ZESZYTY NAUKOWE WYŻSZEJ SZKOŁY PEDAGOGICZNEJ
W RZESZOWIE

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WHAT GOVERNS PHONOLOGY

Introduction

For many years Chomsky and Halle's *Sound Pattern of English* (1968) has been the chief reference book for anyone trying to introduce a new phonological theory. This volume was part of a gigantic project whose aim was to cover the whole range of linguistic phenomena. The concept of Generative Grammar embraced syntax, morphology and phonology and its common feature was the application of rules perceived as tools capable of explaining the nature of linguistic data by deriving actual language from the so-called deep structure. These rules, which lay at the heart of the system, were simultaneously its destruction as it was possible to invent vast numbers of rules necessary to explain every single linguistic phenomenon. This was contrary to the idea of restrictiveness, which should ideally accompany any scientific theory. As the dissatisfaction with the model's inability to restrict itself kept growing, alternative solutions were sought, research continued and a handful of new systems, none of which turned out to be fully satisfactory, appeared in all fields of grammar.

Government Phonology (Kaye, Lowenstamm and Vergnaud – KLV – (1990), Kaye (1990), Charette (1990), Harris (1994)) is a new, highly restrictive, phonological theory of representations which makes a break with all derivational models and views phonological phenomena as stemming directly from a limited number of universal principles and language-specific parameters. The division into phonetic and phonological representations has been abandoned in favour of one non-linear phonological representation, and the distinctive features defining a given segment have given way to melodic primes called **elements** which are endowed with fully autonomous phonetic interpretability. The notions of **government** and **licensing**, borrowed from syntax, have been employed to depict the relations between the levels of representation.

In this paper we will recall the most salient concepts of Government Phonology (**GP**) and consider briefly this theory's main differences from two other frameworks currently functioning in the field of phonology, namely CV-Theory, a branch of GP, and Optimality Theory.

The Theory of Government

What seems to be the chief advantage of Government Phonology is its attempt to depart from arbitrariness. This pertains mainly to the organization of sounds into syllabic constituents and, further, into words. Two concepts functioning in GP deserve special attention: **government** and **licensing**. Government is understood as a binary and asymmetric relation holding between two skeletal positions. Before such a relation can be established, however, the following conditions must be met:

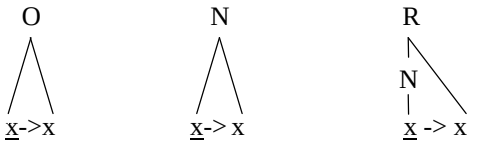
1) STRICT LOCALITY CONDITION (KLV 1990)
The governor must be adjacent to the governee at the P_0 projection, i.e. the projection containing every skeletal point.

2) STRICT DIRECTIONALITY CONDITION (KLV 1990)
Directionality of government at the skeletal level is universal and not subject to parametric variation:
- constituent government is head-initial
- inter-constituent government is head-final.

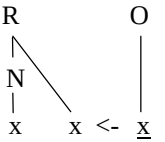
What results from these two conditions ensuring the universal locality and directionality of government is the **Binarity Theorem** which states that all constituents are maximally binary. All these fundamental statements guarantee that government always operates on two adjacent skeletal positions, either within a constituent or between constituents. GP allows for three syllabic constituents universally present in syllabic inventories: Onset, Rhyme and Nucleus, all of which may be either branching or not. Thus, the possible governing relations are as follows:

3)

a. constituent



b. inter-constituent



(->) government; governors are underlined

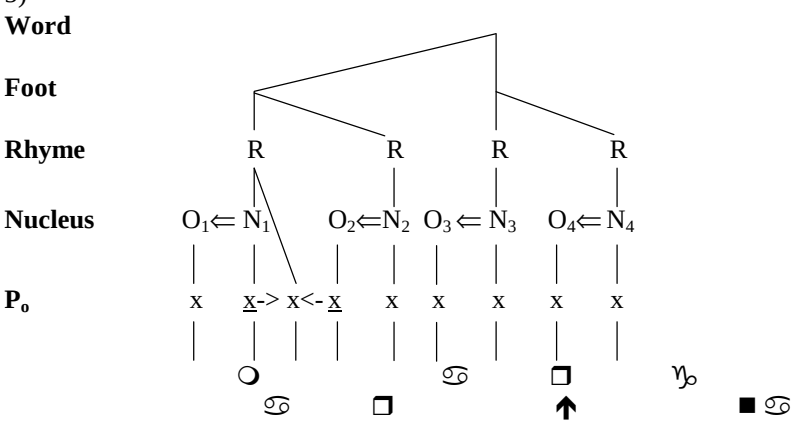
Neither the syllable, frequently exceeding binarity and violating the locality condition, nor the coda, not being a head-initial governing domain in its maximal expansion, can be treated as constituents. Part of the rhyme which is not the nucleus is called the rhymal complement.

