SOME REMARKS ON GENERATIVE CONTRASTIVE PHONOLOGY

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0.0. In contrastive studies as well as in any other field the choice of a model on which the research is based is essential. In this article I shall briefly discuss some of the theoretical assumptions of generative phonology summarized by Chomsky and Halle (1968) and then apply their model to an important problem in Polish-English contrastive studies. Those assumptions have remained essentially unchanged and generative phonologists concentrated on minor problems rather such as notational conventions to make their rules look concise, pretty, and elegant (Kim 1971 : 76). Even Hill and Nessly (1973) in their review of *The sound pattern of English* do not concentrate on the theoretical basis. In such a situation a number of pseudo-problems have arisen, e.g., what should be the underlying representation of the Russian form *čas* "hour" /kēs/, /čēs/, or /čās/? (Lightner 1971: 522–523). This was a natural consequence of the underlying representation model.

1.0. Although Chomsky and Halle's model has some advantages over the traditional approaches (for discussion see Kiparsky 1968), available data should not be ignored, i.e., formalism and simplicity must not be more important that attested language forms. In their list of English vocalic segments Chomsky and Halle give only monophthongs (1968:176) from which they derive all diphthongs on the phonetic representation level. They also derive [ɔy] from some /ǣ/, which is against all we know about the history of English. This diphthong was borrowed during the Middle English period and though its quality is not certain (cp. *puint/point* (Fisiak 1968 : 54–55)), it has never been a monophthong. Chomsky and Halle (1968 : 19) offer the following explanation: "Hence the lexical redundancy rules will be much simplified if we can represent [ɔy], too, as a monophthong V* on the lexical level". The whole paragraph 4.3.3. (1968 : 191–192) is a perfect example of a hocus pocus analysis.

Let us consider the following hypothetical model. One may not recognize diphthongs as "deep structure" units and maintain that in the brain there are only monophthongs. Diphthongs appear therefore only on the level of actual articulation. In other words, diphthongs are in the mouth of the speaker, not in his brain. Then the procedure proposed by Chomsky and Halle would fit the model, which remains internally consistent. But when Chomsky and Halle recognize the existence of diphthongs but do not introduce them to the underlying representation because it would spoil the rules, then, in my opinion, linguistic science is being forsaken.

1.1. Formalism is equally dangerous in diachronic linguistics. Discussing the First Sound Shift Voyles (1967) formulates a number of ordered rules which generate neatly the Proto-Germanic system from the Proto-Indo-European system. Voyles tries to give the impression that he pays attention to relative chronology, i.e., the order in which his rules apply agrees with the historical ordering of the changes. In his use of authorities on the subject, Voyles chooses at random: he accepts or rejects the opinion of the same linguist as it suits him. This is a methodological drawback; the First Sound Shift was not merely a series of changes — it should be rather viewed as a process during which one system changed into another. Therefore one must either accept one linguist's theory of the relative chronology of the change or reject it entirely.

The relative chronology is not, however, Voyles' main concern. he is interested in the rules themselves: "If one puts Rule 5 anywhere before Verner's Law, that rule is increased by one feature" (1967 : 646). and: "The rules are greatly complicated if one assumes a change of IE *p* to labiodental *f* at the same time as *t* becomes *p*. etc." (1967 : 654). Such an approach deprives generative phonology of the explanatory value. the lack of which the followers of this model criticize in other schools.

1.2. A new trend in American phonology. the so-called "natural phonology". turns back to the older European tradition, which combines a structural description of the data with explanatory adequacy (cf. Zabrocki 1960, 1961). For example. Stampe (1972:581) rediscovers such natural laws of diphthongization as: "Diphthongization ... is therefore to be understood as a polarization of color".

