

## VOWEL LENGTH AND STRESS IN GERMAN

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Siebs<sup>1</sup> and the pronunciation *Duden*<sup>2</sup> and Wängler<sup>3</sup> give a number of contrastive characteristics when describing the phonetic nature of the German vowels, mainly in the open-close and long-short dimensions; other contrasts such as front-back, clear-dark are also mentioned. American phonologists have stated two further dimensions, with phonemic status: lax-tense and long-short.<sup>4,5</sup> In contrast to this, Marchand<sup>6</sup> considers that only the open-close dimension is phonemic.

Mueller holds that "with pairs of more or less lax or tense vowels a second feature runs parallel, namely open and close".<sup>7</sup> With pairs such as *spät* : *späht* [ʃpe:t] : [ʃpe:t]<sup>8</sup> he endeavours to prove that vowel length is phonemic in German. The problem of stress in relation to vowel length is not dealt with.

Moulton takes the view that open-close is coterminous with short(lax)-long(tense): "The short [ɪ] is, one might say, *automatically* open, the long [i:] automatically close and such qualities which derive from other factors are phonetically important, but phonemically irrelevant".<sup>9</sup> He also investigates thoroughly the problem of stress with reference to vowels. He emphasises that vowels are only long if they are also stressed. The distinctive features for stressed and unstressed vowels are tense and lax. But this contrast is suspended under certain conditions for [a]: "In formal speech this opposition is suspended in unstressed positions only for the pair [a] - [a]", but he then ends his sentence with the comment that "in the informal speech of many persons, however, it is suspended for all other pairs as well",<sup>10</sup> which seems to annul the significance of the tense-lax distinctive feature. In spite of this, in his transcription he emphasises the length of the long vowels by using the length sign [:] with the tense vowels, already characterised by [·], e.g. tense [e] is transcribed [e:].

Marchand, too, discusses the problem of stress, after emphasising that the distinctive feature for vowels is open-close, and that: "It can easily be shown that length is not the determining feature in the open-close pairs in German. One can

<sup>1</sup> Siebs 1957.

<sup>4</sup> Moulton 1962.

<sup>7</sup> Mueller 1956: 167.

<sup>8</sup> The phonetic transcriptions used by the various authors, and retained when discussing their analyses here are as follows:

*Duden* : [a α ε e i i o o u u ø œ y Y ə ai au ɔY]

*Mueller* : [a α e e i i o σ u υ ö ö ü ũ ə ai au oi]  
α ε i: α u ä ü

*Moulton* : [a ɑ e e i i: o ɔ u u ö ö ü ũ ə ai au oi (ε)]

*Marchand* : [a ε e ɛ i o o u u ö ö ü ü ə ae ao ɔ]

*Driescher* : [a a\* e e\* i i\* o o\* u u\* o o\* u u\* ə ai au oi (ε\*)]

<sup>9</sup> Moulton 1961-62: 4.

<sup>10</sup> Moulton 1962: 64.

<sup>2</sup> *Duden* 1962.

<sup>5</sup> Mueller 1956, 1958.

<sup>3</sup> Wängler 1961.

<sup>6</sup> Marchand 1961.

lengthen the vowel in |bɛt| "bed" to such an extent that it is longer than the vowel in |bet| "flower-bed" without changing the meaning of the two words. If, however, a change in 'quality' is made, a corresponding change in meaning occurs".<sup>11</sup> One might consider this a rather unusual way of saying the word [bɛt], and I shall refer back to this remark later; in the meantime I would like to comment that if open vowels receive stress their opening is increased, and only if affective stress occurs may there be, under certain circumstances, a "lengthening" (see below). Marchand's scheme of vowels has only one |a|. One must therefore suppose that there is only a phonetic difference between [ɑ] and [a]; he says: "if it [i.e., the difference] is presented, it should be presented as a distinction of quality, not quantity. That is, 'short' a is pronounced [ɑ] and long a [a]"<sup>12</sup> Yet the problem is treated rather lightly because the length symbol is also introduced, to distinguish *Hacken* from *Haken*, namely [hakɛn]:[hakaen]. On the whole, Marchand's opinions coincide with those of Moulton, who also emphasises the special features of |a| in unstressed position. The case seems to be that |a| in open syllables is generally [ɑ]; when lengthened, it behaves like a close vowel. It permits an [ɑ:] -form, "as in [hɑ:kɛn]". The *Duden* also does not know how the |a| should be represented and gives without any further explanation both [a<sup>h</sup>ha] and [a<sup>h</sup>ha:]. As regards stress, Marchand states: "Under primary and secondary accent, the above contrasts in vowels are maintained, but under no stress, a reduced vowel system obtains."<sup>13</sup>

ɪ                      u  
 e    ə    o  
 a

Thus, the open:close and the rounded:unrounded oppositions disappear."<sup>14</sup> This means that the unstressed vowels |ɪ| and |u| are open, and |e| and |o| closed, and that rounded forms do not exist. This is perhaps an oversimplification, particularly as regards the disappearance of rounded forms.

The above system of unstressed vowels seems to contradict Marchand's principles of vowel contrast, i.e., that open-close is the distinctive phonemic feature. The vowel opposition is only one-dimensional — along a chain — with a varying degree of opening.<sup>15</sup> If the vowels of this chain receive stress, open or close forms respectively appear, plus rounded forms for |i| and |e|. Thus |i,ü,Û| would be allophones of |ɪ|, and |ɛ,ö,ö| of |e|, etc.

