FINNISH AND POLISH VOWELS

(A preliminary contrastive approach)

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1. *Introductory remarks*

Both Finnish and Polish vowel systems display certain phenomena which have created considerable problems for scholars. Thus the phonemic interpretation of Finnish long vowels as well as the phonemic statu and phonetic nature of nasal vowels in Polish have not yet been given satisfactory solutions. In the present paper we do not intend to solve any of these problems but we shall rather choose the solutions which seem to us best in serving our purpose. And this is a practical one: the learning of Finnish by Poles and the learning of Polish by Finns.

There is no unanimity among scholars as to the number of vowel phonemes in the Finnish inventory. This number depends to a great extent on the interpretation of quantity. At least three competing views have been put forward:

(1) The most widely accepted interpretation provides for eight segmental phonemes: /i e æ ü ö u o a/. The phonetically long vowels are treated biphonematically, i.e., as sequences of two short identical segmental phonemes (Troubetzkoy 1949 : 201; Sauvageot 1949 : 16; Harms 1960 : 7; Enkvist 1962 : 587; Raun 1963 : 20; Wiik 1965 : 40 ff.; Itkonen 1968 : 95; Karlsson 1969 : 352–355; Lehtonen 1970 : 30 ff.).

(2) In the second solution long vowels are considered as a combination of a short phoneme and a chroneme (i.e. suprasegmental phoneme of length). In this case we get nine phonemes eight of which are segmental and one is suprasegmental (cf. Enkvist 1962:587; Robins 1965:135, 208 f.).

(3) In the third approach long vowels are interpreted monophonematically, i.e., as different paradigmatic phonemes. As a result we arrive at sixteen

vowel phonemes (Cf. Malmberg 1944 : 87; Serebrennikov and Kert 1958: 8 ff; Hajdú 1968 : 154).

It should be noted that the third possibility has the least number of adherents. The problem is only to what extent this is justified. If we remove the quantity factor from the paradigmatic plane, we have to shift it to the syntagmatic one. The lack of syntagmatic contrast between two neighbouring vowels may, however, be one of the factors contributing to their perceptive indivisibility.

The phonemic system of a language may be approached from various theoretical positions. The choice of an appropriate model for description should be determined by the goal for which a given model is being constructed. For our subsequent considerations we have decided to use the system containing sixteen vowel phonemes because we intuitively feel that for language teaching and learning the maximal phonemic system is the most convenient. Moreover, long vowels seem to be perceived by native speakers of Finnish as indivisible entities and so exist as abstract mental images in the brain. Independent syntagmatic analysis of two identical phonemes, i.e., without relying on paradigmatic information is hardly possible because of the lack of syntagmatic contrast. And this lack of syntagmatic contrast may contribute to the monophonematic interpretation of long vowels.

II. *Inventory of Finnish vowel phonemes*

Table 1

Phonemes	Allophones	Examples
/i/	[i]	*lika* 'dirt'; *sima* 'honey'; *oppi* '(he) learned';
/i:/	[i:]	*liika* 'excess'; *siima* 'line'; *oppii* '(he) learns';
/e/	[e]	*te* 'you' pl.; *esti* '(he) prevented'; *tule* 'come' imper.;
/e:/	[e:]	*tee* 'tea'; *Eesti* 'Estonia'; *tulee* '(he) comes';
/æ/	[æ]	*käry* 'smell'; *värin* 'color' Gsg.; *mätä* 'rotten';
/æ:/	[æ:]	*kääry* 'roll'; *väärin* 'wrong'; *mätää* 'of rotten';
/ü/	[ü]	*ryppy* 'wrinkle'; *typpi* 'nitrogen'; *synty* 'birth';
/ü:/	[ü:]	*ryyppy* 'drink'; *tyyppi* 'type'; *syntyy* 'is born';
/ö/	[ö]	*pöllö* 'owl'; *löytö* 'discovery';
/ö:/	[ö:]	*insinööri* 'engineer'; *Töölö* 'district of Helsinki'; *löytöön* 'discovery' Illsg.;
/u/	[u]	*tuli* 'fire'; *uni* 'sleep'; *kulo* 'wild fire';
/u:/	[u:]	*tuuli* 'wind'; *uuni* 'oven'; *kuulo* 'hearing';
/o/	[o]	*kota* 'hut'; *koppi* 'box'; *sano* 'say' impor. sg.
/o:/	[o:]	*koota* 'collect'; *kooppi* 'spool'; *sanoo* 'says'
/a/	[a]	*kari* 'rock'; *takka* 'fire place'; *sata* 'hundred';
/a:/	[a:]	*kaari* 'curve'; *taakka* 'burdon'; *sataa* 'it is raining';