2.0. The existence of the phonemic level is one of the central problems in generative phonology. Chomsky and Halle deny the existence of the phoneme and the phonemic level since these have not been demonstrated (1968 : 11). The developments in neurophonetics seem to support their view (Koževnikov and Čistovič 1965, Ohala 1970). Such experiments point out that the smallest unit both of speech production and speech perception is the syllable, or perhaps the word ("deep structure" word?). Spoonerisms like *Calarerie→Cararerie* (Kim 1971 : 54) show that information about the

following syllable is sent simultaneously with the command to pronounce the preceding syllable. It has not yet been convincingly demonstrated whether the neural command sent off by the brain says: pronounce /tu/, or pronounce /t+u/. In perception we still do not know for certain by what feature(s) we distinguish, for example, /d/ and /t/: aspiration, voicing, or tenseness. The brain must, however, store some knowledge about the units of production to send off the right command and the units of perception to identify then correctly (cp. Baudouin de Courtenay's 1910 concept of kinema and akusma). These units must be identical in order to speak and understand a language.

2.1. Thus it becomes extremely important that we be able to identify just those features by which units are identified. Chomsky and Halle's features do not seem to be universal, and they are also "surface" features not essentially different from those proposed by traditional phoneticians and phonologists. An example of a "deeper" feature (perhaps THE feature) was given by Maran (1971), who proposed four glottal features (raised, lowered, spread, and constricted) dispensing with voicing and pressure.

The specification of bilabial stops of various types in terms of glottal features (Kim 1971:98).

	aspirated	partially voiced	implosive	unaspirated	ejective	lax	creaky	voiced aspir.	fully voiced
	[pʰ]	Eng. initial [b]	[b]	Fr. [p]	[p']	Kor. [p*]	Hausa [ʔb]	[bʰ]	Fr.
raised	+	−	−	+	+	−	−	−	−
lowered	−	−	+	−	−	+	−	+	+
spread	+	−	−	−	+	−	+	−	−
constricted	−	−	+	−	+	−	−	−	−

Chomsky and Halle have many difficulties in dealing with what have been traditionally called semivowels and resonants. They try to escape these difficulties by introducing the feature Syllabic (Chomsky and Halle 1968 : 354). But they obscured the problem even more (for details see paragraph 4): the feature Syllabic is not universal, and, moreover, it is a functional feature which should be kept apart from such inherent features as Low, Back, etc. How can it be explained within the framework of Chomsky and Halle's model that the sequence [krvi] "blood" Gen. Sg. is dissyllabic in Serbo-Croatian and the sequence [krfi] is monosyllabic in Polish (cp. Standard Ukrainian *kryvavyj*, Carpathian Ukrainian *kyrvavyj* (Andersen 1972 : 33)). Here stress plays an important role: in Serbo-Croatian the [r] in [krvi] is stressed, in Polish it is not (Abele 1924–5).

One must admit, then, that each language has its specific features or, better, that each language chooses only some features out of a number of universal features. These, however, are still to be found.

2.2. Let us consider another example. Chomsky and Halle (1968 : 177) do not distinguish between the [t] in *ten* and the [t] in *try*, they have one segment /t/. Yet they will have to consider the problem of retroflexives in Norwegian, where /t d l n/ and /ţ ḍ ḷ ṇ/ seem to constitute different segments, e.g., /kat/ *katt* "cat": /kaţ/ *kart* "map", /fa:t/ *fat* "dish" : /fa:ţ/ *fart* "travelled" PP (Vogt 1939). In order to take care of the two different *t*'s in the English formus *ten* and *try*, Chomsky and Halle will have to provide rules which specify their pronunciation, i.e., phonetic representation. Such rules will surely not differ much from traditional phonemic analysis.