Now let us turn to phonological licensing. It is assumed that each unit within a phonological representation must belong to some higher unit: skeletal positions are part of a syllabic constituent, these form a foot, and feet constitute a word. Moreover, each unit in the representation must be allowed to exist by some other unit. Licensing is the mechanism by which that permission is granted. This is formalized as follows:

4) THE LICENSING PRINCIPLE (Harris 1994:156)
Within a domain, all phonological units must be licensed save one, the head of that domain.

Thus, the unlicensed head of the domain (the nucleus bearing primary stress) transmits the licensing potential to the feet, rhymes and nuclei, which finally license (⇐) the preceding onsets. Consider the following example from Polish:

5)



In the Polish word [✹❍♋❒♑♋'❒🡅■♋] – ‘margarine’ the nucleus (N_3) bearing primary stress is the unlicensed head of the whole phonological domain and the main licenser. At the same time it is the head of the rightmost foot. The nucleus (N_1) bearing secondary stress is the head of the leftmost foot receiving licensing at the level of the foot projection. The unstressed nuclei (N_2) and (N_4) are licensed at a yet lower level, i.e. the rhyme projection. This example clearly shows that the level at which a nucleus is licensed depends on the distribution of stress.

There are two types of licensing: **prosodic** and **autosegmental**. The first type, often called **p-licensing**, is responsible for the distribution of licensing

potential from the top licenser to the lower levels of representation, namely through feet and rhymes to nuclei and onsets. The other type, also called **a-licensing**, determines the quality of the melodic component attached to skeletal positions. Thus, p-licensing has a direct impact on a-licensing and, subsequently, on the structure of segments in various contexts. This is formulated below:

6) LICENSING INHERITANCE PRINCIPLE (Harris 1994:206)
A prosodically licensed position inherits its autosegmental licensing potential from its licenser.

This principle is directly related to the theory of **elements**. In GP all phonological segments are viewed as combinations of phonological primes called elements. These are both acoustic and articulatory objects which can be pronounced in isolation. The following elements are presently accepted by many phonologists as indispensable:

7)

A	– coronality	**@**	– velarity	**N**	– nasality
I	– palatality		– stopness	**H**	– high tone
U	– labiality	**h**	– noise	**L**	– low tone

The three resonance elements – **I**, **A**, **U** represent the vowels [], [], [] when pronounced in isolation. They can also combine to form complex vowels, e.g. (**A**, **I**) – [] and (**A**, **U**) – []. **@** is realized as schwa []. The rest, except for tonal elements in some contexts or in tone languages, appear in consonants only. Thus, the typical fortis consonant [] is a fully voiceless (**H**) labial (**U**) stop () characterized by a noise burst (**h**). This happens in languages with fully voiceless stops (e.g. English). Its lenis counterpart [] lacks the element (**H**). In languages with fully voiced stops [] contains (**L**), while [] lacks this tonal component (e.g. Polish).