III. *The system of paradigmatic*[1] *oppositions in Finnish*

The number of sixteen vowel phonemes in Finnish makes necessary four binary decisions in order to distinguish a given vocalic phoneme from every other one. This results from the equation H=ld m (i.e., H=ld 16=4). Thus the minimal number of relevant binary distinctive features to define a particular vowel in the Finnish vowel system equals 4. Of course, this number would be smaller in terms of ternary distinctive features. But it is a well known fact that languages are redundant and redundancy is also present at the phonemic level. On account of this the diacritic system employed in phonemics makes use of a larger number of distinctive features than the minimum required.

From the articulatory (kinemic[2]) point of view the oppositions between vowels in a language may be created along several dimensions which result from the co-operation of various positions of articulators (moveable organs) and various points of articulation (non-moveable organs) as well as from tension in the vocal tract and the duration of an articulatory position in time.

For the Finnish vowel system it is necessary to distinguish the following six articulatory dimensions: (1) duration in time; (2) the horizontal position of the tongue; (3) the place of articulation; (4) the position of the lips; (5) the degree of supraglottal aperture; (6) the vertical position of the tongue.

(1) *Duration in time* conditions the quantity opposition *short* vs. *long*. In Finnish every short vowel phoneme has its long counterpart. Thus there are two series of vowels based on this opposition:

short			long		
/i/	/ü/	/u/	/i:/	/ü:/	/u:/
/e/	/ö/	/o/	/e:/	/ö:/	/o:/
/æ/		/a/	/æ/		/a:/

This distinction does not depend on stress, i.e., it is preserved also in unstressed syllables (cf. *sata* "hundred" vs. *sataa* "it is raining").

(2) *The horizontal position of the tongue*, i.e., the location of the highest part of the tongue in the oral cavity in the horizontal plane, is the dimension according to which we recognize the opposition between *front* and *back* vowels:

front				back	
/i/	/i:/	/ü/	/ü:/	/u/	/u:/
/e/	/e:/	/ö/	/ö:/	/o/	/o:/
/æ/	/æ:/			/a/	/a:/

[1] About the paradigmatic and syntagmatic relationship see Hjelmslev (1943:34).

[2] In the sense of kinemas, a term introduced by Baudouin de Courtenay.

The articulation of front vowels is connected with shifting the body of the tongue forward while the front of the tongue is raised against the hard palate. In articulating back vowels the tongue is retracted and its middle or back part is raised in the direction of the soft palate (velum) and/or back wall of the pharynx (Sovijärvi 1963 : 13 ff.).

(3) *The place of articulation* leads to the arrangement of vowels corresponding to that given in point (2). We have here to do with the opposition *palatal* vs. *velar*:

palatal				velar	
/i/	/i:/	/ü/	/ü:/	/u/	/u:/
/e/	/e:/	/ö/	/ö:/	/o/	/o:/
/æ/	/æ:/			/a/	/a:/

(4) *The position of the lips*, or the degree of rounding. In accordance with this dimension two series of vowels are also distinguished: *labialized* (rounded) and *non-labialized* (unrounded):

non-labialized		labialized			
/i/	/i:/	/ü/	/ü:/	/u/	/u:/
/e/	/e:/	/ö/	/ö:/	/o/	/o:/
/æ/	/æ:/				
/a/	/a:/				

The distinction *rounded* vs. *unrounded* is phonemically significant in Finnish unlike in English or Polish in which the labialization is always a concomittant feature of the back vowels. In Finnish the labialization concerns not only back vowels but also the front ones.

