is exceptionally extensive, but compared with the second and third stress groups, the final fall is larger. Maybe the more extensive fall could be a signal for the syntactic boundary, i.e. for a dissociation between '-ton' and 'und'.

(12) Its movement is bi-directional: falling-rising.

(13) Only the full-line edition is considered.

(14) If it is not larger, the last movement is steeper.

(15) JB had a sentence accent on 'weit', cf. the suppressed patterns on the second and third stress groups.

(16) JoW had a sentence accent on 'ist'.

Table VIII

Presence (+) or absence (-) of four features of local sentence intonation signalling in (the average of) four declarative and one interrogative utterance by nine speakers. "Ki, Km, Kf" designate the isolated utterances with 'Kamma' in initial, medial, and final position, respectively, "L" designates the long declarative, "Q" the question. The information is read off from figures 1-7, 10-18 and 19-27.

		AS	JC	KaP	HS	ES	PBP	JoW	MS	JB
The final stressed vowel changes direction:	Ki	-			-	-	-	+	+	+
	Km	-			-	-	-	+	+	+
	Kf	-			-	-	-	+	+	+
	L	+	-	-[4]	-	-	-	+	+	+
	Q	-	-	-	-	-	-	+[16]	+[13]	+[15]
The final stressed vowel is discontinuously lower than preceding stressed vowels:	Ki	-			+[5]	+[5]	+	-	-	-
	Km	-			+[5]	+[7]	+	-	-	-
	Kf	-[2]			+[5]	+[5]	+	-	-	-
	L	-	-	-	+(b)	-	+	-	-	-
	Q	-[3]	-[3]	-	-	-	-	-	-	-
The final post-tonic Fo minimum is discontinuously lower than preceding Fo minima:	Ki	-			+[6]	?+[8]	?+[8]	+	+	+
	Km	-			-	-	-	+	+	+
	Kf	-			-	?+[8]	?+[8]	+	+	+
	L	-	-	-	-	+[9]	+	+	+	+
	Q	-	-	-	+	+	+	*[10]	+	+
The final stress group performs a larger and/or steeper Fo movement:[1]	Ki	-			-	-	-	+	+	+
	Km	-			-	-	-	+[11]	+[11]	+[11]
	Kf	-			-	-	-	+	+	+
	L	-	-	-	-	-	-	+	+[14]	+
	Q	-	-	-	+	+	+	*[12]	+	+

Table VIII establishes Tønder speakers as having no local prosodic cues to sentence intonation, whereas Sønderborg and German speakers do, and - glossing over minor variations - Table VIII could be summarized thus:

	Tønder decl./interrog.	Sønderborg decl./interrog.	German decl./interrog.
The final stressed vowel changes direction	no/no	no/no	yes/yes
The final stressed vowel is discontinuously lower than preceding ones	no/no	yes/no[1]	no/no
The final post-tonic Fo minimum is discontinuously lower than preceding ones	no/no	yes?/yes	yes/yes[2]
The final stress group performs a larger and/or steeper Fo movement	no/no	no/yes[1]	yes/yes[2]

(1) This is to do with the way Sønderborg speakers control the difference between terminals and non-terminals, by the level of the last stressed vowel - see further section 2. below.

(2) unless it is rising, as with JoW.

Sønderborg and German differ in the nature of the final cue: with the Germans, the final stressed vowel is still acoustically within the range established by preceding ones, though it is falling, and the very final "low" is considerably lower than any preceding ones. With Sønderborg, the last stress group as a whole, without any further qualitative or quantitative change, is positioned somewhat below the range established by the prelude, in the terminals. This lowering is - if not suspended - at least diminished in the non-terminal. I would say that, on the whole, the final cues are weaker, both perceptually and acoustically, in Sønderborg than in German. This fact does not, of course, make a terminal perceptually ambiguous: if we consider terminal intonation the unmarked case (whether generally or when accompanying certain syntactic sentence types) and non-terminal intonation the marked one, then the absence of specific

non-terminal cues is naturally sufficient to secure identification.

A comment about rising versus falling stressed vowel movements: it is entirely possible that these movements are too brief (both in time and in frequency span) to be perceived as movements, cf. Rossi (1971, 1978) and Thorsen (1979), but it would take separate perceptual experiments to find out. Assuming that the stressed vowels, presented to listeners in isolation, would be perceived as levels or points, rather than movements, there are still two possibilities for their production: (1) there IS a separate voluntary gesture involved, though its acoustic result is not perceived accordingly (as a movement), or (2) stressed vowel rises and falls are the by-products of the planning and production of a larger scheme, i.e. the stress group pattern. I have taken the latter view in analyses of Standard Copenhagen Danish, cf. Thorsen (1980a, 1980b, 1982, 1984a). Under this assumption, the German stressed vowel falls in final position can be conceived of as an anticipation of, or shortcut to, the final "low", which would be consistent with the fact that stress groups before a non-terminal juncture have rising stressed vowels: they do not face a final low (cf. the next section). On the other hand: (a) stressed final falling vowels also characterize questions which are marked as such with a final fall-rise, or "high-low-high" if you like, where the lowness of the "low" is debatable, and (b) when the final fall, the low, is transposed to the left, as with medial and initial focal accents, rising (initially) and at least non-falling (medial) stressed vowels are encountered. I shall leave the issue at that, for the moment.

2. PHRASING/JUNCTURES AND RESETTING IN THE LONG DECLARATIVE

No speaker produced six repetitions of the long declarative without some form of perceptible phrasing at/near one or more of the major syntactic boundaries. This phrasing takes different forms and has different consequences for the Fo course.

AS (fig. 10) might pause after 'rutebilen' and 'Tønder', but comparing items with and without such pauses, I could establish that a pause as such has no consequence for Fo (and pauses are suppressed in this and all other figures). There is a clear resetting before 'Tinglev' and it is debatable whether there is not also one before 'fire'. With the stressed vowel representation I have chosen for the calculations in Table IXa (mid point, or maximum in bi-directional movements), 'fi-' is rather level with 'Tøn-', and I have considered the last four stresses to compose one intonational phrase. Thus, AS's long utterance consists of two prosodic phrases, each with its own declination, though subordinate to a grosser overall fall: the second phrase onsets and offsets at lower values than the first phrase (insofar as the phrasal contours are determined by the stressed vowels alone, i.e. the post-tonics carry no independent information about phrase and sentence intonation, they are predictable from the stressed syllables - see further

below about stress group patterns in section C.). This is in line with previous results about Copenhagen Danish and Næstved and Aalborg (Thorsen 1980c, 1987b, 1988a). Falling stressed vowels, though the exception rather than the rule before prosodic phrase and utterance boundaries - if AS, JC, and KaP are representative - is then one of the means at Tønder speakers' disposal to regulate the perceived relation between the stressed vowels and thus the perceived slopes within prosodic phrases, and their subordination to the overall contour. This would mean that it is not the falling movement as such which is planned and controlled but a lower (perceived) level of the stressed vowel. Of course, a lower perceived level - which according to Rossi (1971, 1978) would correspond to the frequency value at 2/3 of the distance from vowel onset - could also be attained from a physically rising stressed vowel, but its onset would have to be rather considerably lower in the three particular instances which are my concern here (two with AS, one with KaP). - JC (fig. 11) would most often pause after 'Thorsen' and again either before the time complement or in the middle of it, i.e. before the very last PP, 'på tirsdag'. Again, pauses as such have no consequence for Fo, and JC's sentence intonation is perfectly smoothly falling, with no distinguishable resettings of the contour. The sequence 'skal med' which seems to step up, sounds like 'med' has secondary stress. This perception of secondary stress could, however, also be due to segmental factors (a rather long vowel), and the disruption between 'Thorsen' and 'skal med', i.e. between NP and VP, may be a separate (optional) boundary cue: 'skal med' is reset to utterance or phrase initial unstressed syllable value, rather than being tagged on to the tail of the preceding stress group. - KaP (fig. 12) would generally pause before the time complement, but irrespective of pausing, she would slightly reset her contour at this point and precede the step-up with a falling stressed vowel as well. KaP is otherwise only remarkable for the very high onset of the contour, succeeded by an immediate 4-5 semitone drop to the second stressed vowel. I think this feature reflects an attempt to add some (clearly audible) liveliness to the rendering of otherwise dead-dull utterances, i.e. it should be put down as a stylistic variable. - Tønder speakers' behaviour is reminiscent of Aalborg (Thorsen 1988b), where in final position in the long declarative, the three speakers had pre-dominantly falling stressed vowels, as opposed to rising-falling ones in other positions and utterances. That apart, Tønder, Aalborg, Næstved and Copenhagen speakers' long declarative utterances can be described along the same lines, as having a globally distributed falling contour, which can be decomposed into a succession of individually slanting phrase contours, whose boundaries are marked solely by resetting, with no special pre-boundary cues (though with the possibility for Tønder and Aalborg speakers to produce the required perceptual lowering, in relation to preceding and/or succeeding stresses, by changing the direction of the stressed vowel movement). More particularly, unstressed syllables which are pre-tonic in the syntactic constituent whose first stressed syllable is being up-stepped or reset, will - more often than not - behave prosodically as post-tonic

to the stressed syllable preceding the syntactic boundary (see, e.g., AS: 'rutebilen fra Tinglev', KaP: 'Tønder a klok fire'), i.e. they will be continuous with the preceding rather than the succeeding stressed syllable.

HS's (fig. 13) two items with a very sharp resetting co-occurred with fairly long pauses, whereas the continuous contours were produced fluently, but note that this has very little consequence for the two syntactically pre-tonic syllables ('a klok'). ES (fig. 14) did not pause in the two otherwise acceptable items, and produced a slight resetting before the time complement. PBP (fig. 15) paused slightly before the time complement in every rendering, but is otherwise a perfect example of a long continuous, slightly declining prelude before the final fall. Downdrift/declination and resetting in contours which end with specific prosodic cues to terminality and juncture will be treated in section 3. below.

JoW (fig. 16a+b) paused once, MS (fig. 17) occasionally, after the time complement (and JB - fig. 18 - never paused), but the pauses as such have no consequences for Fo. Prosodic boundaries were perceived after the NP and the time complement with all speakers, although JoW omitted the NP/VP boundary in two cases (16b). There are different ways to signal the prosodic boundary: (a) JoW does so with a particular phrase-final Fo gesture, a rise-fall-rise, as opposed to the rise-falls of non-phrase-final stress groups, in the same way that he signals prosodically marked questions finally; but no resettings occur, i.e. the stressed syllables perform one long slow declination. Note that here the syntactic and prosodic boundaries coincide exactly, and the syntactically pre-tonic syllables ('werden am', 'mit dem') team up with the succeeding stressed syllable. The same can be said for MS and JB about syntactic and prosodic boundaries, but the boundary signal is different: (b) it consists in higher rises from the stressed to first post-tonic, and a resetting at the second boundary with MS. JB also does a higher rise in 'Markus' and a resetting, but only a discontinuity between the unstressed syllables ('-mittag / mit dem') at the second boundary. - The difference between JoW versus MS and JB (post-tonic rise-fall-rise versus no phrase-final rise) is reflected in their one word echo question, cf. below. Again, one might speculate that this difference in phrase boundary signalling reflects a difference between Standard German and Flensburg, and that MS after all does have Flensburg traits in her prosody. But inspection of the fourth, and unambiguously Standard speaker, HH's data reveals that he, like MS and JB, performs higher rises to the post-tonic, not rise-fall-rises, before a perceived prosodic boundary. Whether this difference is a truly individual one or whether it is a stylistic variable, open for every North German to bring into play, I cannot say. JoW did not to me sound neither more distinct nor more formal than, e.g., MS. - The most interesting fact here is that there seems to be a more distinct tendency in German versus Sønderborg Danish (and Danish in general) to mark syntactic boundaries in longer utterances explicitly.

3. PLANNING AND EXECUTION STRATEGIES

Thorsen (1983) contains data and documentation from declarative utterances of systematically varying length (Standard Copenhagen Danish) which led me to conclude that Standard Danish sentence intonation is handled more easily and adequately within a descriptional framework where the various components are a hierarchically structured set of parametric, simultaneous and interacting categories (sentence contours, superposed by phrase contours, superposed by stress group patterns), the actual production of which demands a certain amount of look-ahead and pre-planning. This view is in opposition to a theory where intonational events occur in linear sequence and where grosser trends in the Fo course is accounted for as the result of iterative application of locally applying rules which can only look back, and where - specifically - look-ahead and pre-planning is uncalled for, except that utterance onset may vary with length, cf. Pierrehumbert (1980), Liberman and Pierrehumbert (1984). For a modified version of the linear sequence approach, see Ladd (1983). - I shall not repeat the argumentation here, but merely note that the Tønder-speakers would be very well accommodated under the same description as Standard Danish (and Aalborg and Næstved). But how do the data from Sønderborg and German fare? It is the description of the prelude, i.e. what leads up to the final lowering, that is our concern, since it is beyond any doubt that there is a separate, special final command involved in the production of the final stress group (Sønderborg) and the final post-tonic (German), respectively.

The material cannot possibly resolve the issues here, because utterance length has not been systematically varied, but the relevant questions can be raised and tentative answers outlined. Firstly, downdrift/declination in the prelude is unmistakable with all Sønderborg and German speakers. With the German speakers, it is nearly as steep as with Tønder speakers, whereas Sønderborg speakers are less slanting, cf. Table IXa. Why this downdrift - what is its function and how is it regulated? There are two possibilities: (1) it is a voluntary, controlled part of the cue to the (unmarked) terminal intonation, in which case I would have to modify the statement, derived from Table VIII, that intonation cues are local in Sønderborg and German, to say that intonation signalling is a mixture of global and local cues, or (2) it is involuntary, automatic in a sense, and a gesture that should be ascribed to a relaxation of those muscles that control Fo height (which is not paramount to saying that this relaxation could not be checked or counter-acted for the production of less slanting contours). Under assumption (1) we would expect the prelude to differ in utterances which are prosodically marked as non-terminal versus terminal: prelude slopes should be steeper in terminals and their offsets lower, ceteris paribus. Furthermore, for a given utterance type, the prelude would show systematic variation with length, either (a) through higher onsets with longer preludes, and/or (b) through lesser slopes with longer preludes. Under assumption (2), preludes would show no systematic difference in onset and slope in long and short terminals, or in terminals vs. non-terminals, ceteris paribus.