2.3. Moreover, the results at which generative phonologists arrive are practically the same as those achieved by traditional phonologists, e.g., Chomsky and Halle's list of English consonantal segments (for vocalic segments see 1.0.) differs from traditionalits' consonant phoneme inventory in only one respect, namely, Chomsky and Halle (1968 : 177) distinguish /x xʷ kʷ gʷ/. On this point they are difficult to follow: "... labialized (rounded) consonants are interpreted as sequences [kw], [gw], and [xw], ... (1968 : 223). Is then /kʷ/ one segment or a sequence of segments? — /w/ is given a separate segment in their list (1968 : 167). What is then the difference between the [w] derived from /w/ and the [w] of /kʷ gʷ xʷ/? Here Chomsky and Halle become victims of their own model.

3.0. Binary notation is another important issue in generative phonology. It does not always happen that language segments are clearly marked by plus or minus signs (cp. multi-valued feature system proposed by Ladefoged (1967, 1971), Fant (1969), Morin (1971)). More often we have to do with the intensity of a feature, e.g., syllabicity. Vowels are syllabic in all languages, resonants are regularly syllabic only in some languages, and even spirants may be regularly syllabic like in Bella Coola (Greenberg 1962) or in Eastern Sudanic languages (Tucker 1940). Similarly, vowels are not only either short or long, in some languages three levels are distinguished: short, half-long, and long (Cimochowski 1949). Thus the assignment of plus or minus signs is not always unarbitrary (cf. Pak 1972 : 34—35).

4.0. The application of Chomsky and Halle's model in contrastive studies involves a number of difficulties and sometimes makes such comparison fruitless.
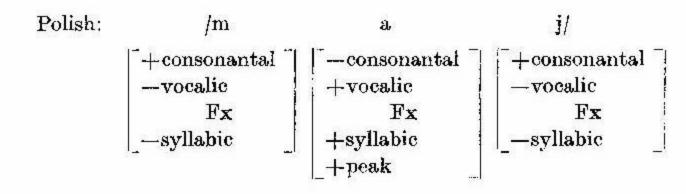
Let us consider Polish and English sequences of the type: Polish *maj* "May" and *bal (się)* "he was afraid" : English *my* and *bow*. These sequences are to be treated as identical on the phonetic representation level, apart, of course, from the differences in the place of articulation of the Polish and English segments. The fact that English *my* and *bow* are derived the under-

lying representations /mĭ/ and /bū/, respectively, does not explain the difference at all. The difficulty springs both from the wrong assignment of features and the rejection of diphthongs on the underlying representation level.
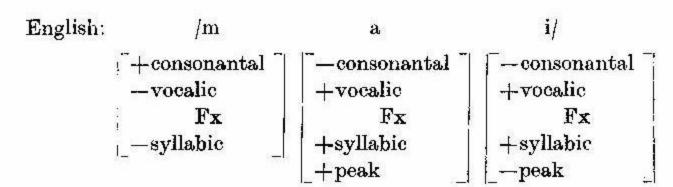
4.1. /w/ and /y/ should be marked as [+consonantal, —syllabic]; they are consonants because both are narrower than /i/, which marks the boundary (arbitrary or not) between two classes of sounds: vowels and consonants. It is true that in some contexts /w/ and /y/ become vowels, i.e., they change into /u/ and /i/, respectively, e.g., OE *bearu* "grove"←*barw-* (cp. *bearwes* Gen. Sg.). But the same process is characteristic of liquid and nasal consonants, e.g., Skt. *dātré* Dat. Sg. Masc. from *dātá* "one who gives": *dātṛné* Dat. Sg. Neutr. Why then should /w/ and /y/ be marked [—consonantal, —syllabic] and syllabic and nasal consonants [+consonantal, +syllabic]? (Chomsky and Halle 1968:354). I propose the following reassignment of the features in question:

(1) Stops (with instantaneous and delayed release): [+consonantal, —vocalic, ... Fx ... —syllabic]
(2) Spirants: [+consonantal, —vocalic, ... Fx ...—syllabic (+syllabic)]
(3) Resonants: [+consonantal, —vocalic, ... Fx ... ±syllabic]
(4) Semivowels: [+consonantal, —vocalic, ... Fx ... —syllabic]
(5) Vowels: [—consonantal, +vocalic, ... Fx ... +syllabic]

Fx stands for other features of articulation. The feature Syllabic is a functional feature and as such must be kept clearly apart from inherent features of articulation.