(5) *The degree of supraglottal aperture*. The opposition *close* vs. *semi-close* vs. *open* in Finnish is based on this dimension.

close	/i/	/i:/	/ü/	/ü:/	/u/	/u:/
semi-close	/e/	/e:/	/ö/	/ö:/	/o/	/o:/
open	/æ/	/æ:/			/a/	/a:/

(6) *The vertical position of the tongue*, i.e., the location of the highest part of the tongue in the oral cavity in the vertical plane. Along this dimension is arrived at the same arrangement of vowel phonemes as is the case with the degree of supraglottal aperture. Thus the vertical position of the tongue corresponds to the degree of supraglottal aperture and the features originating along both the dimensions are mutually dependent, i.e., *high* is associated with *close*, *mid*, with *semi-close* and *low* with *open*.

high	/i/	/i:/	/ü/	/ü:/	/u/	/u:/
mid	/e/	/e:/	/ö/	/ö:/	/o/	/o:/
low	/æ/	/æ:/			/a/	/a:/

The distinctive features along dimensions (1), (2), (3) and (4) are binary; those along (5) and (6), which in addition correspond to each other, are ternary. Moreover, it is worth notice that the opposition along the dimension of tension in the vocal tract (*tense* vs. *lax*) as well as that of the position of velum (*oral* vs. *nasal*) are not phonemically relevant in Finnish.

Finnish phonemes may be encoded with the help of eight distnctive features which comprise aredundant and redundant ones. One ternary decision may be reduced to two binary decisions; thus the opposition *high* vs. *mid* vs. *low* is reducible to: *mid* vs. *non-mid*; *high* vs. *low*.

Table 2

Articulatory distinctive features (binarily arranged) \ Phonemes	i	i:	e	e:	æ	æ:	ü	ü:	ö	ö:	u	u:	o	o:	a	a:
short : long	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+
front : back	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+
palatal : velar	−	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+
unrounded : rounded	−	−	−	−	−	−	+	+	+	+	+	+	+	+	−	−
semiclose : non-semiclose	+	+	−	−	+	+	+	+	−	−	+	+	−	+	+	+
close : open	−	−			+	+	−	−			−	−			+	+
mid : non-mid	+	+	−	−	+	+	+	+	−	−	+	+	−	−	+	+
high : low	−	−			+	+	−	−			−	−			+	+

IV. *Inventory of Polish vowel phonemes*

If the suggestion could be accepted that every oral phoneme has its nasal counterpart in the Polish vowel system, then the inventory of Polish vowel phonemes would consist of the ten following items:

Table 3

Phonemes	Allophones	Examples
/i/	[i]	*pila* [ˈpiwa] 'saw'; *sito* [ˈcito] 'sieve';
	[j]	*pył* [pjw] 'dust'; *typ* [tip] 'type';
/ĩ/	[ĩ][iu̯][iŋ]	*winszować* [ˈvĩʃovaʨ̃, ˈviɲʃovaʨ̃] 'to congratulate'; *wĩęzła* [ˈvĩda, ˈviɲda] 'lift'; *finka* [ˈfĩka, ˈfiŋka] 'bowie knife';
	[i̯] [in] [iŋ]	*czynsz* [ʧ̃ĩʃ, tʃ̃inʃ] 'rent'; *syndykat* [sĩdikat, sindikat] 'syndicate'; *tynk* [tĩk, tiŋk] 'plaster';
/ɛ/	[ɛ]	*lek* [lɛk] 'drug'; *wiek* [ˈvɛk] 'century, age';
	[e]	*siedzi* [ɕɛd̑ʑi] 'he) is sitting';
/ɛ̃/	[ɛ̃][ɛm][ɛŋ]	*kęs* [kɛ̃s, kɛns] 'piece, bit'; *pęto* [pɛ̃to, pɛnto] 'fetter'; *ręka* [rɛ̃ka, rɛŋka] 'hand';