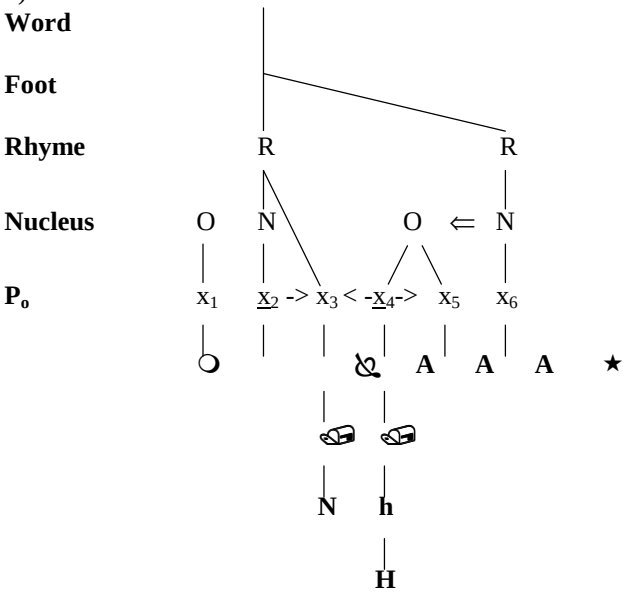
Moreover, the theory of elements is enhanced by the notion of **headedness**. Specifically, some elements in a phonological segment are viewed as more important than others. For instance, the compound (**A**, **U**) can be interpreted in at least two ways: when the element **A** is the **head** and **U** is the **operator**, the resulting vowel is [], and when **U** is the head, the vowel is []. The same refers to (**I**, **A**) which can be realized either as [], with **I** as the head, or as [], with **A** in command. Not all expressions are regarded as headed, though. For instance, English long vowels are thought to be headed, whereas short vowels are headless expressions.

Apart from the theoretical assumption that government operates on the skeletal level, the element structure of segments confirms the governing relations on the melodic level. The strength of segments is expressed in terms of element complexity. In branching onsets the governing segments are more complex than their governees, e.g. *bl*, *tr*, *pj*, whose elements structures are (**U**, **h**,

,) vs. (**A**,), (**A**, **h**, , **H**) vs. (**A**), and (**U**, **h**, , **H**) vs. (**I**), respectively. In general, obstruents are governors, whereas sonorants and glides are governees. Long vowels also obey these principles in the way that the governing positions contain melody and the governed slots serve as harbours for element spreading. In diphthongs the leftmost part is a more complex vowel than its neighbour. Coda-onset sequences are mirror images of branching onsets in that the segment attached to the onset is more complex than the expression under the rhymal complement.

Let us see what influence on the a-licensing potential of segments in the word [is exerted by Licensing Inheritance.

8)



The position (x_2) is the head of the rhyme, of the foot and of the whole word. As the head of the leftmost rhyme (x_2) governs (->) its own rhymal complement (x_3) at the P_o projection and, as the head of the foot, it licenses the nucleus (x_6) on the rhyme projection. (x_6), in turn, licenses (⇐) the preceding onset head position (x_4) to govern (->) the right-hand onset slot (x_5). This onset head governs both (x_5) and the coda (x_3) and is elementally more complex than these two governed slots. The a-licensing licensing potential of both (x_3) and (x_5) is diluted as a result of being acquired from another position, namely (x_4). It is clear, then, that element complexity depends on the position of the skeletal position in the prosodic hierarchy.

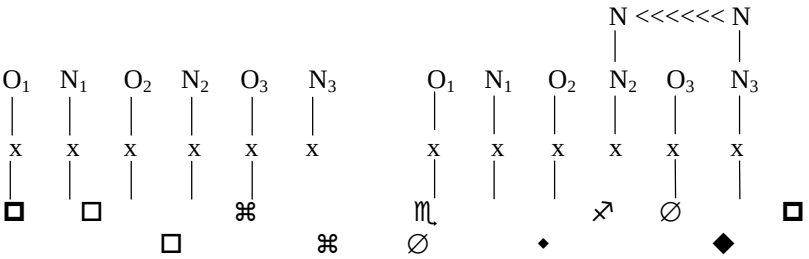
Now let us proceed to **Proper Government** which is a special type of government, and of prosodic licensing, responsible for syncope and vowel-zero

alternations in languages such as Polish, French, Arabic, and many others. Proper Government is a relation between an underlyingly empty nucleus and the following realized vowel. Proper Government is closely related to the following principle:

9) EMPTY CATEGORY PRINCIPLE (Kaye 1990:313)
A properly governed position receives no phonetic interpretation.

This principle states that, in languages which have Proper Government, an underlyingly empty nucleus may be mute if it is followed by a realized nucleus in the posterior syllable. This is illustrated by an example from Polish:

10) a. b.



pozew [□□⌘ℳ↗] – 'summons' *pozwu* [□□⌘◆◆] – 'summons' – gen. sg.