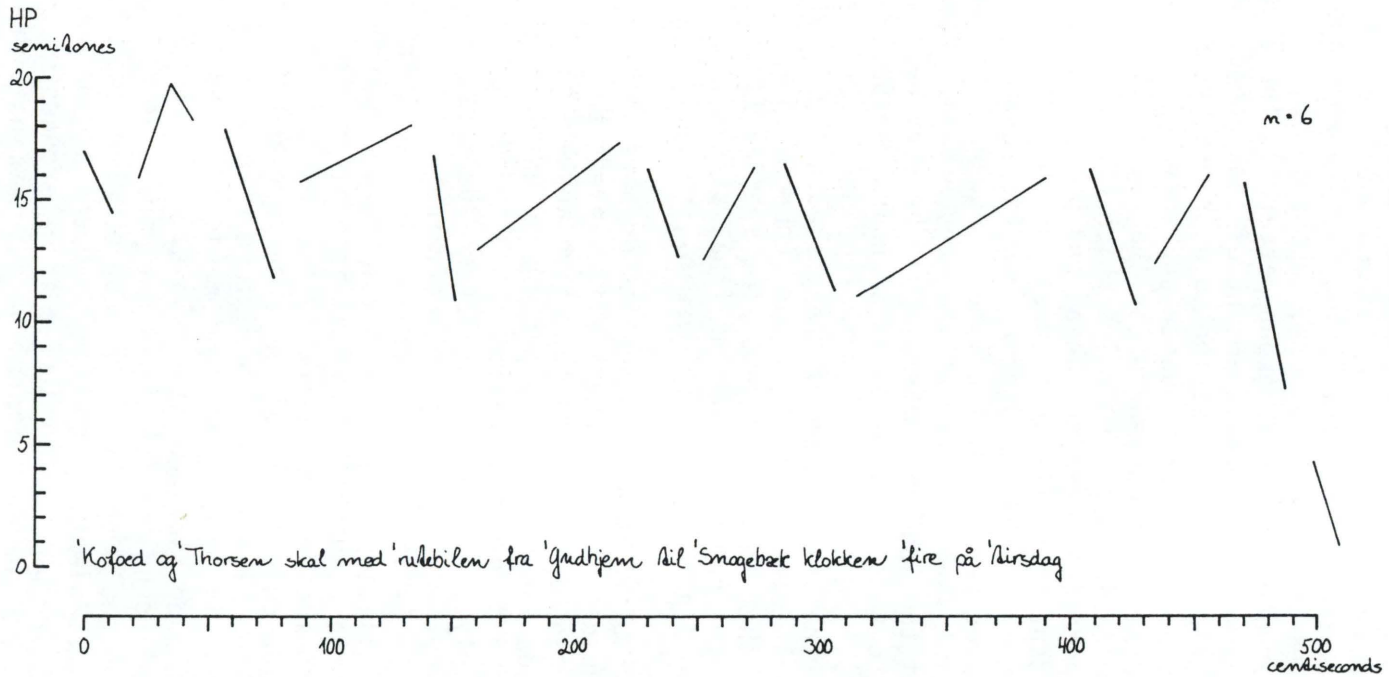


Figure 28

A long declarative utterance by a Bornholm speaker. See the legend to figs. 10-18. - Reproduced from Thorsen (1988a).

Support for assumption (1) - functional, voluntary, controlled prelude declination (at least with the Germans) - comes from two sources: from a comparison with the Bornholm data and from the data itself. In figures 19-24 in Thorsen (1988a), it is evident that prelude declination in long declaratives with six Bornholm speakers is decidedly less steep than in German. Fig. 19 is reproduced here as fig. 28. Simultaneously, the local final fall is more extensive. Thus, with Bornholm speakers it is reasonable to assume that prelude slope has no role in the identification of utterances as terminal vs. non-terminal, which is backed up by the fact that the only difference between a question that is prosodically marked as such and one that is not, lies in the final stress group pattern, preludes are indistinguishable (cf. figs. 33 and 34, Thorsen 1988a). The steeper preludes and relatively weaker final signal in German could therefore both be integral parts of terminal intonation.

Table IXa and IXb present quantitative and qualitative observations relevant to the issue: variation in isolated utterance onset with utterance length, variation in prelude offset with utterance length and type, variation in final low post-tonic values, prelude slopes, and the interval between penultimate and last stressed vowels. Stressed vowels have been measured at their midpoints, because onset, offset, maximum or minimum values would either obscure or exaggerate the variation which is introduced by the fact that not all stressed vowel movements are in the same direction. Note also that the slopes given are not calculated from the time coordinates of the Fo measuring points, but from serial, i.e. left-to-right number. What they really indicate, then, is an average (though not the arithmetic mean) downstep magnitude. This is founded on the assumption that that is how a speaker calculates and produces his stressed vowel intervals; that what is relevant is how many stressed vowels are contained within the phrase, not where, exactly, they occur in time. An assumption to the contrary (that downstep magnitude is a function also of time) would put rather strong demands on the speakers' look-ahead and pre-planning of the execution, having to take into account also how many unstressed syllables intervene between each pair of stressed ones, since the stressed syllables are not isochronous. Thorsen (1984a) contains documentation for this non-isochrony, and you have only to look at the figures here to appreciate how much stressed vowel time intervals can vary. This is entirely uncontroversial and it has long been recognized that so-called stress-timed languages are not characterized by perfect isochrony. See, e.g., Strangert (1985). Values have been left out where they are jeopardized by the presence of sentence accents or resettings (step-ups). Table IXb summarizes IXa, and should be self-explanatory.

Table IX is, of course, a rationalization after the facts which shaped it. (1) It is evident that Sønderborg speakers DO have a discontinuity before the last stressed vowel, compare "last step" with them versus German and Tønder speakers, and note that the difference between overall slope, i.e. "average" step-size, and last step is considerably greater with Sønderborg

Table IXa

Values in semitones of the first and last stressed vowel in intonation contour preludes, as well as the last post-tonic. Preludes include the last stressed vowel with German and Tønder speakers, but terminate with the penultimate with Sønderborg speakers. The interval between penultimate and last stressed vowel ("last step") is given, too. Overall prelude slopes and individual phrase slopes, calculated as the least squares regressions on stressed vowel Fo midpoints or maxima (in rising-falling movements) against their serial left-to-right number are given with their italicized correlation coefficients. Individual phrase offsets and onsets are given in parentheses after "first 'V" and before "last 'V", respectively. Starred values pertain to stressed vowels affected by sentence accent; exclamatory values derive from reset stressed vowels. See further the text and the legend to Table VIII. Km with sentence accent on 'Kamma' is included for comparison with the questions by JoW and JB.

	number of 'Vs	first 'V	last 'V	last post-tonic	last step	overall slope	phrase slopes	correlation between last 'V and last post-tonic
JoW (German)								
La +DA	7	13.8	6.8*	0.9	+0.1*	-1.2/*-0.95*		
Lb +DA	7	12.6	6.3*	0.0	-0.5*	-1.1/*-0.98*		
Ki +DA	2	10.2	8.4*	1.2		-1.8		
Km +DA	4	10.8	7.7*	1.8	-0.3*	-1.1/*-0.97*		0.69
Kf +DA	2	10.4	7.8*	0.8		-2.6		
Q +SA on 'ist'	3	12.8*	(9.5)	11.9				
Km +SA	3	11.3*	(4.9)					
MS (German)								
L -DA	4+3	10.3(→7.4)	(!9.3→)6.3	1.3	-1.5	-0.4/*-0.59*	-1.0/*-0.86*;-1.5/*-1.0*	
Ki -DA	3	9.3	7.1	2.1	-1.6	-1.1/*-0.95*		
Km -DA	4	9.5	5.6	1.8	-1.9	-1.3/*-0.99*		
Kf -DA	3	9.0	6.0	1.5	-2.3	-1.5/*-0.96*		0.88
Kf +DA	3	10.0	8.2*	2.2	-0.2*	-0.9/*-0.91*		
Q -DA	4	10.2	9.4	2.7	+1.0	-0.6/*-0.52*		
JB (German)								
L -DA	2+5	10.0(→8.4)	(!9.0→)5.6	1.5	-1.2	-0.7/*-0.96*	-1.6 ;-0.8/*-0.99*	
Ki -DA	3	9.7	6.2	2.1	-1.4	-1.8/*-0.96*		
Km -DA	4	8.2	5.4	0.6	-1.8	-1.0/*-0.90*		
Km +DA	4	9.6	8.2*	3.0	+0.2*	-0.5/*-0.91*		0.63
Kf -DA	3	10.0	7.0	2.6	-3.0	-1.5/*-0.87*		
Q +SA on 'weit'	4	12.3*	(7.0)	1.2				
Km +SA	3	11.4*	(3.1)	1.3				

Table IXa (continued)

	number of 'Vs	first 'V		last 'V	last post-tonic	last step	overall slope		phrase slopes		correlation between last 'V and last post-tonic
HS (Sønderborg)											
Lb	7	13.8		6.6	2.0	-3.0	-0.8/*-0.95*				
Ki	3	11.8		8.5	1.3	-3.5	-0.8				
Km	3	11.6		8.7	4.1	-3.5	-0.4				0.13
Kf	3	11.4		7.6	2.6	-2.9	-0.9				
Q	1+2	12.0		(12.2→)9.3	2.0	-2.9!			;-2.9		
ES (Sønderborg)											
L	5+2	13.7(→8.6)		(9.9→)7.8	2.2	-2.1!	-0.8/*-0.85*	-1.1/*-0.94*	;-2.1!		
Ki	3	11.6		9.0	3.4	-2.4	-0.2				
Km	3	11.6		8.8	4.5	-2.1	-0.7				0.57
Kf	3	13.3		9.0	3.3	-2.6	-1.7				
Q	2+2	11.8(→9.1)		(11.6→)10.1	3.7	-1.5!		-2.7	;-1.5!		
PBP (Sønderborg)											
L	7	14.5		8.0	1.8	-2.9	-0.7/*-0.84*				
Ki	3	13.0		7.5	3.4	-4.4	-1.1				
Km	3	11.8		7.8	3.8	-3.8	-0.2				0.63
Kf	3	12.2		8.7	3.9	-3.5	0				
Q	4	13.1		9.8	4.8	-2.4	-0.5/*-0.95*				

Table IXa (continued)

	number of 'Vs	first 'V		last 'V	last post-tonic	last step	overall slope	phrase slope	correlation between last 'V and last post-tonic
AS (Tønder)									
L	3+4	14.4(→10.2)	(!11.2→)	7.8	1.7	-0.8	-1.1/*-0.94*	-2.1/*-0.95*;-1.0/*-0.86*	
Ki	3	9.6		6.2	1.5	-1.3	-1.7/*-0.99*		
Km	3	10.8		5.8	2.7	-1.8	-2.5/*-0.99*		0.71
Kf	3	10.2		5.4	3.6	-0.8	-2.4/*-0.81*		
Q	2+2	11.4(→9.2)	(!10.5→)	6.7	1.4	-3.8!	-1.3/*-0.81*	-2.1 ;-3.8!	
JC (Tønder)									
L	7	13.3		6.4	1.8	-1.0	-1.1/*-0.97*		
Q	2+2	10.6(→9.7)	(!10.2→)	6.2	2.3	-4.0!	-1.3/*-0.81*	-0.9 ;-4.0!	
KaP (Tønder)									
L	5+2	13.2 (→6.4)	(!7.6→)	5.8	2.7	-1.8!	-0.9/*-0.80*	-1.5/*-0.87*;-1.8!	
Q	3	12.8		6.4	4.0	-3.2	-3.2/*-1.0*		

speakers. This is why the last vowel with Sønderborg speakers has been excluded from the calculation of overall slope. (2) It is perhaps not justified to give overall slope values at all for utterances with resettings, and some have actually been left out, but anyway the correlation coefficient will attest to the validity or not of this measure, compare, e.g., the long utterance by MS and JB. (3) The questions by JoW and JB do not really compare with anything else, because of the early sentence accent - they will be commented separately below.

We are looking for evidence of controlled differences in the course of the prelude in longer versus shorter terminals, and in terminals versus non-terminals, respectively. German and Sønderborg speakers are in focus here. Even though (i) resettings in the long declarative and in some of the questions, (ii) some early sentence accents, and (iii) uneven number of stressed syllables in utterances to be compared conspire against a simple exposition, such evidence exists, but it is scant and should be backed up by an experiment especially designed to confront the issue.

Long versus short prelude. JoW: the 7- and 4-stress utterances differ mainly in higher onset and lower offset, with a step size of about 1 semitone. But 4- and 2-stress utterances differ mainly in step size, which is twice as large in the shorter utterance. (This is not due to a special final lowering of the last 'V, cf. above.) The resetting in MS's long utterance makes the overall slope invalid for comparison (the correlation coefficient is only -0.59), but note that phrase slopes are inversely proportional to their length. JB's resetting is slight enough that the correlation on the overall slope is high (-0.96) and the smaller average step size is evident at least when we compare with the 3-stress utterances. Neither MS nor JB use onset or offset differences to accommodate differences in length. - The adjustment of step size to the number of steps to be performed, in prosodically terminal intonation contours, cannot come about if the speaker is not supposed to look ahead and preplan the execution of the utterance.