Phonemes	Allophones	Examples
/u/	[u]	*lud* [lut] 'people, nation'; *kura* [kura] 'hen';
/ũ/	[ũ][un][ɯŋ]	*kunszt* [kũʃt, kunʃt] 'masterly skill'; *fundusz* [fũduʃ, fɯnduʃ] 'fund'; *punkt* [pũkt, puŋkt] 'point';
/ɔ/	[ɔ] [o]	*oko* [ɔkɔ] 'eye'; *sok* [sɔk] 'juice'; *ciocia* [t͡ɕo͡ɕa] 'auntie';
/ɔ̃/	[ɔ][ɔn][ɔŋ]	*węż* [vɔ̃ʃ, vɔnʃ] 'snake'; *kąt* [kɔ̃t, kɔnt] 'angle'; *pąk* [pɔ̃k, pɔŋk] 'bud';
/a/	[a] [ɐ]	*mak* [mak] 'poppy'; *kat* [kat] 'executioner'; *dziadzio* [dʑɐdʑo] 'grandpa';
/ã/	[ã][an][aŋ]	*awans* [avãs, avans] 'promotion'; *kant* [kãt, kant] 'arris, edge'; *bank* [bãk, baŋk] 'bank'

V. *The system of paradigmatic oppositions in Polish*

The following six dimensions account for relevant distinctions among Polish vowel phonemes: (1) the position of the velum; (2) the horizontal position of the tongue; (3) the position of the lips; (4) the place of articulation; (5) the degree of supraglottal aperture; (6) the vertical position of the tongue.

(1) *The position of the velum* is the source of binary opposition *oral* vs. *nasal* which affects all Polish vowels:

oral	nasal
/i/ /u/	/ĩ/ /ũ/
/ɛ/ /ɔ/	/ɛ̃/ /ɔ̃/
/a/	/ã/

The nasality of vowels is connected with the lowering of the velum which opens the passage to the nasal cavity allowing the air to escape through the nose during the articulation of a vowel or its part.

Usually only two nasal vowel phonemes /ɛ̃/and /ɔ̃/ are posited for Polish. Their allophones [ɛ̃] and [ɔ̃] appear before all consonants. Before stops and affricates, rarely before spirants, [ɛ̃] and [ɔ̃] are often resolved into *oral vowel+ nasal consonant*. In the same manner the remaining nasal vowel phonemes i.e. /ĩ/, /ũ/, /ã/ behave on the allophonic level and so /ɛ̃/ and /ɔ̃/ are no exceptions to the rule. Even in final position occur [ĩ ã ũ] (cf. *čego pã χcɛ* "what do you want"; *mamĩ synek* "sissy"; *sũ zɯapaɯ śɛ* "catfish was caught"). Thus we do not agree with those statements according to which nasal vowels are quite impossible before affricates and plosives and that their pronunciation in these positions is highly artificial. Therefore, in interpreting nasal vowels in Polish we could follow two alternative solutions:
(1) either to assume only oral vowels while accounting for nasal vowels as

the allophonic realization of the combination *oral vowel+nasal consonant*;
(2) or to postulate for every oral vowel its nasal counterpart interpreting the combination *oral vowel + nasal consonant* as the main variphonic realization of the nasal vowel phoneme before affricates and stops.

The former solution is hardly probable because of such word-final oppositions as e.g.: *te* [tɛ] 'these' Npl. fem. vs. *tę* [tɛ̃, tɛ] 'this' Acc. sg. fem. vs. *ten* [tɛn, tɛ̃] 'this' Nsg. masc.; *to* [tɔ] 'this' NAcc. sg. neutr. vs. *tą* [tɔ̃, tɔ] 'this' Acc. sg. fem. vs. *ton* [tɔn, tɔ̃] 'tone'.

There are different approaches to phonematic interpretation of nasal vowels in Polish (cf. Szober 1931[3] : 47 ff; Gaertner 1931 : 30 f; Troubetzkoy 1949 : 194; Benni 1964[2] : 36 ff; Klemensiewicz 1939–44 : 19; Trager 1938; Folejewski 1956; Šaumjan 1951 : 401 ff.; Stankiewicz 1956 : 519 f; Milewski 1973 : 157; Stieber 1948 : 59 ff.; Stieber 1966 : 102 ff.; Kučera 1968; Schenker 1954; Jassem 1958 : 304 ff., Łobacz 1971). In the present paper we have decided the matter in favor of alternative (b) which better fits the principle of symmetry but which may be considered from the point of view of the traditionally accepted Polish vowel system as an exercise in phonemic extravagance. One cannot deny that such an interpretation of nasal vowels is a bit arbitrary because of the complete lack of paradigmatic opposition between /ĩ ũ ã/ and /in un an/ respectively.

