The pure vowels (monophthongs) of Hałcnovian – spectral characteristics

1. Existing descriptions

No acoustic description of Hałcnovian is available in the literature; even traditional impressionistic ("by ear") descriptions are very few. As a result, this study is definitely the first acoustic description.

From Marek Dolatowski's research within the present project it is apparent that the Hałcnovian stressed vowel system is composed of seven pure vowels (monophthongs) and nine vowel glides (diphthongs). These are – respectively – /i e a o u y ø/ and /aɪ ɛɪ ɔʊ ɛʊ ɔɪ ʊɔ ʊɛ ɪɛ ʏɛ/. If the system is like that in reality, then Hałcnovian would have a noticeably smaller monophthong system and a much richer diphthong system than Standard German. When compared with Wilamowicean (and such a comparison is motivated both by geographic and social proximity and the fact that it is often said that the "sound" of the two languages is similar) there would be more monophthongs but fewer diphthongs.

Fig. 1 shows the traditional vowel quadrilaterals (vowel charts) for German and (by way of comparison) for Polish and Wilamowicean (the latter being one of the products of the present project).

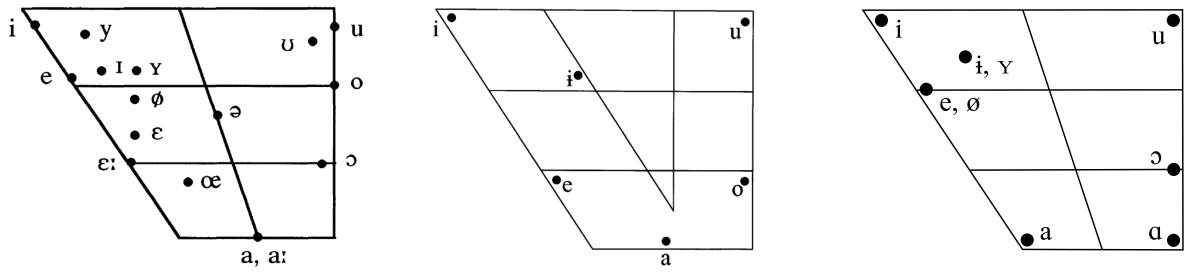

Fig. 1. Vowel quadrilaterals for Standard German (left, Kohler 1999: 87), Polish (centre, Jassem 2003: 105) and Wilamowicean (right).

2. General characteristics

Dolatowski leaves open the question of the significance of vowel length and tenseness for phonemic contrasts between Hałcnovian vowels.

Simplifying slightly, two extreme situations may be identified among Germanic languages as far as modern realization of vowel length is considered. In some languages – e.g. Danish – long and short vowels may form "pairs". For one vowel quality, there may be a long and a short vowel that are very similar in timbre, e.g. long /aː/ in *bane* /baːnə/ and short /a/ in *bande* /banə/. In such cases, the contrast is really based on physical length.

At the other end of the spectrum, length as such is not contrastive, and vowels differ only in quality; Dutch, and in particular Afrikaans, are the best examples. For instance, the contrast between Dutch /i/ and /ɪ/ is similar to that between Polish /i/ and /ɨ/ (e.g. in Polish *mi – my*): it is not based on physical length but on quality. The usual situation is for historically long vowels to be more "peripheral" (some authors using the term "tense"), and for historically short vowels to be "centralized" ("lax"). Another

possibility is for a historically long vowel to become diphthongized: for example, the historically long Dutch /eː/ is realized as [ei] in the modern dialects of western Holland, and the Afrikaans reflex is /iə/.

Most Germanic languages are somewhere in the middle of this continuum, i.e. vowel contrasts use both quality and length. Length may also be employed allophonically (i.e. not to realize phonemic contrasts). Modern German is one example here.

If each of the Hałcnovian monophthongs proposed above indeed represented two phonemes (of which one would be long or "tense", and the other – short or "lax"), the resulting system would be almost identical with the Standard German system (cf. Fig. 1). However, if none of the monophthongs showed a distinction of this kind, we would see a system even simpler than that of Afrikaans. Measurements of the spectral characteristics of vowels can provide at least a partial answer to this questions.