Sønderborg speakers appear not to employ the same strategy: like JoW they will onset higher (and offset lower) in the long utterance. Higher onset, of course, is proof of look-ahead, it is something you do to be able to accommodate more stressed syllables within the same utterance contour, but average step size is unaffected and need not be pre-planned. Compared with the Germans, Sønderborg speakers' downstep through the prelude is smaller, the gross average of their "overall slope" is -0.7 semitones per step, with the Germans it is -1.2 (and -1.7 with Tønder speakers). This leaves room for a much more considerable "last step", averaging 3.2 semitones versus 1.0 semitones with the Germans (and 1.5 with Tønder). ("Last steps" affected by resettings are excluded from these averages.) This last step in Sønderborg is approximately constant over utterances of different length, which means that the last vowel is lower in longer than in shorter utterances. PBP is an exception in that his last vowel in terminals is approximately constant

Table IXb

Qualitative summary of the data in Table IXa. Empty slots occur where comparisons cannot meaningfully be made because values derive either from reset or accented stressed vowels (or where data is missing). Comparisons are made only to identical accentual conditions. Differences in onset, offset and last step are considered to be present if they exceed one semitone, differences in last post-tonic are reckoned if they exceed two semitones. Slopes are different, if the difference exceeds 0.5 semitones per step. Values approaching different status are rendered as (+). JC's and KaP's question is treated as a terminal here, apparently lacking any intonational signalling of the interrogative function.

Long versus shorter terminals

	onset higher	offset lower	lower last 'V	slope smaller	final low lower	final step smaller
JoW	+	+		+[1]	-	(+)
MS resets long	-	-		+[2]	-	-
JB resets long slightly	-	-		(+)	-	-
HS	+	+	+	-	-	-
ES resets long	+[3]	+[4]	+	-	-	-
PBP	+	(+)	-	-	(+)	+
AS resets long slightly	+	--[5]		+	-	-
JC resets question	+	-		-	-	+[6]
KaP resets long	-	-		+[2]	-	+[7]

1) 2 stresses versus more have steeper slopes but no difference between 4 and 7 stresses
2) about overall slopes in utterances with resetting, see the text
3) but note Kf
4) even though it is an upstepped 'V
5) it is higher, actually
6) probably due to the upstep in Q
7) even though the penultimate is upstepped

Table IXb (continued)

Shorter terminals versus non-terminal

	onset higher	offset higher		slope smaller	final low higher	final step smaller
JoW	-[1]	++		?	+++	
MS	-	++		+	(+)	+
JB	-	++		?	-	
			higher last 'V			
HS resets question	-		(+)		-	
ES resets question	-		+		-	
PBP	-	-	+	-	-	+

1) the difference is small enough to be attributable to a difference in instrinsic vowel Fo

over different lengths, which makes the final step from the lower prelude offset in the long utterance decidedly smaller.

The Tønder data is rather incomplete, but if "overall slope" is considered a valid measure (with a correlation coefficient of -0.95) with AS, and if we consider the first of KaP's phrases in the long utterance, then it seems safe to conclude that step size is regulated according to the number of steps to be performed, in conjunction with an optional higher utterance onset. And, again, this is inconceivable under a model where - once you have chosen onset value - succeeding values are (at least for a given utterance type) unaffected by upcoming events, being controlled only by what immediately precedes.

Terminal versus non-terminal. The German data is inconclusive. Taken at face value, the comparison of JoW's and JB's question and Km-utterances, with their early sentence accents, would imply that in the question, the whole contour runs higher in the range and ends higher than in the corresponding declarative, that declination is less in the question. But I am not sure that it is legitimate to compare these utterances, after all. Whether what normally characterizes a prelude without sentence accent can be meaningfully applied to the unaccented tail to an early accent. Whether the speaker still uses the lexically stressed syllables as anchorpoints for the post-accentual Fo course, or whether post-accentual degree of downdrift is performed as a direct control of each (stressed and unstressed) syllable, since the stressed syllables appear to be stripped of their autonomous rise-falls. With JB (fig. 27) this control seems to be rather straightforward: after the step down from the accent, the course runs high and rather exactly level until the final fall to the last post-tonic, but with JoW (fig. 25) a gradual downdrift is observed, until it is checked by the upstepped fall-rise in final 'Kassel'. MS's accented items (fig. 26) follow the pattern of JoW, but the downdrift is somewhat steeper. If we compare MS's unaccented question with the corresponding Kamma-utterances, the pertinent difference is in the level of the last stressed vowel, which is about 3 semitones higher in the question (which accounts for the smaller overall slope), but the penultimate (inferred from "last 'V" and "last step" in Table IXa) is not significantly higher, so it seems that preludes do not differ with MS, but the level of the last vowel does (which is exactly the situation in Sønderborg, cf. below).

What is interesting in JB's and MS's questions/non-terminals, though, is the fact that a considerable final fall to the last post-tonic is maintained; that regardless of what precedes it, the final low can be considered constant and is not confined to terminal intonations. (You will note that some variation in the final post-tonic is present, and is roughly correlated with stressed vowel level, though the correlation is tight only with MS, but the range of variation in the final post-tonic is less than in the preceding stressed vowel, and the extent of the final fall is, accordingly, not constant. Thus,

we have a - somewhat counterintuitive - situation where non-terminals have larger final falls than terminals). What status does this assign to the final low? If it is not a feature only of terminal intonations as such, it should perhaps be regarded as a boundary, a juncture signal in the true sense, not a "terminal juncture" as it is most often understood, i.e. as "the juncture signal which accompanies terminal intonations", but an "end-of-utterance" signal, irrespective of other utterance prosodic characteristics. But where does that leave those utterances which end in a high rise, like JoW's question, and all the Germans' one-word echo-question? Possibly, final utterance boundaries can be signalled either by an extreme high or an extreme low, i.e. by a movement to either end of the speaker's range, where final highs are confined to non-terminal utterance contours, but final lows are not similarly restrained, and could be considered the unmarked utterance final boundary.

Unfortunately, those other questions which have been recorded, the probes to the focal Kamma-utterances, will not serve to back up the data in Table IX. Most of them received non-final sentence accents, and not necessarily in the same place in each rendering. But their termination can be unambiguously ascertained. It turned out that in all six of these questions, JoW performs a high utterance final rise, and so does HH. MS and JB do so invariably in "Wissen Sie who Kamma geboren ist?", MS once in "Wer, ausser Anton, wird nach Kassel fahren?", and JB twice in "Wie heisst Bertha's Schwester?".

A cautious and preliminary conclusion about preludes in long and short terminals and in terminals versus non-terminals in German would state that preludes do show systematic variation with length, either through increased range supplemented with smaller average step size, or through resetting which - when slight - still necessitates adjustment of step size. Non-terminal prelude contours end higher in the range than terminal ones. With MS this appears to be achieved by a simple step up of the last stressed vowel, with JoW and JB it is possible that preceding slopes are also less slanted, if utterances with early sentence accents are indicative. Thus Germans mix global and local prosodic signals to utterance function, and the global part is most likely to be produced under conditions of both look-ahead and pre-planning, not only for adjustment of utterance onset (which is also incorporated in the linear sequence theory mentioned above) but also for the execution of stressed vowel to stressed vowel interval and phrasal resetting.

Sønderborg speakers' non-terminal contours are non-terminal by virtue of a higher position of the last stressed vowel, to judge from PBP, which makes the step down from penultimate to last stress smaller. It would seem, then, that Sønderborg speakers are true local ones, insofar as the only difference between terminal and non-terminal utterances reside in the relative level of the last stressed vowel. Step size - which is fairly small and which could possibly be ascribed to relaxation effects - is no indication to what final cue may follow.

Prelude length is accommodated through increased range or resetting, but no further adjustment of neighbouring stressed vowel interval takes place. Though final lows are not quite constant, they correlate poorly with last 'V, and they are not higher in the questions except maybe with PBP, so again the final fall may have to be considered an utterance juncture cue.

Tønder speakers did not produce the question with an unambiguous perceptible non-terminal Fo marking, and the last stressed vowel is no higher in the question than in the declaratives.

4. THE ONE-STRESS ECHO-QUESTIONS

These are, of course, heavily prosodically marked with all speakers, but in different manners, according to their different prosodic systems.

Tønder speakers reproduce the archetypical, rising-falling stress group patterns, but in expanded form: the rise is higher, to the top of the speaker's range, and the fall deeper, to the level of other utterance final post-tonics. The same can be said for the Sønderborg speakers, although here the higher rise is not as conspicuous, compared with 'Padborg' in final position in the wh-question, because of the relatively higher level which marks the wh-question prosodically as non-terminal.

JoW repeats in 'Kassel' his fall-rise from final position in the wh-question, but the stressed vowel is rising, rather than falling, and as a whole the pattern is situated higher in the range. With MS and JB the stress group pattern changes compared with other final ones, to a clean rise, reminiscent of the pattern of phrase final stress groups in the long declarative.

Common to all speakers, then, is a high stressed vowel, succeeded by a movement either to the lower or the higher end of the speaker's range.

5. CONCLUSION

Tønder speakers' sentence intonation does not differ in any significant way from sentence intonation in Standard Copenhagen or Næstved and Aalborg. There are no specific final cues to either sentence function or utterance juncture. Both are mediated by the way the stressed syllables proceed through the whole utterance. Differences in utterance length affect utterance onset optionally, and the amount of step down between stressed syllables.

Cues to utterance function in Sønderborg are contained solely in the last stress group which is positioned below the grid established by the prelude, a lowering which is more pronounced in terminals than in non-terminals. Prelude onsets may vary with utterance length but slope (step size) is constant, both

over length and utterance function. Sønderborg shares with Tønder the lack of any particular phrasal boundary cue, apart from the optional resetting of the intonation contour, and the apparent lack of any obvious prosodic correlate to the syntactic boundaries, at least in this material. The final, steep fall to the last quasi-constant post-tonic is presumably not indicative of terminal 'mood', because it is present also in non-terminals, but may be purely an end-of-utterance signal.

The German speakers, with no apparent distinction between the one Flensburg and the two Standard German speakers, mix global and local cues to utterance function: downdrift in the preludes is steeper than with Sønderborg speakers, and varies with utterance length both in regard to utterance onset (optionally) and in the amount of step down between stressed syllables. It is debatable whether prelude slopes differ in terminals versus non-terminals or whether it is only the last stressed syllable which is higher in non-terminals, i.e. a local cue, cf. above. But Germans have another option for non-terminals, added to the higher stressed syllable, i.e. the last post-tonic may perform a fall plus a rise, to the upper end of the speaker's range. This is the rule with JoW (and HH), but the exception with MS and JB. And it is this option which is decisive for the classification of German as having definitely also local cues: the presence of the final rise is such a cue to non-terminal intonation. Absence of a final rise is not confined to terminals, however, but the extent of the fall from the higher final stressed vowel to the (constantly) low post-tonic increases (and this is true also of the questions with early sentence accent by JoW and JB). It is curious, and somehow counter-intuitive, that non-terminals thus may be accompanied by more extensive final falls than terminals. This contradiction is dissolved, however, if we regard the final low as an end-of-utterance cue, as with the Sønderborg speakers. Final lows, then, are utterance juncture cues, final highs are specific non-terminal utterance juncture cues. - Prosodic utterance internal boundaries get signalled more explicitly with the Germans and are mapped directly onto the syntactic structure, in contradistinction to the Danes, whose stress group patterns cut across the various syntactic boundaries.

Please note that some of the issues raised here call for a more thorough investigation, and the matter of especially non-terminal intonations cannot be considered anywhere near closed.

On page (4) I quoted one concluding hypothesis from Thorsen (1988a, 1988b) that global intonation precludes final default accents, on the grounds that a globally distributed sentence intonation might be masked perceptually by the extensive final movements pertaining to the default accent. The present data from Flensburg and Standard German blur the neat picture of sentence intonation and default accent occurrence established by the two 1988 investigations: German has both globally distributed and final local cues to sentence intonation function and optional default accents, and it is my own distinct impression that the preludes to the final fall do sound declining,

in accordance with what has been observed in the acoustic registrations. I think the hypothesis will have to be abandoned, which is no great loss, and the difference across languages/varieties in the occurrence of default accent be ascribed to language and regional differences in prosodic expressivity, which is a feature which raises a number of provoking questions and calls for an intimate cooperation between phonetics, linguistics, psycho- and sociolinguistics and pragmatics.

C. ALIGNMENT OF SEGMENTS AND FO

It has been shown previously for Standard Danish (Thorsen 1980a, 1982, 1984a) for Bornholm, Aalborg and Næstved (Thorsen 1988a, 1988b), and for German (Bannert and Thorsen 1988) that the relevant unit for the patterning of Fo is the prosodic stress group, that is: a succession of a stressed plus all following unstressed syllables (if any), irrespective of intervening word or syntactic boundaries, within the same phrase or sentence intonation contour. That is not to say that a speaker has no means at his disposal to signal word boundaries, if he so desires, and one speaker in the 1980a investigation actually did so. I suggested then, that this may be an optional characteristic of rather distinct, though not necessarily slow, speech. - Among the Danish varieties investigated so far, Bornholm stands out by the great variability and flexibility of stress group patterns. For the particulars, see Thorsen 1988a, p. 103 ff, but roughly: the Fo pattern is falling-rising. Both movements are rather extensive and of approximately equal magnitude. The duration and thus the slope of the rise, however, is adjusted to the total duration of the post-tonic syllables, i.e. the rise is expanded and compressed in accordance with the temporal structure of the post-tonics, see fig. 28. In contrast, Copenhagen, Aalborg and Næstved stress group patterns need not involve any particular on-line look-ahead which will scan the segmental composition of the stress group in order to align Fo with the segments: once the pattern is initiated, its course is simply interrupted when no more segments are present to carry it. On this background we shall look at stress group patterns in Tønder, Sønderborg and German.