There is no doubt that [ĩ ũ ã] and [in un an] represent one and the same mental entity, i.e., phoneme, respectively. Schoolchildren regularly mix up *ę* with *en*, *ą* with *om* in spelling (cf. Bułczyńska-Zgółka 1975). There is, however, a problem what kind of phonemic interpretation native speakers resort to. It may be that this interpretation is at the moment a little unstable. Putting this differently, one can ask a question if native speakers perceive here one phoneme, i.e., *nasal vowel*, or a combination of two phonemes, i.e., *oral vowel + nasal consonant*.

The developing morphological opposition *momentaneous* vs. *frequentative* and *durative* vs. *frequentative* which are based upon the distinction /ɔ̃/ vs. /ã/ seem to bear a convincing evidence in support of monophonematic interpretation; cf. *łączyć* : *złączać*; *sączyć* : *wysączać*; *trącić* : *wytrącać*; *zakąsić* : *zakąszać*. These oppositions fit well into the productive alternation pattern in which verbal roots expressing durative or momentaneous action display /ɔ/, while the roots expressing frequentative action have /a/; cf. *chodzić* : : *chadzać*; *topić* : *przetapiać*; *skoczyć* : *skakać* (Szober 1963 : 35). Thus /ɔ/ relates to /a/ as /ɔ̃/ to /ã/.

In addition, our approach finds certain confirmation on the intralingual level. Namely, this agrees with the observations made by foreign speakers who lack nasal vowel phonemes in their language, e.g. Germans or Englishmen, that Poles tend to pronounce nasal vowels instead of the combination *oral*

vowel+nasal consonant when learning the respective foreign languages (cf. e.g. German *Land* [lant] being pronounced as [l$\tilde{a}$t] or English *month* being pronounced as [m$\tilde{a}$θ]). It seems as if this tendency in pronunciation derives from different phonemic status of nasal vowels, i.e., from the existence of nasal vowel phonemes in Polish and not merely from the allophones [$\tilde{i}$ $\tilde{\varepsilon}$ $\tilde{a}$ $\tilde{ɔ}$ $\tilde{u}$] of the respective oral phonemes.

The allophones of nasal vowels seem to acquire often a diphthongal nature being then transcribed as [i$\tilde{w}$ ɛ$\tilde{w}$ a$\tilde{w}$ ɔ$\tilde{w}$ u$\tilde{w}$], i.e., oral vowel followed by nasal glide. This phenomenon results from the asynchronic articulation of oral and nasal element. The onset of the latter is delayed (cf. Dłuska 1950: 53; Jassem 1951 : 97; Schenker 1954; Benni 1959[2] : 36 f.; Doroszewski 1963: 90; Biedrzycki 1963 : 35; Wierzchowska 1971 : 134 ff.; Biedrzycki 1972 : 42; Gussmann 1974 : 107 f.).

(2) *The horizontal position of the tongue* in Polish conditions the ternary opposition *front* vs. *central* vs. *back*:

front	central	back
/i/ /$\tilde{i}$/		/u/ /$\tilde{u}$/
/ɛ/ /$\tilde{ɛ}$/	/a/ /$\tilde{a}$/	/ɔ/ /$\tilde{ɔ}$/

Certain classification problems within this dimension are caused by /a/ which is sometimes thought of as a back vowel (cf. Dłuska 1950 : 38; Klemensiewicz 1070[6]: 19; Szober 1931: 19 f.; Benni et al. 1923 : 24 ff.). In the neighborhood of palatal sounds the articulation of [ɛ a ɔ] is shifted more to the front which creates, consequently, their advanced and more palatal variants: [e æ o] (cf. *nieś* [ɲeɕ]; *siać* [ɕætɕ]; *ciocia* [tɕotɕa]).