3. Methods

Among the materials gathered for the present project, there is a set of recordings from one Hałcnovian speaker. On the basis of a partially phonemic transcription (see Table 1), all analysable pure vowels in stressed syllables located no closer than two syllables from the end of the intonational phrase were marked in Praat. Next, measurements of the first two formants were taken at the midpoint of each vowel. The resulting measurements, expressed in Hz (without normalization) are plotted below on standard charts showing the relationship between the first and second formant (F1 and F2). The charts are oriented so as to match the standard vowel quadrilateral (system origin at upper right, F1 on the Y axis). Thus, the charts can be interpreted (with some reservations) to show close vowels at the top and open vowels at the bottom; and front vowels on the left with back vowels on the right. You can find an introduction to acoustic description of vowels in a separate file available from the project's website.

Table 1. The transcription system used in the study.

Proposed phoneme	Transcription
/i/	<i>
lengthened /i/	<ih>
/y/	<ü>
/e/	<e>
/ø/	<ö>
/a/	<a>
lengthened /a/	<ah>
/o/	<o>
lengthened /o/	<oh>
/u/	<u>

4. Results

Speaker FH is male, aged 81. The recording used for the measurements contained spontaneous speech – short monologues on various topics, e.g. clothing and the social life of Hałcnów. In general, the positions of the vowels are in accordance with Dolatowski's description.

It seems that the measurements partially confirm the hypothesis regarding the presence of quality (tenseness?) variation within at least three of the postulated phonemes: /i/, /e/ and /y/. In all three cases, the chart of individual measurements (Fig. 2, left) shows two groupings of tokens. (Of course the

NARODOWY PROGRAM ROZWOJU HUMANISTYKI

chart of mean values – on the right – hides the distinctions by its very nature.) For /ø/, there are too few measurements to make any conclusions. Similar distinctions within /o/ and /u/ are much less visible (or maybe altogether absent). Interestingly, the sounds marked as <ah> and <oh> in the transcription system used (i.e. those claimed to be lengthened) are not significantly different spectrally from the corresponding vowels without length. However, <ih> occupies an area similar to the "tense" /i/. The nature of the data gathered does not allow a conclusive answer to the questions of whether length itself is distinctive.

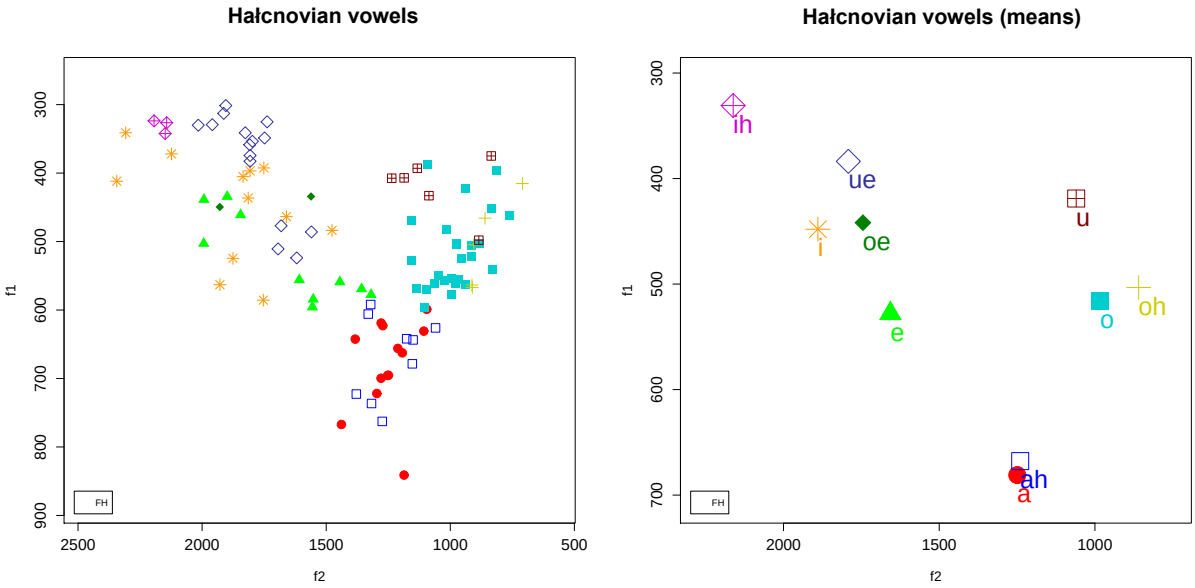

Fig. 2. Speaker FH's Hałcnovian vowels.
Left: Individual measurements; right: means for each vowel.
Transcription conventions: /y/ = ue; /ø/ = oe.

Table 2 illustrates the division of /i y e/ into "tense" [i y e] and "lax" [ɪ ʏ ɛ] by word.