<sup>11</sup> Marchand 1961: 35.

<sup>12</sup> Marchand 1961: 39.

<sup>13</sup> Moulton's unstressed vowels in similar arrangement would be as follows:

ɪ    ɪ                      ʏ    ʏ                      ʊ    ʊ  
 e    e                      ö    ö                      ə                      ø    ø  
 (ɛ)

a

<sup>14</sup> Marchand 1961: 41.

<sup>15</sup> Trubetzkoy 1962: 62.



It is therefore methodologically inadmissible to prove phonemic length for vowels by contrasting them in isolated word-pairs.

The 'short' unstressed tense vowel that occurs in a few words — a problem that has occupied Moulton considerably<sup>25</sup>—presents no difficulties. For example, the first vowel in *lebendig* is |e\*|; as it can never receive stress, it can also never be lengthened. The same applies to the words *Mänade*, *Dämonen*, rendered by Siebs (according to Moulton) as [mɛ:na:də], [dɛmo:nən]; both |ɛ\*| are tense and unstressed: |mɛ\*na\*də|, |dɛ\*mo\*nən|.

As |a| is capable of having a long form, both a tense and a lax form must be postulated, e.g. *Stadt:Staat* = |ʃtat|:|ʃta\*t|; the latter when stressed will be [ʃta\*:t]:

*Dieser Staat* [ʃta\*:t] *hat die Stadt B.* (·<sup>˘</sup>·...)

*Diese Stadt liegt im Staat X* [ʃta\*t] (·<sup>˘</sup>·...)

This shows that one cannot accept Mueller's 'length-phoneme'. Nor, methodologically, can one accept the explanation of German phoneticians that *ruht* must have a clearly long [u:] because it goes back to an earlier *ruhet*. The pair *Ruth:ruht*, quoted by Mueller<sup>26</sup>, presents some difficulty, however. Mueller says that *ruht* has a phonemically distinctive longer [u:] than *Ruth*. I would insist that both have the phonemic shape |Ru\*t| and that each could only become [Ru\*:t] when stressed: it is only in the frame provided by a sentence that the two words become semantically unambiguous. If the two words are combined into one sentence, not only stress but also intonation becomes evident; to this is added the speaker's knowledge of the structure of a simple declaratory sentence, and of a yes-no question. We know that the following conditions apply:

Declaratory sentence: <sup>˘</sup>.      Yes-no question: <sup>˘</sup> °

We also know that in a declaratory sentence the verb is in second position, but in first position in a yes-no question. So the sentence *Ruth ruht*. is spoken: [Ru\*:t+Ru\*t]: as the stress falls on the first word, and |u\*| is phonetically long [u\*:]. In the question *Ruht Ruth?*, the stress falls on *Ruht*, and the question is spoken: [Ru\*:t+Ru\*t]. Phonemically, both sentences have the same shape: |ru\*t + ru\*t|. Only our knowledge of intonation and stress allows a semantic decision. This example makes it clear that 'length' is not 'attached' to a vowel of a certain word, but coincides with stress: in the first sentence *Ruth* has a long vowel, in the question *ruht*.

In a 'normal' sentence, there is only one main stress. According to the utterance-situation<sup>27</sup>, several stresses may occur, and these may increase the number of tense vowels which become long, so that several long vowels may be observed. This is particularly the case in very slow, formal speech, which permits a great number of special stresses. Lengthening of consonants (nasals, spirants and liquids) after lax vowels may also occur. This lengthening of consonants is connected with stress and is non-phonemic.<sup>28</sup>

In the two problematic sentences *Er ist es.* and *Er isst es.*, there is no possibility of distinguishing phonemically or phonetically between them: both are

<sup>25</sup>Moulton 1962: 63, 68.

<sup>27</sup>von Essen 1956: 26.

<sup>26</sup>Mueller 1956: 170.

<sup>28</sup>Mueller 1958: 32; Martens 1957: 4-6.

$|e^*R+ist+es| = [e^*R+is:t+es]$ . Only structural reshaping can avoid ambiguity. On the other hand, the sentence *denn den dehnt er*.  $|den+de^*n+de^*nt+e^*R|$  could show the following varying realisations:

'normal', one stress	: [den+de^*n+de^*:nt+e^*R]
two stresses	: [den+de^*:n+de^*:nt+e^*R]
three stresses	: [den:+de^*:n+de^*:nt+e^*R]
four stresses	: [den:+de^*:n+de^*:nt+e^*:R]

Lax vowels have a greater degree of opening when stressed. If affective stress (*Überdruck*) occurs, and if they are not followed by the above-mentioned consonants, they can be given more prominence by 'singing' them, as the English phonetician D. Jones<sup>29</sup> has demonstrated in his recording of the cardinal vowels. This possibility explains perhaps Marchand's statement that the  $|e|$  in *Bett* can be lengthened in such a way that it is longer than the  $|e^*|$  in *Beet*.

*Summary:* When contrasting minimal pairs, German tense vowels appear long because, as one-word sentences, they are the sole bearers of sentence-stress. In 'normal' speech, only one word is stressed in a sentence of more than one word. If this word contains a tense vowel which receives stress, then it is phonetically lengthened. Unstressed tense vowels remain short. Length is therefore prosodic, a syntactic device to structure sentences. Long vowels are simply allophones of tense vowels.

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<sup>29</sup> Jones 1956.