(3) *The position of the lips*. The articulation of back vowels is linked always to the rounding of the lips, while for all front vowels the spreading of the lips is characteristic. Accordingly, we get along this dimension a ternary opposition which overlaps with that in (2):

spread	neutral	rounded
/i/ /$\tilde{i}$/		/u/ /$\tilde{u}$/
/ɛ/ /$\tilde{ɛ}$/	/a/ /$\tilde{a}$/	/ɔ/ /$\tilde{ɔ}$/

(4) *The place of articulation* serves as basis for distinguishing *palatal* and *velar* vowels:

palatal	velar
/i/ /$\tilde{i}$/	/u/ /$\tilde{u}$/
/ɛ/ /$\tilde{ɛ}$/	/ɔ/ /$\tilde{ɔ}$/
	/a/ /$\tilde{a}$/

(5) *The degree of supraglottal aperture* results in the ternary opposition *close* vs. *semiopen* vs. *open*:

close	/i/ /u/	/$\tilde{i}$/ /$\tilde{u}$/
semiopen	/ɛ/ /ɔ/	/$\tilde{ɛ}$/ /$\tilde{ɔ}$/
open	/a/	/$\tilde{a}$/

(6) *The vertical position of the tongue*. On the scale of this dimension we arrive at the same classification as in (5). This means that one of these dimensions is redundant:

high	/i/ /u/	/$\tilde{i}$/ /$\tilde{u}$/
mid	/ɛ/ /ɔ/	/$\tilde{ɛ}$/ /$\tilde{ɔ}$/
low	/a/	/$\tilde{a}$/

The distinctive features based on dimension (1) and (4) are binary; the rest, i.e., those based on dimension (2), (3), (5) and (6) are ternary. It is also to be remembered that the dimension of tension in the vocal tract (*tense* vs. *lax*) and duration in time have no significance in the organization of Polish vowel system.

Polish phonemes may be encoded with the help of ten binary distinctive features which embrace aredundant and redundant ones in the following way:

Table 4

Articulatory distinctive features (binary arranged) \ Phonemes	i	$\tilde{i}$	ɛ	$\tilde{ɛ}$	u	$\tilde{u}$	ɔ	$\tilde{ɔ}$	a	$\tilde{a}$
oral : nasal	−	+	−	+	−	+	−	+	−	+
central : non-central	+	+	+	+	+	+	+	+	−	−
front : back	−	−	−	−	+	+	+	+		
neutral : non-neutral	+	+	+	+	+	+	+	+	−	−
spread : rounded	−	−	−	−	+	+	+	+		
palatal : velar	−	−	−	−	+	+	+	+	+	+
semiopen : non-semiopen	+	+	−	−	+	+	−	−	+	+
close : open	−	−			−	−			+	+
mid : non-mid	+	+	−	−	+	+	−	−	+	+
high : low	−	−			−	−			+	+

VI. *An attempt to compare the Finnish and Polish vowel systems*

The principles which the vowel system rests on in Finnish and Polish partly differ and partly coincide. They could be subdivided in the following way:

(1) The oppositions which are peculiar to Finnish:
  (a) short vs. long
  (b) non-labialized vs. labialized;
(2) The opposition which is peculiar to Polish:
  (a) oral vs. nasal;
(3) The opposition based on the degree of supraglottal aperture coincides in Finnish and Polish in that there is a three-series scale in both languages. But Finnish semiclose vowels are more closed than Polish semiopen ones.
(4) In Finnish the horizontal position of the tongue results in a binary opposition *front* vs. *back* while in Polish there is a ternary opposition *front* vs. *central* vs. *back*. To be stressed here is the fact that in Polish there is no equivalent to Finnish /æ/ which is very open, approaching almost the aperture of /a/.

The considerable differences between the vowel systems compared above cause Polish speakers learning Finnish to face serious difficulties which emerge on the phonemic as well as on the allophonic plane. The former are consequent on the lack of oppositions: *short* vs. *long* and *rounded* vs. *unrounded* as well as on the non-distinctiveness /æ/ vs. /a/ and /æ/ vs. /ɛ/ in Polish. A primarily allophonic difficulty will be caused by the lack of articulatory equivalence between Finnish semiclose vowels and Polish semiopen ones. Thus Poles will tend to substitute short for long, unrounded for rounded, /ɛ/ or /a/ for /æ/, semiopen for semiclose.