In (10b) the empty nucleus (N_2) is uninterpreted phonetically as it is properly governed (<<<) by the realized nucleus (N_3). In (10a) the nucleus (N_2) is pronounced as [ℳ] because the following nucleus (N_3), being empty, cannot properly govern. Moreover, the labial fricative is associated with the onset position (O_3) both in (10a) and (10b). In (10a) the spirant occurs word-finally and is voiceless with the structure (**U**, **h**), while in (10b) it is followed by a full vowel and it is voiced (**U**, **h**, **L**). The domain-final empty nucleus (N_3) in (10a) is too weak to license the element (**L**) in the preceding onset (O_3) and the spirant is lenited. On the other hand, the nucleus (N_3) in (10b) is a full vowel and its p-licensing potential is stronger, which means that the a-licensing potential of (O_3) is also greater.

There are two reasons why the fricative in (10a) is treated as an onset. Firstly, it is assumed that a word-final consonant is always syllabified as the onset of the following syllable. This is predicted by:

11) CODA LICENSING PRINCIPLE (Kaye 1990:311)
Post nuclear rhymal position must be licensed by a following onset.

In the above principle the word 'coda' means a rhymal complement which is not a syllabic constituent but part of the rhyme. According to (11) if a consonant is word-final, it is associated with the onset position and followed by a domain-

final empty nucleus. If there are two consonants at the end of a word, they can be syllabified in at least two ways. When the leftmost segment is more complex than its neighbour (e.g. -tr), we are dealing with a branching onset preceding an empty nucleus. If the rightmost consonant is more complex (e.g. -rt), then it must be a coda-onset sequence, again followed by an empty nucleus. Secondly, GP assumes that throughout a phonological derivation segments cannot change their subjection to constituents. This means that onsets must remain onsets and rhymal complements must remain within rhymes, which is determined by another principle:

12) PROJECTION PRINCIPLE (KLV 1990:221)
Governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation.

This principle precludes any kind of resyllabification and ensures that the syllabic structure of a given lexical item does not change.

Another interesting thing about licensing is the concept of 'magic licensing' (Kaye 1992). In GP this notion is used to explain the presence of [♦] in front of branching onsets, e.g. *strive* [♦♦❒♋✋❖], *split* [♦□●✋♦]. According to the binarity theorem, constituents cannot contain more than two slots and the cases just mentioned are problematic. Since [♦] is not part of the onset, it must belong to the preceding syllable whose nucleus is phonetically absent. The idea comes from a comparison made on different languages. For example, in Italian the word *stadio* 'stadium' begins with the spirant [♦], while in Spanish there is a vowel preceding the fricative and the word appears as *estadio*.

Certain phonological phenomena and processes which occur in some languages but are absent from others are parameterized in GP. This means that some languages allow them whereas others do not. From among the most important parameters we may select:

- licensing of domain final empty nuclei
- branching *versus* non-branching constituents
- combinations of elements

Different languages choose different solutions in these respects. Therefore, languages such as Polish, Irish, French and English license domain final empty nuclei, which means that a word may end in a consonant in these languages. Thus, the final-empty-nucleus parameter is *ON* there. On the other hand, Zulu and Telugu do not license final empty nuclei and every word in these languages must end in a vowel, i.e. the parameter is *OFF*. Furthermore, onsets can branch in English but not in Arabic, nuclei branch in Yawelmani but not in Polish, rhymes branch in German but not in Zulu. The restrictions on combinations of elements refer mainly to the possibility of combining **I** and **U** in one vocalic segment. German and French allow such a fusion whereas Polish, Irish and

English do not. This is the reason why the front mid [ö] and high [ü] rounded vowels cannot occur in the latter group of languages. This restriction points to the fact that these two elements operate on the same tier in the phonological representation of some languages and hence they can appear in complementary distribution there.

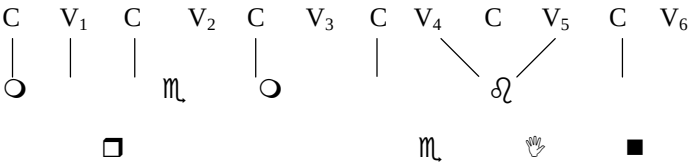
Although this article is devoted mainly to Government Phonology, the reader should be aware that this is by no means the only theory that is popular with linguists nowadays. In the following section we will briefly discuss two other interesting approaches, namely **CV-Theory** and **Optimality Theory**.