1. COMPRESSION OR TRUNCATION

a. Systematically shortened stress groups

Figures 29-37 display the five words where the voiced stretch is shortened progressively from frame to frame. I should point out again that I made a mistake in the Tønder-material: 'vand, kat' were the intended comparisons with the three words at the top of the figures, but I disregarded the fact that those three longer words constitute the first stress group in the utterance (preceded only by unstressed words), whereas the shorter words are preceded by another stressed monosyllable. That first stressed word ('koldt, grå') is therefore included in figs. 29-31.

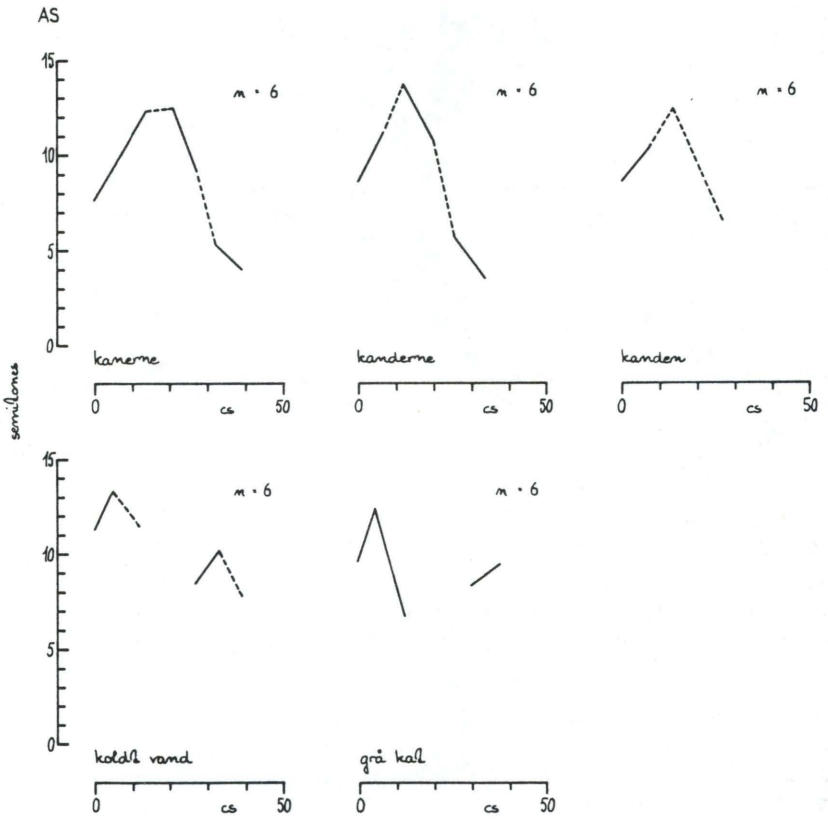


Figure 29

Figures 29-37

Average fundamental frequency tracings (logarithmic display) of five words (three words and two pairs of words in figs. 29-31) where the voiced stretch becomes progressively shorter through the frames. Three Tønder, three Sønderborg, two German and one Flensburg speaker. Where the sonorant consonants could be delimited, they are drawn in broken lines. See further the legend to figures 1-7.