Finns, on the other hand, will meet fewer difficulties while learning Polish. Certain pronunciation errors may originate from the existence of the opposition *oral* vs. *nasal* although in Finnish nasalization of vowels is a known phenomenon at the allophonic level. It occurs regularly in the environment of nasal consonant (Wiik 1965 : 143). In addition to this Finns may have problems in mastering the correct articulatory nature of the Polish semiopen vowels, and they will tend to substitute rounded [ü] for Polish unrounded [i].

REFERENCES

Benni, T. 1964[2]. *Fonetyka opisowa języka polskiego*. Wrocław–Warszawa–Kraków: Ossolineum.

Benni, T., Łoś, J., Nitsch, K., Rozwadowski, J., Ułaszyn, H. 1923. *Gramatyka języka polskiego*. Kraków: PAU.

Biedrzycki, L. 1963. "Fonologiczna interpretacja polskich głosek nosowych". *B PTJ 22*. 25–45.

— 1972. *Polnische Aussprache*. Warszawa: Wiedza Powszechna.

Birnbaum, H. 1963. "Reinterpretacje fonologiczne nosówek słowiańskich (Na podstawie materiału prasłowiańskiego, starosłowiańskiego i polskiego)". *American contributions to the fifth international congress of slavists*, Sofia. September 1963. The Hague: Mouton. 27–48.

Bułczyńska-Zgółka, H. 1975. "Z badań nad językiem młodego pokolenia za Ziemiach Zachodnich". Rocznik Lubuski (in print).

Collinder, Bj. 1957. *Survey of the Uralic languages*. Stockholm: Almqvist and Wiksell.

Dłuska, M. 1950. *Fonetyka polska*. Kraków: Wydawnictwo Studium Słowiańskiego Uniwersytetu Jagiellońskiego.

Doroszewski, W. 1963[2]. *Podstawy gramatyki polskiej*. Warszawa: PWN.

Dukiewicz, L. 1967. *Polskie głoski nosowe*. Warszawa: PWN.

Enkvist, N. E. 1962. "*The choice of transcription in foreign-language teaching*". Proceedings of the 4th international congress of phonological society. The Hague: Mouton. 586–589.

Folejewski, Z. 1956. "The problem of Polish phonemes". *Scando-Slavica 2*. 87–92.

Gaertner, H. 1931. *Gramatyka współczesnego języka polskiego*. Część I. Lwów–Warszawa: Książnica-Atlas.

Gussmann, E. 1974. "Nasality in Polish and English". *Papers and studies in contrastive linguistics 2*. 105–122.

Hajdú, P. 1968. Über den Umfang des uralischen Wortschatzes". *Congressus Secundus Internationale Fenno-Ugristarum. Pars I*. Helsinki: Societas Fenno-Ugrica. 150–160.

Harms, R. T. 1960. "Stress and juncture in Finnish". *American studies in Uralic linguistics*. S-Gravenhage: Mouton. 7–12.

Hjelmslev, L. 1943. *Omkring sprogteoriens grundlaeggelse*. København: Københavns Universitet.

Itkonen, T. 1968. "Itäsuomalaisen liudennuksen fonologinen paradoksi". *Fenno-Ugrica. Juhlakirja Lauri Postin 60-vuotispäiväksi*. MSFOu 145. Helsinki. 76–103.

Jassem, W. 1951. *Wymowa angielska*. Warszawa: PZWS.

— 1956. "Węzłowe zagadnienia fonetyki". *BPTJ 15*. 13–30.

— 1958. "A phonologic and acoustic classification of Polish vowels". *ZfPhon. und allg. Sprachwiss. 11. 4*.

— 1966. "The distinctive features and the entropy of the Polish phoneme system". *BPTJ 24*. 87–108.

Karlsson, F. 1969. "Suomen yleiskielen segmentaalifoneemien paradigma". *Virittäjä* 4. 351–361.