CV Theory

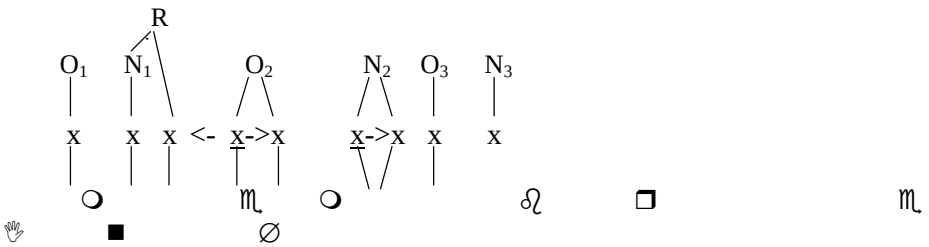
CV-Theory (Lowenstamm 1996) was originally meant to be a refinement of Government Phonology and, despite considerable differences, it may still be treated as a sub-branch of GP. Having analyzed a number of languages, Lowenstamm makes a radical claim that syllable structure universally reduces to CV, that is a consonant-vowel sequence. Therefore in languages in which long vowels, diphthongs, geminates, and consonant clusters occur, a considerable number of empty positions must be recognized. Consider two representations of the English word ‘membrane’ from the viewpoint of CV-Theory in (13a) and according to standard GP in (13b):

13)

a.



b.



In (13b) we can see constituent government (->) in (O_2) and (N_2) as well as inter-constituent government (<-) between the leftmost slot in (O_2) and the

preceding rhymal complement. In (13a) the nucleus (V_3) may be unrealized as it is properly governed by (V_4), but (V_2) cannot be governed by the empty (V_3). The fact that (V_2) is not properly governed does not mean that CV-Theory has problems with explaining phonological facts; it simply has to employ different tools to account for them. In this case the notion of **Interonset Government** (Kaye 1990, Gussmann and Kaye 1993) another type of government present in standard GP, can be used. Interonset Government is a governing relation between two consecutive onsets which may license an intervening empty nucleus to remain unpronounced. Therefore, CV-Theory is more restrictive than standard GP and offers different universal generalizations as far as how the syllable is organized, but the mechanisms used by this approach are not much different and equally effective.

Optimality Theory

When we turn to Optimality Theory (Prince and Smolensky 1993), a most recent development of Generative Phonology, we see that this framework offers yet another approach to universality in phonology, namely a theory of language-specific interactions of universal grammatical constraints. These constraints are filters through which the phonetic output is obtained. The central idea of the theory is that surface forms of a given language reflect resolutions of conflicts between competing constraints. Few of these constraints are ever satisfied as what matters is the order in which they function in a given language. A surface form, the only form that really matters, is 'optimal' if it violates the fewest universal constraints. For example, let us apply two typical constraints to the Polish word *kod* [&□♦] – 'code':

14)

A. *VOICED-CODA: *Obstruents must not be voiced in coda position.*
B. IDENT-INPUT/OUTPUT (voice): *The specification for the feature [voice] of an input segment must be preserved in the output.*

Since in Polish word-final obstruents are always voiceless, Constraint **A** is satisfied in this case, while **B** is violated because the phonological input would be /kod/. Thus **A** is ranked higher than **B** in Polish. It goes without saying that usually issues more serious than word-final devoicing are considered and a greater number of constraints are involved, but the above example shows how the system works. The GP explanation of this problem would be that domain-final empty nuclei in Polish are simply too weak to license the element (**L**) responsible for full voicedness in the preceding onset (see (10a) above).

Conclusion

Over the past two decades new theories have been appearing and the nature of phonological studies and the problems these approaches face have slightly changed. Generative Phonology was based on rules linking the abstract phonological representation with the phonetic representation. Government Phonology offers one non-linear representation which is fully interpretable in both phonetic and phonological terms. Optimality Theory attaches importance to the ranking of universal constraints in particular languages and pays no attention to the phonological input. What these two theories have in common is that there is no division into the phonological and phonetic level of representation. What matters is the faithfulness to the linguistic data without resorting to too abstract levels of representation. Therefore, what governs phonology nowadays is the problem of how to present actual phonetic facts of language in a coherent, universal and relatively restrictive phonological theory which is as close as possible to the phonetic data.

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