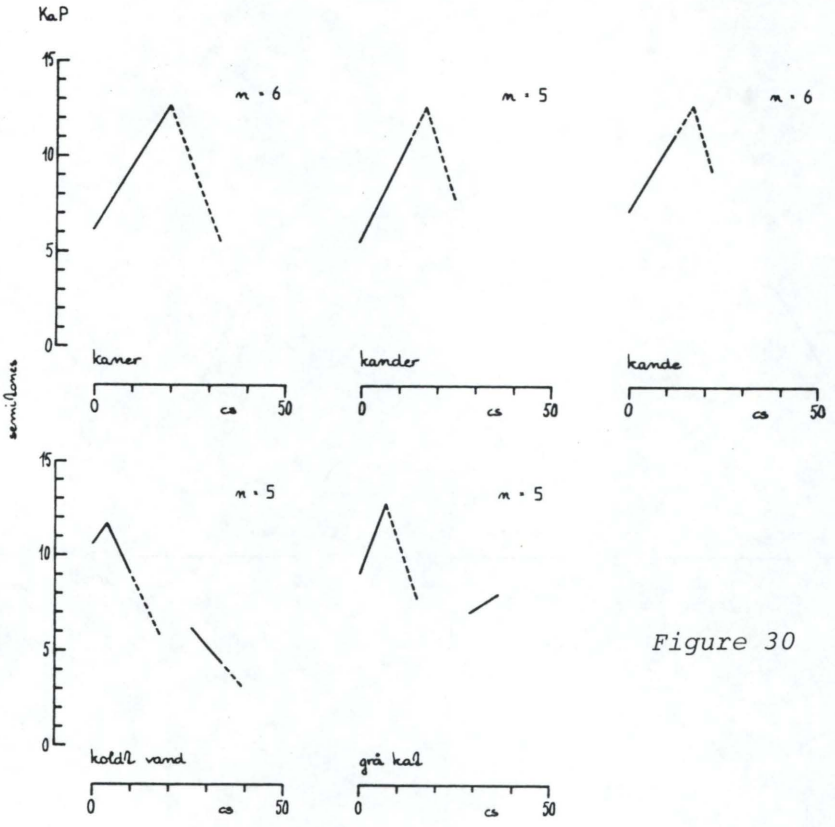


Figure 30

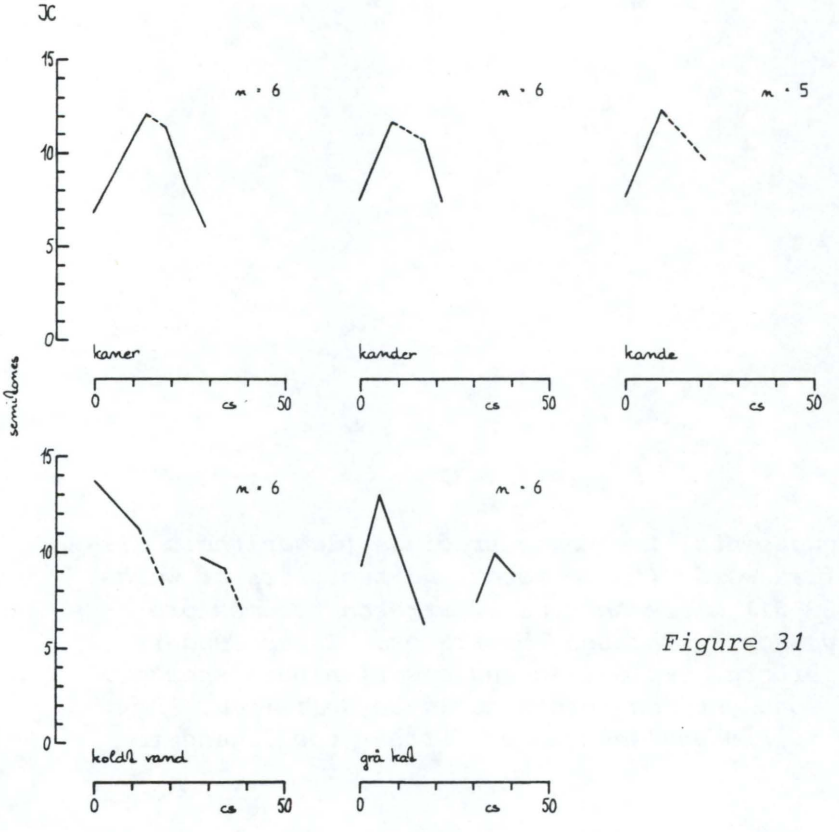


Figure 31

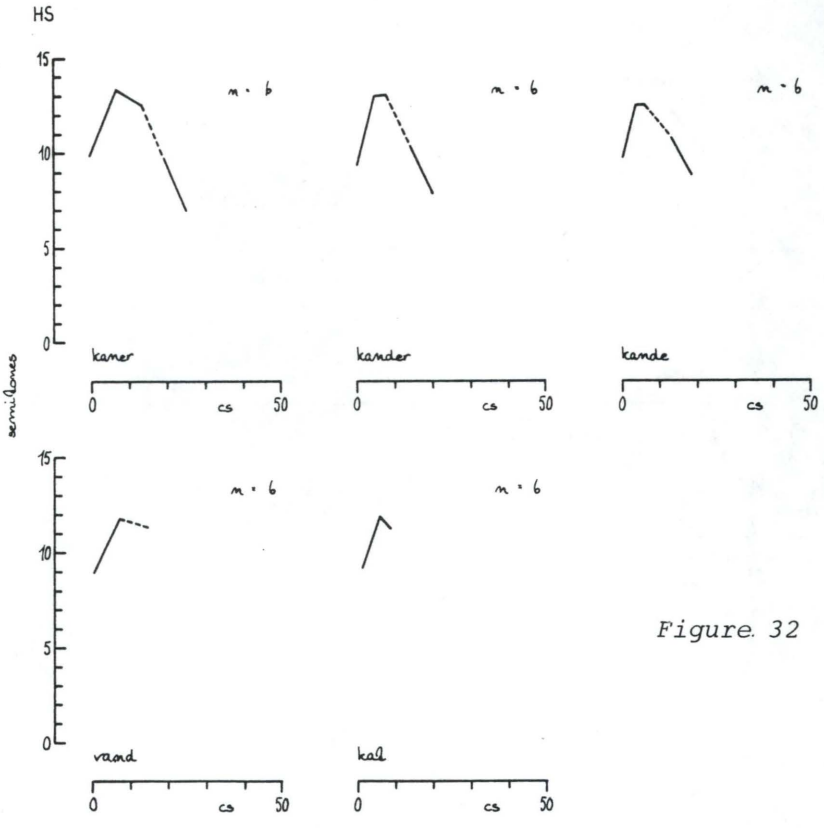


Figure 32

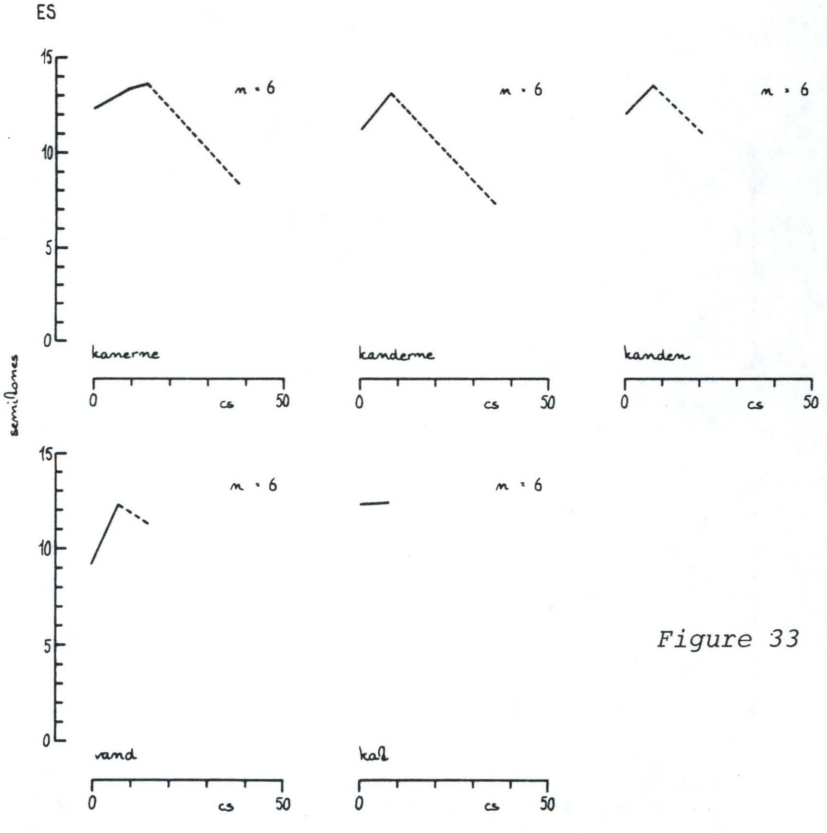


Figure 33

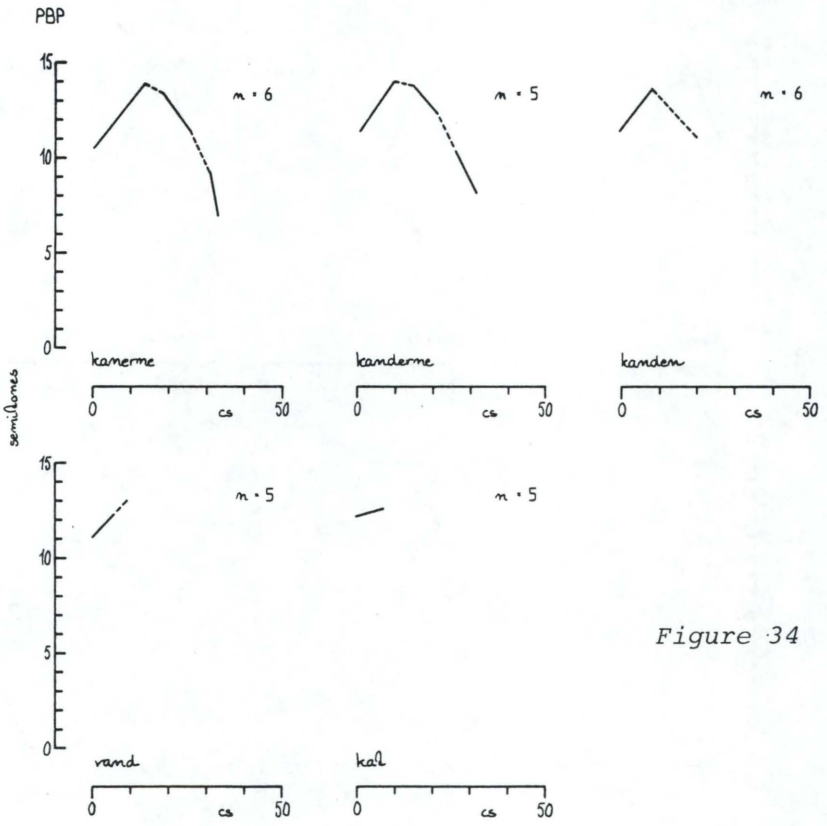


Figure 34

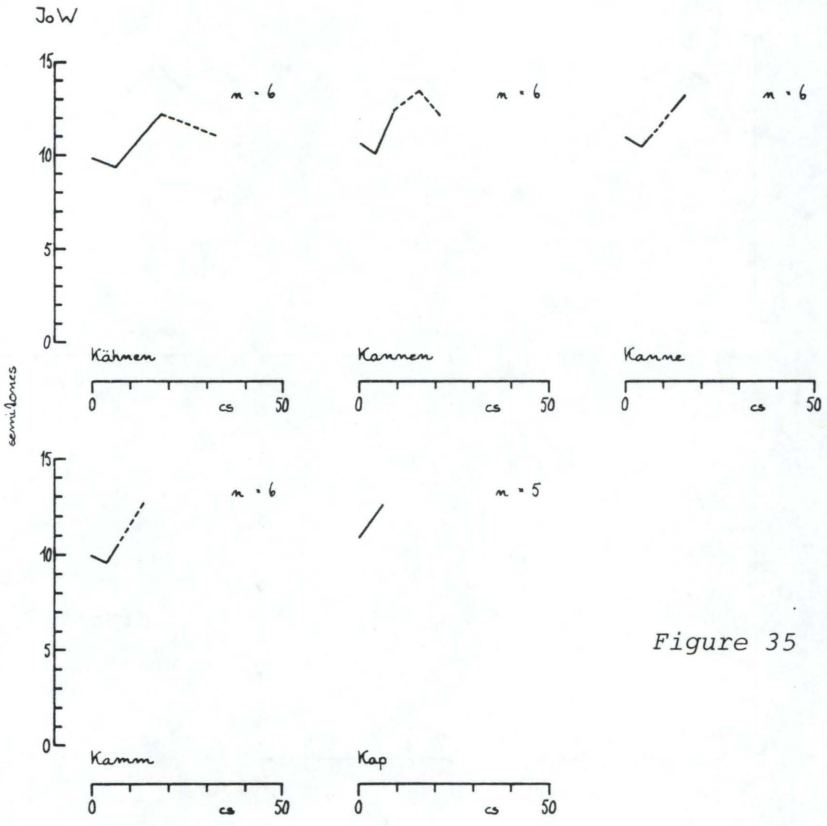


Figure 35

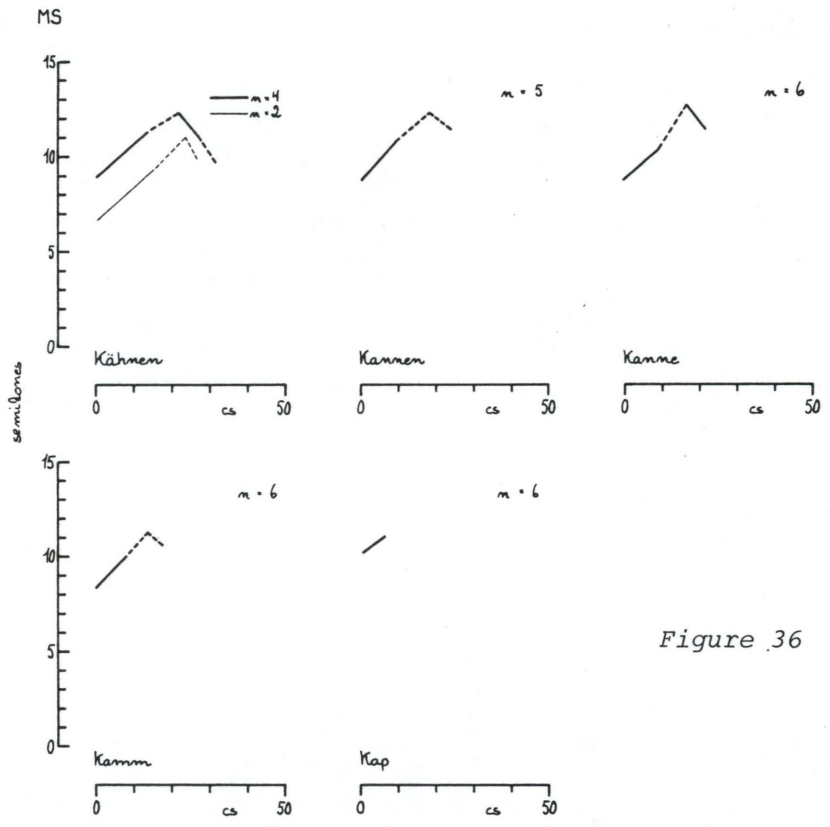


Figure 36

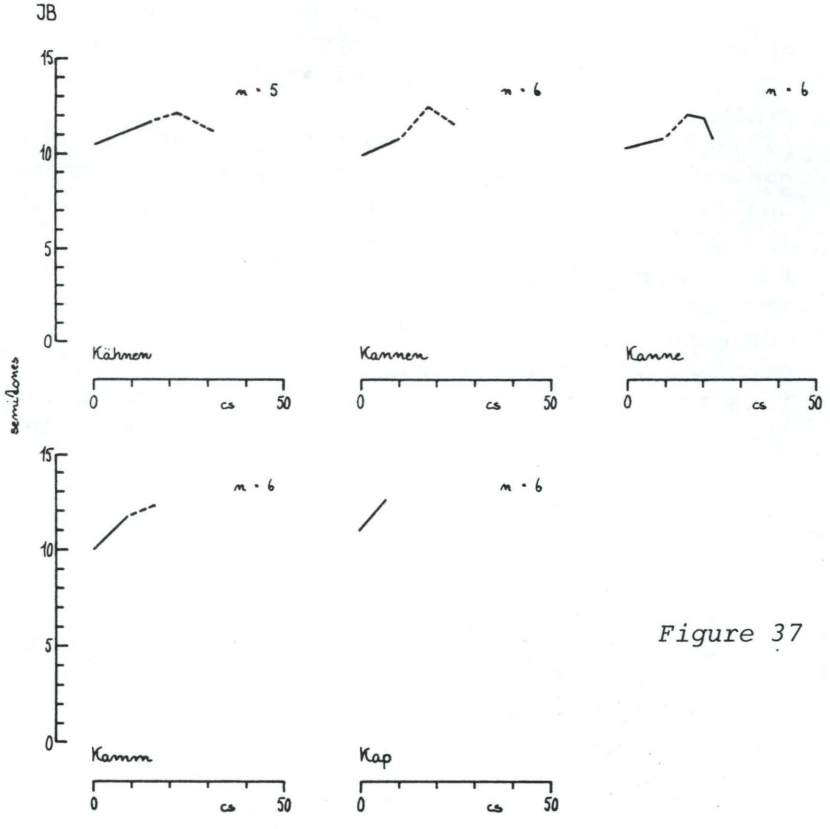


Figure 37

JC, KaP, and HS produced the upper three words with a pre-positioned definite article, which somewhat shortens these words, compared with Tønder, but it is nevertheless abundantly clear, and with all nine speakers, that the shorter stress groups are truncated editions of the longer ones; nowhere does a pattern maintain its range of movement, compressed in time, i.e. steeper and quicker in the shorter editions. - What looks like compressed Fo movements in 'grå' with the three Tønder speakers is probably the effect of the presence of a stød, and likewise in 'koldt' and 'vand': they may not appear time compressed but the fall begins earlier than you would expect from the apparition of the three upper (stød-less) words.

Rises and falls, both, are more extensive, ceteris paribus, with Tønder speakers, and least so with German speakers (and least of all with JB, cf. below). Rises are also slower with the Germans, to the effect that the peak of the pattern occurs later relative to stressed syllable onset with them.

b. Stress groups in the long utterances

(i) As mentioned previously, the fall from the maximum is so deep and steep with Tønder speakers that the bottom of the speaker's range is reached within the first or second post-tonic, most expressively so with KaP. Post-tonics after that continue low and level. The falls are less extensive with Sønderborg speakers, but completed, also with them, within the first or second post-tonic, and succeeding post-tonics continue at the level where the fall lands them, only that level is relatively higher than with Tønder speakers. It is evident from figs. 16-19 that the maximum with the Germans is generally only reached in the first post-tonic. The picture of stress group pattern falls is complicated by the presence of specific prosodic boundary cues:
(ii) As noted above, the prosodic stress group patterns seem generally to be insensitive to syntactic boundaries with Tønder and Sønderborg, but not with German speakers. Their control of the unstressed syllables is less automatized, and it is evident that the higher rises and fall-rises encountered at the arrows in figs. 16-18 are time-compressed, i.e. they are steeper than corresponding movements in other positions. Falling final stressed vowels and steeper falls altogether finally also attest to a more active control of stress group patterns than that exercised by the Danes, see further section 2. below.

Figures 38-45

Average fundamental frequency tracings (logarithmic display) of two sequences with different word boundary locations, by three Tønder, three Sønderborg, and two German speakers. The composite words were pronounced with two main stresses by the two groups of Danish speakers. See further the legend to figures 1-7 and see the text.

