"TONEME 3" IN NORWEGIAN

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The Norwegian toneme system is usually regarded as being binary and toneme oppositions only occur in syllables with primary stress, followed by one or more unstressed syllables, or when a stressed monosyllable is followed by an unstressed word. Monosyllables have traditionally been regarded as having toneme 1.

Vanvik[4,5] has raised the question, if there exists a third toneme in Norwegian. According to him the traditional opinion that monosyllables have toneme 1, seems to be based chiefly upon historical considerations. He points out that a stressed monosyllable followed by one or more unstressed syllables can contrast with polysyllabic words (with toneme 1 or 2), and that the primary acoustical difference between toneme 1 and "toneme 3" is that of F_0[6,7]. Mo[3] also sets up a third toneme for stressed monosyllables. Haugen[2] does not agree with Vanvik's interpretation, and Borgström[1] has pointed out that the third toneme may be regarded as an allotone to toneme 1.

A listening test and acoustical analysis have been carried out. The results from three town dialects will be given here. It is assumed that in disyllabic words the tonemes may be recognized in the stressed syllable. A monosyllabic word may therefore be compared with the stressed syllable in toneme 1 and 2 words. The name *Liv* was read twice in the frame *navnet er Liv* by three subjects from each of the towns of Oslo, Ålesund, and Trondheim, and made the basis for a listening test. The words were presented in random order to listener groups (167 subjects) speaking the same dialects. The listeners were about 16 years old, not phonetically trained and had never taken part in similar experiments. They were told that they would hear the first part of the words *'livet* or *''live* spoken in different dialects, and were asked to mark on forms to fill in which of the two words they thought the segments were cut from. They had no idea that the original word was simply *Liv*.

The responses were largely dependent upon both the speaker and the listener group. When speaker and listener used the same dialect the decision for toneme 1 was very significant for Oslo and Ålesund, whereas no significance for either of the tonemes could be detected for Trondheim (see table). In fact, none of the Trondheim speakers were significantly decided to use either toneme 1 or toneme 2 by any of the listener groups. Similarly, the combination Oslo speaker and Trondheim listeners showed no significant response for toneme 1 or toneme 2. For comparison, all the

listener groups significantly identified the tonemes in the words *'livet* and *"liv e* spoken by the same subjects, even when they did not hear the final vowel. Fig. 1 shows the F_0 tracings for the words *Liv*, *'livet*, and *"live* spoken in the three dialects.

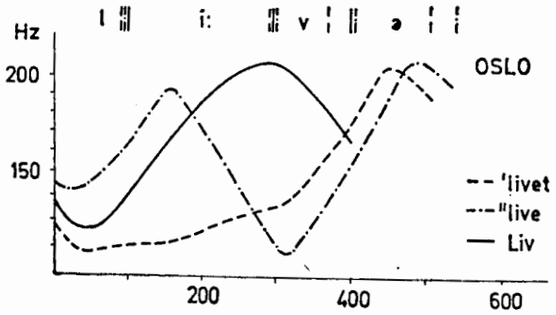

Fig. 1.

The duration and the frequency pattern are average values for each sound. At the first rate the curves for the monosyllables deviate rather much from toneme 1 in Oslo and Trondheim dialects, and they seem to be more like toneme 2. But the most important cue for toneme 2 in these dialects seems to be the falling F_0 from the be-

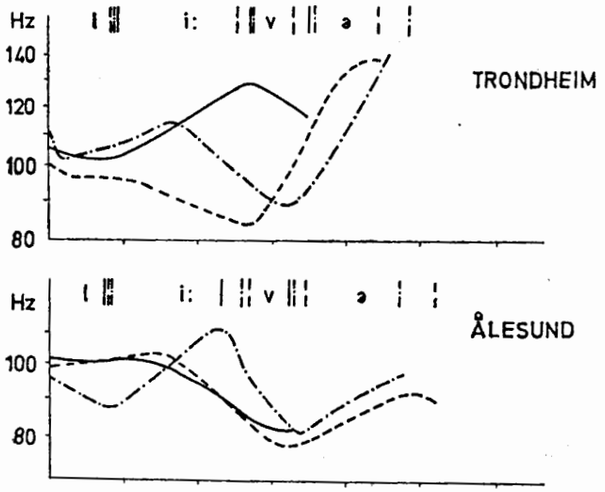

Fig. 2.

ginning of the stressed vowel which does not occur in the monosyllable. In Oslo dialect, however, the raising F_0 during the entire stressed vowel corresponds to toneme 1. In Trondheim, on the other hand, the F_0 pattern for the monosyllable does not correspond to either of the two tonemes.

From the perceptual point of view the results may indicate that there may be a need for "toneme 3" in Trondheim dialect. Only in Ålesund dialect do Trondheim listeners identify monosyllables as having toneme 1. In this case the F_0-curve for *Liv* and *'livet* are practically identical: It is not time to discuss the interaction between the dialects any further, as this problem is much more complicated.

From about 3000 decisions (all the material in bulk) there is significance on the 0.1 % level for the monosyllables to be identified as having toneme 1. If the monosyllables had "toneme 3", and "toneme 3" deviates from both the other tonemes, none of the two would be preferred by the listeners. That means that about 50 % of the responses would be given to each of the tonemes. The decisions are, as seen, largely dependent both on the individual speaker and the speaker's and listener's dialect, but by and large the monosyllables are identified as having toneme 1, and "toneme 3" may be regarded as an allotone to toneme 1.

A monosyllable, Liv' identified as having toneme 1 or 2

		Listeners					
	Toneme	Oslo		Ålesund		Trondheim	
		1	2	1	2	1	2
Readers	Oslo	196	140	202	122	178	164
	Ålesund	190	146	203	121	218	124
	Trondheim	180	156	168	156	165	177

Level of significance for toneme 1

		Listeners		
		Oslo	Ålesund	Trondheim
Readers	Oslo	1 %	0,1 %	—
	Ålesund	5 %	0,1 %	0,1 %
	Trondheim	—	—	—

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Vanvik:

The term "toneme 3" should not be used at all, since a monosyllable cannot possibly form a minimal pair with a polysyllable by means of tonemic opposition.—Very much depends on the pronunciation of the test word. Since it carries an intonational nucleus of a falling type, the results of the investigation say nothing about the majority of monosyllables, viz. those occurring in non-nuclear position and those carrying an intonational nucleus of a rising type.