Unfortunately, the data gathered is not sufficient to unequivocally determine the character of this phenomenon. At least three hypotheses may be formulated. First, the distinction may be phonemic (allowing pronunciation distinctions between words), similar to e.g. Standard German. To confirm whether this is indeed the case, minimal pairs would be needed (such as German *bitten – bieten*). However, if this was the case, the distribution of the phonemes would be slightly different than in German or Dutch. It is apparent from Table 2 that words that have a peripheral vowel in German (e.g. *spielt*, *Fabrik*) may have a centralized vowel in Hałcnovian (*schpilt*, *fabrik*) and the other way round (German *mussten* and Hałcnovian *müsta*). One complication is that in some cases (e.g. *müsta*) the auditory impression is more in line with a "lax" vowel.

Secondly, this could be an allophonic process (one that is determined by the position of a sound in the word and does not lead to a phonemic contrast). Some evidence may be provided by articulations such as [i] in *ginga* (vowel raising before nasal consonants is a cross-linguistically typical process) or [ɪ] in *schpilt* (centralization before a "dark" [ɬ] is also typical). In order to decide this question, a much larger speech sample would be needed, allowing several hundred measurements.

Table 2. "Tense" and "lax" /i y e/ by word.

Tense (peripheral)		Lax (centralized)	
		/i/	
[i]:	g**i**nga 'go (PAST.3PL)', n**i**mant 'no-one(× 2)	[ɪ]:	m**i**lich 'milk', v**i**nter 'winter, aizenfabr**i**k 'steel factory', tuXfabr**i**k 'textile factory' (× 2), tuchfabr**i**ka 'textile factory', schp**i**lt 'play (PRS.3SG)', ts**i**mer 'room', schpr**i**t 'spirit'
[iː]:	h**ih**ner 'hens', l**ih**der 'songs' (× 2)		
		/y/	
[y]:	k**ü** 'cow', g**ü**t 'good', m**ü**sta 'must (PAST.1/3PL)', t**ü**chfabrika[1] 'textile factory', h**ü**t 'hat', f**ü**s 'foot' (× 3), m**ü**zik 'music' (× 2), bez**ü**ch 'visit'	[ʏ]:	B**ü**lts 'Bielsko' (× 3), sch**ü**sel 'bowl'
		/e/	
[e]:	**e**ta 'now' (× 2), t**eh** 'tea', n**e** 'no'	[ɛ]:	**e**ltere 'elders', h**e**mdrok 'hemdrock', h**e**mt 'shirt', v**e**st 'waistcoat' (× 2), tsf**e** 'two'

These two hypotheses can be tested in further studies.

Thirdly, the variation observed may be idiosyncratic, specific for this speaker only. Due to the vanishingly small number of Hałcnovian speakers, determining whether this is indeed the case would be very difficult.

Another complication is added by the long-term contact of Hałcnovian with Polish, and the complete trilingualism of all speakers (Hałcnovian, German and Polish, with Polish dominant). As a result, one could even consider a fourth hypothesis: that there is a good correlation between the Hałcnovian and Standard German system but that unsystematic disturbances exist due to the contact with Polish (where the vowel system is much simpler).

[1] The word 'textile factory' is used by the informants in a number of different variants, including *tüchfabrika* (Pl.), *tuXfabrik*, *tuchfabrika* (Pl.).

5. Examples

Sound	Spelling	Gloss	Audio
ih [i]	l**ih**der	'songs'	
i [i]	n**i**mant	'no-one'	
i [ɪ]	schp**i**lt	'plays'	
i [ɪ]	v**i**nter	'winter'	
y [y]	t**ü**chfabrika	'textile factories'	
y [ʏ]	sch**ü**sel	'bowl'	
e [e]	**e**ta	'now'	
e [ɛ]	h**e**mdrok	'hemdrock'	
ah [a]	ferk**ah**fta	'sold'	
a [a]	**a**lde	'old'	
oh [ɔ]	k**oh**la	'coal'	
o [ɔ]	k**o**ma	'come'	
u [u]	p**u**ter	'butter'	

6. Sources

Jassem, Wiktor (2003). "Polish". *Journal of the International Phonetic Association* 33(1): 103–107.

Kohler, Klaus (1999). "German". *Handbook of the International Phonetic Association*. Cambridge: Cambridge University Press. 86–89.

Prepared by:
Jarosław Weckwerth
Faculty of English
Adam Mickiewicz University in Poznań
wjarek@wa.amu.edu.pl