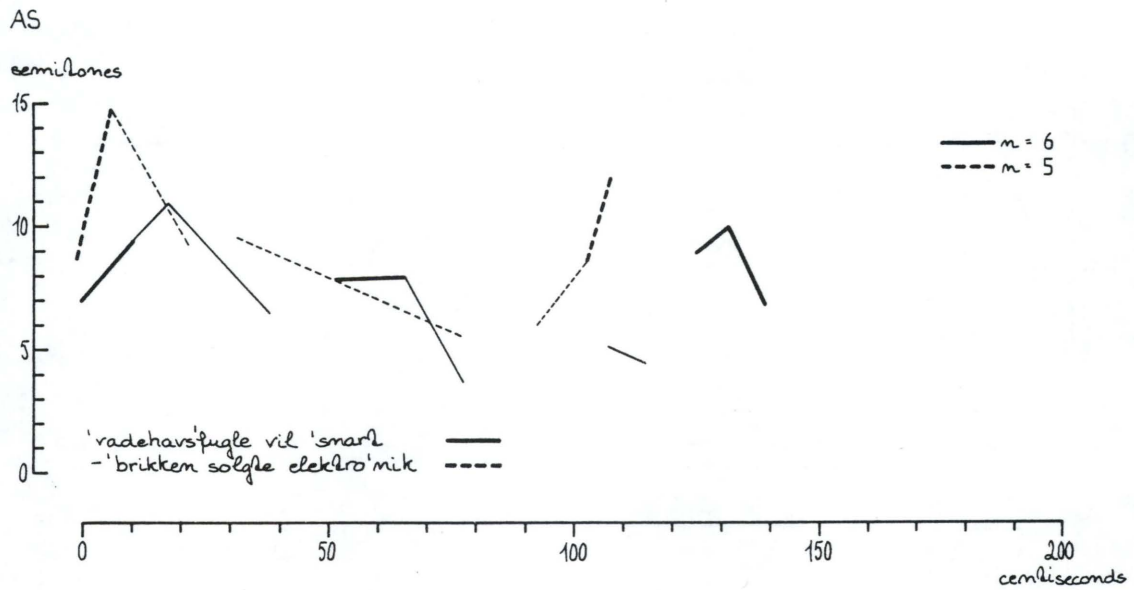


Figure 38

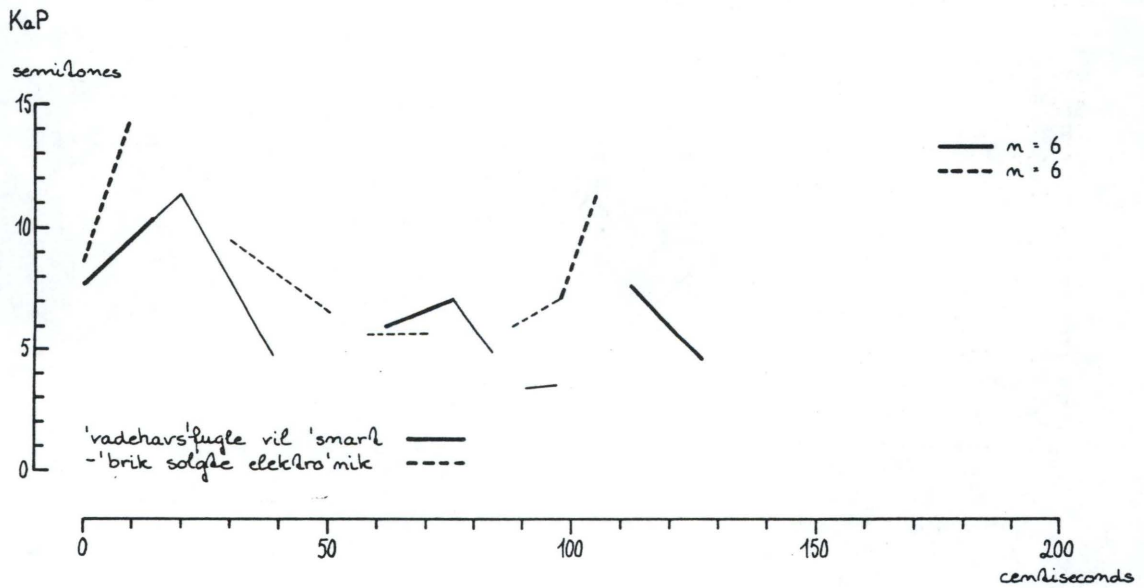


Figure 39

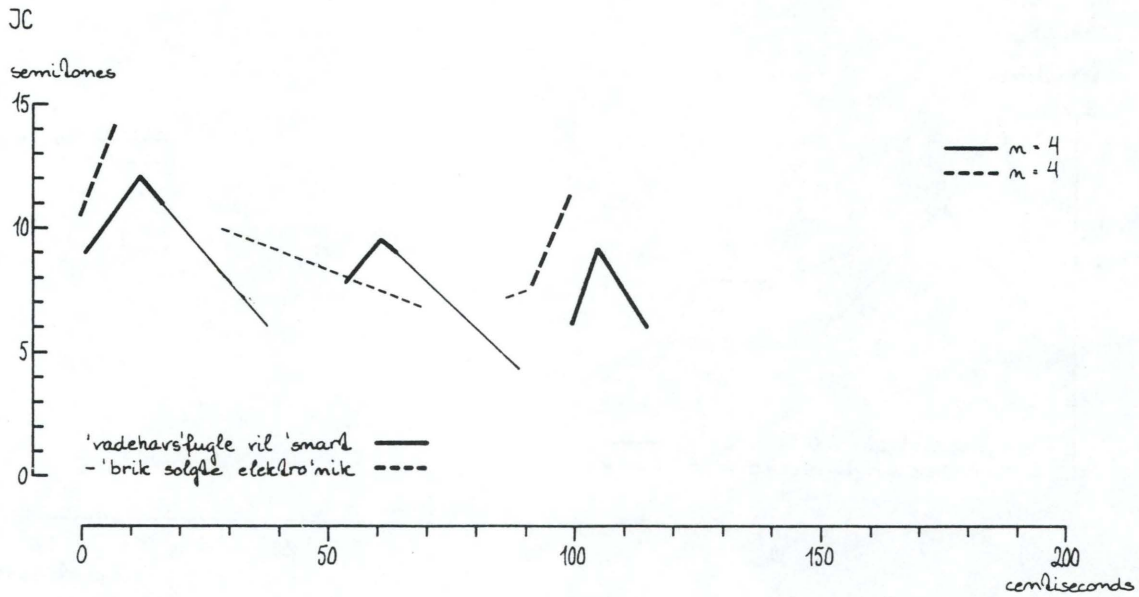


Figure 40

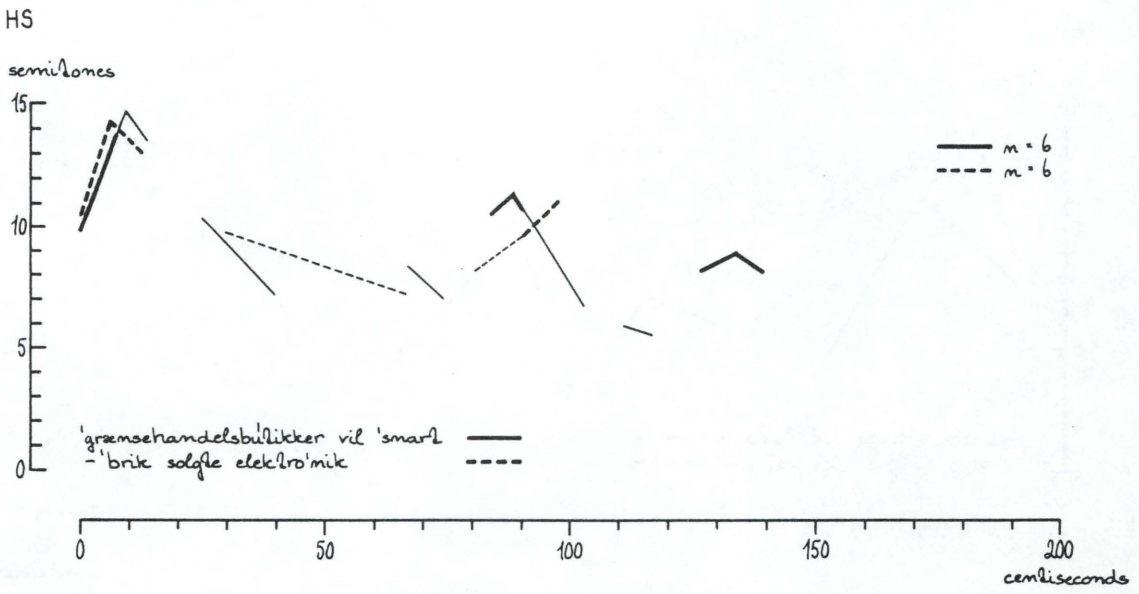


Figure 41

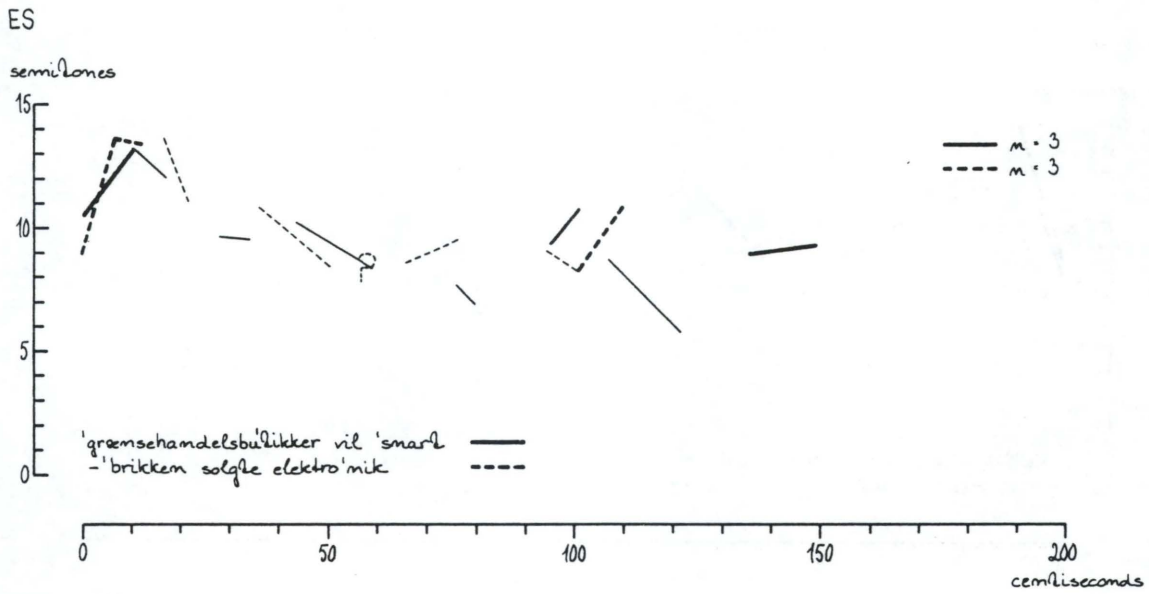


Figure 42

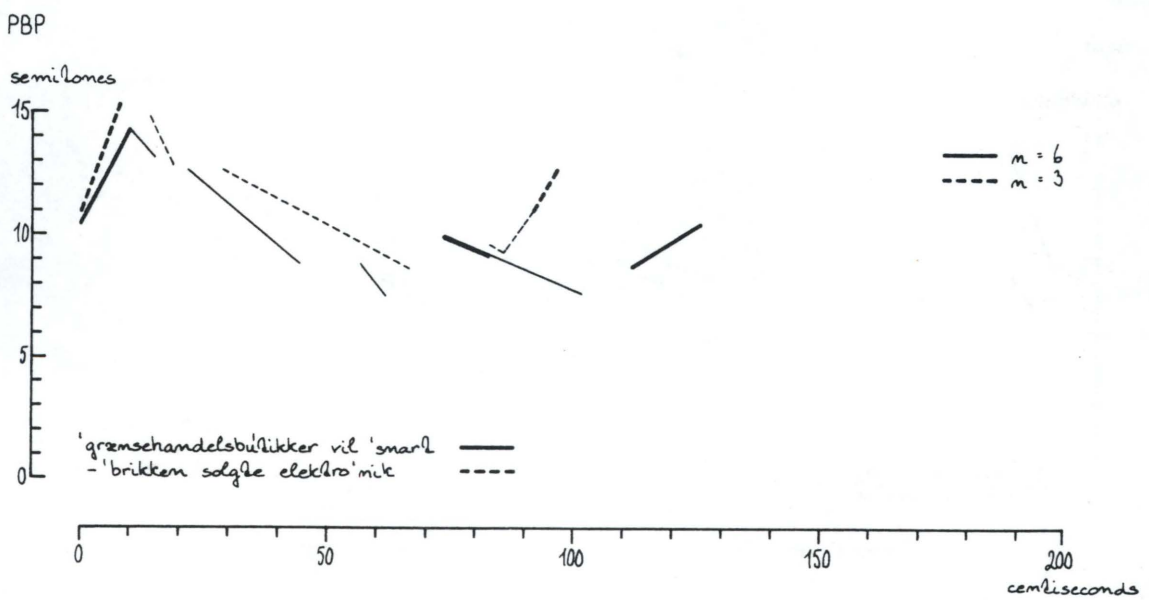


Figure 43

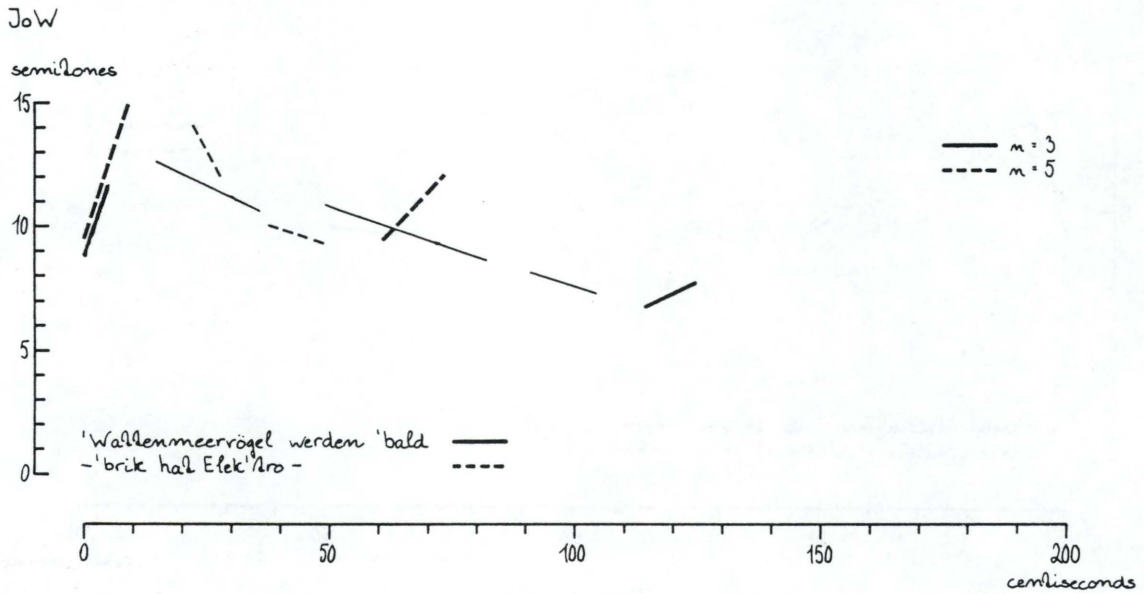


Figure 44

Figure 45

c. Long stress groups

This caption is inappropriate where 'vadehavsfugle vil' (and 'grænsehandelsbutikker') are concerned with the Danes. From dialect studies in the area, we could expect the composita to be produced with two main stresses (Jensen and Nyberg 1977, p. 53-54, Bjerrum 1948, p. 73-79), and that is how they turned out, cf. figs. 38-43, i.e. both long words are produced with two clear rising-falling patterns, which fall into their expected places on the intonation contour. Note also that the difference seen above, in section B.3, between intonation contour (prelude) slopes comes out here: 'vadehavs-' and 'grænsehandelsbu-' respectively is the second stress group in the utterance, 'brikken --' is the first one, which accounts for the different placement in the range with Tønder speakers, whose slopes slant more than with the Sønderborg speakers, where those two stressed syllables nearly coincide. JB produced a clear prosodic boundary after 'Wattenmeervögel' and stressed 'Elektronik' on the last syllable, and is left out in this section.

Particularly with the double stressed words by the Danes, it is very apparent that what shapes the Fo patterns is the stressed syllables, irrespective of where in the word the stress(es) may be located. Word boundaries as such leave no separate trace in the Fo course. The stress group patterns are bound to the left by the onset of the stressed vowel and to the right by the onset of the next stressed vowel. HS, ES and PBP offer very clear cases in point: '-brik solgte elektro-' and 'grænsehandelsbu-' would be exactly concurrent, if voicing was unbroken throughout.