The feature Syllabic has to be extended, namely, by the feature Peak. Resonants (and spirants) when marked [+syllabic] are always [+peak]. With vowels the problem is different, and only /a/ is always [+syllabic, +peak] Other vowels can be both [+peak] and [—peak], e.g., in the English form *pit* /i/ is marked [+syllabic, +peak] while in the form *buy* (as the second element of the diphthong) it will be marked [+syllabic, —peak]. The feature Peak is directly connected with the degree of opening of the vocal tract; the principle is that the more open segment is marked [+peak]. Sometimes, however, other factors can change this principle, e.g., stress. In the English diphthong /iə/ the feature [+peak] is attached to the first less open element because of stress placement. This discrepancy between the [+peak] function and the degree of opening often causes the change of /iə/ into /jə/, i.e., the more open element becomes [+syllabic, +peak] since /j/ is marked [—syllabic].

4.2. Let us consider again Polish *maj* and English *my*. They may be marked as follows:

Polish: /m   a   j/

$$\begin{bmatrix} +\text{consonantal} \\ -\text{vocalic} \\ \text{Fx} \\ -\text{syllabic} \end{bmatrix} \quad \begin{bmatrix} -\text{consonantal} \\ +\text{vocalic} \\ \text{Fx} \\ +\text{syllabic} \\ +\text{peak} \end{bmatrix} \quad \begin{bmatrix} +\text{consonantal} \\ -\text{vocalic} \\ \text{Fx} \\ -\text{syllabic} \end{bmatrix}$$

English: /m   a   i/

$$\begin{bmatrix} +\text{consonantal} \\ -\text{vocalic} \\ \text{Fx} \\ -\text{syllabic} \end{bmatrix} \quad \begin{bmatrix} -\text{consonantal} \\ +\text{vocalic} \\ \text{Fx} \\ +\text{syllabic} \\ +\text{peak} \end{bmatrix} \quad \begin{bmatrix} -\text{consonantal} \\ +\text{vocalic} \\ \text{Fx} \\ +\text{syllabic} \\ -\text{peak} \end{bmatrix}$$

The above brings us to the definition of the diphthong as a combination of two vocalic segments, one which is marked [+syllabic, +peak], the other [+syllabic, —peak]. Now the difference between these Polish and English sequences is quite clear: in Polish there are no segments marked [+syllabic, —peak] and hence there are no diphthongs. On the other hand, English has segments marked [+syllabic, —peak] and hence it has diphthongs.

4.3. The solution proposed in 4.2. is possible even within the framework of Chomsky and Halle's (1968) model. The feature Peak may be also introduced in the form of feature redundancy rules proposed by Vennemann and Ladefoged (1973). I feel, however, that the introduction of diphthongs to the underlying representation level would certainly add to the explanatory adequacy of the model even though rules may become more complicated. Anyway, in its present form Chomsky and Halle's model can hardly be applied to contrastive studies.

5.0. In the article I tried to show that the advantages of generative phonology over traditional phonemics in synchronic, diachronic, and comparative studies are not so obvious as often believed. It should be remembered that Chomsky and Halle's criticism of phonemic theory and phonemic analysis concerns first of all the American school, which represented the extreme pole; some of European phoneme theories are more "acceptable" (cf. Zabrocki 1962; Kortland 1973). Those critical remarks, however, do not automatically put the author of this article on the side of traditionalists in phonemics. I intended only to indicate the weak points of generative phonology. Chomsky and Halle (1968: 400) admit that "the entire discussion of phonology in this book (i.e., *The sound pattern of English*) suffers from a fundamental theoretical inadequacy". This modest statement, is, unfortunately, true.

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