Klemensiewicz, Z. 1939–40. "System fonologiczny i morfologiczny współczesnej polszczyzny kulturalnej". *Sprawozdania PAU XLV*. 18–20.

— 1970[6]. *Podstawowe wiadomości z gramatyki języka polskiego*. Warszawa: PWN.

Kučera, H. 1958. "Inquiry into coexistent phonemic system in Slavic languages" *American contributions to the fourth international congress of slavicists*. Moscow, September 1958. 'S-Gravenhage: Mouton. 169–189.

Lehtonen, J. 1970. *Aspects of quantity in Standard Finnish*. Jyväskylä. Gummerus.

Łobacz, P. 1971. "Entropia oraz parametry akustyczne jako kryteria interpretacji fonetycznej". *BPTJ 29*. 77–93.

Malmberg, B. 1944. "Die Quantität als phonetisch-phonologischer Begriff". Lunds Universitets Årskrift N. F. Avd. 1. Bd. 41. Nr 2.

— 1962. "Levels of abstraction in phonetic and phonemic analysis. *Phonetica 8*. 220–243.

Milewski, T. 1949. "Derywacja fonologiczna". *BPTJ 9*. 43–57.

— 1973. *Introduction to the study of language*. The Hague: Mouton.

Morciniec, N., Prędota, S. 1973. *Fonetyka kontrastywna języka niemieckiego*. Warszawa–Wrocław: PWN.

Raun, A. 1963. *Johdatusta strukturaalikielitieteeseen*. Helsinki: Suomalaisen Kirjallisuuden Seura.
Robins, R. H. 1965². *General linguistics: an introductory survey*. London: Longmans.
Sauvageot, A. 1949. *Esquisse de la langue finnoise*. Paris: Klincksieck.
Schenker, A. 1954. "Polish conjugation". *Word 9*. 469–481.
Sebeok, Th. E. 1944. "Phonemes and orthography in Finnish". *Acta Linguistica 4*. 130–135.
Серебренников, Б. А., Керт, Г. М. (eds.). 1958. *Грамматика финскова языка*. Москва – Ленинград: Изд. Академии наук СССР.
Sovijärvi, A. 1961. *Yleisen fonetiikan peruskurssi*. Helsinki: Monistettu.
— 1963. *Suomen kielen äännekuvasto*. Jyväskylä: Gummerus.
— 1966. "Suomen yleiskielen foneemien luontaisista vastakohtapiirteistä". *Virittäjä* 2. 189–196.
Stankiewicz, E. 1956. "The phonemic patterns of the Polish dialects". *For Roman Jakobson*. The Hague: Mouton. 518–530.
— 1958. "Towards phonemic typology of the Slavic languages". *American contributions to the fourth international congress of slavicists*. Moscow, September 1958. 'S-Gravenhage Mouton. 301–319.
Stieber, Z. 1948. „Dwa problemy polskiej fonologii". *BPTJ*. 56–78.
— 1966. *Historyczna i współczesna fonologia języka polskiego*. Warszawa: PWN.
Шаумян, С. К. 1951. „Система гласных фонем современного польсково литературного языка." *Ученые записки Института Славяноведения III*. 394-406.
Szober, S. 1931³. *Gramatyka języka polskiego. Część 2. Głosownia*. Warszawa: M. Arct, S.A.
— 1963. *Gramatyka języka polskiego*. Warszawa: PWN.
Trager, G. L. 1938. "La systèmatique des phonèmes du polonais". *Acta Linguistica 1*. 179–188.
Troubetzkoy, N. S. 1949. *Principes de phonologie*. Paris: Klincksieck.
Wierzchowska, B. 1971². *Wymowa polska*. Warszawa: PZWS.
Wierzchowska, B., Wierzchowski, J. 1969. "Nasal phonemes and their realization in Polish". *Study of sounds 14*. 397–406.
Wiik, K. 1965. *Finnish and English vowels*. Turku: Turun Yliopisto.
Zagórska-Brooks, W. 1968. *Nasal vowels in contemporary standard Polish*. The Hague: Mouton.
Zwoliński, P. 1951. „Dokoła fonemów potencjalnych". *Lingua Posnaniensis 3*. 323–339.