The longest stress group ('-brikken solgte elektro-') with the Danes confirms the impression of stress group patterns, that the fall from the maximum is largely performed within the first and second post-tonic, and then levels out, and that this fall is more extensive in Tønder. But the two Germans, on the contrary, seem to expand the fall in time. I am not sure that MS did not produce a prosodic boundary at the NP/VP boundary in 'Die Fabrik/hat Elektronik ...', cf. the discontinuity between the maximum in '-brik' and succeding 'hat'. But JoW did not, so it is legitimate to compare the behaviour of the post-tonics in the two stress groups in fig. 44: the extent of the fall is approximately the same, but the full line edition is about twice as long, and accordingly the slope is less steep (and compares well with MS's long stress group). If this is a general feature, which previous figures do not contradict, and if we except stress group patterns before phrase or utterance boundaries, it seems that the Germans have some of Bornholm's characteristics: stress group pattern rises and falls are frequency constant, and falling slopes are adjusted in accordance with the temporal structure, which calls for a vigilant, on-line look-ahead and scanning of the composition of each stress group, in order not to miss the target, i.e. the proper offset value in the last post-tonic. Inspection of all of the utterances by the Germans exhibited here, indicates that this

offset is equal to the onset of the next stressed syllable, still excepting post-tonics prior to a phrase boundary, and final post-tonics, of course. In other words, the Fo onsets of the stressed syllables constitute the turning points, the local minima in the rising-falling stress group patterns - they set the lower limit of the prelude grid. - Since there is a limit to how rapidly Fo will change (in the absence of accentual or junctural "lows"), the fall is truncated in the shorter stress groups, as demonstrated by figs. 35 and 36.

2. STRESS GROUPS AT PHRASE AND UTTERANCE BOUNDARIES AND UNDER SENTENCE ACCENT

a. Phrase and utterance boundaries

Stress groups at phrase or utterance boundaries suffer no qualitative change with neither Tønder nor Sønderborg speakers, except that the rising stressed vowel movement may be falling, but that is probably the exception rather than the rule. Quantitative changes are apparent only with the global Tønder speakers: the narrowing of the grid, induced by the progressively lowering stressed syllables, make stress group patterns at the end of the contour less extensive than at its beginning.

Boundaries induce both qualitative and quantitative changes with the German speakers. Utterance final stress group patterns change from rising-falling ones into clean falls, i.e. the stressed vowel changes its movement from rising to falling, and the extent of the fall to the utterance final "low" is greater than in preceding stress groups in terminal contours. This fall is even greater in non-terminal contours, beginning as it does from a higher onset, with those speakers who do not prosodically signal interrogative mood with a final post-tonic rise. It is still not clear to me what status to assign to the change in stressed vowel movement before an utterance boundary: whether it is an anticipatory effect from the succeeding "low" (if so: why is the last 'V also falling in JoW's non-terminals, which end in a post-tonic rise?), or whether it is an independent utterance boundary feature. In the latter case we would have to explain the rising stressed vowels in the one-stress echo questions. Note that utterance final falls are not expanded in time (as seems to be the case with long stress groups in utterance medial position, cf. above) - the "low" is reached with the first post-tonic, and the succeeding post-tonics continue low and level after that (: 'Kassel fahren' in figs. 16-19). - Utterance medial phrasal boundaries disrupt the otherwise smooth course of the post-tonics, to the effect that the syntactic boundary is clearly localized in the Fo configuration, either by a fall-rise pattern immediately prior to the syntactic/prosodic boundary, or by a higher rise to the post-tonic in the constituent to the left and a discontinuous fall to the pre-tonic to the right of the boundary. The evidence from JoW, MS and JB seems to suggest that final fall-rises in non-terminals imply phrasal boundary fall-rises

too, but that is not so: the fourth speaker, HH, had fall-rises finally in his questions, but not at the phrasal boundary after 'Markus' in the long utterance.

b. Sentence accents

Final sentence accents are manifest only with Germans, and focal and default accents are not distinguishable: the falling pattern is maintained, but it is more extensive, starting as it does from a relatively higher level.

Stress group patterns retain their rising-falling movements in connection with non-final (focal) sentence accents with the Danes. The accented item itself carries no overt cue, but succeeding stress group patterns are subjected to a lowering in the range and a diminishing of the extent of movement, though not a complete wiping-out. Non-final sentence accents with the Germans may be upwards boosted, i.e. the stressed syllable may be higher in the range than under no-accent condition, ceteris paribus, but not necessarily so. The common feature is an extensive fall in the first post-tonic of the accented item. Succeeding stress groups continue at the low level where the accent lands them. An utterance final, post-accentual stress group will retain some of its otherwise distinct fall, cf. figs. 5, 6 and 7: 'Kappeln', 'Kassel' and 'Kamma' (broken-dotted line), where the (lexically) stressed syllable steps up slightly from the preceding unstressed syllable and performs a modest fall. The accentual fall is another example of non-expansion in time of Fo movements through unstressed syllables: Apparently, the demands of accent and boundary signals suspend the "neutral" characteristics of stress groups with the Germans. These falls from high to low in non-final sentence accents are troublesome for the phonological interpretation: I have assumed that the utterance final falls in the isolated utterances were not, per se, anything to do with sentence accents, because they are present also when no default accent is perceived, whilst a default accent simply enhances the fall by increasing its onset; nor are they terminal, because they may be present also in non-terminal contours (which is the rule rather than the exception with MS and JB) and even larger still, because the onset is yet higher (see Table IXa, MS: Ki, Kf +DA, and Q where the same word 'Kassel' is in final position; its stressed vowel increases from 7.1 through 8.2 to 9.4 semitones and concomitantly the interval from the penultimate stressed vowel decreases from -1.6 through -0.2 to +1.0 semitones, while the final low remains quasi constant at 2.1, 2.2 and 2.7 semitones, respectively). A similar difference in extent of the utterance final fall was observed between the question and a declarative with early sentence accents (with JB, cf. Table IXa: Q +SA, Km +SA): both utterances have a sharp fall from the accent, but in the question it is not as extensive, to the effect that the post-accentual level stretch runs higher in the range until the last (lexically) stressed syllable, where a final drop to "low" is executed. These facts suggested to me that utterance final "lows" were junctural, end-of-utterance cues, not specifically

accentual and not terminal either. (Another end-of-utterance cue is the final rise to "high" which accompanies some non-terminals, and which is more common with some speakers than with others.) But what do we make, then, of the early and steep falls on accented items in the terminal declaratives? They cannot be "end-of-utterance" manifestations, but must reasonably be assigned to the accent. Where is the utterance boundary cue, then (apart from the final lengthening, cf. section D. below)? We can probably claim that a slight final fall is present. This would mean that there are two "lows" involved in the system, one associated with sentence accent, and one associated with juncture, both of which are subordinate to or constrained by grosser sentence intonation features. The "low" juncture accompanies terminal intonations and some non-terminal ones (with some speakers, at least), but non-terminals may also have a "high", or maybe better: a "low-high" at the utterance boundary. In isolated utterances without perceived default accent, what we get is the uncontaminated manifestation of the juncture "low", i.e. a 4-5 semitone drop from the stressed syllable. With an added default or final focal accent, the accentual and the junctural "lows" merge, and the fall from the higher accented syllable is greater. In terminals with an early accent, the accentual low moves left with the accent and leaves little room for the manifestation of (a fall to) the junctural low (i.e. the final juncture is subordinate to the demand for suppressed or deleted Fo patterns after the accent). In non-terminals with an early sentence accent, the manifestation of the accentual low is checked or counter-acted by, i.e. subordinate to, the demand for a higher post-accentual contour than in terminals (as witnessed by JoW and JB's question), the termination of which may be with a junctural "low" (JB) or a junctural "high" (JoW). - To interpret extensive Fo falls as having exclusively to do with sentence accents, and thus to signal "last significant Fo event in the utterance", which is the position taken by Bannert (1985), is not quite satisfactory, for two reasons: Not every final fall induces the perception of an extra prominence relative to previous stressed syllables, i.e. a sentence accent (unless we want to postulate that an extensive fall expresses 'sentence accent', whether perceived as especially prominent or not - but that would make the denotation 'sentence accent' rather void). Secondly, a final fall is encountered to a greater (in non-terminals) or lesser (in terminals) degree in utterances with non-final sentence accents. - Some of this reasoning rests on rather scarce evidence, but if it is tenable it is interesting, among other things, because of the interdependence it demonstrates between tonal events at different levels in the prosodic hierarchy, in casu: sentence intonation function, sentence accent and juncture, where sentence intonation governs the realisation of the accent "low", and where sentence accent location determines the extent of the fall to junctural "low".

3. CONCLUDING REMARKS

To highlight the differences, and put them in perspective, in the alignment of segments and Fo in the prosodic stress group, which are difficult to include in the schematic summary in section IV. below, fig. 46 displays model stress groups from each of the languages/varieties investigated so far. They represent stress groups in non-final position, not under sentence accent and not preceding a prosodic phrase boundary (these remarks are crucial only for Sønderborg and German). Each frame should bring out what appear to be the salient characteristics, the prototypes. Most frames are modelled from stress groups in the long terminal declarative, but are also impressionated by the five systematically shortened ones. No speaker faithfully produces each and every stress group as fig. 46 would predict - there is a considerable leniency, a margin for play within the limits set by fig. 46. And synthetic speech would, I presume, sound dull and mechanical without a certain improvisation (whether context dependent or random) over these themes. Nevertheless, I am certain that fig. 46 does reflect pertinent differences, in range spanned, in extent of rising and falling movements, in slope of rising and falling movements, and in strategies to meet differences in stress group duration. - I also think that it is these differences which contribute more than any other single parameter to our immediate, unreflected recognition of language/regional characteristics.

At the top of the figure I have assembled those stress groups where some form of compression/expansion takes place, as indicated by the boundary arrows at the top of each frame, whereas the lower part of fig. 46 displays types where a clean truncation reduces the pattern in extent when the stress group is shortened. Note that long and short vowels onset differently in Aalborg, Tønder and Sønderborg, but their offset is constant with respect to the stress group maximum. The small arrows beneath the upper row of frames indicate the location of Fo turning points in relation to definite segmental events. Beneath each frame I have auditorily characterized each pattern in terms of movements and/or a sequence of highs and lows. Naturally, every pattern can be formally described in terms of either one or the other - the distinction in the figure is due to my own auditory impression that in some cases the movements are perceptually very distinct and heavily significant as such, in others I perceive rather a succession of levels. Some cases I cannot quite decide. The distinction is clearly correlated with the extent of the movement, and how rapidly it is performed, i.e. its slope. Thus, with Aalborg, Tønder and Sønderborg, I hear the rises as such when the stressed vowel is long, but as a "high" when it is short. Standard German, Flensburg and Copenhagen have "declining" post-tonic falls, which distinguishes them auditorily from the more extensive "falling" movements in other frames.

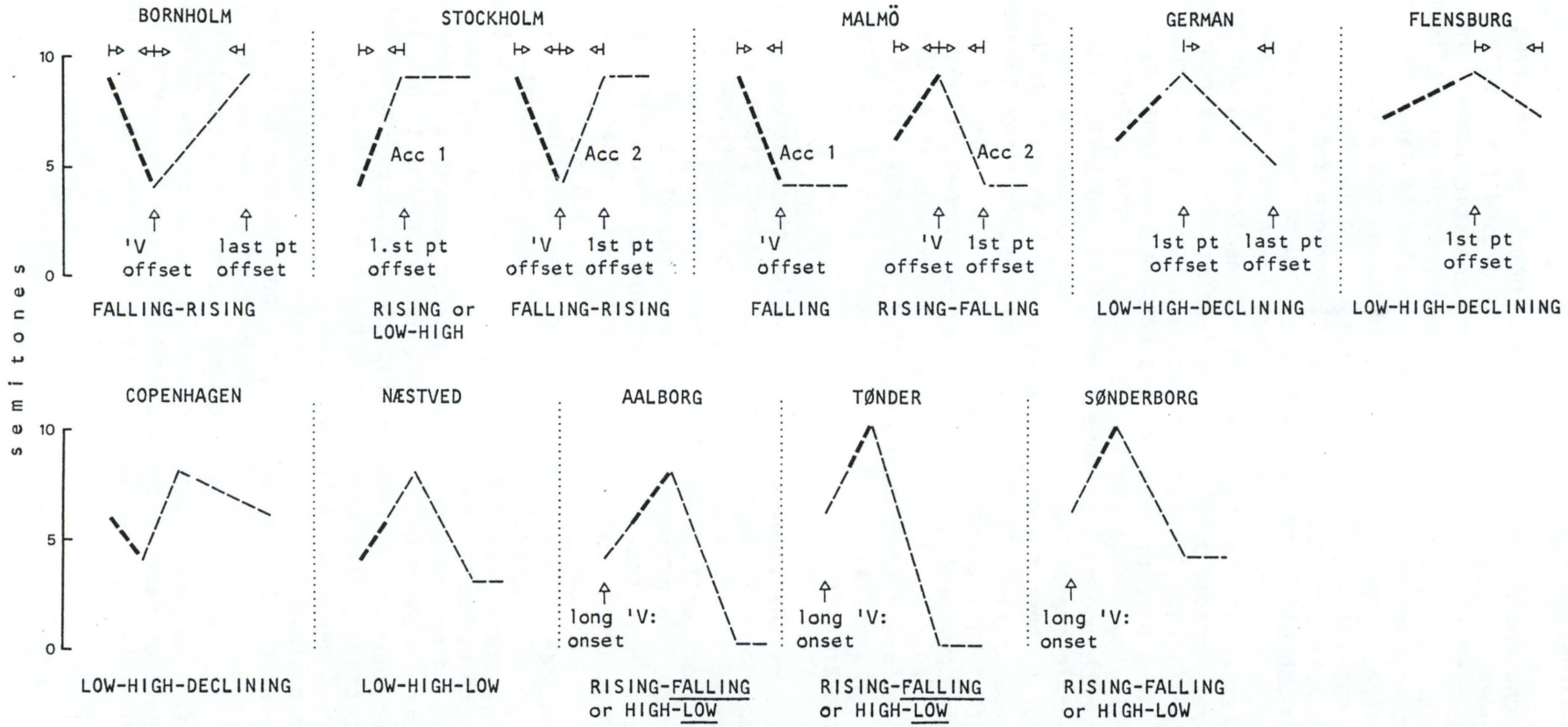


Figure 46

Model stress group patterns from ten languages/regional variants. Horizontal arrows delimit movements which may be expanded or compressed. Vertical arrows depict turning points which anchor segmental events. The patterns are characterized auditorily below each frame. See further the text.

Bornholm, Stockholm (Accent II) and Malmö (Accent I) are the only ones to have falling stressed vowels, all the others are either low, rising, or high with declining or falling post-tonic tails. For a discussion of the way I have characterized the word accent patterns in Swedish, which deviates from the - by now - standard descriptions of Gösta Bruce and Eva Gårding, see Thorsen (1988a, p. 48ff) and the references therein.

Bornholm is the most uncomprimisingly compressing/expanding sample in this collection: stressed vowel slope as well as the rising post-tonic tail are neatly adjusted to their durations, i.e. the adjustment encompasses all of the prosodic stress group. Not so with the two Swedish varieties, where a modest adjustment is performed within that part of the segmental chain which is relevant for the word accent distinction, i.e. the stressed syllable in Accent I and the stressed and first post-tonic in Accent II. Succeeding post-tonics are extended roughly level from or cut back to the word accent offset, which is what warrants the "compression and truncation" label in the schema in section IV. below. Standard German and Flensburg are similarly labelled, but here the characterization refers to the fact that the post-tonic slopes are expanded/compressed only to a point: beyond a certain steepness, the post-tonic tail is truncated.

Standard German and Flensburg patterns are similar in shape, but the movements are less extensive and slower in Flensburg. I wonder whether there are not also rather characteristic differences in vowel durations or vowel to consonant duration ratios (as I have intimated in the frames) in Flensburg versus Standard German, and whether this may not be the most significant prosodic difference between them, since I have found little else in my data that the Flensburg speaker did or did not do, in opposition to the two Standard German speakers. The same comment probably holds for Aalborg versus Tønder and Sønderborg, that vowel/consonant ratios are significantly different. Segment duration will be the object of a separate investigation I intend to undertake. Tønder and Sønderborg patterns differ mainly in the extent of the fall. Copenhagen and Næstved differ partly in the location of the stressed vowel relative to the first low point, partly in the quick movement to a perceptually rather salient "low" in Næstved. Although the turning points in the lower part of fig. 46 are time constant, the high in Copenhagen is generally located in the first post-tonic, the low in Næstved in the second post-tonic, the low in Aalborg in the first post-tonic, the lows in Tønder and Sønderborg in (or between) the first and second post-tonics.

D. FINAL LENGTHENING

Due to the rather parenthetical nature of this part of the investigation, the present section will be restricted to a mere presentation of the facts. For a thorough treatment of segment duration as a function of context, including references to the existing literature, the reader is referred to Lindblom (1978)

and Fischer-Jørgensen (1982). See Thorsen 1988a, p. 130ff, and 1988b, p. 192ff, for accounts of final lengthening in Copenhagen, Bornholm, Skanian, Stockholm Swedish, Næstved and Aalborg.

I have measured each segment in 'Kamma' (in initial and final position in isolated utterances and in utterances which invited a focal accent on 'Kamma' as well as a focal accent somewhere else in the utterance), excluding the closure of the aspirated stop, though, which cannot be delimited in utterance initial position. I have measured groups of segments in '-rí/st/erne'/, /'-rí/st/en', as indicated by the slants. There are two major segmentation problems: intervocalic /r/ in 'turísterne'/ /-rísten', which is a uvular approximant or weak obstruent, and the final vowels. The /r/-onset was determined where the intensity curves begin to drop from the preceding vowel. The final vowels are more cumbersome. They may terminate in weak breathy voice or in weak unvoiced aspiration (but rarely in creaky voice, which generally characterized the Stockholm speakers). The segmentation which offers the best uniformity across speakers and utterances is a vowel offset coinciding with the point in time where the high-pass filtered intensity curve reaches zero, which is accordingly the criterion adopted here. This corresponds physiologically to the point in time where the vibratory pattern of the vocal cords produces a source function with little energy in the upper part of the spectrum and where any energy below 500 Hz, which might be produced by 'edge vibrations' is disregarded. An objection to the effect that this cuts back precisely that phase which may constitute the final lengthening is at least partially muted by the fact that the same procedure has been employed across all speakers and regional languages, but it did indeed lead to different results. Correspondingly, the final vowel in initial words was offset at the point in time where the intensity of the noise of the succeeding fricative (/s/ or /f/) ('Kamma stammer ...'; 'Turisterne fordobler ...') rises sharply, or where the closure of succeeding /g/ ('Turisterne gør ...') has been formed, i.e. where the intensity reaches zero.

The results are presented in Table X, where the difference, in centiseconds, of the total duration of the (part of the) word in final minus initial position is given, with indication of the distribution of the lengthening in those cases where it is both statistically significant and considerable. Note that there are negative values, i.e. instances where the initial item was longer than the final item, ceteris paribus.

Final lengthening is not a stable feature of Tønder speakers, on the contrary: AS actually shortens his segments in utterance final position, compared with initial position. Sønderborg speakers are not entirely unambiguous, either, cf. HS and PBP's values on initial 'Kamma', but probably warrant a classification as generally lengthening finally. The Germans uniformly lengthen final segments, and in some cases rather considerably. Common to all instances of final lengthening

Table X

Differences in duration, in centiseconds, of (parts of) words in utterance final minus utterance initial position, based on averages of measurements by speakers from Tønder, Sønderborg, Standard German and Flensburg. Values in parenthesis pertain to cases where the number of measurements behind the average value is less than five. Differences that are statistically significant (student's one-tailed t-test) are indicated with one, two, or three stars, corresponding to levels of probability of 0.05, 0.005, and 0.0005, respectively. "'Kamma" is the word from the isolated utterance, "''Kamma" is the word under focal accent, and ",Kamma" is the word from utterances where the focal accent was located somewhere else.

	'Kamma	''Kamma	,Kamma	-rister(ne)/ -risten
AS	-4.2** ($_{o}$a)[1]			-4.6 (erne)
JC				3.7 (ster)[2]
HS	2.2 (m)			9.0*** (st)[2]
ES	6.2*** ('ama)			4.7* (erne)
PBP	-0.1			5.0*** (erne)
JoW		4.6*** ($_{o}$a)	11.4*** ($_{o}$a)	
MS				13.5*** (sten)
JB	4.3** ($_{o}$a)		5.2** ($_{o}$a)	6.5** (sten)

1) the parentheses indicate that or those segments which carry most of the difference. Underlined segments are relatively more lengthened.

2) JC and HS pre-positioned the definite article, i.e. final '-ne' is lacking.

is the fact that it hits the post-tonic segments, except with ES's "'Kamma". The 1988 investigations established final lengthening as a feature independent from pronounced final Fo movements, cf. p. 4 above and Thorsen (1988a, 1988b), which is corroborated by the German data here, since final "ˌKamma" is lengthened even though its Fo movement is greatly reduced, due to the occurrence of a focal accent earlier in the utterance. Thus, the independence of the final lengthening parameter, and its non-universality has been attested to again.

IV. SUMMARY

The parameters investigated are listed in tabular form below, including the results from previously investigated languages/ varieties.

	SENTENCE INTONATION SIGNALLING	DEFAULT SENTENCE ACCENTS	FOCAL SENTENCE ACCENTS	FOCUS BY STRESS REDUCTION OF SURROUNDINGS	FINAL LENGTHENING	STRESS GROUP PATTERNS GET TRUNCATED/ COMPRESSED
STOCKHOLM	local	compulsory	compulsory	- - -	yes, extensive	truncation and compression
BORNHOLM	local	optional	optional, frequent	- - -	no	extensive compression
MALMÖ	global	no	no	optional, rare	optional?	truncation and compression
COPENHAGEN	global	no	no	optional, never finally	yes, modest	truncation
NÆSTVED	global	no	no	rare, never finally	optional	truncation
AALBORG	global	no	no	optional, rare finally	optional	truncation
TØNDER	global	no	no	optional, never finally	yes and no	truncation
SØNDERBORG	local	no	no	optional, never finally	yes	truncation
FLENSBURG	local	optional	optional, frequent	- - -	yes	truncation and compression
STANDARD NORTH GERMAN	local and global	optional	compulsory, except finally	- - -	yes	truncation and compression

The schema speaks for itself, and the appropriate comments have been given in each of the concluding sections above. There are, however, a few features which I wish to touch upon briefly here, again. It appears that there are hardly any categorial differences between the Flensburg and the Standard North German varieties. If the present results are valid, the difference seems to lie in the shape of the Fo pattern, which spans a smaller range and reaches its maximum later with the one Flensburg speaker, than with the two Standard speakers, and where furthermore a difference in vowel to consonant ratios may be found. This presupposes, of course, that I have not accidentally hit upon a completely individual characteristic with JB. The difference between Tønder and Sønderborg seems to lie mainly in their different strategies for sentence intonation function signalling, as well as in stress group pattern differences. One feature that might contribute towards the aforementioned German-sounding Sønderborg intonation may be the systematic difference between non-final and final stress groups, the latter offsetting at a particularly low value. Besides, but this is something which awaits an investigation of durational relations within the prosodic stress group, I suspect that Sønderborg stands out from other Danish regional languages and teams up with German, in its rather fuller and thus longer (i.e. non-reduced) post-tonic syllables. On the other hand, the two German varieties stand out from Danish by a number of facts: by a weighting of individual elements within syntactic constituents, by a more direct and variable control of stress group patterns in connection with prosodic/syntactic boundaries and with declarative vs. interrogative mood, by the optional occurrence of, albeit weak, default accents, and by the manifestation of focal accents. If, in spite of these rather decisive differences between (Standard) German and (inter alia) Sønderborg, Sønderborg could still be mistaken for German in a noisy transmission, i.e. where segmental information carries insufficient cues for identification, then my assumption that stress group patterning, including timing, contributes more than anything else towards our discrimination and identification of languages/dialects/regional varieties of standard languages is supported.

The prosodic differences between these otherwise closely related languages are rather considerable and one is left to wonder why this is so. It is hardly conceivable that they be due to corresponding differences in syntax. Danish, Swedish and German are not that different syntactically, and - particularly - the materials recorded for the comparative analyses were near identical, both semantically and syntactically. It is possible, though perhaps not very likely either, that somewhat greater differences would be found in the syntax of spontaneous speech (versus read 'lab speech'), and that the prosodic systems are basically tuned to the latter speech style. This is an empirical issue, but I doubt very much that spontaneous Danish should be so much richer in structure (compared with Swedish and German) to reasonably compensate for the rather poorer inventory of prosodic parameters and their manifestation. Instead, I propose that some languages/variants

simply go down as less expressive prosodically than others. Copenhagen would then lie at the lower end of that continuum, and Bornholm and Central Swedish at the other, something which matches rather accurately the linguistically naïve prejudice that Copenhagen Danish is flat and monotonous, whereas, e.g., the Swedes sing a whole lot more.

Finally, I am aware that with time and with each new investigation in this series, modifications of previous ideas have been introduced, terminology has been adapted, and new features introduced. Thus, juncture signals were not considered in the 1988a and 1988b investigations. - In a forthcoming paper I will attempt to summarize the pertinent facts about accents, sentence intonation and junctures and consider the theoretical implications. More specifically, I will discuss these various prosodic systems with respect to two current theories about the phonology of intonation.

V. NOTES

1. However, on p. 55-56 in Thorsen (1988a) I noted that Accent II words in pre-focal position also come up with a rise - though not as extensive as under sentence accent, and I suggested that the rise might actually be part of the accent command, which is then reinforced under sentence accent. The complete lack of any rise in Accent II words in post-focal position, I suggested on p. 68, might be due to a de-stressing, which does not apply in pre-focal position. This is a matter for further investigations.

2. Only in the final stages of getting this manuscript ready for printing did a copy of the book by Hans Altmann, Anton Batliner und Wilhelm Oppenrieder: Zur Intonation von Modus und Fokus im Deutschen, Max Niemeyer Verlag, Tübingen 1989 reach me. I am sorry that I have not been able to read it in time to take it into account here.

ACKNOWLEDGEMENTS

I gratefully acknowledge the assistance rendered me by all the speakers: Bjørn Clausen, Marianne Michaelsen, Inge Sandholt, Palle Bang Petersen, Ena Steffens, Heine Steffens, Birte Lilholm Petersen, John Christensen, Katrine Pörchsen, Andreas Schütt, Miriam Stender, Jon Brandt, Hartmut Haberland and Johannes Wagner, as well as Karen Margrethe Pedersen and Hans Jørgen Sørensen, who established the contacts with Tønder and Sønderborg speakers, respectively. Further thanks to Mette Tyge who very generously and hospitably put her home at my disposal for the Tønder-recordings. Marie Bjerrum, Institute of Danish dialectology, solved certain problems in connection with the material for me, and Magda Nyberg, likewise of the Institute of Danish dialectology, supplied me with the appropriate references to literature about stress in compounds in Southern Jutland. Sincere thanks are also due to Klaus Kohler,

Institut für Phonetik und digitale Sprachverarbeitung, Universität Kiel, who helped me transform the Danish material to acceptable German and furthermore took it upon himself to listen to the recordings of the German subjects. Finally, I am grateful to Niels Dyhr, Birgitte Jakobsen and Jeanette Holtse for assistance with measurements and graphics work. - Since this is to be the last issue of ARIPUC in its present form, I doubt that I shall have the pleasure again of seeing my manuscripts transformed into their neat printed appearance through Else Parkmann's flawless typing. Actually, Else Parkmann retired a year ago, but nevertheless consented to come here and do me this favour.

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